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

JUL 2 0 1953

Mr. P. H. Boether, President
American Copper Company
312 California Building
Stockton, California

Re: Docket No. MM-2922 (Copper)
American Copper Company
Sunset Mine
Pinal County, Arizona

Dear Mr. Boether:

Your application for aid for an exploration project and other reports available to us in Washington referring to your application have been reviewed.

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

Careful study of all our information, although noting a small amount of ore on your property, indicates to us that the probability of disclosing minable ore reserves by your proposed program is not sufficiently promising to justify Government participation. We regret to advise you, under these circumstances, that your application for exploration assistance is denied.

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

Sincerely yours,

C. O. Mittendorf

Administrator

JWAlt/hmj
(7/20/53
CC to: Docket
Adm. R. File
Op. Committee
Region IV (2)
Base Metals Div.
Mr. Kinkel
Mr. Bishop
Mr. Alt.
Chron.

R.C.S. 7-23-53

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

July 20, 1953

Memorandum

To: The Administrator

From: Chief, Base Metals Division

Subject: Denial of Application, Docket No. DMEA-2922, American Copper Company, Sunset Mine, Pinal County, Arizona (Copper)

The final Field Team Report of the above cited application was received by this office on July 6, 1953.

The Applicant proposed to deepen the shaft from the 610-foot level to the 910-foot level, or 300' of shaft sinking, and to do 600 feet of drifting on 4 levels. The Applicant requested $60,214.00 for the exploration work of this project.

This property had previously been denied Government exploration assistance. E. G. Bowman obtained an option to purchase the Sunset mine, and on May 28, 1951, made an application for Government assistance in an exploration project to cost $100,000.00. This application which was denied on August 13, 1951, is known as Docket No. DMA-389X.

On October 10, 1952, the American Copper Co. obtained an option on the property, and on February 16, 1953, filed an application for Government assistance in an exploration project to cost $60,214.00.

The Field Team examining engineer believes that further sinking and drifting at greater depth is not warranted and that the property is a poor gold mine containing a little copper. It is also their opinion that there is no geologic evidence that a secondarily enriched copper ore body, such as Applicant states, exists.

We concur with the Field Team and the Commodity members of the USGS and the USBM that this application be denied.

W. R. Griswold

W. R. Griswold

Attachments

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

July 20, 1953

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From: Chief, Base Metals Division

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W. R. Griswold

W. R. Griswold

Attachments

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J.W. Alt

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

July 20, 1953

Memorandum

To: The Administrator

From: Chief, Base Metals Division

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On October 10, 1952, the American Copper Co. obtained an option on the property, and on February 16, 1953, filed an application for Government assistance in an exploration project to cost $60,214.00.

The Field Team examining engineer believes that further sinking and drifting at greater depth is not warranted and that the property is a poor gold mine containing a little copper. It is also their opinion that there is no geologic evidence that a secondarily enriched copper ore body, such as Applicant states, exists.

We concur with the Field Team and the Commodity members of the USGS and the USBM that this application be denied.

W. R. Griswold

W. R. Griswold

Attachments
JWAlt/hmj
(7/20/53)
CC to: Docket
Op. Committee
Base Metals
Chron

R.C.G. 7-23-53

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

Bureau Mines Administration
RECEIVED
JUL 10 1953

July 10, 1953

7/14/53. Received by DMEA.

Memorandum

To: W. R. Griswold, DMEA

From: C. H. Johnson, Bureau of Mines

Subject: DMEA-2922 (Copper), American Copper Company, Sunset Mine, Pinal County, Arizona

I have reviewed the Field Team report on this property and concur in the recommended denial of the application.

C. H. Johnson

C. H. Johnson

Copy to - Minerals Division
Mr. Kinkel, GSA, B-242-A
C. H. Johnson
Files

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

JUL 10 1953

July 10, 1953

Memorandum

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From: C. H. Johnson, Bureau of Mines

Subject: DMEA-2922 (Copper), American Copper Company, Sunset Mine, Pinal County, Arizona

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C. H. Johnson

C. H. Johnson

CHJohnson:ks

Copy to - Minerals Division
Mr. Kinkel, GSA, B-242-A
C. H. Johnson
Files

IN REPLY REFER TO:

ALK

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

July 7, 1953

Memorandum

Re: DMEA-2922
Sunset mine, Pinal County, Arizona
Gold, Copper
$60,214.00

To: Mr. E. Wm. Ellis

From: A. R. Kinkel, Jr.

Subject: Denial of application

I concur with the field team in recommending a denial for the subject application, for reasons given by the field team.

A R Kinkel Jr

A. R. Kinkel, Jr.

IN REPLY REFER TO:

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

July 7, 1953

Memorandum

Re: DMEA-2922
Sunset mine, Pinal County, Arizona
Gold, Copper
$60,214.00

To: Mr. F. Wm. Ellis

From: A. R. Kinkel, Jr.

Subject: Denial of application

I concur with the field team in recommending a denial for the subject application, for reasons given by the field team.

A. R. Kinkel, Jr.

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

224 New Customhouse
Denver 2, Colorado

June 26, 1953.

Memorandum

To: Secretary to the Operating Committee, Defense Minerals Exploration Administration.

From: Field Team, Region IV

Subject: Final Report, DMEA Docket 2922 (Copper), American Copper Company, Sunset Mine, Pinal County, Arizona.

Enclosed are the original and three copies of the report pertaining to the above application.

The field examiners concur in the belief that exploration at greater depth on this property is not warranted.

We recommend that the application in the amount of $60,214.00 be denied.

W. H. King
W. H. King

A. H. Koschmann
A. H. Koschmann

Enclosures

Reviewed by
DMEA OPERATING COMMITTEE
7-6-53
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

June 26, 1953.

Mining Division
Region IV

Memorandum

To: Field Team, Region IV

From: Chief, Mining Division, Region IV

Subject: Final Report, DMEA Docket 2522 (Copper), American Copper Company, Sunset Mine, Pinal County, Arizona.

Enclosed are nine copies of the final engineering report on the subject docket.

The applicant requested $60,214.00 to sink the shaft another 300 feet and some drifting.

The examining engineer believes that further sinking and drifting at greater depth is not warranted and that the property is a poor gold mine containing a little copper. He recommends that the application be denied and we concur in this recommendation.

W. H. King
W. H. King

Enclosures

Reviewed by
DMEA OPERATING COMMITTEE
7-6-53
(date)

DMEA DIVISION
REGION IV

June 10, 1953

Memorandum

To : [illegible], Chief, Mining Division, Region IV

From : Chief, Mining Branch [illegible], Mining Div., Region IV

Subject : Report on Contact [illegible], American Copper Co., Cancel Copper Mine, Mineral [illegible], Mineral County, Nevada.

Enclosed are original and 3 copies of the section on summary, conclusions and recommendations by [illegible] and [illegible] Hayes of the Bureau of Mines and [illegible] of the Geological Survey, and the section on Engineering by Fleming and Hayes. A separate section on Geology will be submitted by the Geological Survey.

As the property has been primarily a gold producer instead of a copper mine, and as there seems little chance of discovering significant amounts of copper ore, the examiners recommend that no exploration loan be denied. I concur with their recommendations.

Maps are will be returned to you by the Geological Survey.

Walter R. Storms

Walter R. Storms

cc [illegible] (10)
[illegible]
[illegible]

[illegible]:mrj

Reviewed by
DMEA OPERATING COMMITTEE
7-6-53
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.
200 New Customhouse
Denver 2, Colorado

June 22, 1953

Memorandum

To: DMEA Field Team, Region IV

From: A. H. Koschmann

Subject: DMEA Docket 2/22, American Copper Company, Sunset Mine, Pinal County, Arizona

Enclosed is the original and eight copies of the geological report by Raymond F. Robinson of the U. S. Geological Survey covering the above docket.

It has been recommended that the loan be denied.

E. M. Haeshman
for A. H. Koschmann
Supervising Geologist
Colorado-Wyoming

Enclosures (9)

Reviewed by
DMEA OPERATING COMMITTEE
7-6-53
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
P.O. Box 1126, University Station
Tucson, Arizona

June 19, 1953

Memorandum

To: [illegible], Denver, Colorado

From: Raymond F. [illegible], Tucson, Arizona

Subject: [illegible] 1272, Lone Star Copper Company, Sunset Mine, Pinal County, Arizona

Enclosed with this memorandum is the original and eight copies of the geological report on the subject docket.

The writer is of the opinion that the applicant should be denied a [illegible] exploration loan because there is no geologic evidence that a secondarily enriched copper ore body, such as he postulates in his application, exists. Also, the principal metallic mineralization on the structure he proposes to explore is gold. The gold values do not appear to be significant.

Raymond F. Robinson

Raymond F. Robinson
Acting District Supervisor
Arizona-New Mexico

Enclosures 9

Reviewed by
DMEA OPERATING COMMITTEE
7-6-53
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION IV

DMEA-2922, American Copper Company's Sunset Copper Mine

Mineral Hill District, Pinal County, Arizona

M. J. Kleing, Consulting Mining Engineer
U. S. Bureau of Mines

J. F. Haynes, Mining Engineer
U. S. Bureau of Mines

R. F. Robinson, Geologist
U. S. Geological Survey

June 1953

Reviewed by
DMEA OPERATING COMMITTEE
7-6-53
(date)

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

A. J. Alsing, J. F. Haynes[1/], and R. F. Robinson[2/][3/]

On April 9, 1953, the Field Team, Region IV, of the Defense Minerals Exploration Administration requested that a report be made on the application of the American Copper Co., F. H. Soether, president, for Government assistance in an exploration project at the Sunset Mine, Mineral Hill district, Pinal County, Ariz. The applicant estimated that the project would cost $60,214. It was given the docket number DMEA-2922 (Copper).

A. J. Alsing and J. F. Haynes of the U. S. Bureau of Mines and R. F. Robinson of the Geological Survey spent May 19, 1953 in an examination of the underground workings and surface showings at the Sunset mine.

The property is most easily reached by travelling east on the Florence Junction-Superior highway (U. S. Highway 60-70) for 3 miles from Florence Junction where a turn is made to the South on a country road. It is then 9 miles to the mine over a good desert road.

The Sunset vein dips at 25° and 35° to the northeast. The vein is a breccia vein in schist and is from 1 to 4 feet wide. It is tight, dense and compact, and highly siliceous. It is iron stained and also contains some malachite staining. Nearly 2,500 tons of ore have been mined and smelted at Hayden and Superior, Ariz.

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

The average grade of the ore was less than one percent copper, but nearly one-half ounce of gold. The gold value of the ore was approximately 4 times that of the copper. The mine is a poor gold mine containing a little copper. There is practically no evidence to lead to the belief that the presently accessible showings represent the gossan above secondarily enriched copper ore, or high-grade primary ore.

The present stope openings show that the oreshoots will be small in length and from 1 to 4 feet in thickness. Therefore, the cost of mining will be high. It is almost certain that the tonnage produced did not pay the cost of mining, transportation, and smelting. If exploration and development costs are added, the loss would be substantial on the production that was made from 1932 to 1942.

Because it is believed that further sinking and drifting at greater depth on the Sunset vein will not disclose copper ore that will aid in the Defense Effort, it is recommended that the application of the American Copper Co., P. R. Beether, president, for Government aid in an exploration project costing $60,214, or any lesser sum, be denied.

[illegible]
[illegible]
[illegible]
[illegible] 2922

[illegible]

Geology

By
Raymond F. [illegible]
Geologist, U. S. Geological Survey

SUNSET MINE
[illegible]
PERRY COUNTY, ARKANSAS
IM A 2922

COPY B

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Figure 1 Geological and sample map of the Sunset mine workings Following page 1

Figure 2 Surface map of a portion of the Sunset mine showing veins and sample values Following page 2

GEOLOGICAL REPORT

The Sunset mine is located on the Sunset vein which is one of several veins or vein structures in the immediate area. They have been classed as fissure veins and occur in the Pinal schist which is the only country rock in the district.

On the footwall of the Sunset mine workings the Pinal is a fine-grained, thinly foliated, brown weathering micaceous schist. It strikes generally to the vein structure and dips to the west 35 degrees. East-westerly undulations suggest gentle east-westerly folding has taken place in the past and this observation is borne out by exposures along the surface outcrops to the north end of the property. The hanging wall of the workings consists of thick blocky schist which is brecciated to a strong degree near the vein structure. It is suggested that the contrast of the wall rocks is due to relative fault displacement along the vein structure.

The Sunset Vein structure is intermittently exposed on the surface along a series of open cuts and bare outcrops for a distance of 1000 feet along its strike (Figure 1). It is also exposed in underground workings in an inclined shaft 610 feet deep and drifts from it as shown on figure 2. The workings are now accessible for inspection down to 80 feet below the 210 level which is the top of the present water level in the mine.

The Sunset "vein" is not a true vein but rather a highly chloritized brecciated zone which may have been a basic dike originally.

The structure exhibits strongly marked smooth walls. The dark green and red soft gouggy breccia stands in sharp contrast to the brown rusty schist of the walls. Breccia fragments consist of well rounded pieces of schist which are covered by a thin red hematite coating. The structure strikes north 25° west, dips 35-45 degrees northeast and exhibits a constant appearance throughout its extent on strike and dip. Widths vary from one to five feet but the average width of the stoped areas is close to three feet.

Strike faulting along the main structure has been the most marked structural disturbance in the mine area and this is evidenced by the brecciated material in the "vein" described above and also by the shattering and brecciation of the hanging wall which extends at least fifteen feet from the drifts on the main structure. There is no way to determine the amount of movement which has taken place.

After strike faulting, a series of cross faults offset the main structure four to five feet. These faults seen in the mine workings are shown on figure 2. They strike east-west, northwest-southeast, or southwest-northeast, but they all dip 43-53 degrees southwesterly and have right throw displacements.

A footwall fault zone parallel to the main structure was disclosed in one crosscut and short drift on the 210 level as shown in figure 2. All the structure was not investigated at any other place or any other level in spite of the fact that it contains more evidence of copper mineralization than any other now visible in the mine.

The type of ore mineralization of the Sunset "vein" is not megascopically apparent in the mine workings. According to the mine records of production, gold values predominated. Actually, the tight gouggy filling of the fault structure looks relatively impermeable and it seems probable that it was never well mineralized in the mine area.

At the outcrop the fault filling material is covered by a thin limonitic coating which decreases down the dip of the workings. Traces of malachite could be seen in a few places in the mine workings and, as mentioned above, it was most abundant on a minor, little exposed parallel fault in the footwall of the Sunset "vein". Wherever the malachite occurs, it is near cross fault intersections with the Sunset structure. These intersections may have been instrumental in localizing ore values along the vein.

Neither pyrite or chalcopyrite were observed in the fault filling and there is no evidence that any soluble minerals have been leached from the structure at any place. There is a definite lack of gossan although oxidation of the wall rocks is evident by strong rusty stains throughout the mine. On the 310 Level the green gouggy filling stands in contrast to the rusty stained walls. Since there is no evidence of a source for copper in the vein, there is no evidence that any secondary enrichment of copper has taken place below. Specular hematite is the only metallic mineral identified megascopically in the fault filling and it occurs in fine-grained, granular mixture with chlorite. The brecciated hanging wall contains large amounts of crystalline specularite together with rare narrow quartz and calcite stringers. Evidences of "slouging" in the hanging wall at several places

suggests that some fair gold values may have been found in the specularite-quartz-calcite stringers.

The Stanley vein, as shown on Figure 1, strikes north 47° west and dips 82-83 degrees northeast. It has the appearance of a replacement vein in a strongly brecciated zone. It is not exposed in the presently accessible mine openings, although a vein which was cut in a long crosscut driven northwest from the 210 level (now under water) may be the Stanley vein. See Figure 2. It lay about 160 feet northeast of the Sunset structure. At the surface it is exposed intermittently by small cuts, pits, two short tunnels, and several outcrops over a distance of about 750 feet.

In contrast to the Sunset "vein", the Stanley vein consists of three to five feet of hard porous siliceous vein matter containing brecciated fragments of wall rock and a great deal of disseminated specularite. Within the vein are a few scattered lenses of rusty cellular pseudomorphs containing some malachite, and also cellular porous lenses of malachite and silica. These vary in size from a few inches to [illegible] in width and from a few inches to a few feet in length. In relative volume they are insignificant. Magnetite was observed in an outcrop and rendered a transit compass useless. Like the Sunset structure the walls of the vein are marked by sharp shear planes.

At the north end of the property as shown on Figure 1 the Sunset structure and Stanley Vein either make a structural junction or a linking vein is present between the two. The low copper content of the veins on the property did not warrant an investigation extensive

enough to work this problem out, however it is structurally a favorable area for mineralization. In vein x in this area, as noted in figure 1, chalcopyrite was seen to cover with specularite. It was not seen at any other place, although it seems rather probable that the malachite along the Stanley vein was derived from similar mineral.

Sampling

Several samples were taken to determine the value of vein material at several points which are indicated on figures 1 and 2, and the values are as follows:

			Au	Ag	Cu %	
1.	(12814)	16"	0.03	0.7	0.15	Grab of underhand stope mainly hangingwall of vein - much specularite
2.	(12815)	2.0'	.02	0.7	0.15	Miller sample - mined ore grade
3.	(12816)	4.7' [illegible]	.02	0.2	0.05	Grab of drift under stoped portion
4.	(12817)	2.1' [illegible]	.28	0.2	0.28	Mineralized dusty green brecciated portion [illegible] line as (3) on HW side
5.	(12818)	5.1'	.12	.15	0.30	Sample of "vein" at surface near inclined shaft
6.	(12819)	3.0' Tom FW	.03	.3	0.22	Sunset vein at outcrop on hill south of shaft
7.	(12820)	1.[illegible]'	.01	0.15	.30	Stanley vein
8.	(12821)	4.3'	.01	.2	.37	Stanley vein on top of saddle 400' N 60° [illegible] of inclined shaft collar
9.	(12822)	Grab	.02	.45	3.37	Malachite lens in vein

Discussion of the applicant's objective for exploration

The applicant proposes to find below the water table an enriched copper zone on the Sunset "vein". The copper which formed the said zone he believes came from the Sunset vein by leaching of copper sulfide minerals in the usually familiarly postulated manner. There is no evidence of this leaching in the mine workings or the outcrop and no evidence that amounts of copper sulfides ever existed in the vein in quantities sufficient to form an enriched zone of even a small size.

The water table where the applicant feels he will find the secondarily enriched zone is at present above the 310 level and mine exploration has been conducted down to the 610 level without finding such a zone. Even if the outcrop indicated the possibility of an enriched zone, it is not known where the water table was at the time the leaching and deposition took place. There is no information on it available in the area. The only vein on which there may be a very small amount of copper enrichment nearplace, the Stanley vein, is not and has not been considered for exploration by the applicant.

The conclusion is reached that either the applicant's reasoning is faulty because of ignorance of geological concepts and mining procedures or he is trying to explore the mine for its gold potentialities under the guise of searching for copper.

CONCLUSION

The Sunset Mine workings are or what must be classified as a gold bearing structure with negligible copper mineralization.

There is some doubt that the applicant is sincerely interested in a copper prospect and some possibility that gold is the principle attraction to him. According to sample assays it cannot even be classed as a good gold mine.

The Stanley vein is the only vein on the property bearing appreciable amounts of copper mineralization and it is not likely to develop into an ore producing structure. It has not been proposed for exploration.

It is recommended that the loan application be denied because there is no geological indication that a copper ore body will be found on the mineralized structures on the property.

BMEA-2922, AMERICAN COPPER COMPANY'S SUNSET COPPER MINE
MINERAL HILL DISTRICT, PINAL COUNTY, ARIZONA

Engineering Report

By M. J. Elsing, Consulting Mining Engineer
U. S. Bureau of Mines

J. F. Haynes, Mining Engineer
U. S. Bureau of Mines

JUNE 1953

BMEA-2922, AMERICAN COPPER COMPANY'S SUNSET COPPER MINE
MINERAL HILL DISTRICT, PINAL COUNTY, ARIZONA

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INTRODUCTION

On April 9, 1953, the Field Team, Region IV, of the Defense Minerals Exploration Administration requested that a report be made on the application of the American Copper Co. for Government assistance in an exploration project at the Sunset Mine, Mineral Hill District, Pinal County, Ariz. The applicant estimated the cost of the project to be $60,214.

The project has been given the number, DMEA-2922 (Copper).

A. J. Kleing and J. F. Haynes, in company with R. F. Robinson of the U. S. Geological Survey, spent May 19, 1953 in an examination of the underground workings and surface showings at the Sunset mine.

ACKNOWLEDGMENTS

Acknowledgments are due to F. H. Boether who accompanied the examiners to the property and contributed whatever information regarding the property that he could.

LOCATION, TOPOGRAPHY AND PHYSICAL FEATURES

The Sunset property is situated in T. 3 S., R. 11 E. in the Mineral Hill mining district, Pinal County, Ariz. (see figure 1). From the mine it is 5 miles in a southerly direction to Price, a station on the Arizona Eastern Railroad. The best road to the property is from the north. It can be most easily reached by travelling east on the Florence Junction-Superior Highway (U. S. Highway 60-70) for 3 miles from Florence Junction where a turn is made to the south on a county road. It is then 9 miles to the mine over a good desert road.

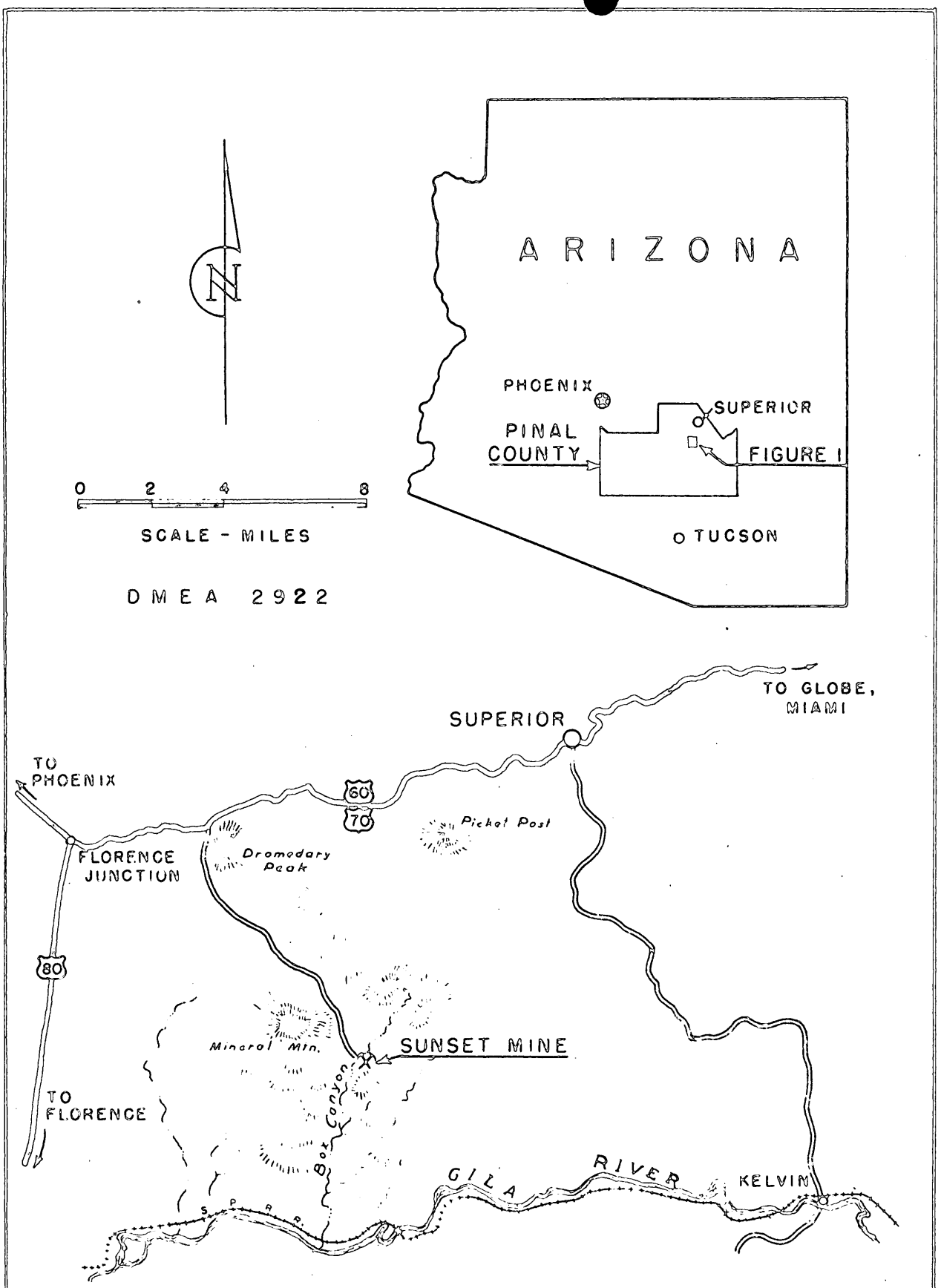

FIGURE 1. - LOCATION MAP - SUNSET MINE
PINAL COUNTY, ARIZONA

The topography in the immediate vicinity of the mine is of the rolling hills type, rough in spots but not rugged. The vegetation is typical of the Arizona desert with elevations of between 2,000 and 3,000 feet.

HISTORY AND PRODUCTION

The early history of the mine is not available. Several Bureau of Mines engineers have examined it since 1942. It seems that the first recorded production was in 1939 and operations continued until some time in 1942. The production for this period is shown below:

Production Sunset Mine

Year	Ore, tons	Copper, percent	Gold, ounces	Silver, ounces	Returns
1939	251	0.56	0.487	0.76	$2,530.30
1940	769	.44	.530	..60	8,793.73
1941	486	.60	.540	.67	5,410.72
1942	182	1.39	.224	.73	815.33
	1,688	0.60	0.494	0.66	$17,550.08

Another statement regarding production at the Sunset shows that from 1939 to 1942, 2,447 tons were produced with the following results:

	Tons	Gold, ounces	Silver, ounces	Copper, percent	Net value per ton*
1939-41	1,534	0.46	0.60	0.40	$9.88
1942	913	.217	.73	1.88	6.33
	2,447	0.37	0.65	0.95	$8.55

*Net proceeds after deducting freight and smelting, etc.

It is quite apparent from information on file in the office of the Bureau of Mines that the Sunset Mining Co., which owns this property was not operating profitably and that the company was seeking

Government assistance, beginning some time in 1942. An attempt was made to get the Bureau of Mines to do some diamond drilling and an application also was made for a loan from the Reconstruction Finance Corporation, both without success.

In 1942 the shaft was only 310 feet deep. By July 1944, enough money had been raised to sink the shaft to a depth of 610 feet and to do a little drifting on the 400 and 500 levels. The 310-foot level crosscut also was driven sufficiently far to intersect the Stanley vein, but no minable ore was found.

E. C. Bowman obtained an option to purchase the Sunset mine, and on May 28, 1951, made an application for Government assistance in an exploration project to cost $100,000. This application, which was denied, is known as Docket No. DMA-389X.

On October 10, 1952, the American Copper Co. obtained an option on the property and under date of February 16, 1953, filed an application for Government assistance in an exploration project to cost $60,214 (Docket DMEA-2923).

OWNERSHIP AND EXTENT

The property consists of 8 full-sized, unpatented lode mining claims of record in the County Recorder's office at Florence, Pinal County, Ariz. in the book and on the page herewith shown:

Claim	Book	Page No.
Sunset No. 5	47	620
Sunset No. 6	47	621
Sunset No. 7	47	621
Sunset No. 8	47	622
Sunset No. 9	47	622
Sunset No. 10	47	623
Sunset No. 11	47	623

The applicant was unable to provide the book and page number of the Callback claim.

The property is owned by the Sunset Mining Co., a California corporation of which W. O. Kay is president. Kay is also a part-owner of this group of claims. The option agreement to Soether is signed by Kay as president and by Kay as an individual.

Soether has assigned his option to the American Copper Co. and has provided a copy of the acceptance of this assignment, signed by the American Copper Co. Should it be decided to approve an exploration loan, it will be necessary to obtain a subordination agreement from the Sunset Mining Co. and also a similar agreement from Kay, as part owner.

Attached to the docket there is a copy of the option agreement between Soether, and the Sunset Mining Co., and Kay.

DESCRIPTION OF DEPOSIT

The Sunset vein has a strike a little west of north and dips to the northeast at 25° to 35°. It varies in width from 1 to 4 feet. It is in Pinal schist and can be traced on the surface for more than 1,500 feet. The shaft follows the vein to a depth of 610 feet (see figure 2). The most important level is at 310 feet

from the cellar. Some steping has been done above this level. Production has been 2,447 tons which was smelted at Hayden and Superior, Ariz. The grade of the ore averaged slightly less than 1 percent copper and nearly one-half ounce gold with a little silver.

The vein is strongly brecciated and silicified, and iron is present mostly as a stain. The ore is reported to have been used at the smelter as a siliceous flux. Copper is present mainly as a malachite-chrysocolla stain. Water stands at a point above the 110-foot level. In the accessible workings the vein filling was dense, tight and compact. The vein does not show evidence that could be interpreted as its being the capping of a secondary deposit of copper or that additional depth might disclose high-grade primary copper ore.

Some 300 feet to the east of the Sunset vein there is a parallel vein called the Stanley vein. In places on the surface this veins shows some evidence of copper mineralization, but not in sufficient strength to warrant exploration in depth. A drift on the 110-foot level is reported to have intersected the Stanley vein which was barren.

MINABLE ORE RESERVES

It is quite apparent there are no minable copper ore reserves above the water level. L. G. Bowen, the applicant in the original application DMA-389A, stated that there is "no blocked out ore, but several faces on which to work in ore".

The American Copper Co., the present applicant, stated "there are no ore reserves or current production".

PRESENT STATUS

Exploration and Development

The property has been developed by an inclined shaft with a dip of from 25° to 35°, to a depth of 610 feet. There are 8 levels and intermediate levels, comprising a total of 1,555 feet of drifting and crosscutting as follows:

Level	Footage
70	380
90	60
140	135
170	75
210	310
310	560
400	20
500	15
Total	1,555

In addition to the above, there are numerous raises and stope openings which are reported to haveproduced some 2,447 tons of ore.

The applicant lists the mine equipment as follows:

1	Sullivan compressor	$3,700
4	Mine cars	240
1	Stoper	250
5	Sullivan jackhammers	350
1	Ford truck	1,250
2	Portable pumps	300
1	Ventilation blower	100
	Ventilation tubing	300
	Portable tools	100
	Drill steel, pipe, hose, rails	1,200
	Timber and lumber	600
		$8,390

Most of this equipment is in poor condition.

PROJECT PROPOSALS

The applicant proposes to deepen the shaft from the 610-foot level to the 910-foot level, or 300 feet, and to do 600 feet of drifting on 4 levels with approximately 75 feet of work on the 500, 600, 725 and 850 levels.

The applicant has submitted a revised estimate of the total cost of sinking, including capital investments on a footage basis as follows:

Break-down of Shaft Sinking Cost

(Size of Shaft 8 Feet by 10 Feet)

	Per foot
Labor	$59.50
Insurance	10.50
Explosives	7.50
Timber	7.30
Rail, pipe, ventube	2.70
Compressed air, steel and fuel	5.50
Hoisting and fuel	1.50
Engineering, assaying, consulting	2.00
Superintendent	4.00
Contingencies	3.50
Total	$104.00

The applicant stated that it would be willing to sink the shaft, supply all equipment, install it, and do all the necessary things in connection with preparing the shaft for sinking on the basis of a total price of $100 per foot, including unwatering and current pumping. It also stated that it would do the drifting at $35 per foot.

The applicant did not present any definite plan for surface exploration and therefore the cost of the present project includes only 300 feet of shaft sinking at $100 per foot and 600 feet of drifting at $35 per foot, or a total of $51,000.

The cost estimates of the applicant are very reasonable but it is doubtful that it could do the work at those figures. There is considerable water in the mine and pumping will be an item which it has not adequately provided for. It also has underestimated the cost of the equipment necessary for work at the proposed depths.

CONCLUSIONS

The water has risen in the shaft to a point above the 310 level, therefore no inspection could be made of that level. An inspection was made of each level above the water level. All drifts and crosscuts above water level were open and in good condition.

The vein strikes a little to the west of north and dips at 25° to 35° to the northeast. There are numerous small stopes on the levels above the 210-foot level. The largest stope is between the 210 and 310 levels. It stands open and was seen from the 210 level. It is about 45 feet long, from 1 to 4 feet wide and extends from the 310 level to a little above the 210 level. Water could be seen in the bottom of the stope.

Production records of the Sunset mine show that the value of the gold content of the ore was 4 times as great as that of the copper. While it is true that the 1942 production showed higher grade copper and lower grade gold than any previous year, it cannot be argued that copper was increasing with depth. Since the method of mining was overhand stoping the first ore mined on any level was the deepest ore on that level. There is no visual evidence that copper is increasing with depth and it is not believed that the

record of production should be used to prove or disprove this fact. Without more evidence it is believed that it is best to say that the past production indicates that the mine is a gold mine containing some copper. Most smelter schedules deduct at least 10 pounds of copper as a slag and stack loss and in the case of the Sunset this would mean that probably a considerable part of its production showed no pay for copper.

The returns from the 2,447 tons of ore shipped and smelted probably were insufficient to pay the extraction and treatment charges. Present day costs are nearly 3 times those of the 1939-42 period and the loss today on this ore would be much greater.

No appreciable part of the Sunset vein has the usual characteristics of the typical gossan of a secondary copper deposit or of a high-grade primary deposit.

RECOMMENDATIONS

Because it is believed that further sinking and drifting at greater depth on the Sunset vein will not disclose copper ore that will aid in the defense effort, it is recommended that the application of the American Copper Co., F. H. Boether, President, for Government aid in an exploration project costing $60,214, or any lesser sum, be denied.

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

224 New Customhouse
Denver 2, Colorado

June 26, 1953.

Memorandum

To: Secretary to the Operating Committee, Defense Minerals Exploration Administration.

From: Field Team, Region IV

Subject: Final Report, DMEA Docket 2322 (Copper), American Copper Company, Sunset Mine, Pinal County, Arizona.

Enclosed are the original and three copies of the report pertaining to the above application.

The field examiners concur in the belief that exploration at greater depth on this property is not warranted.

We recommend that the application in the amount of $60,214.00 be denied.

W. H. King
W. H. King

A. N. Koechmann
A. N. Koechmann

WHK.

Enclosures

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

June 26, 1953.

Mining Division
Region IV

Memorandum

To: Field Team, Region IV

From: Chief, Mining Division, Region IV

Subject: Final Report, RFCA Docket 2922 (Copper), American Copper Company, Sunset Mine, Pinal County, Arizona.

Enclosed are nine copies of the final engineering report on the subject docket.

The applicant requested $60,214.00 to sink the shaft another 300 feet and some drifting.

The examining engineer believes that further sinking and drifting at greater depth is not warranted and that the property is a poor gold mine containing a little copper. He recommends that the application be denied and we concur in this recommendation.

W. H. King

W. H. King

Enclosures

MINING DIVISION
REGION IV

June 10, 1953

Memorandum

To : W. M. King, Chief, Mining Division, Region IV

From : Chief, Mining Methods Br., Mining Div., Region IV

Subject : Report on Docket DMEA-2922, American Copper Co.'s Sunset Copper Mine, Mineral Hill District, Pinal County, Ariz.

Enclosed are original and 8 copies of the section on Summary, Conclusions and Recommendations by M. J. Elsing and J. F. Haynes of the Bureau of Mines and R. F. Robinson of the Geological Survey, and the section on Engineering by Elsing and Haynes. A separate section on Geology will be submitted by the Geological Survey.

As the property has been primarily a gold producer instead of a copper mine, and as there seems little chance of discovering significant amounts of copper ore, the examiners recommend that an exploration loan be denied. I concur with their recommendations.

Brochure will be returned to you by the Geological Survey.

Walter R. Storms

Walter R. Storms

CC W. M. King (8)
DMEA-2922
DF

WRStorms:frj

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.
200 New Customhouse
Denver 2, Colorado

June 22, 1953

Memorandum

To: DMEA Field Team, Region IV

From: A. H. Koschmann

Subject: DMEA Docket 2922, American Copper Company, Sunset Mine, Pinal County, Arizona

Enclosed is the original and eight copies of the geological report by Raymond F. Robinson of the U. S. Geological Survey covering the above docket.

It has been recommended that the loan be denied.

E. N. Harshman
for A. H. Koschmann
Supervising Geologist
Colorado-Wyoming

Enclosures (9)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
P.O. Box 4126, University Station
Tucson 5, Arizona

June 10, 1953

Memorandum

To: A. H. Koschmann, Denver, Colorado

From: Raymond F. Robinson, Tucson, Arizona

Subject: M. A. 2922, American Copper Company, Sunset Mine, Pinal County, Arizona

Included with this memorandum are the original and eight copies of the geological report on the subject docket.

The writer is of the opinion that the applicant should be denied a DMT exploration loan because there is no geologic evidence that a secondarily enriched copper ore body, such as he postulates in his application, exists. Also, the principle metallic mineralization on the structure which he proposes to explore is gold. The gold values do not appear to be significant.

Raymond F. Robinson

Raymond F. Robinson
Acting District Supervisor
Arizona-New Mexico

Enclosures 9

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION IV

7/21/53

DMEA-2922, American Copper Company's Sunset Copper Mine

Mineral Hill District, Pinal County, Arizona

M. J. Elsing, Consulting Mining Engineer
U. S. Bureau of Mines

J. F. Haynes, Mining Engineer
U. S. Bureau of Mines

R. F. Robinson, Geologist
U. S. Geological Survey

June 1953

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

M. J. Elsing[1], J. F. Haynes[2], and R. F. Robinson[3]

On April 9, 1953, the Field Team, Region IV, of the Defense Minerals Exploration Administration requested that a report be made on the application of the American Copper Co., P. H. Boether, president, for Government assistance in an exploration project at the Sunset Mine, Mineral Hill district, Pinal County, Ariz. The applicant estimated that the project would cost $60,214. It was given the docket number DMEA-2922 (Copper).

M. J. Elsing and J. F. Haynes of the U. S. Bureau of Mines and R. F. Robinson of the Geological Survey spent May 19, 1953 in an examination of the underground workings and surface showings at the Sunset mine.

The property is most easily reached by travelling east on the Florence Junction-Superior highway (U. S. Highway 60-70) for 3 miles from Florence Junction where a turn is made to the south on a country road. It is then 9 miles to the mine over a good desert road.

The Sunset vein dips at 25° and 35° to the northeast. The vein is a breccia vein in schist and is from 1 to 4 feet wide. It is tight, dense and compact, and highly siliceous. It is iron stained and also contains some malachite staining. Nearly 2,500 tons of ore have been mined and smelted at Hayden and Superior, Ariz.

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

The average grade of the ore was less than one percent copper, but nearly one-half ounce of gold. The gold value of the ore was approximately 4 times that of the copper. The mine is a poor gold mine containing a little copper. There is practically no evidence to lead to the belief that the presently accessible showings represent the gossan above secondarily enriched copper ore, or high-grade primary ore.

The present stope openings show that the oreshoots will be small in length and from 1 to 4 feet in thickness. Therefore, the cost of mining will be high. It is almost certain that the tonnage produced did not pay the cost of mining, transportation, and smelting. If exploration and development costs are added, the loss would be substantial on the production that was made from 1932 to 1942.

Because it is believed that further sinking and drifting at greater depth on the Sunset vein will not disclose copper ore that will aid in the Defense Effort, it is recommended that the application of the American Copper Co., P. H. Boether, president, for Government aid in an exploration project costing $60,214, or any lesser sum, be denied.

SUNSET MINE
AMERICAN COPPER COMPANY
PINAL COUNTY, ARIZONA
DMEA 2922

COPPER

Geology

By
Raymond F. Robinson
Geologist, U. S. Geological Survey

SUNSET MINE
AMERICAN COPPER COMPANY
PINAL COUNTY, ARIZONA
DMEA 2922

COPPER

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Figure 1 Geological and sample map of the Sunset mine workings Following Page 1

Figure 2 Surface map of a portion of the Sunset mine showing veins and sample values Following Page 2

GEOLOGICAL REPORT

The Sunset mine is located on the Sunset Vein which is one of several veins or vein structures in the immediate area. They have been classed as fissure veins and occur in the Pinal schist which is the only country rock in the district.

On the footwall of the Sunset mine workings the Pinal is a fine-grained, thinly foliated, brown weathering micaceous schist. It strikes parallel to the vein structure and dips to the west 35 degrees. East-westerly undulations suggest gentle east-westerly folding has taken place in the past and this observation is born out by exposures along the surface outcrops to the north end of the property. The hangingwall of the workings consists of thick blocky schist which is brecciated to a strong degree near the vein structure. It is suggested that the contrast of the wall rocks is due to relative fault displacement along the vein structure.

The Sunset Vein structure is intermittently exposed on the surface along a series of open cuts and bare outcrops for a distance of 1000 feet along its strike (Figure 1). It is also exposed in underground workings in an inclined shaft 610 feet deep and drifts from it as shown on figure 2. The workings are now accessible for inspection down to 80 feet below the 210 level which is the top of the present water level in the mine.

The Sunset "vein" is not a true vein but rather a highly chloritized brecciated zone which may have been a basic dike originally.

The structure exhibits strongly marked smooth walls. The dark green and red soft gougey breccia stands in sharp contrast to the brown rusty schist of the walls. Breccia fragments consist of well rounded pieces of schist which are covered by a thin red hematite coating. The structure strikes north 25° west, dips 35-45 degrees northeast and exhibits a constant appearance throughout its extent on strike and dip. Widths vary from one to five feet but the average width of the stoped areas is close to three feet.

Strike faulting along the main structure has been the most marked structural disturbance in the mine area and this is evidenced by the brecciated material in the "vein" described above and also by the shattering and brecciation of the hangingwall which extends at least fifteen feet from the drifts on the main structure. There is no way to determine the amount of movement which has taken place.

After strike faulting, a series of cross faults offset the main structure four to five feet. These faults seen in the mine workings are shown on figure 2. They strike east-west, northwest-southeast, or southwest-northeast, but they all dip 43-53 degrees southwesterly and have right throw displacements.

A footwall fault zone parallel to the main structure was disclosed in one crosscut and short drift on the 210 level as shown in figure 2. All the structure was not investigated at any other place or any other level in spite of the fact that it contains more evidence of copper mineralization than any other now visable in the mine.

The type of ore mineralization of the Sunset "vein" is not megascopically apparent in the mine workings. According to the mine records of production, gold values predominated. Actually, the tight gougey filling of the fault structure looks relatively impermeable and it seems probable that it was never well mineralized in the mine area.

At the outcrop the fault filling material is covered by a thin limonitic coating which decreases down the dip of the workings. Traces of malachite could be seen in a few places in the mine workings and, as mentioned above, it was most abundant on a minor, little exposed parallel fault in the footwall of the Sunset "vein". Wherever the malachite occurs, it is near cross fault intersections with the Sunset structure. These intersections may have been instrumental in localizing ore values along the vein.

Neither pyrite or chalcopyrite were observed in the fault filling and there is no evidence that any soluble minerals have been leached from the structure at any place. There is a definite lack of gossan although oxidation of the wall rocks is evident by strong rusty stains throughout the mine. On the 310 level the green gougey filling stands in contrast to the rusty stained walls. Since there is no evidence of a source for copper in the vein, there is no evidence that any secondary enrichment of copper has taken place below. Specular hematite is the only metallic mineral identified megascopically in the fault filling and it occurs in fine-grained, granular mixture with chlorite. The brecciated hangingwall contains large amounts of crystalline specularite together with numerous narrow quartz and calcite stringers. Evidences of "gouging" in the hangingwall at several places

suggests that some fair gold values may have been found in the specularite-quartz-calcite stringers.

The Stanley vein, as shown on figure 1, strikes North 47° west and dips 35-53 degrees northeast. It has the appearance of a replacement vein in a strongly brecciated zone. It is not exposed in the presently accessible mine openings, although a vein which was cut in a long crosscut driven northwest from the 310 level (now under water) may be the Stanley vein. See figure 2. It lay about 460 feet northeast of the Sunset structure. At the surface it is exposed intermittently by shallow cuts, pits, two short tunnels, and several outcrops over a distance of about 750 feet.

In contrast to the Sunset "vein", the Stanley vein consists of three to five feet of hard porous siliceous vein matter containing brecciated fragments of wall rock and a great deal of disseminated specularite. Within the vein are a few scattered lenses of rusty cellular gossan containing some malachite, and also cellular porous lenses of malachite and silica. They vary in size from a few inches to a foot in width and from a few inches to a few feet in length. In relative volume they are insignificant. Magnetite was observed in one outcrop and rendered a brunton compass useless. Like the Sunset structure the walls of the vein are marked by sharp shear planes.

At the north end of the property as shown on figure 1 the Sunset structure and Stanley Vein either make a structural junction or a linking vein is present between the two. The low copper content of the veins on the property did not warrant an investigation extensive

enough to work this problem out, however it is structurally a favorable area for mineralization. In vein x in this area, as noted in figure 1, chalcopyrite was seen together with specularite. It was not seen at any other place, although it seems rather probable that the malachite along the Stanley vein was derived from similar mineral.

Sampling

Several samples were taken to determine the value of vein material at several points which are indicated on figures 1 and 2, and the values are as follows:

			Au	Ag	Cu %	
1.	(12814)	16"	0.03	0.2	0.15	Grab of underhand stope mainly hangingwall of vein - much specularite
2.	(12815)	2.0'	.02	0.2	0.15	Pillar sample - mined ore grade
3.	(12816)	4.7' FW	.02	0.2	0.05	Back of drift under stoped portion
4.	(12817)	2.1' HW	.28	0.2	0.28	Oxidized dusty green brecciated portion Some line as (3) on HW side
5.	(12818)	5.1'	.12	.45	0.30	Sample of "vein" at surface near inclined shaft
6.	(12819)	3.0' Ton FW	.03	.3	0.22	Sunset vein at outcrop on hill south of shaft
7.	(12820)	1.5'	.01	0.15	.30	Stanley vein
8.	(12821)	4.3'	.01	.2	.37	Stanley vein on top of saddle 400' N 60° E of inclined shaft collar
9.	(12822)	Grab	.02	.45	3.37	Malachite lens in vein

Discussion of the applicant's objective for exploration

The applicant proposes to find below the water table an enriched copper zone on the Sunset "vein". The copper which formed the said zone he believes came from the Sunset vein by leaching of copper sulfide minerals in the usually familiarly postulated manner. There is no evidence of this leaching in the mine workings or the outcrop and no evidence that amounts of copper sulfides ever existed in the vein in quantities sufficient to form an enriched zone of even a small size.

The water table where the applicant feels he will find the secondarily enriched zone is at present above the 310 level and mine exploration has been conducted down to the 610 level without finding such a zone. Even if the outcrop indicated the possibility of an enriched zone, it is not known where the water table was at the time the leaching and deposition took place. There is no information on it available in the area. The only vein on which there may be a very small amount of copper enrichment someplace, the Stanley vein, is not and has not been considered for exploration by the applicant.

The conclusion is reached that either the applicant's reasoning is faulty because of ignorance of geological concepts and mining procedures or he is trying to explore the mine for its gold potentialities under the guise of searching for copper.

CONCLUSION

The Sunset Mine workings are on what must be classified as a gold bearing structure with negligible copper mineralization.

There is some doubt that the applicant is sincerely interested in a copper prospect and some possibility that gold is the principle attraction to him. According to sample assays it cannot even be classed as a good gold mine.

The Stanley vein is the only vein on the property bearing appreciable amounts of copper mineralization and it is not likely to develop into an ore producing structure. It has not been proposed for exploration.

It is recommended that the loan application be denied because there is no geological indication that a copper ore body will be found on the mineralized structures on the property.

DMEA-2922, AMERICAN COPPER COMPANY'S SUNSET COPPER MINE
MINERAL HILL DISTRICT, PINAL COUNTY, ARIZONA

Engineering Report

By M. J. Elsing, Consulting Mining Engineer
U. S. Bureau of Mines

J. F. Haynes, Mining Engineer
U. S. Bureau of Mines

JUNE 1953

DMEA-2922, AMERICAN COPPER COMPANY'S SUNSET COPPER MINE
MINERAL HILL DISTRICT, PINAL COUNTY, ARIZONA

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INTRODUCTION

On April 9, 1953, the Field Team, Region IV, of the Defense Minerals Exploration Administration requested that a report be made on the application of the American Copper Co. for Government assistance in an exploration project at the Sunset Mine, Mineral Hill District, Pinal County, Ariz. The applicant estimated the cost of the project to be $60,214.

The project has been given the number, DMEA-2922 (Copper).

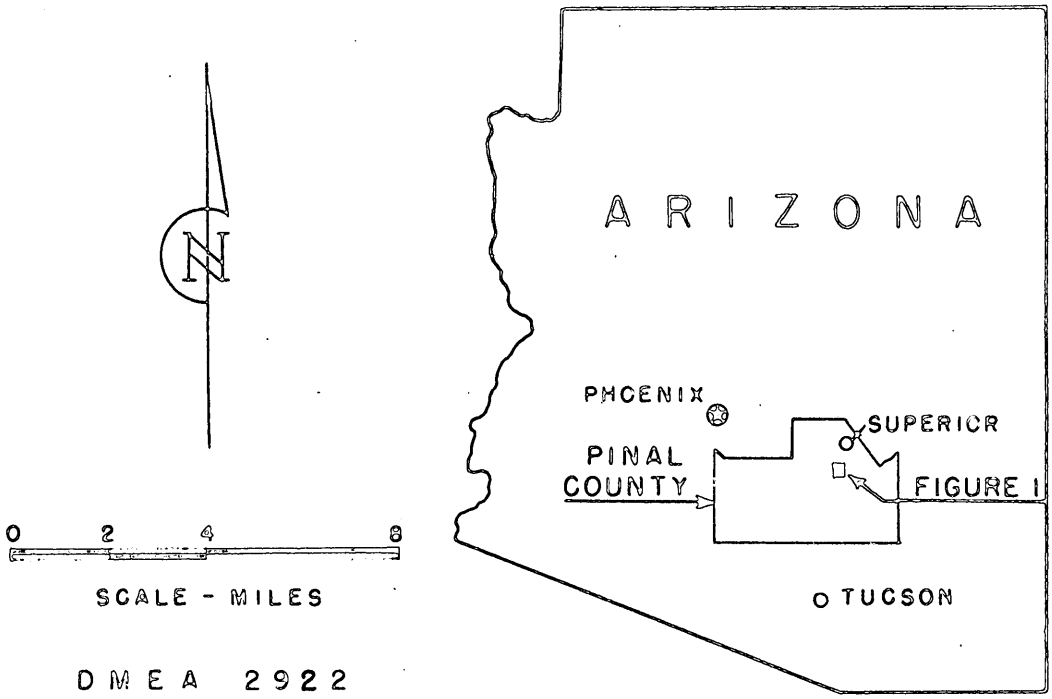
M. J. Elsing and J. F. Haynes, in company with R. F. Robinson of the U. S. Geological Survey, spent May 19, 1953 in an examination of the underground workings and surface showings at the Sunset mine.

ACKNOWLEDGMENTS

Acknowledgments are due to P. H. Boether who accompanied the examiners to the property and contributed whatever information regarding the property that he could.

LOCATION, TOPOGRAPHY AND PHYSICAL FEATURES

The Sunset property is situated in T. 3 S., R. 11 E. in the Mineral Hill mining district, Pinal County, Ariz. (see figure 1). From the mine it is 5 miles in a southerly direction to Price, a station on the Arizona Eastern Railroad. The best road to the property is from the north. It can be most easily reached by travelling east on the Florence Junction-Superior highway (U. S. Highway 60-70) for 3 miles from Florence Junction where a turn is made to the south on a county road. It is then 9 miles to the mine over a good desert road.



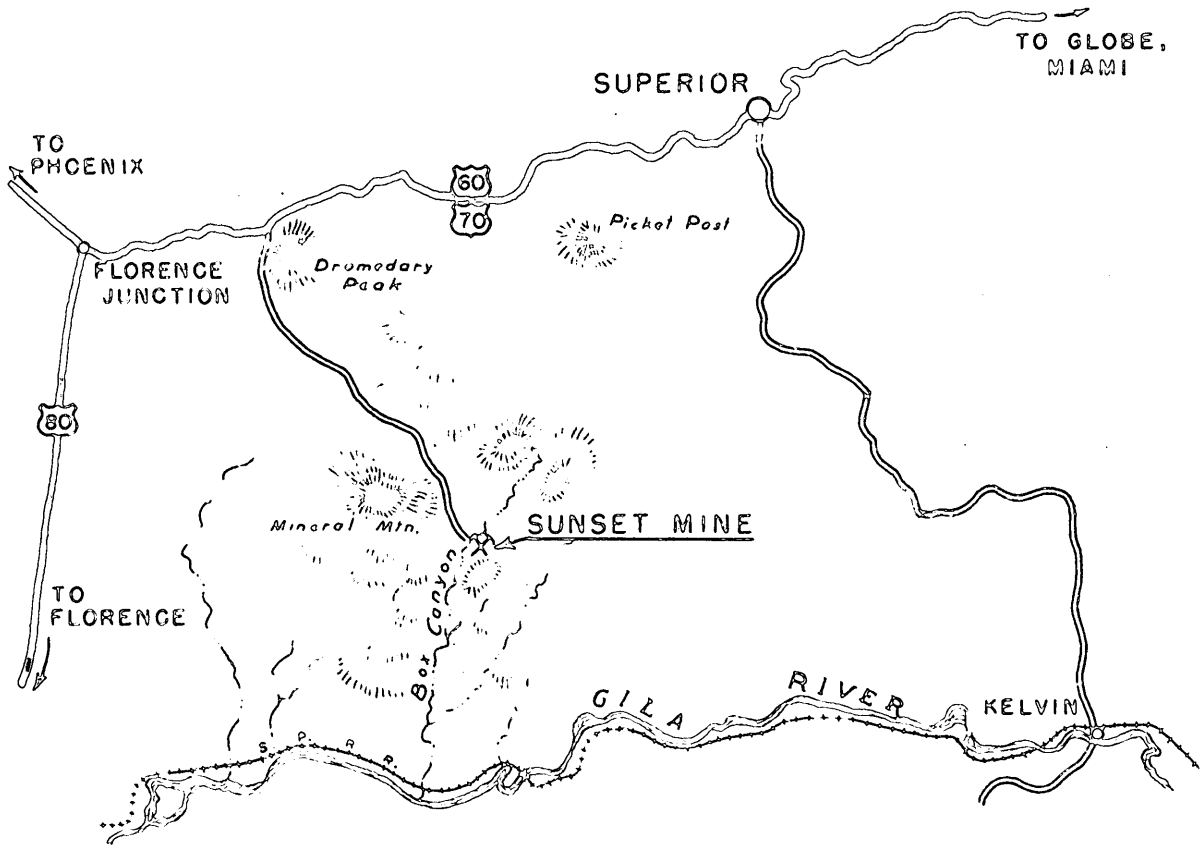


FIGURE 1. - LOCATION MAP - SUNSET MINE
PINAL COUNTY, ARIZONA

The topography in the immediate vicinity of the mine is of the rolling hills type, rough in spots but not rugged. The vegetation is typical of the Arizona desert with elevations of between 2,000 and 3,000 feet.

HISTORY AND PRODUCTION

The early history of the mine is not available. Several Bureau of Mines engineers have examined it since 1942. It seems that the first recorded production was in 1939 and operations continued until some time in 1942. The production for this period is shown below:

Production Sunset Mine

Year	Ore, tons	Copper, percent	Gold, ounces	Silver, ounces	Returns
1939	251	0.56	0.487	0.76	$2,530.30
1940	769	.44	.530	..60	8,793.73
1941	486	.60	.540	.67	5,410.72
1942	182	1.39	.224	.73	815.33
	1,688	0.60	0.494	0.66	$17,550.08

Another statement regarding production at the Sunset shows that from 1939 to 1942, 2,447 tons were produced with the following results:

	Tons	Gold, ounces	Silver, ounces	Copper, percent	Net value per ton*
1939-41	1,534	0.46	0.60	0.40	$9.88
1942	913	.217	.73	1.88	6.33
	2,447	0.37	0.65	0.95	$8.55

*Net proceeds after deducting freight and smelting, etc.

It is quite apparent from information on file in the office of the Bureau of Mines that the Sunset Mining Co., which owns this property was not operating profitably and that the company was seeking

Government assistance, beginning some time in 1942. An attempt was made to get the Bureau of Mines to do some diamond drilling and an application also was made for a loan from the Reconstruction Finance Corporation, both without success.

In 1942 the shaft was only 310 feet deep. By July 1944, enough money had been raised to sink the shaft to a depth of 610 feet and to do a little drifting on the 400 and 500 levels. The 310-foot level crosscut also was driven sufficiently far to intersect the Stanley vein, but no minable ore was found.

E. G. Bowman obtained an option to purchase the Sunset mine, and on May 28, 1951, made an application for Government assistance in an exploration project to cost $100,000. This application, which was denied, is known as Docket No. DMA-389X.

On October 10, 1952, the American Copper Co. obtained an option on the property and under date of February 16, 1953, filed an application for Government assistance in an exploration project to cost $60,214 (Docket DMEA-2922).

OWNERSHIP AND EXTENT

The property consists of 8 full-sized, unpatented lode mining claims of record in the County Recorder's office at Florence, Pinal County, Ariz. in the book and on the page herewith shown:

Claim	Book	Page No.
Sunset No. 5	47	620
Sunset No. 6	47	621
Sunset No. 7	47	621
Sunset No. 8	47	622
Sunset No. 9	47	622
Sunset No. 10	47	623
Sunset No. 11	47	623

The applicant was unable to provide the book and page number of the Callback claim.

The property is owned by the Sunset Mining Co., a California corporation of which W. O. Kay is president. Kay is also a part-owner of this group of claims. The option agreement to Boether is signed by Kay as president and by Kay as an individual.

Boether has assigned his option to the American Copper Co. and has provided a copy of the acceptance of this assignment, signed by the American Copper Co. Should it be decided to approve an exploration loan, it will be necessary to obtain a subordination agreement from the Sunset Mining Co. and also a similar agreement from Kay, as part owner.

Attached to the docket there is a copy of the option agreement between Boether, and the Sunset Mining Co., and Kay.

DESCRIPTION OF DEPOSIT

The Sunset vein has a strike a little west of north and dips to the northeast at 25° to 35°. It varies in width from 1 to 4 feet. It is in Pinal schist and can be traced on the surface for more than 1,500 feet. The shaft follows the vein to a depth of 610 feet (see figure 2). The most important level is at 310 feet

from the collar. Some stoping has been done above this level. Production has been 2,447 tons which was smelted at Hayden and Superior, Ariz. The grade of the ore averaged slightly less than 1 percent copper and nearly one-half ounce gold with a little silver.

The vein is strongly brecciated and silicified, and iron is present mostly as a stain. The ore is reported to have been used at the smelter as a siliceous flux. Copper is present mainly as a malachite-chrysocolla stain. Water stands at a point above the 310-foot level. In the accessible workings the vein filling was dense, tight and compact. The vein does not show evidence that could be interpreted as its being the capping of a secondary deposit of copper or that additional depth might disclose high-grade primary copper ore.

Some 300 feet to the east of the Sunset vein there is a parallel vein called the Stanley vein. In places on the surface this veins shows some evidence of copper mineralization, but not in sufficient strength to warrant exploration in depth. A drift on the 310-foot level is reported to have intersected the Stanley vein which was barren.

MINABLE ORE RESERVES

It is quite apparent there are no minable copper ore reserves above the water level. E. G. Bowen, the applicant in the original application DMA-389X, stated that there is "no blocked out ore, but several faces on which to work in ore".

The American Copper Co., the present applicant, stated "there are no ore reserves or current production".

PRESENT STATUS

Exploration and Development

The property has been developed by an inclined shaft with a dip of from 25° to 35°, to a depth of 610 feet. There are 8 levels and intermediate levels, comprising a total of 1,555 feet of drifting and crosscutting as follows:

Level	Footage
70	380
90	60
140	135
170	75
210	310
310	560
400	20
500	15
Total	1,555

In addition to the above, there are numerous raises and stope openings which are reported to haveproduced some 2,447 tons of ore.

The applicant lists the mine equipment as follows:

1	Sullivan compressor	$3,700
4	Mine cars	240
1	Stoper	250
5	Sullivan jackhammers	350
1	Ford truck	1,250
2	Portable pumps	300
1	Ventilation blower	100
	Ventilation tubing	300
	Portable tools	100
	Drill steel, pipe, hose, rails	1,200
	Timber and lumber	600
		$8,390

Most of this equipment is in poor condition.

PROJECT PROPOSALS

The applicant proposes to deepen the shaft from the 610-foot level to the 910-foot level, or 300 feet, and to do 600 feet of drifting on 4 levels with approximately 75 feet of work on the 500, 600, 725 and 850 levels.

The applicant has submitted a revised estimate of the total cost of sinking, including capital investments on a footage basis as follows:

Break-down of Shaft Sinking Cost

(Size of Shaft 8 Feet by 10 Feet)

	Per foot
Labor	$59.50
Insurance	10.50
Explosives	7.50
Timber	7.30
Rail, pipe, ventube	2.70
Compressed air, steel and fuel	5.50
Hoisting and fuel	1.50
Engineering, assaying, consulting	2.00
Superintendent	4.00
Contingencies	3.50
Total	$104.00

The applicant stated that it would be willing to sink the shaft, supply all equipment, install it, and do all the necessary things in connection with preparing the shaft for sinking on the basis of a total price of $100 per foot, including unwatering and current pumping. It also stated that it would do the drifting at $35 per foot.

The applicant did not present any definite plan for surface exploration and therefore the cost of the present project includes only 300 feet of shaft sinking at $100 per foot and 600 feet of drifting at $35 per foot, or a total of $51,000.

The cost estimates of the applicant are very reasonable but it is doubtful that it could do the work at those figures. There is considerable water in the mine and pumping will be an item which it has not adequately provided for. It also has underestimated the cost of the equipment necessary for work at the proposed depths.

CONCLUSIONS

The water has risen in the shaft to a point above the 310 level, therefore no inspection could be made of that level. An inspection was made of each level above the water level. All drifts and crosscuts above water level were open and in good condition.

The vein strikes a little to the west of north and dips at 25° to 35° to the northeast. There are numerous small stopes on the levels above the 210-foot level. The largest stope is between the 210 and 310 levels. It stands open and was seen from the 210 level. It is about 45 feet long, from 1 to 4 feet wide and extends from the 310 level to a little above the 210 level. Water could be seen in the bottom of the stope.

Production records of the Sunset mine show that the value of the gold content of the ore was 4 times as great as that of the copper. While it is true that the 1942 production showed higher grade copper and lower grade gold than any previous year, it cannot be argued that copper was increasing with depth. Since the method of mining was overhand stoping the first ore mined on any level was the deepest ore on that level. There is no visual evidence that copper is increasing with depth and it is not believed that the

record of production should be used to prove or disprove this fact. Without more evidence it is believed that it is best to say that the past production indicates that the mine is a gold mine containing some copper. Most smelter schedules deduct at least 10 pounds of copper as a slag and stack loss and in the case of the Sunset this would mean that probably a considerable part of its production showed no pay for copper.

The returns from the 2,447 tons of ore shipped and smelted probably were insufficient to pay the extraction and treatment charges. Present day costs are nearly 3 times those of the 1939-42 period and the loss today on this ore would be much greater.

No appreciable part of the Sunset vein has the usual characteristics of the typical gossan of a secondary copper deposit or of a high-grade primary deposit.

RECOMMENDATIONS

Because it is believed that further sinking and drifting at greater depth on the Sunset vein will not disclose copper ore that will aid in the Defense Effort, it is recommended that the application of the American Copper Co., P. H. Boether, President, for Government aid in an exploration project costing $60,214, or any lesser sum, be denied.

700
FILE COPY
SURNAME:

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

APR 6 1953

Mr. F. R. Boether, President
American Copper Company
312 California Building
Stockton, California

Re: Docket No. [illegible]A-2922 (Copper)
Sunset Mines
Mineral Hills District
Pinal County, Arizona

Dear Mr. Boether:

The application for assistance in exploring your property in Pinal County, Arizona, under the above captioned docket number, has been reviewed by the Rare and Miscellaneous Metals Division of the Defense Minerals Exploration Administration. Your application has been referred to the Executive Officer of Region IV at the following address:

Mr. [illegible] King
[illegible] Field Team, Region IV
224 New Customhouse Building
Denver 2, Colorado

The Field Team will contact you if they require any additional information.

Sincerely yours,

C. O. Mittendorf (for)
Administrator

4/6/53

FLKnouse/eef
3/31/53

cc to: Adm. Reading File
Docket
Messrs. Ellis
Knouse
Field Team, RegionIV

FILE COPY
SURNAME:

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

APR 6 1953

. . . in
Executive Officer
U.S. Field Office, Region 2
Federal Insurance Building
Denver 2, Colorado

Re: Lease No. [illegible]-2977 (Copper)
American Copper Company
Pilot Lines
Mineral Hills District
Pinal County, Arizona

Dear Mr. King:

We enclose application [illegible] for consent and recommendation or a field examination if you deem it advisable. It is possible that your office has information which indicates justification for a modified exploration program that would be approved by the applicant.

An application on this property was submitted to us, Docket No. [illegible]-389, Consolidated Mining Company, Inc., dated May 2[illegible], 1951, for Government exploration aid. This applicant was denied Government aid by letter addressed to Mr. R. D. Bowen, 391 Grant Avenue, San Francisco 8, California (copy attached). We also attach a copy of the application [illegible]-103, R. D. Bowen - operator. In addition we enclose copies of memoranda from Mr. [illegible] Johnson, dated March 11, 1953 and Mr. [illegible] L. Newcomb, dated March 19, and March 25, 1953, to be considered and covered in the engineer's report to us.

If your office should make a field examination and recommend either the proposed program submitted by the applicant, or an alternate one approved by the Applicant, kindly furnish us the detailed information required to draft a contract. This information should include any property controlled by the Applicant that will benefit from a recommended exploration program. Also submit the required copies signed by the property owners of Form [illegible]-203 "Owner's Consent to Lien" covering any property to be included in the contract that is not owned by the Appli-

cant. No executed "Owner's Consent to Lien" forms were submitted by the Applicant.

In your memorandum dated March 5, 1953, transmitting the application, you indicated you have retained one copy of the application and related data in your office.

Sincerely yours,

George C. Selfridge

(JHB)

Chairman, Operating Committee

Enclosures 5

Approved

J. H. Hodges (JHB)

Member, Bureau of Mines

A. R. Kinkel, Jr. (JHB)

Member, Geological Survey

FLKnouse/eef
4/1/53

cc to: Adm. Reading Files
Docket
Operating Committee
Messrs. CHJohnson, Rm. 3621
ARKinkel, Rm. 4234
Mr. Ellis
Mr. Knouse

J.H.
4/6/53

3/26/53 gla

IN REPLY REFER TO:

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

March 25, 1953

Memorandum

To: Mr. E. Wm. Ellis

From: E. L. Newcomb

Subject: Recommendation for denial

Re: DMEA-2922
Sunset Mine
Mineral Hills District
Pinal County, Arizona
$60,214
Copper

At the time I reviewed this application and prepared my memorandum of March 19, 1953, I was unaware that an earlier application DMA-389X, on the Sunset mine had been denied on August 13, 1951.

The new application does not have any additional information which indicates that exploration assistance on the property is warranted. The reasons for the original denial are still valid and I recommend the new application be denied without referral to the field team.

E. L. Newcomb
E. L. Newcomb
Geologist

IN REPLY REFER TO:

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

March 25, 1953

Memorandum

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Sunset Mine
Mineral Hills District
Pinal County, Arizona
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E. L. Newcomb
Geologist

3/25/53 gla

IN REPLY REFER TO:

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

March 19, 1953

Memorandum

Re: DMEA-2922
Sunset Mine
Mineral Hills District
Pinal County, Arizona
$60,214
Copper

To: Mr. E. Wm. Ellis

From: E. L. Newcomb

Subject: Recommendation for field referral

The applicant requests assistance to explore for a possible zone of secondary enrichment and the sulfide mineralization below this zone. The proposed work involves deepening the present 610-foot inclined shaft for 300 feet and driving about 600 feet of drifts and crosscuts from the deepened shaft.

The Sunset mine has been developed primarily on the prominent Sunset vein structure which strikes northwest and dips about 45° northeastward. The main workings consist of an inclined shaft with levels at 60, 110, 150, 210, and 310 feet. Also, a 425-foot crosscut has been driven eastward on the 310 level to explore for a possible parallel vein. The mine is reported to be accessible down to the 310 level.

The Sunset claims are in pre-Cambrian Pinal schist. Several parallel fissure veins outcrop at the surface which appear to be developed in shear zones parallel to the bedding or schistosity of the host rock.

Most of the past production has been obtained from a small steeply plunging ore shoot in the Sunset vein structure. This ore body is estimated to have been about 30 feet long, 3 feet wide and to have extended at least to the 310 level. Between 1939-1942 about 1700 tons of oxidized ore averaging 0.6 per cent copper, 0.66 oz. silver, and 0.49 oz. gold were produced from this ore body. There has been no production since 1942, and the applicant states that there are no ore reserves. The copper values are low and are largely in secondary minerals in an enriched zone, and there is considerable doubt if the project is justified on the basis of copper.

Although the objective of the exploration may be logical there is the important question of whether the proposed work will be of sufficient depth to reach the target zones. The bottom of the zone of oxidation could be considerably deeper than the depth of the proposed shaft extension, especially if the ground has been severely faulted and sheared. Unless the depth of oxidation can be reasonably

inferred from known data from nearby properties, diamond drilling should be considered to determine the depths of the enriched zone and the sulfide zone.

I recommend the application be referred to the field team for their appraisal and recommendation, particularly on the question of whether this should be considered as a gold mine or a copper mine.

E. L. Newcomb

E. L. Newcomb
Geologist

IN REPLY REFER TO:

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

March 19, 1953

Memorandum

Re: DMEA-2922
Sunset Mine
Mineral Hills District
Pinal County, Arizona
$60,214
Copper

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From: E. L. Newcomb

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I recommend the application be referred to the field team for their appraisal and recommendation, particularly on the question of whether this should be considered as a gold mine or a copper mine.

L. L. Newcomb
Geologist

3/12/53 gla

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

March 11, 1953

Memorandum

To: E. W. Ellis, DMEA

From: C. H. Johnson, Bureau of Mines

Subject: DMEA-2922 (Copper); American Copper Company, Sunset Mine, Pinal County, Arizona

This application proposes exploration of the same property that was the subject of an earlier application, DMA-389X, E. G. Bowen, which was denied August 13, 1951. So far as can be determined, no new information has been submitted. I am of the opinion the application should be denied without referral to the field.

The application is returned herewith.

C. H. Johnson

C. H. Johnson

Attachment

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAR 12 1953

Copy to - Mr. Kinkel - Room 4234, USGS
Minerals Division
C. H. Johnson
Files

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

March 11, 1953

[illegible]

[illegible]

[illegible] C. H. Johnson, [illegible]

Subject: [illegible]-2222 (Honorat) [illegible], [illegible],
[illegible] County, [illegible]

This application requests exploration [illegible] property
[illegible] the subject [illegible] application, [illegible], which was filed August 12, [illegible] as far as [illegible], no
[illegible] has been established. [illegible] the [illegible] application should be denied [illegible] to the field.

The application is returned herewith.

C. H. JOHNSON

C. H. Johnson

Attachment

C. Johnson:ls

[illegible] - [illegible] Mineral [illegible], [illegible]
Mineral Division
C. H. Johnson
File

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAR 12 1953

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

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

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAR 10 1953

Not to be filled in by applicant

Docket No. dmea 2922
Metal or Mineral
Date Received 3-10-53
Estimated Cost
Participation (Government %)

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

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: Mexican Copper Company, a California corporation, XXXXX 312 California Building, Stockton, California. P.H. Mosher, Pres., Lodi, California; Max Alson, V.Pres., Lodi, California; L.H. Anderson, Sec. Treas., Stockton, California; V. Mortz, Dir., Lodi, Calif; J.W. Mike, Dir., Lodi, Calif.

(*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.

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

(*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 Sunset No.5, Sunset No.6, Sunset No.7, Sunset No.8, Sunset No.9, Sunset No.10, Sunset No.11, and Callback unpatented lode mining claims, situated in T.[illegible], R.[illegible], G.&S.R.B.&M., Mineral Hills Mining District Pinal County, Arizona.

(*b*) State any mine name by which the property is known. Sunset Mine

(*c*) State your interest in the land, whether owner, lessee, purchaser under contract, or otherwise Purchaser under contract agreement

(*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.

(*e*) If you own the land, describe any liens or encumbrances on it

(*f*) If the land consists of unpatented claims, add to the description above, the book and page numbers for each recorded location notice. Book 47, pages 620 to 623, County Recorder, Pinal County, Arizona

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.

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

(*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.

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

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

5. *The exploration project.*—(*a*) State the mineral or minerals for which you wish to explore Copper

(*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.

(*c*) The work will start within 60 days and be completed within 12 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.

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.).

(*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.

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

(*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.

(*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.

(*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?

☒ Money ☐ 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 February 16, 1959

American Copper Company
(Applicant)

By Paul H. Becker Pres.

W H Anderson Sec. Treas.

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

AMERICAN COPPER COMPANY,
312 California Bldg.,
Stockton, California.

INSTRUCTIONS (cont'd)

4. Physical description.-

(a) No mining operations are presently being conducted. Past operations are outlined in Wyman Report, page 2, and in the Clark Supplement Report, Sheet Fourteen. Existing mine workings are indicated by sketch-map of Clark Report (Map No.1). Present production facilities are not completely adequate for any sizeable operation.

Applicant's interest in the past workings and other mine assets is covered by the Purchase Agreement, dated June 10,1952, and the Assignment, dated October 10,1952.

The mine workings are accessible down to the 300 foot level, with water below.

(b) There are no ore reserves or current production.
Past production is described in the Clark Supplement Report, Sheet Fourteen, and in the Wyman Report, page 2.

(c) Geologic conditions of the property are fully described in the Clark Report, Sheet Nine, and in the Thomsen and Wyman Reports.

Showings or ore and qualified recommendations warrant further exploration; past findings indicate possible deposition of sizeable ore bodies at lower depths. The proposed extension of the present 610 foot inclinal main shaft and contemplated drift levels are indicated by broken green lines on the sketch-map of the Clark Report (Map No.1). The principal objective is the zone of primary sulphides or the zone of secondary enrichment, estimated approximately 300 feet below the present depth.

(d) Accessibility of project is outlined in the Clark Report, Sheets Ten and Eleven. Water well was deepened subsequent to the report.

(e) Sufficient manpower, materials, supplies, equipment and water are available. (Clark Report, Sheet Ten) No electric power available; it is contemplated installing portable electric plant or Diesel-electric equipment.

5. The exploration project.-

(b) The proposed exploration work is indicated by the broken green lines on the sketch-map of the Clark Report (Map No.1). This constitutes sinking the present main inclinal 610 foot shaft, approximately 300 feet more, with the zone of primary sulphides, or the zone of secondary enrichment as the main objective, either in one or more large bodies or in a complex vein system. Drifting and crosscutting to be done when advisable or recommended. Surface veins and exposures also to be further explored.

(d) Corporation is new in the field of mining. P.H. Boether, president, has 20 years practical experience in the repairing and maintenance of automotive, tractor and heavy equipment; oil well drilling experience; supervisory and managerial experience; finances oil and mining operations. L.H. Linka, director, has 20 years experience in mining and supervision of mining operations. However, proposed work is to be under the supervision of G.E. Cassar, former contractor of work of this mine, and former employee of Magna Copper Company. Engineers and assayers to be engaged at intervals. Proposed work to be on contract basis.

AMERICAN COPPER COMPANY
312 California Bldg.,
Stockton, California

INSTRUCTIONS (cont'd)

6. Estimate of costs.-

(a) Independent contracts.-

Cost of 300 feet of sinking @ $65.00 per foot.....	$19500.00
Cost of 600 feet of drifting @ $25.00 per foot.....	15000.00

(above prices include labor, fuel, powder, payroll taxes, workmen's compensation insurance, timbering, and track laying. Does not include steel or timber)

(b) Labor, supervision, consultants.-

Supt. salary @ $400.00 per month (5 mo.).....	$ 2000.00
Engineer or consultant fees.....	1000.00
2 miners, or asst. @ $16.00 per day (5 mo.).....	4000.00

(c) Operating materials and supplies.-

Timber and lumber.....	1000.00
Rails.....	300.00
Pipe- 1½", 300 feet @ 25¢ per foot.....	75.00
Pipe- 2½", 300 feet @ 53¢ per foot.....	159.00
Air hose- 1", 200 feet @ 77¢ per foot.....	154.00
Water hose- 3/4", 200 feet @ 63¢ per foot.....	126.00
Drill bits.....	200.00
Ventilation tubing.....	100.00
Spikes.....	50.00
Gas & oil for cars and trucks.....	300.00

(d) Operating equipment.-

To be rented.-

500-600 C.F.M. Compressor @ $800.00 per mo.(5 Mo.)	$ 4000.00
3-5 T. double drum hoist, @ $800.00 per mo.(5 Mo.)..	4000.00

(Above to be diesel driven or diesel-electric)

To be purchased:

2 Ore cars.....	$ 150.00
2 Jackhammers.....	650.00
2 Portable pumps.....	250.00
1 Stationery pump.....	450.00
1 Stoper.....	450.00

To be furnished by the company.-

1 Sullivan Compressor, portable	valued	at	$3700.00
4 mine cars	"	"	340.00
1 stoper	"	"	250.00
5 Sullivan Jackhammers	"	"	350.00
1 Ford truck	"	"	1250.00
2 Portable pumps	"	"	500.00
Ventilation blower	"	"	100.00
Ventilation tubing (Rails)	"	"	300.00
Portable tools	"	"	100.00
Drill steel, pipe, hose, rails	"	"	1200.00
Timber & lumber	"	"	600.00
	Total		$ 8390.00

AMERICAN COPPER COMPANY
312 California Bldg.,
Stockton, California.

INSTRUCTIONS (cont'd)

(d) Operating equipment.- cont'd.

Depreciation: $ 8390.00 / 60 mo. = $ 139.83 per month × 5 months = $ 699.15 — $ 699.15

(e) Rehabilitation and repairs.-

Repairs to Ford truck	150.00
Repairs to camp buildings	150.00
Repairs to portable compressor	175.00
Repairs to portable tools and materials	100.00

(f) New buildings, improvements, installations.-

Extra sleeping cabin	250.00
Installation of compressor and hoist	150.00

(g) Miscellaneous.-

Analytical work	400.00
Accounting	400.00
Workmen's Comp. Ins. & payroll taxes (company only)	400.00
Fire insurance	100.00
Employer's liability insurance(premises)	200.00
Maintenance of equipment	400.00

(h) Contingencies	2725.85
Total estimated cost	$60,214.00

7. (a) Applicant is prepared to furnish its share of the cost of the proposed project in accordance with the regulations on government participation.

(b) Applicant proposes to furnish its share of the cost with money.

March 10, 1953

Mr. P. H. Boether, President
American Copper Company
312 California Building
Stockton, California

Subject: DMEA-2922
Re: Exploration Assistance
Sunset Mine

My dear Mr. Boether:

The receipt of your application dated February 16, 1953 for exploration assistance under the Defense Production Act of 1950, as amended, is hereby acknowledged.

Your application has been assigned Docket Number DMEA-2922 and referred to the Rare and Miscellaneous Metals Division.

Kindly refer to DMEA-2922 in any future correspondence relating to your application.

Sincerely yours,

ROBERT E. ADAMS
Robert E. Adams
Chief, Operations Control
and Statistics Division

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

March 10, 1953

Memorandum

To: Executive Officer, DMEA Field Team, Region IV

From: Chief, Operation's Control and Statistics Division

Subject: Assignment of Docket Number

There is listed below the assigned docket number to an application recently received from Region IV.

DMEA - 2922 American Copper Company

ROBERT E. ADAMS

Robert E. Adams,
Chief, Operation's Control
and Statistics Division

33980

Amea 2922

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

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAR 10 1953

224 New Customhouse
Denver 2, Colorado

March 3, 1953

Memorandum

To: Secretary to the Operating Committee, Defense Minerals Exploration Administration

From: Field Team, Region IV

Subject: (Copper) Application of American Copper Company, Sunset Mine, Pinal County, Arizona

The following documents, included in the subject application are being sent you herewith:

3 Copies of completed Form MF-103
6 Copies of executed Form MF-203
3 Copies of Report by Alfred M. Thomsen, L. C. Wyman and assay certificates
3 Copies of Report by Addison N. Clark
3 Copies of Photostats of Agreement #86118
3 Copies of assignment to Sunset Mining Company

The total estimated cost of the applicant's proposal is $60,214.00.

We are keeping one copy of the above in this office, except Form MF-203.

W. H. King
W. H. King

A. H. Koschmann
A. H. Koschmann

Enclosures

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

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

DEPARTMENT OF THE INTERIOR
Minerals Administration
RECEIVED
MAR 10 1953

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. dmea 2 9 2 2
Metal or Mineral
Date Received 3-10-53
Estimated Cost
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: American Copper Company, a California corporation, ~~XXXXX~~ 312 California Building, Stockton, California. P.H. Boether, Pres., Lodi, California; Max Elson, V.Pres., Lodi, California; W.H. Anderson, Sec. Treas., Stockton, California; V. Mertz, Dir., Lodi, Calif; S.H. Linka, Dir., Lodi, Calif.

(*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.

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

(*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 Sunset No.5, Sunset No.6, Sunset No.7, Sunset No.8, Sunset No.9, Sunset No.10, Sunset No.11, and Callback unpatented lode mining claims, situated in T3S., R11E., G.R.B.&M., Mineral Hills Mining District Pinal County, Arizona.

(*b*) State any mine name by which the property is known. Sunset Mine

(*c*) State your interest in the land, whether owner, lessee, purchaser under contract, or otherwise
Purchaser under contract agreement

(*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.

(*e*) If you own the land, describe any liens or encumbrances on it

(*f*) If the land consists of unpatented claims, add to the description above, the book and page numbers for each recorded location notice. Book 47, pages 620 to 623, County Recorder, Pinal County, Arizona

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.

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

(*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.

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

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

5. *The exploration project.*—(*a*) State the mineral or minerals for which you wish to explore Copper

(*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.

(*c*) The work will start within 60 days and be completed within 12 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.

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.).

(*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.

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

(*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.

(*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.

(*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 [ ] 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 February 16, 1953

American Copper Company
(Applicant)

By Paul H. Boettler Pres.

W H Anderson Sec. Treas.

AMERICAN COPPER COMPANY INCORPORATED

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

AMERICAN COPPER COMPANY,
312 California Bldg.,
Stockton, California.

INSTRUCTIONS (cont'd)

4. Physical description.-

(a) No mining operations are presently being conducted. Past operations are outlined in Wyman Report, page 2, and in the Clark Supplement Report, Sheet Fourteen. Existing mine workings are indicated by sketch-map of Clark Report (Map No.1). Present production facilities are not completely adequate for any sizeable operation.

Applicant's interest in the past workings and other mine assets is covered by the Purchase Agreement, dated June 10,1952, and the Assignment, dated October 10,1952.

The mine workings are accessible down to the 300 foot level, with water below.

(b) There are no ore reserves or current production.
Past production is described in the Clark Supplement Report, Sheet Fourteen, and in the Wyman Report, page 2.

(c) Geologic conditions of the property are fully described in the Clark Report, Sheet Nine, and in the Thomsen and Wyman Reports.

Showings or ore and qualified recommendations warrant further exploration; past findings indicate possible deposition of sizeable ore bodies at lower depths. The proposed extension of the present 610 foot inclinal main shaft and contemplated drift levels are indicated by broken green lines on the sketch-map of the Clark Report (Map No.1). The principal objective is the zone of primary sulphides or the zone of secondary enrichment, estimated approximately 300 feet below the present depth.

(d) Accessibility of project is outlined in the Clark Report, Sheets Ten and Eleven. Water well was deepened subsequent to the report.

(e) Sufficient manpower, materials, supplies, equipment and water are available. (Clark Report, Sheet Ten) No electric power available; it is contemplated installing portable electric plant or Diesel-electric equipment.

5. The exploration project.-

(b) The proposed exploration work is indicated by the broken green lines on the sketch-map of the Clark Report (Map No.1). This constitutes sinking the present main inclinal 610 foot shaft, approximately 300 feet more, with the zone of primary sulphides, or the zone of secondary enrichment as the main objective, either in one or more large bodies or in a complex vein system. Drifting and crosscutting to be done when advisable or recommended. Surface veins and exposures also to be further explored.

(d) Corporation is new in the field of mining. P.H. Boether, president, has 20 years practical experience in the repairing and maintenance of automotive, tractor and heavy equipment; oil well drilling experience; supervisory and managerial experience; finances oil and mining operations. L.H. Linka, director, has 20 years experience in mining and supervision of mining operations. However, proposed work is to be under the supervision of G.E. Cassar, former contractor of work of this mine, and former employee of Magma Copper Company. Engineers and assayers to be engaged at intervals. Proposed work to be on contract basis.

AMERICAN COPPER COMPANY
312 California Bldg.,
Stockton, California

INSTRUCTIONS (cont'd)

6. Estimate of costs.-

(a) Independent contracts.-

Cost of 300 feet of sinking @ $65.00 per foot.....	$19500.00
Cost of 600 feet of drifting @ $25.00 per foot.....	15000.00

(above prices include labor, fuel, powder, payroll taxes, workmen's compensation insurance, timbering, and track laying. Does not include steel or timber)

(b) Labor, supervision, consultants.-

Supt. salary @ $400.00 per month (5 mo.).....	$ 2000.00
Engineer or consultant fees.....	1000.00
2 miners, or asst. @ $16.00 per day (5 mo.).....	4000.00

(c) Operating materials and supplies.-

Timber and lumber.....	1000.00
Rails.....	300.00
Pipe- 1½", 300 feet @ 25¢ per foot.....	75.00
Pipe- 2½", 300 feet @ 53¢ per foot.....	159.00
Air hose- 1", 200 feet @ 77¢ per foot.....	154.00
Water hose- 3/4", 200 feet @ 63¢ per foot.....	126.00
Drill bits.....	200.00
Ventilation tubing.....	100.00
Spikes.....	50.00
Gas & oil for cars and trucks.....	300.00

(d) Operating equipment.-

To be rented.-

500-600 C.F.M. Compressor @ $800.00 per mo.(5 Mo.)$	4000.00
3-5 T. double drum hoist, @ $800.00 per mo.(5 Mo.)..	4000.00

(Above to be diesel driven or diesel-electric)

To be purchased:

2 Ore cars.....$	150.00
2 Jackhammers.....	650.00
2 Portable pumps.....	250.00
1 Stationery pump.....	450.00
1 Stoper.....	450.00

To be furnished by the company.-

1 Sullivan Compressor, portable	valued	at	$3700.00
4 mine cars	"	"	240.00
1 stoper	"	"	250.00
5 Sullivan Jackhammers	"	"	350.00
1 Ford truck	"	"	1250.00
2 Portable pumps	"	"	300.00
Ventilation blower	"	"	100.00
Ventilation tubing (Bemis)	"	"	300.00
Portable tools	"	"	100.00
Drill steel, pipe, hose, rails	"	"	1200.00
Timber & lumber	"	"	600.00
	Total		$8390.00

AMERICAN COPPER COMPANY
312 California Bldg.,
Stockton, California.

INSTRUCTIONS (cont'd)

(d) Operating equipment.- cont'd.

Depreciation: $\frac{\$\ 8390.00}{60\ \text{mo.}}$ = $ 139.83 per month × 5 months = $ 699.15 — $ 699.15

(e) Rehabilitation and repairs.-

Repairs to Ford truck	150.00
Repairs to camp buildings	150.00
Repairs to portable compressor	175.00
Repairs to portable tools and materials	100.00

(f) New buildings, improvements, installations.-

Extra sleeping cabin	250.00
Installation of compressor and hoist	150.00

(g) Miscellaneous.-

Analytical work	400.00
Accounting	400.00
Workmen's Comp. Ins. & payroll taxes (company only)	400.00
Fire insurance	100.00
Employer's liability insurance(premises)	200.00
Maintenance of equipment	400.00

(h) Contingencies	2725.85
Total estimated cost	$60,214.00

7.
(a) Applicant is prepared to furnish its share of the cost of the proposed project in accordance with the regulations on government participation.

(b) Applicant proposes to furnish its share of the cost with money.

MF-203

OWNER'S CONSENT TO LIEN

WHEREAS, the undersigned, as owner, co-owner, lessor, or seller has an interest in certain property in the State of Arizona, County of Pinal, described as follows:1/

Sunset No. 5, Sunset No. 6, Sunset No. 7, Sunset No. 8, Sunset No. 9, Sunset No. 10, Sunset No. 11, and Callback unpatented lode mining claims, situated in the Mineral Hills Mining District, Pinal County, Arizona; recorded in Book 47, pages 620 to 623, County Recorder office, Pinal County. Purchase Agreement dated June 10,1952, recorded in book 67, page 335, said county

which is the subject of a proposed exploration project contract, hereinafter called the "contract", between the United States of America, hereinafter called the "Government", and

2/ American Copper Company, a California corporation,

hereinafter called the "Operator"; and

WHEREAS, under certain provisions of said contract which are set forth on the reverse side hereof, the Government is entitled to a percentage royalty on production and to certain other rights and equities which do or may conflict with or be adverse to the interest of the undersigned in said property;

NOW THEREFORE, the undersigned, in consideration of said contract and as an inducement to the Government to enter into same, undertakes and agrees as follows:

1. The Government's equity in and right to dismantle, sever, take possession of, and remove and dispose of facilities, buildings, fixtures, equipment, or other items as provided in the contract, or any amendment thereof, shall prevail over and be prior and superior to any conflicting or adverse rights of the undersigned, and the Government is authorized to enter upon the land for such purposes.

2. To secure the payment to the Government of the percentage royalty on production3/ provided for under the terms of said exploration project contract, or any amendment thereof which does not increase the maximum amount of the Government's claim here stated or alter the provisions for repayment, there is hereby granted to the Government a lien upon the land herein described and upon any production of minerals therefrom, until the royalty claim is fully paid in the amount of the Government's contribution, not in excess of 4/$30,107.00, or ten years have elapsed from the date of the contract.

3. The undersigned shall commit no act nor assert any claim that may contravene or conflict with the lien, claim, or rights of the Government under the provisions of said contract. This agreement shall be binding upon the heirs, executors, administrators, successors, and assigns of the undersigned.

Dated this 16th day of February, 1953.

W. D. Kay Pres. [Seal]

Jessie A. Lindsay Sec.Treas. [Seal]

[Seal]

1/ Either (a) insert the legal description of the land, or (b) strike out the words "as follows" and insert "in a lease [or contract, deed, or other document] dated _____, and recorded in book _____ page _____ official records of said county." If (b) is used, the book and page of recordation cannot be dispensed with. If the space provided is insufficient, use an Annex, and refer to the Annex in the space.

2/ Insert the name of the Operator as it will appear in the exploration project contract.

3/ Mining or production from the land is not required, and in the absence of production there is no obligation to repay the Government.

4/ Insert the maximum amount of the Government's contribution.

RELEVANT CONTRACT PROVISIONS

Repayment by Operator. (a) If, at any time, the Government considers that a discovery or a development from which production may be made has resulted from the exploration work, the Government, at any time not later than six months after the Operator has rendered the required final report and final account, may so certify in writing to the Operator. The certification shall describe broadly or indicate the nature of the discovery or development. In the event of such certification, any minerals mined or produced from the land described in Article 2 within 10 years from the date of this contract, including any mined or produced before the certification, shall be subject to a percentage royalty which the Operator or his successor in interest shall pay to the Government, upon the net smelter returns, the net concentrator returns, or other net amounts realized from the sale or other disposition of any such production, in whatever form disposed of, including ore, concentrates, or metal, until the total amount contributed by the Government, without interest, is fully repaid, or said 10 years have elapsed, whichever occurs first, as follows:

(1) One and one-half (1½) per cent of any such net amounts not in excess of eight dollars ($8.00) per ton.

(2) One and one-half (1½) per cent of any such net amounts, plus one-half (½) per cent such net amounts for each additional full fifty cents ($0.50) by which such net amounts exceed eight dollars ($8.00) per ton, but not in excess of five (5) per cent of such net amounts.

(For instance: the percentage royalty on a net amount of five dollars ($5.00) per ton, would be one and one-half (1½) per cent; on a net amount of ten dollars ($10.00) per ton, three and one-half (3½) per cent.)

(b) As here used, "net smelter returns", "net concentrator returns", and "other net amounts realized from the sale or other disposition", mean gross revenue from sales; or if not sold, the market value, the market value of the material after it is mined in the form in which and the place where it is held. In the case of integrated operations in which the material is not disposed of as such, these terms mean what is or would be gross income from mining operations for percentage depletion purposes in income tax determination.

(c) To secure the payment of its percentage royalty, the Government shall have and is hereby granted a lien upon the land described in Article 2 and upon any production of minerals therefrom, until the royalty claim is extinguished by lapse of time or is fully paid.

(d) This article is not to be construed as imposing any obligation on the Operator or the Operator's successor in interest to engage in any mining or production operations.

Title to and disposition of property. All facilities, buildings, fixtures, equipment, or other items costing more than $50.00 each, paid for or purchased with funds contributed jointly by the Operator and the Government, although title may be taken in the name of the Operator, shall belong to the Operator and the Government jointly, in proportion to their respective contributions, and upon the completion of the work or the termination of the contract shall be disposed of promptly by the Operator for the joint account of the Government and the Operator, either by return to the vendor, by sale to others, or purchase by the Operator at a price at least as high as could otherwise be obtained, as may appear to be for the best interest of the Government, unless the Government, in writing, waives its interest in any such item. If necessary to accomplish such disposition, the Operator shall dismantle, sever from the land, and remove any such item, the cost thereof to be for the joint account of the parties in proportion to their respective interests. If the Operator, within 90 days after the receipt of written notice from the Government, fails, neglects, or refuses to dispose of such property, the Government may itself enter upon the land, take possession of, and remove and dispose of any such property as above provided.

MF-203

OWNER'S CONSENT TO LIEN

WHEREAS, the undersigned, as owner, co-owner, lessor, or seller has an interest in certain property in the State of Arizona, County of Pinal, described as follows:1/

Sunset No. 5, Sunset No. 6, Sunset No. 7, Sunset No. 8, Sunset No. 9, Sunset No. 10, Sunset No. 11, and Callback unpatented lode mining claims, situated in the Mineral Hills Mining District, Pinal County, Arizona; recorded in Book 47, pages 620 to 623, County Recorder office, Pinal County. Purchase Agreement dated June 10,1952, recorded in book 67, page 335, Pinal County

which is the subject of a proposed exploration project contract, hereinafter called the "contract", between the United States of America, hereinafter called the "Government", and

2/ American Copper Company, a California corporation,

hereinafter called the "Operator"; and

WHEREAS, under certain provisions of said contract which are set forth on the reverse side hereof, the Government is entitled to a percentage royalty on production and to certain other rights and equities which do or may conflict with or be adverse to the interest of the undersigned in said property;

NOW THEREFORE, the undersigned, in consideration of said contract and as an inducement to the Government to enter into same, undertakes and agrees as follows:

1. The Government's equity in and right to dismantle, sever, take possession of, and remove and dispose of facilities, buildings, fixtures, equipment, or other items as provided in the contract, or any amendment thereof, shall prevail over and be prior and superior to any conflicting or adverse rights of the undersigned, and the Government is authorized to enter upon the land for such purposes.

2. To secure the payment to the Government of the percentage royalty on production3/ provided for under the terms of said exploration project contract, or any amendment thereof which does not increase the maximum amount of the Government's claim here stated or alter the provisions for repayment, there is hereby granted to the Government a lien upon the land herein described and upon any production of minerals therefrom, until the ~~royalty claim~~ is fully paid in the amount of the Government's contribution, not in excess of 4/$30,107.00, or ten years have elapsed from the date of the contract.

3. The undersigned shall commit no act nor assert any claim that may contravene or conflict with the lien, claim, or rights of the Government under the provisions of said contract. This agreement shall be binding upon the heirs, executors, administrators, successors, and assigns of the undersigned.

Dated this 16th day of February, 1953.

W. J. Kay Pres. [Seal]

Jessie A. Lindsay Sec.Treas. [Seal]

[Seal]

1/ Either (a) insert the legal description of the land, or (b) strike out the words "as follows" and insert "in a lease [or contract, deed, or other document] dated _____, and recorded in book _____ page _____ official records of said county." If (b) is used, the book and page of recordation cannot be dispensed with. If the space provided is insufficient, use an Annex, and refer to the Annex in the space.

2/ Insert the name of the Operator as it will appear in the exploration project contract.

3/ Mining or production from the land is not required, and in the absence of production there is no obligation to repay the Government.

4/ Insert the maximum amount of the Government's contribution.

Repayment by Operator. (a) If, at any time, the Government considers that a discovery or a development from which production may be made has resulted from the exploration work, the Government, at any time not later than six months after the Operator has rendered the required final report and final account, may so certify in writing to the Operator. The certification shall describe broadly or indicate the nature of the discovery or development. In the event of such certification, any minerals mined or produced from the land described in Article 2 within 10 years from the date of this contract, including any mined or produced before the certification, shall be subject to a percentage royalty which the Operator or his successor in interest shall pay to the Government, upon the net smelter returns, the net concentrator returns, or other net amounts realized from the sale or other disposition of any such production, in whatever form disposed of, including ore, concentrates, or metal, until the total amount contributed by the Government, without interest, is fully repaid, or said 10 years have elapsed, whichever occurs first, as follows:

(1) One and one-half (1½) per cent of any such net amounts not in excess of eight dollars ($8.00) per ton.

(2) One and one-half (1½) per cent of any such net amounts, plus one-half (½) per cent such net amounts for each additional full fifty cents ($0.50) by which such net amounts exceed eight dollars ($8.00) per ton, but not in excess of five (5) per cent of such net amounts.

(For instance: the percentage royalty on a net amount of five dollars ($5.00) per ton, would be one and one-half (1½) per cent; on a net amount of ten dollars ($10.00) per ton, three and one-half (3½) per cent.)

(b) As here used, "net smelter returns", "net concentrator returns", and "other net amounts realized from the sale or other disposition", mean gross revenue from sales; or if not sold, the market value, the market value of the material after it is mined in the form in which and the place where it is held. In the case of integrated operations in which the material is not disposed of as such, these terms mean what is or would be gross income from mining operations for percentage depletion purposes in income tax determination.

(c) To secure the payment of its percentage royalty, the Government shall have and is hereby granted a lien upon the land described in Article 2 and upon any production of minerals therefrom, until the royalty claim is extinguished by lapse of time or is fully paid.

(d) This article is not to be construed as imposing any obligation on the Operator or the Operator's successor in interest to engage in any mining or production operations.

Title to and disposition of property. All facilities, buildings, fixtures, equipment, or other items costing more than $50.00 each, paid for or purchased with funds contributed jointly by the Operator and the Government, although title may be taken in the name of the Operator, shall belong to the Operator and the Government jointly, in proportion to their respective contributions, and upon the completion of the work or the termination of the contract shall be disposed of promptly by the Operator for the joint account of the Government and the Operator, either by return to the vendor, by sale to others, or purchase by the Operator at a price at least as high as could otherwise be obtained, as may appear to be for the best interest of the Government, unless the Government, in writing, waives its interest in any such item. If necessary to accomplish such disposition, the Operator shall dismantle, sever from the land, and remove any such item, the cost thereof to be for the joint account of the parties in proportion to their respective interests. If the Operator, within 90 days after the receipt of written notice from the Government, fails, neglects, or refuses to dispose of such property, the Government may itself enter upon the land, take possession of, and remove and dispose of any such property as above provided.

MF-203

OWNER'S CONSENT TO LIEN

WHEREAS, the undersigned, as owner, co-owner, lessor, or seller has an interest in certain property in the State of Arizona, County of Pinal, described as follows:1/

Sunset No. 5, Sunset No. 6, Sunset No. 7, Sunset No. 8, Sunset No. 9, Sunset No. 10, Sunset No. 11, and Gallback unpatented lode mining claims, situated in the Mineral Hills Mining District, Pinal County, Arizona; recorded in Book 47, pages 620 to 625, County Recorder Office, Pinal County. Purchase Agreement dated June 10,1952, recorded in Book 67, page 335, said county

which is the subject of a proposed exploration project contract, hereinafter called the "contract", between the United States of America, hereinafter called the "Government", and

2/ American Copper Company, a California corporation,

hereinafter called the "Operator"; and

WHEREAS, under certain provisions of said contract which are set forth on the reverse side hereof, the Government is entitled to a percentage royalty on production and to certain other rights and equities which do or may conflict with or be adverse to the interest of the undersigned in said property;

NOW THEREFORE, the undersigned, in consideration of said contract and as an inducement to the Government to enter into same, undertakes and agrees as follows:

1. The Government's equity in and right to dismantle, sever, take possession of, and remove and dispose of facilities, buildings, fixtures, equipment, or other items as provided in the contract, or any amendment thereof, shall prevail over and be prior and superior to any conflicting or adverse rights of the undersigned, and the Government is authorized to enter upon the land for such purposes.

2. To secure the payment to the Government of the percentage royalty on production3/ provided for under the terms of said exploration project contract, or any amendment thereof which does not increase the maximum amount of the Government's claim here stated or alter the provisions for repayment, there is hereby granted to the Government a lien upon the land herein described and upon any production of minerals therefrom, until the royalty claim is fully paid in the amount of the Government's contribution, not in excess of 4/$30,107.00, or ten years have elapsed from the date of the contract.

3. The undersigned shall commit no act nor assert any claim that may contravene or conflict with the lien, claim, or rights of the Government under the provisions of said contract. This agreement shall be binding upon the heirs, executors, administrators, successors, and assigns of the undersigned.

Dated this 16th day of February, 1959.

W O Kay Pres. [Seal]

Jessie C. Lindsay Sec.-Treas. [Seal]

[Seal]

1/ Either (a) insert the legal description of the land, or (b) strike out the words "as follows" and insert "in a lease [or contract, deed, or other document] dated _____, and recorded in book _____ page _____ official records of said county." If (b) is used, the book and page of recordation cannot be dispensed with. If the space provided is insufficient, use an Annex, and refer to the Annex in the space.

2/ Insert the name of the Operator as it will appear in the exploration project contract.

3/ Mining or production from the land is not required, and in the absence of production there is no obligation to repay the Government.

4/ Insert the maximum amount of the Government's contribution.

Repayment by Operator. (a) If, at any time, the Government considers that a discovery or a development from which production may be made has resulted from the exploration work, the Government, at any time not later than six months after the Operator has rendered the required final report and final account, may so certify in writing to the Operator. The certification shall describe broadly or indicate the nature of the discovery or development. In the event of such certification, any minerals mined or produced from the land described in Article 2 within 10 years from the date of this contract, including any mined or produced before the certification, shall be subject to a percentage royalty which the Operator or his successor in interest shall pay to the Government, upon the net smelter returns, the net concentrator returns, or other net amounts realized from the sale or other disposition of any such production, in whatever form disposed of, including ore, concentrates, or metal, until the total amount contributed by the Government, without interest, is fully repaid, or said 10 years have elapsed, whichever occurs first, as follows:

(1) One and one-half (1½) per cent of any such net amounts not in excess of eight dollars ($8.00) per ton.

(2) One and one-half (1½) per cent of any such net amounts, plus one-half (½) per cent such net amounts for each additional full fifty cents ($0.50) by which such net amounts exceed eight dollars ($8.00) per ton, but not in excess of five (5) per cent of such net amounts.

(For instance: the percentage royalty on a net amount of five dollars ($5.00) per ton, would be one and one-half (1½) per cent; on a net amount of ten dollars ($10.00) per ton, three and one-half (3½) per cent.)

(b) As here used, "net smelter returns", "net concentrator returns", and "other net amounts realized from the sale or other disposition", mean gross revenue from sales; or if not sold, the market value, the market value of the material after it is mined in the form in which and the place where it is held. In the case of integrated operations in which the material is not disposed of as such, these terms mean what is or would be gross income from mining operations for percentage depletion purposes in income tax determination.

(c) To secure the payment of its percentage royalty, the Government shall have and is hereby granted a lien upon the land described in Article 2 and upon any production of minerals therefrom, until the royalty claim is extinguished by lapse of time or is fully paid.

(d) This article is not to be construed as imposing any obligation on the Operator or the Operator's successor in interest to engage in any mining or production operations.

Title to and disposition of property. All facilities, buildings, fixtures, equipment, or other items costing more than $50.00 each, paid for or purchased with funds contributed jointly by the Operator and the Government, although title may be taken in the name of the Operator, shall belong to the Operator and the Government jointly, in proportion to their respective contributions, and upon the completion of the work or the termination of the contract shall be disposed of promptly by the Operator for the joint account of the Government and the Operator, either by return to the vendor, by sale to others, or purchase by the Operator at a price at least as high as could otherwise be obtained, as may appear to be for the best interest of the Government, unless the Government, in writing, waives its interest in any such item. If necessary to accomplish such disposition, the Operator shall dismantle, sever from the land, and remove any such item, the cost thereof to be for the joint account of the parties in proportion to their respective interests. If the Operator, within 90 days after the receipt of written notice from the Government, fails, neglects, or refuses to dispose of such property, the Government may itself enter upon the land, take possession of, and remove and dispose of any such property as above provided.

MF-203

OWNER'S CONSENT TO LIEN

WHEREAS, the undersigned, as owner, co-owner, lessor, or seller has an interest in certain property in the State of Arizona, County of Pima, described as follows:1/

Sunset No. 5, Sunset No. 6, Sunset No. 7, Sunset No. 8, Sunset No. 9, Sunset No. 10, Sunset No. 11, and Gallbock unpatented lode mining claims, situated in the Pima Mine Mining District, Pima County, Arizona; recorded in Book 47, pages 618 to 623, County Recorder's office, Pima County. Purchase agreement dated June 10,1952, recorded in book 6?, page 335, said county

which is the subject of a proposed exploration project contract, hereinafter called the "contract", between the United States of America, hereinafter called the "Government", and

2/ American Copper Company, a California corporation,

hereinafter called the "Operator"; and

WHEREAS, under certain provisions of said contract which are set forth on the reverse side hereof, the Government is entitled to a percentage royalty on production and to certain other rights and equities which do or may conflict with or be adverse to the interest of the undersigned in said property;

NOW THEREFORE, the undersigned, in consideration of said contract and as an inducement to the Government to enter into same, undertakes and agrees as follows:

1. The Government's equity in and right to dismantle, sever, take possession of, and remove and dispose of facilities, buildings, fixtures, equipment, or other items as provided in the contract, or any amendment thereof, shall prevail over and be prior and superior to any conflicting or adverse rights of the undersigned, and the Government is authorized to enter upon the land for such purposes.

2. To secure the payment to the Government of the percentage royalty on production3/ provided for under the terms of said exploration project contract, or any amendment thereof which does not increase the maximum amount of the Government's claim here stated or alter the provisions for repayment, there is hereby granted to the Government a lien upon the land herein described and upon any production of minerals therefrom, until the royalty claim is fully paid in the amount of the Government's contribution, not in excess of 4/$30,107.00, or ten years have elapsed from the date of the contract.

3. The undersigned shall commit no act nor assert any claim that may contravene or conflict with the lien, claim, or rights of the Government under the provisions of said contract. This agreement shall be binding upon the heirs, executors, administrators, successors, and assigns of the undersigned.

Dated this 16th day of February, 1953.

W. O. Kay Pres. [Seal]

Jessie A. Lindsay Sec. [Seal]

[Seal]

1/ Either (a) insert the legal description of the land, or (b) strike out the words "as follows" and insert "in a lease [or contract, deed, or other document] dated _____, and recorded in book _____ page _____ official records of said county." If (b) is used, the book and page of recordation cannot be dispensed with. If the space provided is insufficient, use an Annex, and refer to the Annex in the space.

2/ Insert the name of the Operator as it will appear in the exploration project contract.

3/ Mining or production from the land is not required, and in the absence of production there is no obligation to repay the Government.

4/ Insert the maximum amount of the Government's contribution.

Repayment by Operator. (a) If, at any time, the Government considers that a discovery or a development from which production may be made has resulted from the exploration work, the Government, at any time not later than six months after the Operator has rendered the required final report and final account, may so certify in writing to the Operator. The certification shall describe broadly or indicate the nature of the discovery or development. In the event of such certification, any minerals mined or produced from the land described in Article 2 within 10 years from the date of this contract, including any mined or produced before the certification, shall be subject to a percentage royalty which the Operator or his successor in interest shall pay to the Government, upon the net smelter returns, the net concentrator returns, or other net amounts realized from the sale or other disposition of any such production, in whatever form disposed of, including ore, concentrates, or metal, until the total amount contributed by the Government, without interest, is fully repaid, or said 10 years have elapsed, whichever occurs first, as follows:

(1) One and one-half (1½) per cent of any such net amounts not in excess of eight dollars ($8.00) per ton.

(2) One and one-half (1½) per cent of any such net amounts, plus one-half (½) per cent such net amounts for each additional full fifty cents ($0.50) by which such net amounts exceed eight dollars ($8.00) per ton, but not in excess of five (5) per cent of such net amounts.

(For instance: the percentage royalty on a net amount of five dollars ($5.00) per ton, would be one and one-half (1½) per cent; on a net amount of ten dollars ($10.00) per ton, three and one-half (3½) per cent.)

(b) As here used, "net smelter returns", "net concentrator returns", and "other net amounts realized from the sale or other disposition", mean gross revenue from sales; or if not sold, the market value, the market value of the material after it is mined in the form in which and the place where it is held. In the case of integrated operations in which the material is not disposed of as such, these terms mean what is or would be gross income from mining operations for percentage depletion purposes in income tax determination.

(c) To secure the payment of its percentage royalty, the Government shall have and is hereby granted a lien upon the land described in Article 2 and upon any production of minerals therefrom, until the royalty claim is extinguished by lapse of time or is fully paid.

(d) This article is not to be construed as imposing any obligation on the Operator or the Operator's successor in interest to engage in any mining or production operations.

Title to and disposition of property. All facilities, buildings, fixtures, equipment, or other items costing more than $50.00 each, paid for or purchased with funds contributed jointly by the Operator and the Government, although title may be taken in the name of the Operator, shall belong to the Operator and the Government jointly, in proportion to their respective contributions, and upon the completion of the work or the termination of the contract shall be disposed of promptly by the Operator for the joint account of the Government and the Operator, either by return to the vendor, by sale to others, or purchase by the Operator at a price at least as high as could otherwise be obtained, as may appear to be for the best interest of the Government, unless the Government, in writing, waives its interest in any such item. If necessary to accomplish such disposition, the Operator shall dismantle, sever from the land, and remove any such item, the cost thereof to be for the joint account of the parties in proportion to their respective interests. If the Operator, within 90 days after the receipt of written notice from the Government, fails, neglects, or refuses to dispose of such property, the Government may itself enter upon the land, take possession of, and remove and dispose of any such property as above provided.

MF-203

OWNER'S CONSENT TO LIEN

WHEREAS, the undersigned, as owner, co-owner, lessor, or seller has an interest in certain property in the State of Arizona, County of Pinal, described as follows:1/

Sunset No. 5, Sunset No. 6, Sunset No. 7, Sunset No. 8, Sunset No. 9. Sunset No. 10, Sunset No. 11, and Callback unpatented lode mining claims, situated in the Mineral Hills Mining District, Pinal County, Arizona; ~~recorded in Book 47, pages 620 to 623, County Recorder office, Pinal County.~~ Purchase Agreement dated June 10,1952,recorded in book 67,page 335,said county.

which is the subject of a proposed exploration project contract, hereinafter called the "contract", between the United States of America, hereinafter called the "Government", and

2/ American Copper Company, a California corporation

hereinafter called the "Operator"; and

WHEREAS, under certain provisions of said contract which are set forth on the reverse side hereof, the Government is entitled to a percentage royalty on production and to certain other rights and equities which do or may conflict with or be adverse to the interest of the undersigned in said property;

NOW THEREFORE, the undersigned, in consideration of said contract and as an inducement to the Government to enter into same, undertakes and agrees as follows:

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3. The undersigned shall commit no act nor assert any claim that may contravene or conflict with the lien, claim, or rights of the Government under the provisions of said contract. This agreement shall be binding upon the heirs, executors, administrators, successors, and assigns of the undersigned.

Dated this 16th day of February, 1953.

W. O. Kay Pres. [Seal]

Jessie A. Lindsay Sec. Treas. [Seal]

[Seal]

1/ Either (a) insert the legal description of the land, or (b) strike out the words "as follows" and insert "in a lease [or contract, deed, or other document] dated _____, and recorded in book _____ page _____ official records of said county." If (b) is used, the book and page of recordation cannot be dispensed with. If the space provided is insufficient, use an Annex, and refer to the Annex in the space.

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4/ Insert the maximum amount of the Government's contribution.

Repayment by Operator. (a) If, at any time, the Government considers that a discovery or a development from which production may be made has resulted from the exploration work, the Government, at any time not later than six months after the Operator has rendered the required final report and final account, may so certify in writing to the Operator. The certification shall describe broadly or indicate the nature of the discovery or development. In the event of such certification, any minerals mined or produced from the land described in Article 2 within 10 years from the date of this contract, including any mined or produced before the certification, shall be subject to a percentage royalty which the Operator or his successor in interest shall pay to the Government, upon the net smelter returns, the net concentrator returns, or other net amounts realized from the sale or other disposition of any such production, in whatever form disposed of, including ore, concentrates, or metal, until the total amount contributed by the Government, without interest, is fully repaid, or said 10 years have elapsed, whichever occurs first, as follows:

(1) One and one-half (1½) per cent of any such net amounts not in excess of eight dollars ($8.00) per ton.

(2) One and one-half (1½) per cent of any such net amounts, plus one-half (½) per cent such net amounts for each additional full fifty cents ($0.50) by which such net amounts exceed eight dollars ($8.00) per ton, but not in excess of five (5) per cent of such net amounts.

(For instance: the percentage royalty on a net amount of five dollars ($5.00) per ton, would be one and one-half (1½) per cent; on a net amount of ten dollars ($10.00) per ton, three and one-half (3½) per cent.)

(b) As here used, "net smelter returns", "net concentrator returns", and "other net amounts realized from the sale or other disposition", mean gross revenue from sales; or if not sold, the market value, the market value of the material after it is mined in the form in which and the place where it is held. In the case of integrated operations in which the material is not disposed of as such, these terms mean what is or would be gross income from mining operations for percentage depletion purposes in income tax determination.

(c) To secure the payment of its percentage royalty, the Government shall have and is hereby granted a lien upon the land described in Article 2 and upon any production of minerals therefrom, until the royalty claim is extinguished by lapse of time or is fully paid.

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MF-203

OWNER'S CONSENT TO LIEN

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which is the subject of a proposed exploration project contract, hereinafter called the "contract", between the United States of America, hereinafter called the "Government", and

2/ American Copper Company, a California corporation

hereinafter called the "Operator"; and

WHEREAS, under certain provisions of said contract which are set forth on the reverse side hereof, the Government is entitled to a percentage royalty on production and to certain other rights and equities which do or may conflict with or be adverse to the interest of the undersigned in said property;

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Dated this 16th day of February, 195 3.

W. O Kay Pres. [Seal]

Jessie L. Finch Sec. Treas. [Seal]

[Seal]

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2/ Insert the name of the Operator as it will appear in the exploration project contract.

3/ Mining or production from the land is not required, and in the absence of production there is no obligation to repay the Government.

4/ Insert the maximum amount of the Government's contribution.

RELEVANT CONTRACT PROVISIONS

Repayment by Operator. (a) If, at any time, the Government considers that a discovery or a development from which production may be made has resulted from the exploration work, the Government, at any time not later than six months after the Operator has rendered the required final report and final account, may so certify in writing to the Operator. The certification shall describe broadly or indicate the nature of the discovery or development. In the event of such certification, any minerals mined or produced from the land described in Article 2 within 10 years from the date of this contract, including any mined or produced before the certification, shall be subject to a percentage royalty which the Operator or his successor in interest shall pay to the Government, upon the net smelter returns, the net concentrator returns, or other net amounts realized from the sale or other disposition of any such production, in whatever form disposed of, including ore, concentrates, or metal, until the total amount contributed by the Government, without interest, is fully repaid, or said 10 years have elapsed, whichever occurs first, as follows:

(1) One and one-half (1½) per cent of any such net amounts not in excess of eight dollars ($8.00) per ton.

(2) One and one-half (1½) per cent of any such net amounts, plus one-half (½) per cent such net amounts for each additional full fifty cents ($0.50) by which such net amounts exceed eight dollars ($8.00) per ton, but not in excess of five (5) per cent of such net amounts.

(For instance: the percentage royalty on a net amount of five dollars ($5.00) per ton, would be one and one-half (1½) per cent; on a net amount of ten dollars ($10.00) per ton, three and one-half (3½) per cent.)

(b) As here used, "net smelter returns", "net concentrator returns", and "other net amounts realized from the sale or other disposition", mean gross revenue from sales; or if not sold, the market value, the market value of the material after it is mined in the form in which and the place where it is held. In the case of integrated operations in which the material is not disposed of as such, these terms mean what is or would be gross income from mining operations for percentage depletion purposes in income tax determination.

(c) To secure the payment of its percentage royalty, the Government shall have and is hereby granted a lien upon the land described in Article 2 and upon any production of minerals therefrom, until the royalty claim is extinguished by lapse of time or is fully paid.

(d) This article is not to be construed as imposing any obligation on the Operator or the Operator's successor in interest to engage in any mining or production operations.

Title to and disposition of property. All facilities, buildings, fixtures, equipment, or other items costing more than $50.00 each, paid for or purchased with funds contributed jointly by the Operator and the Government, although title may be taken in the name of the Operator, shall belong to the Operator and the Government jointly, in proportion to their respective contributions, and upon the completion of the work or the termination of the contract shall be disposed of promptly by the Operator for the joint account of the Government and the Operator, either by return to the vendor, by sale to others, or purchase by the Operator at a price at least as high as could otherwise be obtained, as may appear to be for the best interest of the Government, unless the Government, in writing, waives its interest in any such item. If necessary to accomplish such disposition, the Operator shall dismantle, sever from the land, and remove any such item, the cost thereof to be for the joint account of the parties in proportion to their respective interests. If the Operator, within 90 days after the receipt of written notice from the Government, fails, neglects, or refuses to dispose of such property, the Government may itself enter upon the land, take possession of, and remove and dispose of any such property as above provided.

STATE OF ARIZONA, County of Pinal; No. 86118 } ss.
I do hereby certify that the within instrument was filed and recorded at request of Smith & Geller
on OCT 16 1952 at 9:50 A M., Docket 67 PAGE 335
Page ..... Records of Pinal County, Arizona.
WITNESS my hand and official seal the day and year first above written.
SOPHIE M. SMITH, County Recorder,
By Margaret K. Samrick, Deputy.
DOCKET 67 PAGE 335
Dmed 29222
CONTRACT INDEXED

THIS AGREEMENT, made and entered into this 10th day of June, 1952, by and between SUNSET MINING COMPANY, a California corporation, and W. O. KAY, a single man, of San Francisco, California, hereinafter referred to and called First Party, and PAUL H. BOETHER, of Lodi, California, hereinafter referred to and called Second Party;

W I T N E S S E T H:

WHEREAS, First Party is the owner of all of the hereinafter described mining claims, the real property upon which the same are located, the dumps and tailings, buildings, mining tools, machinery, equipment, improvements and all other property located in, on or about said real property and said mining claims; and

WHEREAS, First Party desires to sell all of the same for the price and in the manner as in this agreement hereinafter provided, to Second Party, and Second Party desires to purchase the same from First Party for said price and upon said terms and conditions;

NOW THEREFORE, in consideration of the premises and of the covenants and agreements of the parties hereto as hereinafter provided, it is hereby mutually understood, covenanted and agreed by and between First Party and Second Party as follows, to-wit:

1. First Party does hereby covenant and agree with Second Party to sell, convey and transfer to Second Party by a good and sufficient merchantable title free and clear of any and all encumbrances, all of those certain unpatented lode mining claims located and being in the Mineral Hills Mining District in Pinal County, State of Arizona, and more particularly described as follows, to-wit: Sunset No. 5, Sunset No. 6, Sunset No. 7, Sunset No. 8, Sunset No. 9, Sunset No. 10, Sunset No. 11 and Callback Lode Mining Claims situate as aforesaid in said Mineral Hills Mining District, Pinal County, State of Arizona, and recorded in Book 47, pages 620 to 623 in the office of the County Recorder of Pinal County, Arizona, together with the real property upon which all of said mining claims are located, the dumps and tailings, buildings, mining tools, machinery, equipment, improvements and all other property located in, on or about said real property and said mining claims, for the total purchase price of Four Hundred Thousand ($400,000.00) Dollars, which shall be payable by Second Party to First Party in the manner following, to-wit: Second Party shall cause to be paid over and delivered to First Party by such smelter as purchases the ore produced from said mining claims, a sum of money equal to ten per cent (10%) of the net smelter

returns (net smelter returns being moneys received after deducting costs of transportation, smeltering and taxes) from all ore produced from said mining claims until said First Party shall have received from that source the said purchase price of Four Hundred Thousand ($400,000.00) Dollars; said purchase price, however, shall be paid by Second Party to First Party over a period of not to exceed thirty (30) years from the date hereof, it being understood and agreed, however, that said Second Party shall have the right to pay said sum of Four Hundred Thousand ($400,000.00) Dollars to First Party at any time and from whatsoever source he, said Second Party, may desire.

2. Second Party does hereby covenant and agree with First Party that he, said Second Party, shall instruct any smelter that purchases the ore produced from said property to furnish First Party a duplicate copy of all of such smelter returns and to mail to said First Party at 213 Minna Street, San Francisco, California, or at such other address as First Party may at any time hereafter by written instructions direct, its check representing said ten per cent (10%) of the net smelter returns.

3. First Party does hereby covenant and agree with Second Party that he, said First Party, will on or before one (1) year from date hereof, execute warranty deeds and bills of sale covering all of the property and mining claims herein agreed to be sold, conveyed and transferred by him to Second Party, wherein and whereby a good and merchantable title to all of the same will be conveyed and transferred to Second Party free and clear of any and all claims and interests of any other person whatsoever and guaranteed by a policy of title insurance in the usual form, and said deeds and bills of sale upon their execution shall be by said First Party deposited with any bank in San Francisco, California, mutually acceptable to First Party and Second Party, with instructions to deliver the same over to Second Party when First Party shall have instructed such bank that he has received from Second Party said full purchase price of Four Hundred Thousand ($400,000.00) Dollars, and said First Party does hereby covenant and agree with Second Party irrevocably to so instruct such bank forthwith upon the receipt by him from Second Party of said sum of Four Hundred Thousand ($400,000.00) Dollars.

4. Second Party agrees that he shall perform all assessment work on the unpatented mining claims the subject of this agreement, in conformity with all laws and regulations in respect thereto.

5. First Party does hereby covenant and agree with Second Party that he, said

First Party, will at all times warrant and at his own cost and expense, defend the title to each, all and every of the properties and mining claims the subject of this agreement against all adverse claims or any claims whatsoever adverse to those herein agreed to be transferred and conveyed by him to Second Party, to the end and with the intent and purpose that said Second Party shall have, own and possess all of said property and the mining claims the subject of this agreement, free and clear of any adverse claims or interests of any other person, firm or corporation, the United States Government, the State of Arizona, the County of Pinal or any other agency.

6. Second Party does hereby covenant and agree with First Party that he, said Second Party, will assume full responsibility for the financing of the development and operational work of said mining claims and that said development and operational work shall be performed in accordance with standard mining practices.

7. Second Party does hereby covenant and agree with First Party that from and after six (6) months from the date of execution of this agreement, First Party shall each year thereafter perform not less than an average of fifty (50) working shifts per month on said mining claims.

8. First Party does hereby give Second Party the right to remove any of the machinery and equipment now located on said properties for the purpose of exchanging or trading the same to others for other or similar equipment to be placed on said properties in its place and stead and for that purpose said Second Party shall and he is hereby given the right to transfer a good and sufficient title to the same to such person, firm or corporation to whom the same shall by him be traded or exchanged and it is understood, covenanted and agreed by First Party that any and all such new machinery, equipment or any other property of a similar or dissimilar nature purchased by Second Party or brought upon the property by virtue of the exchange or trade-in as in this paragraph mentioned, shall be and belong to Second Party, in and to which said First Party shall not at any time or under any circumstances have any right, title, share, claim or interest, and all of such machinery and equipment so brought upon said property and irrespective of the manner in which the same is used or attached thereto, shall for all purposes be considered as personal property and Second Party shall and he is hereby given the right to remove the same from said property at any time.

9. First Party and Second Party do hereby represent and acknowledge one to the

other, that Second Party prior to the execution of this agreement has formed a corporation and it is Second Party's intention to sell, transfer and convey to said corporation this agreement and all of his (said Second Party's) rights, duties and obligations as in said agreement provided, and upon such sale, transfer and conveyance to said corporation, to be released by First Party of all of such duties and obligations as in said agreement provided to be performed by Second Party, and First Party in recognition thereof and in further consideration of the execution of this agreement by Second Party, does hereby covenant and agree with Second Party that he, said Second Party, shall and he is hereby given the right irrevocably to transfer this agreement and all of his rights, duties and obligations hereunder to said corporation and upon such transfer having been made and consummated, all duties, obligations and liabilities of Second Party to First Party hereunder shall cease and terminate and the same shall be assumed and performed by said corporation, and said First Party shall look solely to said corporation for the performance thereof.

10. It is mutually understood, covenanted and agreed that in the event Second Party fails to perform any of the terms, covenants or conditions of this agreement on his part agreed to be kept and performed in the manner and at the times as in this agreement provided, and upon his, said Second Party's, failure to remedy the same within sixty (60) days after written notice so to do by First Party, said First Party may at his election, terminate this agreement, in which event all rights of Second Party in and to said property shall be at an end, save and except said Second Party shall and he is hereby given the right to remove any and all property and improvements removable by him hereunder.

11. It is further mutually understood and agreed by and between the parties hereto that if any act to be done by Second Party or any work to be performed by him hereunder is delayed or prevented by reason of strikes, lockouts, shortage of labor, shortage of materials, failure or refusal of smelter or smelters adjacent to or in the vicinity of said mining claims to accept the ores produced therefrom, riots, Acts of God, war, storms, state or local emergency, collapse of metal or mineral markets, or other casualties or causes beyond the control of Second Party, then and in any such event said Second Party shall be excused from performing such act or work for such time as the same shall have been so delayed or prevented.

12. First Party agrees that if at any time during the continuance of this

agreement Second Party in the mining, development, exploration or operation of said mining claims, requires in the sole and absolute discretion of Second Party, additional capital or financing in connection therewith, that said Second Party shall and he is hereby given such reasonable time, which in no event shall be less than six (6) months, as he may require within which to raise or provide such additional capital or financing, and Second Party is hereby relieved from performing any of the provisions of this agreement in respect to working shifts or doing any work on said mining claims during the entire period while he is so providing for such additional capital or financing, anything in this agreement to the contrary notwithstanding.

13. First Party does covenant and agree with Second Party that in the event First Party should elect to and does terminate this agreement under the provisions of this agreement whereby First Party has a right so to do, then and in that event, upon such termination, all further liability of Second Party hereunder shall cease and terminate.

14. First Party does covenant and agree prior to the execution hereof by First Party, to cause to be called a stockholders' meeting for the purpose of authorizing the execution of this agreement by the officers of Sunset Mining Company, a California corporation, such meeting to be called and all notices given and resolutions passed in conformity to the laws of the State of California in respect thereto and in accordance to the Articles of Incorporation and the By-Laws of said Sunset Mining Company, a California corporation, and that a certified copy of such resolution shall be annexed to this agreement, duly certified by the Secretary of said corporation, marked Exhibit "A", and by reference made a part hereof the same and as effectively as though set forth at length herein.

15. It is mutually understood, covenanted and agreed by and between First Party and Second Party that this agreement and each, all and every of its terms, covenants and conditions shall be binding upon and inure to the benefit of the respective heirs, executors, administrators, assigns, grantees and successors in interest of the parties hereto.

16. It is understood that the words "First Party" and the words "Second Party" shall each include both the singular and plural numbers and the masculine gender shall include both the feminine and neuter genders. The promises and obligations of First Party herein are the joint and several obligations of said First Party.

17. First Party does hereby warrant and represent to Second Party that he is now the owner and entitled to the exclusive possession of all of the real property, mining claims, machinery, equipment, mining tools and all other property the subject of this agreement and that he, said First Party, will as and when called upon so to do, execute bills of sale and any other documents of transfer in reference to any of such property which by the terms of this agreement said Second Party has been given the right to transfer, trade in, sell or exchange while this agreement is in force; that he, said First Party, will hand over and deliver to Second Party any and all documents, papers and reports appertaining to or in any way connected with the property the subject of this agreement, and which said Second Party may demand for use in connection with the formation of a corporation by said Second Party and the application by said corporation thereafter to the Commissioner of Corporations of the State of California and/or the State of Arizona or any other state and/or the Securities and Exchange Commission, in connection with the issuance by said corporation of its stock, and to execute any and all documents and papers which may be necessary or required in carrying out and performing this agreement in all of its particulars in accordance to its intent and purpose as in said agreement provided.

18. Second Party does hereby covenant and agree with First Party to purchase the said mining claims and other property the subject of this agreement for the price and upon the terms, covenants and conditions as in this agreement set forth.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement in triplicate the day and year first above appearing, said Sunset Mining Company, a California corporation, by its officers thereunto first duly authorized.

SUNSET MINING COMPANY, a California corporation

By W. O. Kay
Its President

By J. R. Lodge
Its Secretary

W. O. Kay
First Party

Second Party

STATE OF ARIZONA, County of Pinal; No. 86121 } ss.
I do hereby certify that the within instrument was filed and recorded at request of Smith & Jeller
on OCT 16 1952 at 9:50A M., Docket 67 PAGE 354
Page, Records of Pinal County, Arizona.
WITNESS my hand and official seal the day and year first above written.
SOPHIE M. SMITH, County Recorder,
By Margaret K. Damrich, Deputy.

DOCKET 67 PAGE 354

COMPARED

ASSIGNMENT

The undersigned, PAUL H. BOETHER, in consideration of One ($1.00) Dollar and other and further valuable consideration to be paid, and of being released by the American Copper Company, a California corporation, of and from any and all obligations and liabilities of whatsoever kind, character or description, under and by virtue of the terms and provisions of that certain written agreement dated June 10, 1952 wherein Sunset Mining Company, a California corporation, and W. O. Kay are First Party, and the undersigned, Paul H. Boether, is Second Party, and of the said American Copper Company, a California corporation, upon the acceptance of this assignment assuming any and all such obligations and responsibilities of the undersigned under said agreement, does hereby sell, transfer, convey and assign to the said American Copper Company, a California corporation, all of his right, title, claim and interest in, to, under and by virtue of that certain written agreement dated June 10, 1952 between Sunset Mining Company, a California corporation, and W. O. Kay as First Party, and the undersigned, Paul H. Boether, as Second Party, and in which said written agreement said First Party therein covenants and agrees to sell to said Second Party therein according to the terms and provisions thereof, all those certain unpatented lode mining claims located and being in the Mineral Hills Mining District in Pinal County, State of Arizona, and more particularly described as Sunset No. 5, Sunset No. 6, Sunset No. 7, Sunset No. 8, Sunset No. 9, Sunset No. 10, Sunset No. 11 and Callback, recorded in Book 47, pages 620 to 623 in the office of the County Recorder of Pinal County, Arizona, and the other properties described therein.

Dated: October 10th, 1952.

Paul H. Boether

Amer 2 9 2 2

ACCEPTANCE OF ASSIGNMENT

The undersigned, AMERICAN COPPER COMPANY, a California corporation, does hereby accept in accordance to the terms thereof, the above and foregoing Assignment of the written agreement therein mentioned, and does hereby covenant and agree with the said Paul H. Boether to perform said agreement in accordance to each, all and every of its terms and provisions, and does further covenant and agree to save harmless the said Paul H. Boether of and from any and all liability or obligations to the said Sunset Mining Company, a California corporation, and W. O. Kay arising, growing out of, or in any way connected with said written agreement so assigned by the said Paul H. Boether to the undersigned, and the undersigned has executed this acceptance of said assignment by its officer thereunto first duly authorized and empowered.

Dated: October 10th, 1952.

AMERICAN COPPER COMPANY, a California corporation

By Max Elson

Its Vice-President

STATE OF ARIZONA, County of Pinal, No. 86118 } ss.
I do hereby certify that the within instrument was filed and recorded at request of Smith & Geller on OCT 16 1952 at 9:50 A M., Docket 67 PAGE 335 Page 2922, Records of Pinal County, Arizona.
WITNESS my hand and official seal the day and year first above written.
SOPHIE M. SMITH, County Recorder,
By Margaret K. Samrick, Deputy.
DOCKET 67 PAGE 335
INDEXED

THIS AGREEMENT, made and entered into this 10th day of June, 1952, by and between SUNSET MINING COMPANY, a California corporation, and W. O. KAY, a single man, of San Francisco, California, hereinafter referred to and called First Party, and PAUL H. BOETHER, of Lodi, California, hereinafter referred to and called Second Party;

W I T N E S S E T H:

WHEREAS, First Party is the owner of all of the hereinafter described mining claims, the real property upon which the same are located, the dumps and tailings, buildings, mining tools, machinery, equipment, improvements and all other property located in, on or about said real property and said mining claims; and

WHEREAS, First Party desires to sell all of the same for the price and in the manner as in this agreement hereinafter provided, to Second Party, and Second Party desires to purchase the same from First Party for said price and upon said terms and conditions;

NOW THEREFORE, in consideration of the premises and of the covenants and agreements of the parties hereto as hereinafter provided, it is hereby mutually understood, covenanted and agreed by and between First Party and Second Party as follows, to-wit:

1. First Party does hereby covenant and agree with Second Party to sell, convey and transfer to Second Party by a good and sufficient merchantable title free and clear of any and all encumbrances, all of those certain unpatented lode mining claims located and being in the Mineral Hills Mining District in Pinal County, State of Arizona, and more particularly described as follows, to-wit: Sunset No. 5, Sunset No. 6, Sunset No. 7, Sunset No. 8, Sunset No. 9, Sunset No. 10, Sunset No. 11 and Callback Lode Mining Claims situate as aforesaid in said Mineral Hills Mining District, Pinal County, State of Arizona, and recorded in Book 47, pages 620 to 623 in the office of the County Recorder of Pinal County, Arizona, together with the real property upon which all of said mining claims are located, the dumps and tailings, buildings, mining tools, machinery, equipment, improvements and all other property located in, on or about said real property and said mining claims, for the total purchase price of Four Hundred Thousand ($400,000.00) Dollars, which shall be payable by Second Party to First Party in the manner following, to-wit: Second Party shall cause to be paid over and delivered to First Party by such smelter as purchases the ore produced from said mining claims, a sum of money equal to ten per cent (10%) of the net smelter

returns (net smelter returns being moneys received after deducting costs of transportation, smeltering and taxes) from all ore produced from said mining claims until said First Party shall have received from that source the said purchase price of Four Hundred Thousand ($400,000.00) Dollars; said purchase price, however, shall be paid by Second Party to First Party over a period of not to exceed thirty (30) years from the date hereof, it being understood and agreed, however, that said Second Party shall have the right to pay said sum of Four Hundred Thousand ($400,000.00) Dollars to First Party at any time and from whatsoever source he, said Second Party, may desire.

2. Second Party does hereby covenant and agree with First Party that he, said Second Party, shall instruct any smelter that purchases the ore produced from said property to furnish First Party a duplicate copy of all of such smelter returns and to mail to said First Party at 213 Minna Street, San Francisco, California, or at such other address as First Party may at any time hereafter by written instructions direct, its check representing said ten per cent (10%) of the net smelter returns.

3. First Party does hereby covenant and agree with Second Party that he, said First Party, will on or before one (1) year from date hereof, execute warranty deeds and bills of sale covering all of the property and mining claims herein agreed to be sold, conveyed and transferred by him to Second Party, wherein and whereby a good and merchantable title to all of the same will be conveyed and transferred to Second Party free and clear of any and all claims and interests of any other person whatsoever and guaranteed by a policy of title insurance in the usual form, and said deeds and bills of sale upon their execution shall be by said First Party deposited with any bank in San Francisco, California, mutually acceptable to First Party and Second Party, with instructions to deliver the same over to Second Party when First Party shall have instructed such bank that he has received from Second Party said full purchase price of Four Hundred Thousand ($400,000.00) Dollars, and said First Party does hereby covenant and agree with Second Party irrevocably to so instruct such bank forthwith upon the receipt by him from Second Party of said sum of Four Hundred Thousand ($400,000.00) Dollars.

4. Second Party agrees that he shall perform all assessment work on the unpatented mining claims the subject of this agreement, in conformity with all laws and regulations in respect thereto.

5. First Party does hereby covenant and agree with Second Party that he, said

First Party, will at all times warrant and at his own cost and expense, defend the title to each, all and every of the properties and mining claims the subject of this agreement against all adverse claims or any claims whatsoever adverse to those herein agreed to be transferred and conveyed by him to Second Party, to the end and with the intent and purpose that said Second Party shall have, own and possess all of said property and the mining claims the subject of this agreement, free and clear of any adverse claims or interests of any other person, firm or corporation, the United States Government, the State of Arizona, the County of Pinal or any other agency.

6. Second Party does hereby covenant and agree with First Party that he, said Second Party, will assume full responsibility for the financing of the development and operational work of said mining claims and that said development and operational work shall be performed in accordance with standard mining practices.

7. Second Party does hereby covenant and agree with First Party that from and after six (6) months from the date of execution of this agreement, First Party shall each year thereafter perform not less than an average of fifty (50) working shifts per month on said mining claims.

8. First Party does hereby give Second Party the right to remove any of the machinery and equipment now located on said properties for the purpose of exchanging or trading the same to others for other or similar equipment to be placed on said properties in its place and stead and for that purpose said Second Party shall and he is hereby given the right to transfer a good and sufficient title to the same to such person, firm or corporation to whom the same shall by him be traded or exchanged and it is understood, covenanted and agreed by First Party that any and all such new machinery, equipment or any other property of a similar or dissimilar nature purchased by Second Party or brought upon the property by virtue of the exchange or trade-in as in this paragraph mentioned, shall be and belong to Second Party, in and to which said First Party shall not at any time or under any circumstances have any right, title, share, claim or interest, and all of such machinery and equipment so brought upon said property and irrespective of the manner in which the same is used or attached thereto, shall for all purposes be considered as personal property and Second Party shall and he is hereby given the right to remove the same from said property at any time.

9. First Party and Second Party do hereby represent and acknowledge one to the

other, that Second Party prior to the execution of this agreement has formed a corporation and it is Second Party's intention to sell, transfer and convey to said corporation this agreement and all of his (said Second Party's) rights, duties and obligations as in said agreement provided, and upon such sale, transfer and conveyance to said corporation, to be released by First Party of all of such duties and obligations as in said agreement provided to be performed by Second Party, and First Party in recognition thereof and in further consideration of the execution of this agreement by Second Party, does hereby covenant and agree with Second Party that he, said Second Party, shall and he is hereby given the right irrevocably to transfer this agreement and all of his rights, duties and obligations hereunder to said corporation and upon such transfer having been made and consummated, all duties, obligations and liabilities of Second Party to First Party hereunder shall cease and terminate and the same shall be assumed and performed by said corporation, and said First Party shall look solely to said corporation for the performance thereof.

10. It is mutually understood, covenanted and agreed that in the event Second Party fails to perform any of the terms, covenants or conditions of this agreement on his part agreed to be kept and performed in the manner and at the times as in this agreement provided, and upon his, said Second Party's, failure to remedy the same within sixty (60) days after written notice so to do by First Party, said First Party may at his election, terminate this agreement, in which event all rights of Second Party in and to said property shall be at an end, save and except said Second Party shall and he is hereby given the right to remove any and all property and improvements removable by him hereunder.

11. It is further mutually understood and agreed by and between the parties hereto that if any act to be done by Second Party or any work to be performed by him hereunder is delayed or prevented by reason of strikes, lockouts, shortage of labor, shortage of materials, failure or refusal of smelter or smelters adjacent to or in the vicinity of said mining claims to accept the ores produced therefrom, riots, Acts of God, war, storms, state or local emergency, collapse of metal or mineral markets, or other casualties or causes beyond the control of Second Party, then and in any such event said Second Party shall be excused from performing such act or work for such time as the same shall have been so delayed or prevented.

12. First Party agrees that if at any time during the continuance of this

agreement Second Party in the mining, development, exploration or operation of said mining claims, requires in the sole and absolute discretion of Second Party, additional capital or financing in connection therewith, that said Second Party shall and he is hereby given such reasonable time, which in no event shall be less than six (6) months, as he may require within which to raise or provide such additional capital or financing, and Second Party is hereby relieved from performing any of the provisions of this agreement in respect to working shifts or doing any work on said mining claims during the entire period while he is so providing for such additional capital or financing, anything in this agreement to the contrary notwithstanding.

13. First Party does covenant and agree with Second Party that in the event First Party should elect to and does terminate this agreement under the provisions of this agreement whereby First Party has a right so to do, then and in that event, upon such termination, all further liability of Second Party hereunder shall cease and terminate.

14. First Party does covenant and agree prior to the execution hereof by First Party, to cause to be called a stockholders' meeting for the purpose of authorizing the execution of this agreement by the officers of Sunset Mining Company, a California corporation, such meeting to be called and all notices given and resolutions passed in conformity to the laws of the State of California in respect thereto and in accordance to the Articles of Incorporation and the By-Laws of said Sunset Mining Company, a California corporation, and that a certified copy of such resolution shall be annexed to this agreement, duly certified by the Secretary of said corporation, marked Exhibit "A", and by reference made a part hereof the same and as effectively as though set forth at length herein.

15. It is mutually understood, covenanted and agreed by and between First Party and Second Party that this agreement and each, all and every of its terms, covenants and conditions shall be binding upon and inure to the benefit of the respective heirs, executors, administrators, assigns, grantees and successors in interest of the parties hereto.

16. It is understood that the words "First Party" and the words "Second Party" shall each include both the singular and plural numbers and the masculine gender shall include both the feminine and neuter genders. The promises and obligations of First Party herein are the joint and several obligations of said First Party.

17. First Party does hereby warrant and represent to Second Party that he is now the owner and entitled to the exclusive possession of all of the real property, mining claims, machinery, equipment, mining tools and all other property the subject of this agreement and that he, said First Party, will as and when called upon so to do, execute bills of sale and any other documents of transfer in reference to any of such property which by the terms of this agreement said Second Party has been given the right to transfer, trade in, sell or exchange while this agreement is in force; that he, said First Party, will hand over and deliver to Second Party any and all documents, papers and reports appertaining to or in any way connected with the property the subject of this agreement, and which said Second Party may demand for use in connection with the formation of a corporation by said Second Party and the application by said corporation thereafter to the Commissioner of Corporations of the State of California and/or the State of Arizona or any other state and/or the Securities and Exchange Commission, in connection with the issuance by said corporation of its stock, and to execute any and all documents and papers which may be necessary or required in carrying out and performing this agreement in all of its particulars in accordance to its intent and purpose as in said agreement provided.

18. Second Party does hereby covenant and agree with First Party to purchase the said mining claims and other property the subject of this agreement for the price and upon the terms, covenants and conditions as in this agreement set forth.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement in triplicate the day and year first above appearing, said Sunset Mining Company, a California corporation, by its officers thereunto first duly authorized.

SUNSET MINING COMPANY, a California corporation

By W. O. Kay
Its President

By J. R. Lindsay
Its Secretary

W. O. Kay
First Party

Second Party

STATE OF ARIZONA, County of Pinal } ss.
No. 86121
I do hereby certify that the within instrument was filed and recorded at request of Smith & Feller
on OCT 16 1952 at 9:30 A.M., Docket 67 PAGE 354,
Page ....., Records of Pinal County, Arizona.
WITNESS my hand and official seal the day and year first above written.
SOPHIE M. SMITH, County Recorder,
By Margaret K. Damrich, Deputy.

DOCKET 67 PAGE 354

INDEXED COMPARED

Amed 29202

ASSIGNMENT

The undersigned, PAUL H. BOETHER, in consideration of One ($1.00) Dollar and other and further valuable consideration to be paid, and of being released by the American Copper Company, a California corporation, of and from any and all obligations and liabilities of whatsoever kind, character or description, under and by virtue of the terms and provisions of that certain written agreement dated June 10, 1952 wherein Sunset Mining Company, a California corporation, and W. O. Kay are First Party, and the undersigned, Paul H. Boether, is Second Party, and of the said American Copper Company, a California corporation, upon the acceptance of this assignment assuming any and all such obligations and responsibilities of the undersigned under said agreement, does hereby sell, transfer, convey and assign to the said American Copper Company, a California corporation, all of his right, title, claim and interest in, to, under and by virtue of that certain written agreement dated June 10, 1952 between Sunset Mining Company, a California corporation, and W. O. Kay as First Party, and the undersigned, Paul H. Boether, as Second Party, and in which said written agreement said First Party therein covenants and agrees to sell to said Second Party therein according to the terms and provisions thereof, all those certain unpatented lode mining claims located and being in the Mineral Hills Mining District in Pinal County, State of Arizona, and more particularly described as Sunset No. 5, Sunset No. 6, Sunset No. 7, Sunset No. 8, Sunset No. 9, Sunset No. 10, Sunset No. 11 and Callback, recorded in Book 47, pages 620 to 623 in the office of the County Recorder of Pinal County, Arizona, and the other properties described therein.

Dated: October 10th, 1952.

Paul H. Boether

Amend 29224

ACCEPTANCE OF ASSIGNMENT

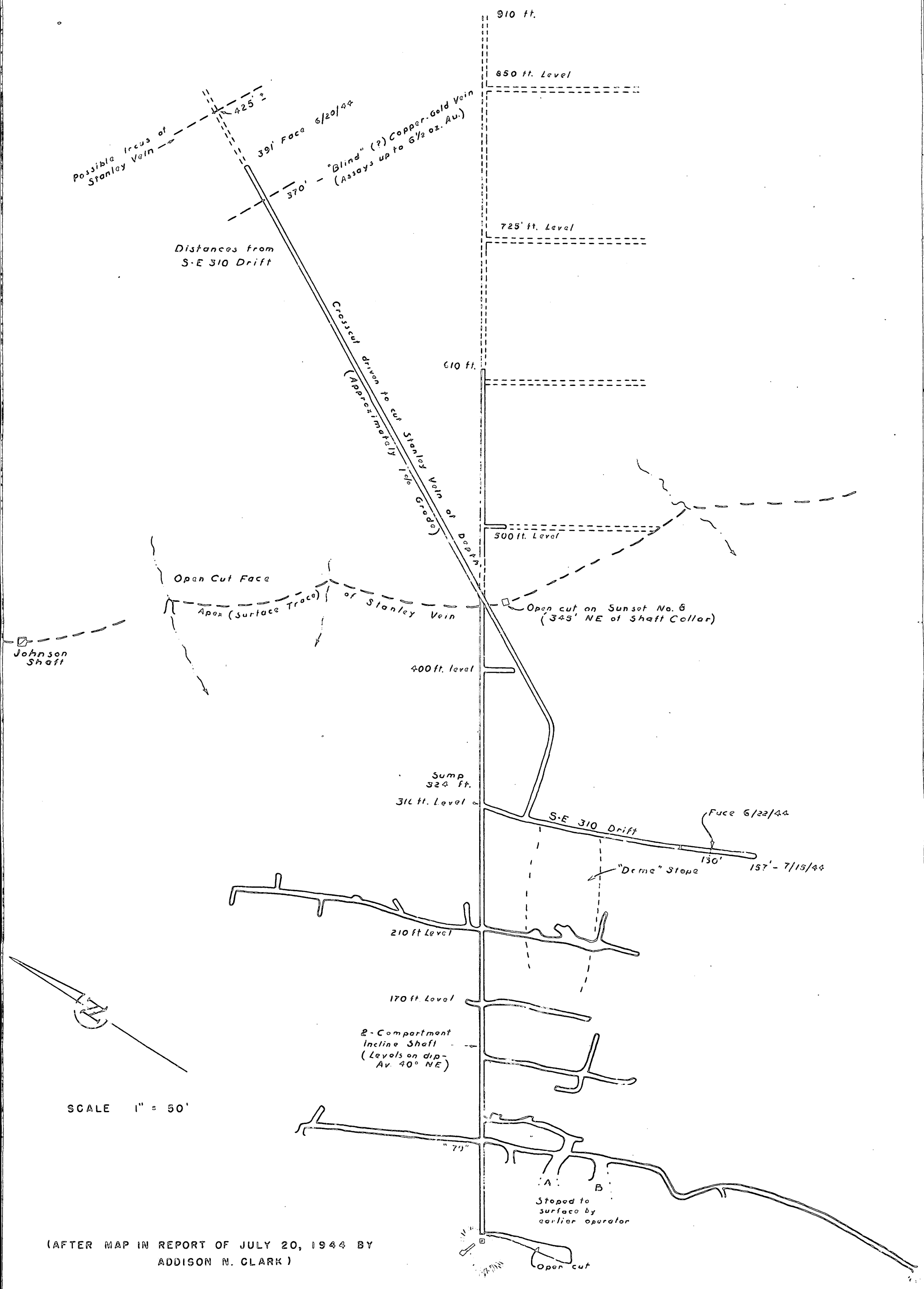
The undersigned, AMERICAN COPPER COMPANY, a California corporation, does hereby accept in accordance to the terms thereof, the above and foregoing Assignment of the written agreement therein mentioned, and does hereby covenant and agree with the said Paul H. Boether to perform said agreement in accordance to each, all and every of its terms and provisions, and does further covenant and agree to save harmless the said Paul H. Boether of and from any and all liability or obligations to the said Sunset Mining Company, a California corporation, and W. O. Kay arising, growing out of, or in any way connected with said written agreement so assigned by the said Paul H. Boether to the undersigned, and the undersigned has executed this acceptance of said assignment by its officer thereunto first duly authorized and empowered.

Dated: October 10th, 1952.

AMERICAN COPPER COMPANY, a California corporation

By [signature]

Its Vice-President

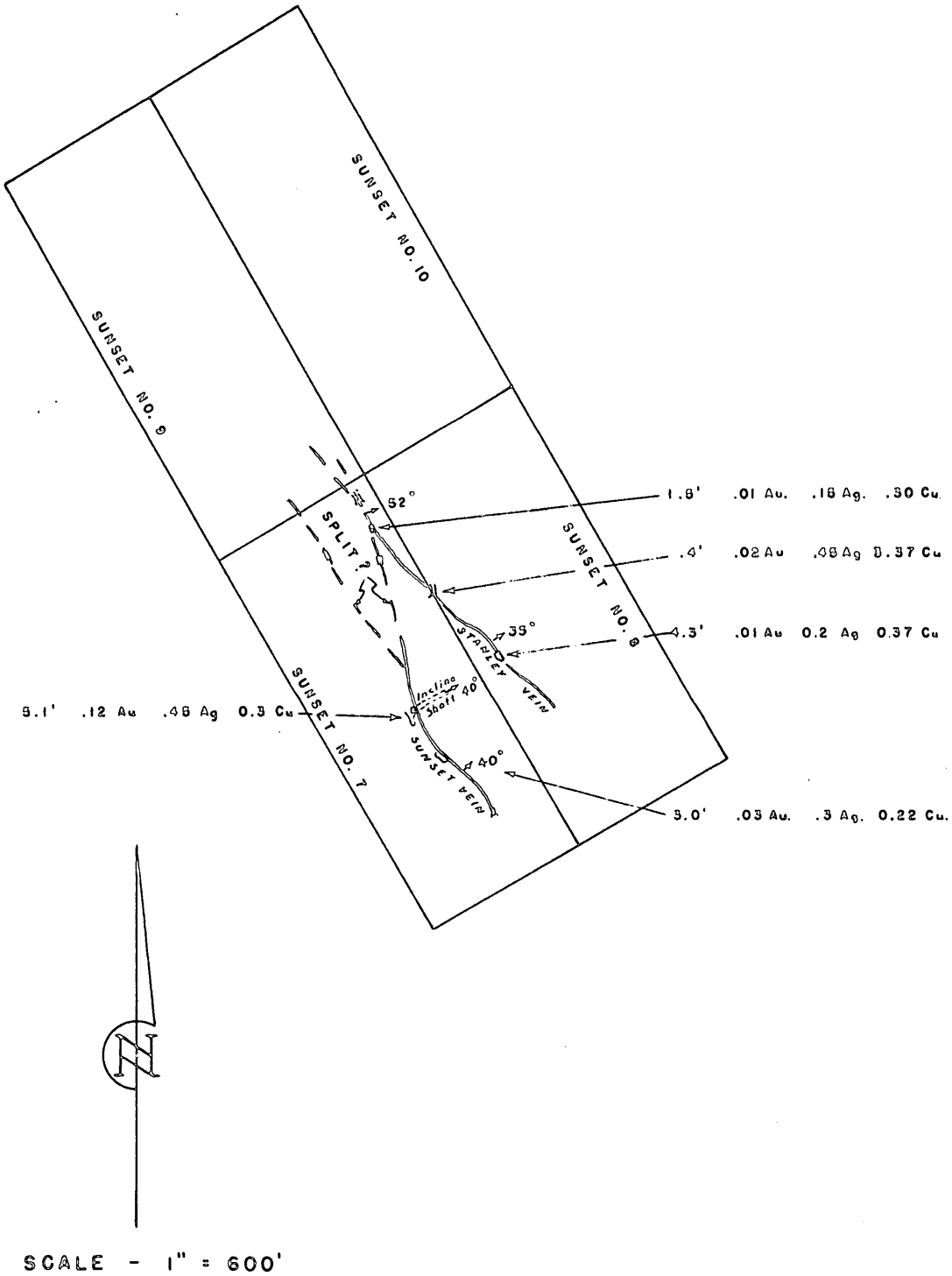


(AFTER MAP IN REPORT OF JULY 20, 1944 BY ADDISON N. CLARK)

D M E A 2922 (COPPER)

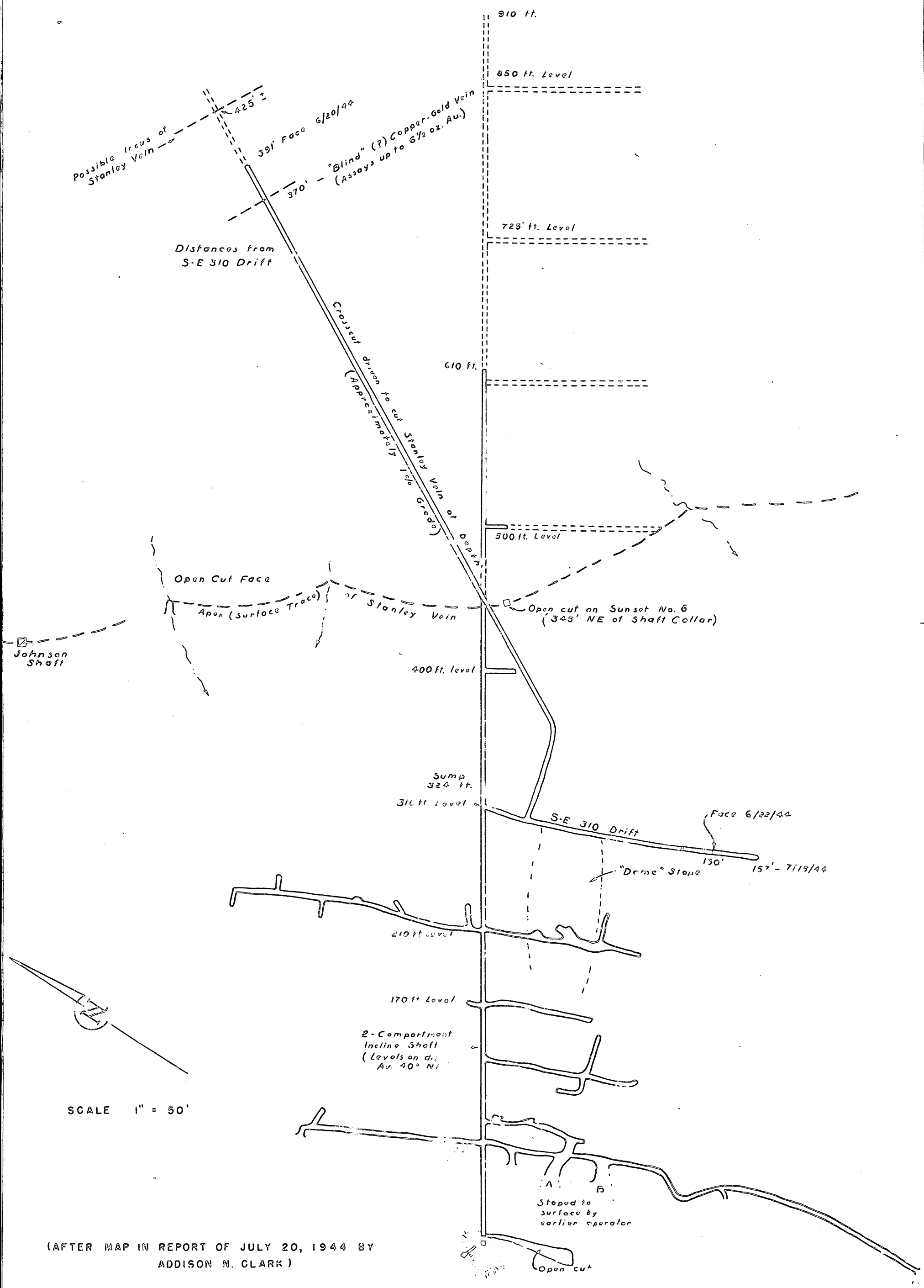
FIGURE 2. - PLAN OF SUNSET MINE WORKINGS

MINERAL HILLS DISTRICT PINAL COUNTY, ARIZONA



DMEA 2922

FIGURE 2. - SURFACE MAP OF A PORTION OF THE SUNSET MINE SHOWING VEINS AND SAMPLE VALUES

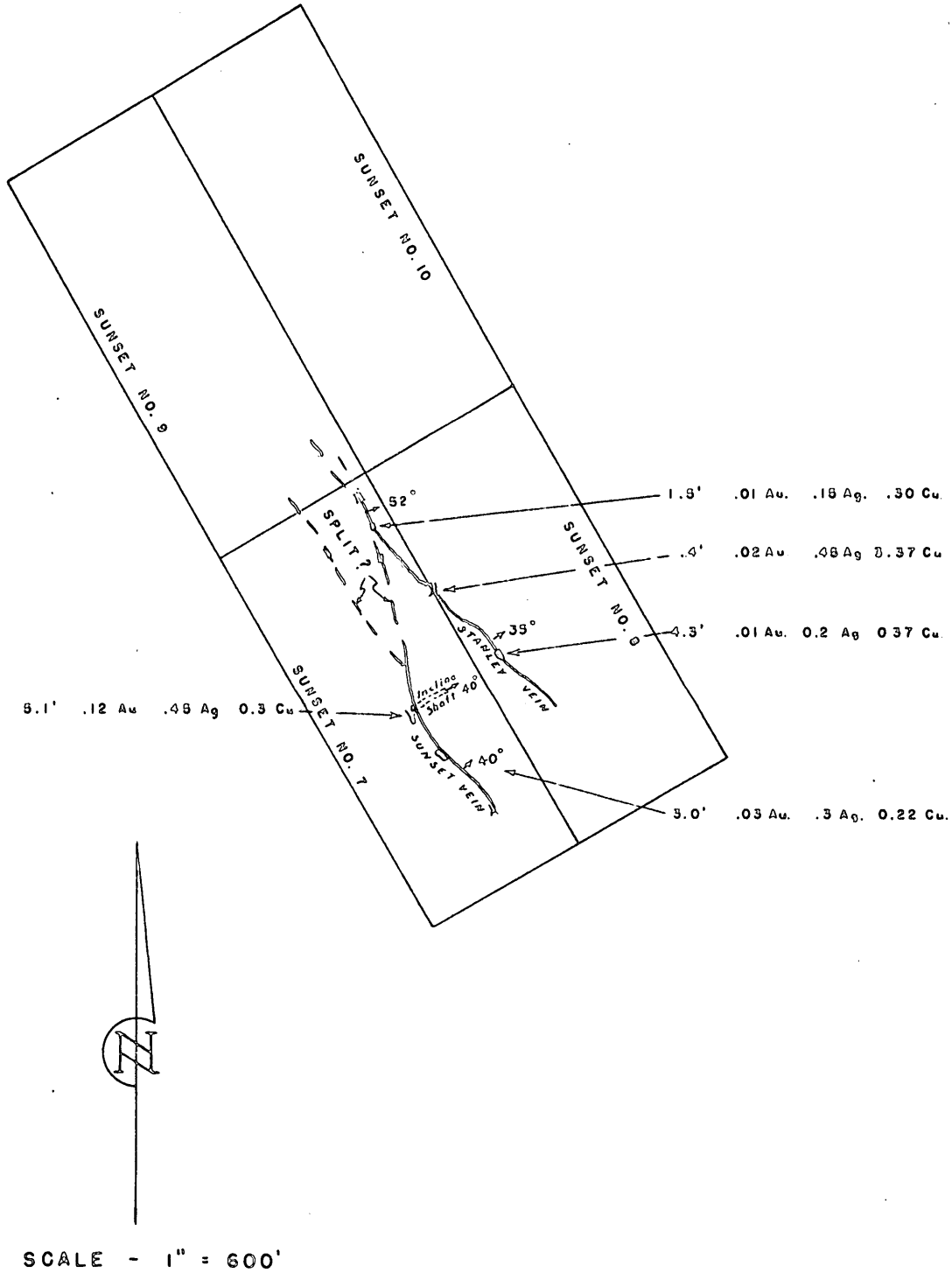


(AFTER MAP IN REPORT OF JULY 20, 1944 BY ADDISON N. CLARK)

D M E A 2922 (COPPER)

FIGURE 2. - PLAN OF SUNSET MINE WORKINGS

MINERAL HILLS DISTRICT PINAL COUNTY, ARIZONA



DMEA 2922

FIGURE 2. - SURFACE MAP OF A PORTION OF THE SUNSET MINE SHOWING VEINS AND SAMPLE VALUES

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July 20
1 9 4 4

Mr. William O. Kay, General Manager,
The Sunset Mining Company, Inc.,
P.O. Box 265, Superior, Arizona.

My dear Mr. Kay:--

Pursuant to the commission given me by yourself and your associate, Mr. Joseph L. Baiocchi of Oakland, I transmit herewith the report covering my examination of the Sunset Mining Property southwest of Superior. And, while normally I write such mine reports in triplicate, two for the client and one for my files (the triplicate being complete as to maps, illustrations, etc.) this one, as requested by Mr. Baiocchi, is written and illustrated in quadruplicate.

That is so that Mr. Baiocchi will have a copy here; you and Dr. Willard Kay will have one at Superior; and your Company's attorney will have one for filing, with his documents, at the office of the Commissioner of Corporations for study by the Chief Engineer of the Commission, Mr. L. C. Wyman.

I want to express here my very deep appreciation for the friendly and whole-hearted cooperation and kindnesses shown to me during my visit at the mine, and in superior, by yourself, your mine personnel, your business associate Mr. Baiocchi, and your two cousins the Willard Kays and their and your friends in Superior and Florence Junction.

It is only the fair thing to say here that it is mighty rare for an examining engineer to find, in a mining property, more than he expected to find there . . . and don't forget, please, Mark Twain's famous definition of a mine. In this case the engineer did find more than he expected to find---far more; and he didn't find the liar, either.

In the Sunset Mine you and your associates have a property that in my very considered opinion has a most promising future; and I should feel remiss if I did not state that opinion frankly here.

Sincerely yours,

Addison N. Clark

ANC/mm

2/18/45 - To 2/25/45
Miles from
W. O. Kay's house
to Magna Hotel
is 905 Miles
Via Garman,
& Lancaster.

Addison N. Clark

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Oct. 6
1944

Mr. Joseph L. Baiocchi, President,
Sunset Mining Company,
621 Sixth Street,
Oakland/7, Calif.

Dear Mr. Baiocchi:--

On page 8 of my report of June examination of the Sunset mining property, the text says: "As it stands, the mine has no definite blocked-out, sampled ore to break, sort and ship, as in older, longer-established properties." Which paragraph I would ask you and Mr. Kay to re-read in full, along with its context.

That statement is no longer true, since development work done in the ensuing months by Mr. Kay in advancing the 310-foot level drift southeast 65 feet in the "Tehhey ore-shoot" (from the point 130 feet southeast of the shaft where I sampled the face in June) gives you, with the approximately 25 feet of that shoot already driven through at the time of my examination, 90 feet of exposed copper-gold-silver shipping ore in sight on that level. Results of the stoping done overhand from the 310-foot level in the past three weeks, as evidenced by assay returns on Mr. Kay's sampling, give adequate corroborative evidence---and Mr. Simon's last assay certificate on Mr. Kay's sampling in that stope 25 feet up, $27.80 per ton, with $8.50 in gold and silver values plus 6% copper, more or less speaks for itself. From Mr. Kay's report to me as to the stope and that sampling I find that his sampling was across 3 feet, and that a narrow "horse" shows in the vein there with a foot and a half of ore on the other side of it (which he apparently did not sample). So for the purpose hereof let's consider the 3 feet only --also, to stay on the conservative side, let's cut Kay's assay return from Simon in half and use an average of $14 per ton.

Although surface exposures in Tenney shoot cuts warrant computing the thing as a rough parallelogram-prism of ore, again we shall be conservative and halve it to the basis of a triangular-faced prism, with a 90-ft. base and a 375-ft. altitude (to surface on the shaftward side). By computation, we have 1875 cu. yds. of ore, on the 3-ft. basis; or, @ 1½ tons per yd., 2800 tons. At the halved dollar-figure, $14 per ton, that represents $39,200 gross (in place). And since consistently the gold and silver values combined, in the Sunset Vein ore, have been such as to meet costs of mining and smelting, and Kay's last assay from Simon holds that end up, I may add that you now can consistently say that the Company has 2800 tons of shipping ore blocked out as outlined above. I doubt I shall have to work very hard, when I return to the property this month to collaborate with Mr. Kay in stepping up ore-recovery and shipments, to confirm the foregoing to my own satisfaction and that of your Board of Directors.

I am writing this in quadruplicate, that Mr. Kay and your attorney, Mr. Elwood Murphey, may receive copies---the latter to attach his copy to my report for transmittal therewith to the State Division of Corporations.

ANC/mm
cc/Messrs. Kay and Murphey

Yours very truly,
Addison N. Clark

Addison N. Clark

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Report of Preliminary Examination of The

S U N S E T M I N E

In the Mineral Hills Mining District

Pinal County, Arizona

Purpose, Summary, Conclusions, Recommendations

To make a surface and underground study of the mining property named, owned under possessory title by the Sunset Mining Company, Inc. (a California corporation) and held under personal working bond-lease by Mr. William O. Kay of San Francisco, for several years active operator of the property as its General Manager under the said bond-lease, the writer was retained in June of 1944 by Mr. Kay and his associate, Mr. Joseph L. Baiocchi of Oakland as consulting engineer. Major objectives of the survey and study were (a) to step up broader development of, and ore-production from, its known and partially-developed main (Sunset) vein; its paralleling Stanley vein, so-called; and its discovered but as yet undeveloped intervening (also parallel) copper-gold vein; and (b) to make this report as an adjunct to a planned program for sound corporate financing of such augmented development and production, as well as to embody such recommendations as may appear advisable.

A "sub-objective" was determination by the writer whether, in the light of his findings on and under the ground, such a step-up of development, and the needful corporate financing to enable it, were advisable or otherwise---especially in the light of war requirements for copper.

To that end the writer, accompanied by Mr. Baiocchi (who jointly with Mr. Kay controls the property and the said Corporation in which its possessory title is vested) spent the ten days from June 15 to 25 in making the said examination. Reason for use of the word "preliminary" in the title is that the geology of the immediate area of the property and the contiguous copper-production areas of Superior (locus of the famous Magma copper mine) and Ray and Globe, and the ore-genesis of this and those near-by producing areas, are far too complex for any engineer or geologist to digest in any ten-day study; and that the writer's deductions and conslusions as to that will necessarily require longer and more detailed study in the future. The fact that Doctor Wilson D. Michell, Geologist for the Magma interests, is spending the better part of 1944 working out the complicated geology of the area of Superior alone, bears quite

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directly on that phase of this job---and the writer here expresses deep appreciation of the geological courtesies extended to him by Doctor Michell, and likewise by Mr. William W. Simon, Chief Assayer of the Magma Copper Company, long familiar with this property, who has done Mr. Kay's routine assaying for a long period. The writer's confidence in Mr. Simon and his work may be judged by the fact that this is the first mine examination report he ever has written using a local assayer, having previously always lugged his samples home and had them assayed by firms with which he had done business for years. Mr. Simon's long familiarity with the copper ores of this region was a distinct asset.

Summary:

The property, 11 miles southwest of Superior (airline) and 21 miles via paved highway and fairly good county dirt road (see Map No. 1) consists of eight standard lode claims held, as said, under possessory title under Federal and State mining laws. Maps Nos. 2 and 3, and the partial transverse section, plus the photographs, tell the essentials better than words. It is suggested that the reader digress to them before proceeding here.

Traversing it longitudinally are two strong copper-gold veins ---true fissures in the so-called "Pinal schist"---plus intervening lesser veins. They are designated as the Sunset Vein and the Stanley Vein; and both carry minor silver content in the ore. Between them (so far as current disclosures indicate) was recently cut, as is indicated in the partial section, a similarly-dipping vein carrying noteworthy gold values. The writer's determinative sample from the latter (see assay-report) carried one ounce per ton, and almost 2 percent copper; and General Manager Kay and Assayer W. W. Simon showed the writer recent assays carrying, in one, approximately four ounces in gold per ton, and in another six and one-half ounces---figures which caused considerable of a flurry in the Superior area.

The fourteen samples taken by the writer were for the purpose of indicating the ore-characteristics. The supplementary sheet as to the samples taken, together with the Simon certificate, is self-explanatory and more or less speaks for itself save as to the two "duds" (Samples SS-1 and SS-7).

Especial attention is invited to Samples SS-2, SS-3, SS-5 and SS-6. Shortly before the writer's examination the southeast drift on the 310-foot level encountered covellite along with the chalcopyrite, and considerable black oxide. Higher copper values naturally showed up in the assays (routine) and in the writer's samples, though gold values are minor there. The gangue carrying the covellite values is a brecciated, recemented metamorphic material with the covellite incrusted over it it flaky form. In the opinion of the writer, that drift is well into the downward extension, on its

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"rake," of the so-called "Tenney ore-shoot" which has been exposed in the open cut (see Photo I) about 175 feet southeast of the collar of the shaft. While the writer made no microscopic studies of the ores, as yet, that specific ore opened up in the main (Sunset) vein shows values indicative of primary character ("hypogenes"as called by F. L. Ransome of the U. S. Geological Survey) and also show evidence of "secondary enrichment" ("supergenes" as Mr. Ransome terms them). That is to say, the vein was enriched by deposition from both hot ascending solutions and cold down-percolating solutions. Moreover, even at the comparatively shallow depth of 310 feet there is evidence that at no very much greater depth the vein will yield more massive sulphides, and that with added depth the covellite will cease showing in its flaky form and appear in mass form---with chalcocite also showing up; likewise bornite.

The clean-cut walls of both the Sunset and Stanley veins, as they appear in the underground photos, and the daylight shots of the Stanley vein, are prima-facie evidence of true fissures in the Pinal schist which, barring excessive faulting as yet undiscovered, should persist to great depth and permanence. Photos H and I both show that characteristic clearly in the Sunset vein. So do Photos K, L. M, N, T and U in the Sunset vein. Photos Q and R illustrate the same characteristic in the Stanley vein.

The two veins are converging as they run northwest, being 345 feet apart on the northeasterly line through the shaft and only 175 feet on the northeasterly line through the "Johnson tunnel" face. As to how far northwest of the existent workings the fissures merge, the writer does not say at this stage; but it is logical to expect that when their junction is exposed in the property's future, a considerable orebody will be found.

As to the "blind gold vein" indicated on the transverse partial section, and also on Map No. 3, and as to "possible locus of Stanley vein" thereon, the latter is predicated upon its holding its average dip as measured where it is exposed. If on the other hand its dip has steepened with depth, there is the possibility that the "blind copper-gold vein" which was cut in the crosscut on the 310-foot level could be the Stanley vein itself. A moderate amount of drifting both ways in that "blind" vein should disclose whether or not that is so; perhaps some overhand stoping in it. A winze has been suggested (since the values were found in the floor of the crosscut) but that would involve pumping and hoisting with the "tugger hoist" that is on the ground. As this is written the crosscut is being driven ahead, and soon should determine whether or not the Stanley vein is where indicated.

The two-compartment shaft and equipment associated with it leave considerable to be desired, as far as speed of operations is concerned, but for the immediate present the management is getting by with it, and can for some months step up operations both in the

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southeast drift on the 310-foot level and there stope an excellent grade of shipping ore---clear to the surface if, as is indicated, that drift is in the downward extension of the "Tenney shoot"; and also tap the Stanley vein at more than 400-foot depth on the dip, which it is logical to expect, from the character of that vein and its ore where opened up at four places on the surface, will yield good-grade shipping ore.

Also, with reference to the Stanley vein, by putting a crew of two men driving a drift southeasterly into it from a point in the gulch between the "Johnson shaft" and "Johnson tunnels" (see Map No. 2) good shipping ore can be mined from that level, very inexpensively, with an all-downhill truck haul from that drift's portal and bin.

The property's camp is well equipped as to quarters and mess facilities, and the climate is such that tent-wall "kennels" could be used pro-tem to house a stepped-up personnel.

There is more than a mile of the Sunset vein workable, as the map (No. 2) shows. The same should be true of the Stanley vein as well. And as depth is gained, the ore in both can be expected to enrich in sulphide values. It is obvious, therefore, that a long-lived mine is in the making---one which with good Scotch management can be made a consistent dividend payer.

Conclusions:

That preceding paragraph may be taken as a frank, blunt conclusion itself. The writer's opinion as to that is concurred in by numerous people in the Superior area---including both of the Magma gentlemen named---and the writer is not afraid to "stand pat" on the prediction, provided his recommendations are carried through (as he is sure that they will be by those who control and manage the property).

By mining both of the major veins, tonnage produced and shipped can be brought to a magnitude such that a backlog of operating cash can be built up to supplement operating capital which it is planned by the management to raise by appropriate corporate financing methods in the near future, with funds left over for dividends.

The day will arrive, naturally, when the existing inclined shaft and associated equipment will have to give way to a vertical operating shaft with modern electric hoisting equipment. (Electric power is as near as Florence, 13 miles southwest). However, for the immediate present the incline will have a heavy job to do, and will handle it with care and precaution. From visible indications it will have, ere long, stoped ore from three places in the mine . . . the southeast 310 drift, the Stanley vein in the crosscut, and (unless it and the Stanley are the same) the "blind copper-gold vein."

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To handle that, it will be necessary to plan carefully the routine of shooting, mucking and hoisting; but that can be done. And the mining of ore from the upper level of the Stanley vein, northwest of the "Johnson shaft" in the gulch, will be independent of work in the lower levels---can start as soon as Supervisor Spray of Pinal County gets his bulldozer on the job to cut out a usable road up the wash to the site (which Mr. Spray promised to do while I was there).

(Mr. Spray, incidentally, has another good reason, aside from his consistently friendly attitude towards the Sunset group, to keep this stretch of County road in good shape---he has a lease-option over in Martinez Canyon, three miles northeast (see Map No. 1) near the famous old Silver Bell Mine; and his recent samplings, assayed by Mr. Simon, as reported to the writer by Messrs. Kay and Simon, carried 966 ounces in silver and 68% lead---the latter in carbonate form. Which brings up the fact that the Sunset Company has a potential ace-in-the-hole in the form of a well-defined lead-silver-zinc vein about at the center of the Sunset No. 10 claim (see Map No. 2) which the writer sampled. It is noted that it sampled (see SS-8L on assay sheet) 19.8% lead. That vein strikes and dips conformably with the copper-gold fissure veins to the southwest of it; and the cropping where it is opened up with a cut (see Photo W) is high on the ridge, so that ample backs can be had by drifting northwesterly from the upper gulch. However, that vein is to be let severely alone for the present, in favor of the others. The day will come when America's lead-zinc industry will move westward, as the mining region around Joplin, Missouri, tapers off in yield; which will be the time to look into this and possibly other lead-silver ledges in the picture---especially if ore comparable with that unearthed by Supervisor Spray can be developed.

Recommendations:

In the order of their comparative importance, as the writer sees it, he deems these steps should be taken:

1. Get the southeast drift on the 310-foot level swung a bit to the northeast so that (see Photos M and N) right-side overhand stoping can be started soon. It is evident, from the photos, that the drift roof to the left is the vein's footwall gouge-seam. The ore here carries enough highgrade, as to copper content, and the covellite and black oxide are so fine and flaky, as to warrant most careful handling and cobbing. With such care in handling this ore, judging from its character where exposed, this stope should yield commensurately with, and probably better than, the so-called "Big Dome stope" mined under Mr. Kay's direction in the ore-shoot next to the northwest (shown in Photos K and L).

2. Drive the long crosscut ahead to possible intersection with the Stanley vein; and, if cut, and cut at a "lean streak" between ore-shoots, drift both ways to pick up a pay-shoot of the character

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found in these veins---then get promptly to stoping.

3. Check up, simultaneously with No. 2, on the "blind copper-gold vein" in the crosscut 370 feet from the shaft . . . with the suspicion ever to the fore that, due to dip-steepening (or possible lateral-thrust faulting) this may be the Stanley vein itself. It is noted (see Assay SS-4G) that the sample carried almost 2% copper. That sample, however, carried its copper mainly as carbonates with some chrysocolla (silicate) and showed little sulphide---whereas in the several open-cut exposures of the Stanley vein on the ridges above, and in the upper gulch to the northwest, the ore is marked by ample sulphides in its unleached denser parts, indicating that this particular vein is not the Stanley, but a paralleling narrower vein or stringer. Its high gold content will make excellent "sweetening" in a binfull of copper ore, to help build that cash backlog.

4. Put a handpicked two-man crew at work in the gulch northwest of the "Johnson shaft"---opposite and facing the "Johnson tunnels---driving a drift southeasterly into the Stanley vein, just high enough above the wash to permit building a rough-neck ore bin at proper height to load by gravity into a truck. When that drift gets under the Johnson shaft it will have approximately 40 feet of backs on the vein-dip; more than 25 feet beneath the exposed face shown in Photo R; and close to 75 feet beneath the cut on the ridge on Sunset No. 8 claim---and good sulphide ore is opened up at all three points; as also in the "Johnson tunnel" across the northerly gulch from the recommended drifting site. All of which ore, recovered, will augment the shipped tonnage.

5. As expeditiously as possible, hand-sort the mixture of ore and plain rock in the main pre-bin at present---rid it of the waste dumped in during the Manager's absence, so as to eliminate it from the next smelter shipment. (In this connection, the writer points out that in assorted orepiles at various open-cuts on both major veins lie (probably) close to fifteen tons of good shipping ore---strongly sulphides---which can somehow be rounded up and conveyed to the main bin or near it. That will offset to large extent the loss and cost incidental to re-sorting the ore now in the main bin, and, as the assay-sheet indicates, "sweeten" the next shipment to appreciable extent).

6. Reverse the hoisting cable in the incline, to keep abraded spots on the drum, and install new cable-rollers at proper points as soon as possible. Also, install continuous handrail alongside the manway as an added safety measure. As a further safety measure the writer recommends setting of stulls and possible lagging as well in the "Big Dome stope," plus a ladder up it from the 310-foot level, thus making it at least a partway-up "second entry" for use in case of accident in the main shaft. While the ground is solid, as the photos (K and L) show, cave-ins do occur at such spots in mines.

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7. Get air down into the long crosscut, and also the southeast 310-level drift---and into stopes from both, as they develop---as expeditiously as possible. Good air sent thither will materially step up the work-output of personnel. Use the 200-odd feet of canvas air-pipe now on the ground, and augment it with sufficient Bemis Bag Company "Flexipipe," to hold costs down (and because sheet-steel air-pipe is hard to buy). If the small helical fan on the job now is adequate to handle sufficient air-volume, use it. If not, it will pay dividends to buy a bigger one---preferably of the high-speed centrifugal type.

8. Purchase a new air drill, to ally with the present usable one as insurance against shutdowns for repairs. The writer recommends the Sullivan Type L-57 Jackhamer---and is aware of one to be had forthwith, in San Francisco, procurable with the Company's priority certificate in hand.

9. Arrange as soon as possible with Mr. J. H. Hedges, District Engineer at Tucson for the U. S. Bureau of Mines, under the plan in past effect (and, the writer understands, again available to be done with funds earmarked for the purpose) to have some diamond-drill exploratory work done as a means of holding down costs. Primary need for that is in the face of the long crosscut, to drill straight ahead to locate and sample the Stanley vein. If not encountered in line ahead of the present face of the crosscut, where expected, one or more holes can be drilled overhead at an angle---since the dip of that vein, as indicated at the several openings along its apex, can have changed with depth. Another advisable spot for drill exploration is at the face of the southeast 310-foot level drift---ahead (southeasterly) as a check on the downward extension of the "Tenney shoot"; and, possibly, also, upward to the right into that shoot as a check-up on stoping, and downward to the left to test that lower ground for added sinking and further southeasterly drifting and stoping. (It is presumed that the shoot nearer to the shaft, which yielded good grade shipping ore from the Kay "Big Dome stope," will yield further good ore at lower levels; which means that there can be expected two workable, commercially valuable ore-shoots to the southeast of the shaft, stopable from one or more lower-level drifts, with the "Tenney shoot" stopable now from the 310 level upward). It does not appear necessary, to the writer, to do any diamond drilling in the Stanley vein at the level where the drift is recommended in the gulch due north from the camp.

10. Set the lights "green" and proceed with such speed as is possible, with funds now available, with the recommended steps . . . objective, getting shipping ore out of the property, with equipment at hand, and to the smelter, to reduce somewhat the amount of operating capital to be raised through corporate financing.

11. Begin planning <u>now</u> towards a suitably modified corporate set-up to finance a faster tempo of ore-recovery. As an initial

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step in said financing, the writer recommends a workable plan to provide a working treasury, operating fund, of not less than $50,000.00. Since the Corporation is organized under the laws of California and of file-record with the State Division of Corporations, qualified to operate as of now in Arizona, and as control and management has shifted advantageously to present administrative and executive personnel, two ways are open for such financing: (a) Increasing of present capitalization of 80,000 shares of par-value of $1.00, with 44,000 shares issued, to a level of, say, $250,000 or $300,000, same par, with authorization to sell and issue to a close "handpicked" group who are in touch with the property and its operations and have expressed desire to "sit in," 50,000 shares at par to create that fund, together with such further issuance as may be required for balance of administrative control and other equitable factors; or (b) Creation of a subsidiary, also a California corporation, to take over the existent bond-lease and other assets and, with similar financing steps, to enlist the required capital to carry ahead and step up mining tempo. That, however, is more properly a matter for discussion with the Company's legal department, by the management, rather than with the engineering.

As it stands, the mine has no definite blocked-out, sampled ore to break, sort and ship, as in older, longer-established properties. It is, however, vastly more than a mere "prospect," and conditions as found existent on and in the ground by the writer assuredly are such as to warrant such an engineering and financing program as the writer has here recommended; likewise such as to warrant reasonable expectation, in lieu of mere hope, of adequate commercial profits to the Corporation and to those who already, to the writer's knowledge, have voiced desire to "sit in."

The most casual examination of the dump at the Sunset shaft is sufficient for the estimate that in it are at least 25,000 tons of concentratable copper-gold ore; hence, as a sort of follow-through (future) step in planning ahead, the writer feels it is not too soon to begin planning erection of a simple, compact gravity-concentration plant in the main gulch below the incline. Especially since ore yet to be mined in the immediate future, via the present shaft, can be advantageously concentrated; and even flotation concentration is in the cards as a pre-shipment stage. Paying freight on gangue and included plain waste hikes up operating overhead expensively; and such a plant will pay for itself---plus dividends on its cost. Even at the present stage the property is definitely of magnitude and promise to warrant such planning ahead. Having that in mind for future development of the operating equipment, it is right now secondary to the requirement of a faster-operating two-compartment vertical shaft so located as to cut both veins at depth and permit more efficient mining with greater safety than with the existent incline and skip. And even as of the present, it is desirable to replace the old Fairbanks-Morse slow hoisting engine with a faster, more powerful one---cost of which will be included in a breakdown of that recommended $50,000

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fund which the writer will present in the near future as a supplement to this report.

The bulk of the program herein recommended can be inaugurated and got under way with the machinery and equipment already on the property, as quickly as needful funds are made available for it.

Miscellaneous Relative Information

Local Geology:

While geological conditions here are far less complex than they are in the near-by mining areas of Superior, Ray, Globe, Miami, etc., all in the same general copper-producing region or belt, they would require so many pages of discursive text as to defeat the primary aim and purpose of this report---by clogging the document with technicalities. Hence, while it was the writer's original purpose to go into the property's geology in as much detail as his brief survey of it would permit---along with the geology of abutting ground---he has decided to curtail discussion thereof materially so as to shorten this specific report. Detailed analysis of such geology therefore will be deferred to a later report on the property, at a stage of developments when it will be more necessary than here.

Suffice to say here, as already has been said in the second paragraph under "Summary," that the property is traversed longitudinally by two strong copper-gold veins, both true fissures dipping between 40° and 45° (average) northeasterly, in conformity with the "country", and that, as also previously stated, both veins are operable for at least a mile within property lines. The Stanley vein definitely dips out the northeasterly sidelines---but the Federal Mining Laws as to apex rights definitely protect the Company in its operating bond-lease. It is probable that, barring material steepening of its dip, that the Sunset vein also extends out under the northeasterly sidelines. The same is true, probably (if that be a separate vein) of the vein cut at 370 feet northeast of the incline on the 310-foot level; and the same laws hold). It also is probably equally true of the lead-zinc-silver vein apexing on the Sunset No. 10 claim---any development whereof is far in the future.

All veins cited are fissures in the formation designated as the "Pinal schist, of pre-Cambrian age; and all examined show evidences of heavy ground movement---which likewise is manifest in the marked brecciation of the ore and gangue. That is indicative of depth and permanence of the veins. All evidences of such movement examined showed up-or-down wall movement (i.e., slickensides at right-angles to the strikes of the veins---as several photographs show) and as yet the writer has found no evidence, in the workings, of any lateral ground movement (which conforms, hence, with the movements which caused the uplift of the range and paralleling ranges of the region). Nor did he find any evidence of lateral-thrust cross-faults in the workings examined.

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Which, for the purposes immediately in hand, sufficiently covers matters geological so far as concerns the property. The writer has a notion, however, that he later will "gang up" somewhat with Doctor Wilson Michell, geologist with the Magma interests (who has been an interested visitor to and student of this property) and also tap the published regional geological data of such U. S. Geological Survey writers as Frederick L. Ransome, and in a later report combine their findings with his own in a lengthy discussion of the subject thus briefly handled here.

Location and Accessibility:

These are so graphically covered by Map No. 1 of the report that reference thereto is sufficient. The property is within a few hours' driving of the majority of Arizona's most famous copper mining towns. Within an hour's drive (less for a fast chauffeur) of the County Seat of Pinal County, Florence---for consultation of county records, etc. A good driver can make Tucson, seat of the State University of Arizona with its School of Mines records, and a regional headquarters of the U. S. Bureau of Mines, in a couple of hours. The same is true of Phoenix, State Capital and center of most of the routine supplies and equipment needed. Barring cloudbursts, the county (dirt) road connecting the mine with the main State highways is always drivable; and Supervisor "Joe" Spray is a co-operative fellow in the matter of keeping that road in drivable condition with his bulldozer crews and graders.

Water Supply:

This, right now, is a real problem---even as to domestic supply. However, Manager Kay has in hand the task of deepening and improving the well in the "wash" just below the camp, and adding a suitable small pump---this for cooking and drinking uses. The mine water is used at the mess hall for washing purposes.

When a concentrating plant is added, it is probable, from indications (though at present once or twice a week pumping holds the water-level below the 310-foot level) that considerable added mine water will be available. Doctor Willard E. Kay, associated with his cousin Manager "Bill" Kay, has in hand an analysis of the mine water at the laboratories of the University of Arizona at Tucson---one object being to check it for possible fluorine content; another being to check it for milling uses "when and as."

Without having wagged a willow wand up the "wash," or waved a doodlebug, the writer is reasonably sure that reasonably shallow water wells sunk, at right points up the gulch, will produce among them enough water to augment even present low-flow mine water.

Lumber, Timber, Hardware, Etc.:

These are readily procurable as near-by as Superior, at fair

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current prices---and the Corporation holds a War Production Board priority rating adequate to meet all purchases of equipment and supplies at present, likewise under the program herein outlined and recommended. The same holds good for powder, fuse and caps, and proper storage facilities for explosives, State-inspected, are safely and handily located with respect to the workings.

Fuel:

At present this is gasoline, procurable at "non-highway-use" prices from major oil corporations. Fair storage facilities exist on the property near the workings. At present and for the immediate future it will be the fuel for the hoisting engine and the heavy-duty compressor, as well as (when used) the Sullivan stand-by portable compressor (which, it is possible, may be moved from present locus near the shaft---see Photos, it stands near main ore-bin---to the site of the planned high-level drift, in the upper gulch, in the Stanley vein). Also will be presently used for a ventilation blower engine.

Gradually, it is the plan of the management, concurred in by the writer, to shift to Diesel power---and the replacement hoist referred to under "Recommendations" will be chosen with that economy in view.

Potential Electric Power:

As already said, this is available as near as Florence, a dozen miles southwest, airline; or from the power line serving Superior. Frequency of that commercial alternating-current power, however, is 25-cycle---which demands that driven power units be of design (off-standard) to fit. It also, as is well-known throughout the parts of Arizona served thus, makes lights flicker unpleasantly ---and raises hob with innumerable radio receivers, which are highly needful under partly-isolated conditions in current times.

Hence, when the time comes to move over to electric power General Manager Kayband the writer think in unison in favor of locally generated 60-cycle A-C power---with a sizeable Diesel-electric unit as its source. The latter plan, moreover, will be considerably less expensive both as to first cost and as to operating cost, than will a long central-station power line; especially one delivering an undesirable A-C frequency.

Material and Equipment Now On Hand:

This is shown by the transcript of the Company's inventory of such material, machinery and equipment, which will supplement this report. As stated herein, with a couple of exceptions it will be adequate to getting the recommended program well under way.

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Climatic Conditions:

These are perfect for all-year-'round operation. As to winter months, it need only be borne in mind that southern Arizona is a world-famous winter resort. As to summer months, the desert heat is dry---hence not only endurable but, as to certain human ailments, highly beneficial. The in-between seasons are about as near climatically perfect as they come.

Maps and Photographs:

The accompanying maps are self-explanatory. So also are the photographs, with their inter-keyed captions. The writer is habitually liberal with photographs in his mine-reports, on the principle of the old Chinese proverb: "One picture is worth one thousand written words, ten thousand spoken words." Surface and underground pictures, 24 in all, were taken with the object of giving readers of the report as clear as possible an overall perspective of the property, and making it possible for them to visualize conditions at long range.

A One-Paragraph Recapitulation:

The writer (as the letter of transmittal states) found in the property more than he expected to find---and he had been led to expect to find considerable. The administration and management has its collective feet on the ground; knows how to make a development-operating dollar roll an ample distance. The showings on and under ground, as per the writer's findings, justify enlistment and expenditure, as rapidly as possible, a minimum of $50,000 as recommended, and expansion of the corporate structure to permit such. The samplings of the writer (see assay sheets, with supplementary smelter-return data) speak for themselves---remember that his samples were taken for determinative purposes, as to ore-character and typical values per ton. In short, as the situation stands today and as it soon will stand improved, the enterprise may be adjudged to be what economists term "an excellent speculative investment"---one with reasonable expectation of worth-while returns instead of mere hope.

Addison N. Clark

Oakland, California
July 20, 1 9 4 4.

Consulting Mining Engineer

Supplement To
Sunset Mine Report

Addison N. Clark

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Amplification of Assay Certificate (Following) of Mr. W. W. Simon, Chief Assayer of the Magma Copper Co., due to its abbreviation because of small-sized form used; all samples, taken by the writer in his June/'44 examination, being solely determinative and indicative of the character of ore in the several parts of the workings:

(Columns 3, 4 and 5 of the Simon certificate not repeated here)

SAMPLE	TAKEN FROM	NATURE OF SAMPLE	PER TON
1-S	Johnson Shaft in Stanley Vein	Grab from ore with red oxide (some sulphides)	$11.56
2-S	Ditto	Grab from ore showing black oxides, also sulphides	$14.80
3-S	Johnson Tunnel 250' NW Johnson Shaft	Grab: Red oxides and some sulphides	$22.37
4-S	Ditto	Grab: Heavy black oxide; sulph.& carbonates	$25.72
5-S	Face in Stanley Vein cut Shown in Photo R	Malachite, Some Azurite, Red Oxide, and Heavy black sulphide	$42.62
6-S	Cut, Stanley V. on Sunset #8	Grab: Carbonates and Some Sulphides	$13.72
SS-1	Sunset Vein, 210 Level;Cross-fissure 30' N of Shaft	Copper showings mainly as Carbonates--- Little Sulphide	$ 1.76
SS-2	Sunset V, Face of 310 Lev. 130 Ft. S of Shaft	Covellite, Black Oxide, Chalcopyrite: (a Grab-Sample)	$73.38
SS-3	Ditto/Across Two Feet Above Footwall Gouge-Seam	Same mineralization as in SS-2---but "spread thinner"	$14.00
SS-4G	"Blind" Cop-Gold Vein in 310 X-cut 370 ft. from Shft.	Copper mainly carbs. & Silicate; very little Sulphides	$41.80
SS-5	Grab fr.Skipload from 310 S.Face	About as in SS-3	$10.56
SS-6	Across 1½ft.from H-W, 310 S Face	Same as in SS-3	$45.75
SS-7	Across 2 ft.below F-W, 310 S Face	Mineralization with Carbonates (apparently)	$ 0.70
SS-8L	Orepile in Cut on Lead-Silver-Zinc Vein, Sunset #10	Much Galena plus Evidence of Zinc Content	$31.20

Mr. Addison N. Clark,
Consulting Mining Engineer,
1440 Broadway,
Oakland, California.

MAGMA COPPER COMPANY

MINE ASSAY CERTIFICATE

DATE June 23, 1944

No.	LOCATION	Cu.%	Ag. Oz.	Au. Oz.	Pb%	Zinc%	%Moisture	REMARKS
1-S	Johnson Sh/Stanley V	2.41	0.80	0.08	(Grab/Red Oxide Ore)			$11.56/Ton
2-S	" " " "	2.21	0.40	0.20	(" /Black " ")			$14.80/Ton
3-S	" Tun.250'NW/Sh.	1.33	0.50	0.50	(Red Ox/some sulph.)			$22.37/Ton
4-S	" " " " "	5.75	0.80	0.16	(Hvy.blk.sul.& CO_3)			$25.72/Ton
5-S	S.V.Tun.350'SE Sh.	11.50	2.00	0.06	(" " " & Malach)			$42.62/Ton
6-S	Cut,SS#8,Stan.Vein	3.79	0.20	0.02	(Grab/Sul.& Carbs)			$13.72/Ton
SS-1	Sunset Vein/210'Lev.	0.39	0.10	0.02	(X-Fissure N of Sh.)			$ 1.76/Ton
SS-2	SS Vein/310'Lev.S.	20.75	3.00	0.02	(Covellite & Bl.Ox.)			$73.38/Ton
SS-3	" " / " " "	3.74	0.80	0.02	(Same/across 2 feet)			$14.00/Ton
SS-4G	X-Cut 310'Lev.370'NE	1.92	0.40	1.00	(Au.Vein,top shoot)			$41.80/Ton
SS-5	310' Lev.S., Face	2.90	0.60	0.02	(Grab fr. skipload)			$10.56/Ton
SS-6	" " " "	12.78	2.00	0.02	(1½' W. fr. H-W)			$45.75/Ton
SS-7	" " " "	0.20	0.10	0.02	(2' below FW Gouge)			$ 0.70/Ton
SS-8L	Lead-Zinc V, S.S.#10	0.20	0.40	0.01	19.8	3.3		$31.20/Ton

Sunset Mine Examination Samples: Cu @17¢ incl. Prem.; Ag @ 71¢; Au @ $35; Pb @ 6½¢; Zn @ 8¼¢.

W. W. Simon
ASSAYER

Addison N. Clark

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Smelter Returns Studied

The writer, as an adjunct to his own determinative sampling and resultant assays, as cited on the two preceding sheets, was given full and free access, by General Manager Kay, to an extensive sheaf of his own assays over a considerable period of operation. Likewise access to all of Mr. Kay's smelter returns from ore shipments during his administration. As to the former, suffice to say here that his own routine assays (all done by Mr. W. W. Simon) were of a nature to check nicely with those done by the same gentleman for the writer---with this difference: His sheaf of certificates showed far more "duds" than the two that appear in the foregoing two pages. Reason: He was sampling, often, to ascertain where NOT to strike for shipping ore; whereas the writer sought to check up as to where and what to mine.

As to smelter returns, for the scope of this report, and so as not to "choke it with columns of figures" and thus impede its purpose, from about "Pearl Harbor Day" onward his smelter returns showed a gross value in round figures of $45,000 and a net just above $22,000. That covers a total tonnage shipped (wet weight) of 1300---which averages out a net just under $17 per ton. The writervwent carefully through the said sheaf of smelter return sheets (American Smelting & Refining Co., plant at Hayden) and may add that they tell their own story. They are, as Mr. Kay states, available for study by persons interested in the future potentialities of the property, as well as by officials of governmental regulatory bodies.

Ore taken under Mr. Kay's administration out of the "Big Dome stope" (shown in Photos K and L) grossed, he stated to the writer, $10,433; and the balance stoped grossed a little under $35,000. The totals cited above represent ore mined and shipped down to the vein-depth of 280 feet---since in the ore-shoot termed the "Big Dome stope" shoot his crews were in ore only from a level almost 30 feet above the 310-foot level. (There is, however, unrecovered ore in that shoot below 280 feet---the writer sat on unmined highgrade to take Photo L).

The foregoing covers this phase in about the briefest form.

Supplement to
Sunset Mine Report

Addison N. Clark

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Physical Inventory of Sunset Mining Property
As of August 2, 1943 (From W. O. Kay, General
Manager, Checked by The Writer):

1	Ingersoll-Rand Compressor (Stationary)	$ 5,800.00
1	Sullivan Compressor (Portable)	3,700.00
1	Fairbanks-Morse Gas Engine and Hoist	1,500.00
4	Mine Cars	300.00
1	Stoper Drill with Shell	250.00
2	Sullivan Jackhamer drills	400.00
1	Truck, 1½-Ton	500.00
2	Mine Pumps (one a Cameron, shown in Photo U) .	450.00
1	Ventilation Blower	150.00
	Drill Steel, Pipe, Hose, Rails, Etc.	1,500.00
	Tools	150.00
	Machine Shop	100.00
3	Bunk Houses	250.00
1	Mess Hall	200.00
1	Shower and Change Room	450.00
10	Cots	100.00
1	Refrigerator (Kerosene-Operated)	250.00
	Kitchen and Dining Utensils and Dishes	250.00
	Water Tanks	100.00
	Sub-Total	$ 16,400.00
	Road Improvements Within Property	2,000.00
	Underground Workings	40,000.00
	T o t a l	$ 58,400.00

Note: From the writer's examination and appraisal of the inventoried machinery and physical equipment ten and one-half months later, he considers Manager Kay's inventory, as cited above, to be a fair and conservative one.---A.N.C.

Addison N. Clark

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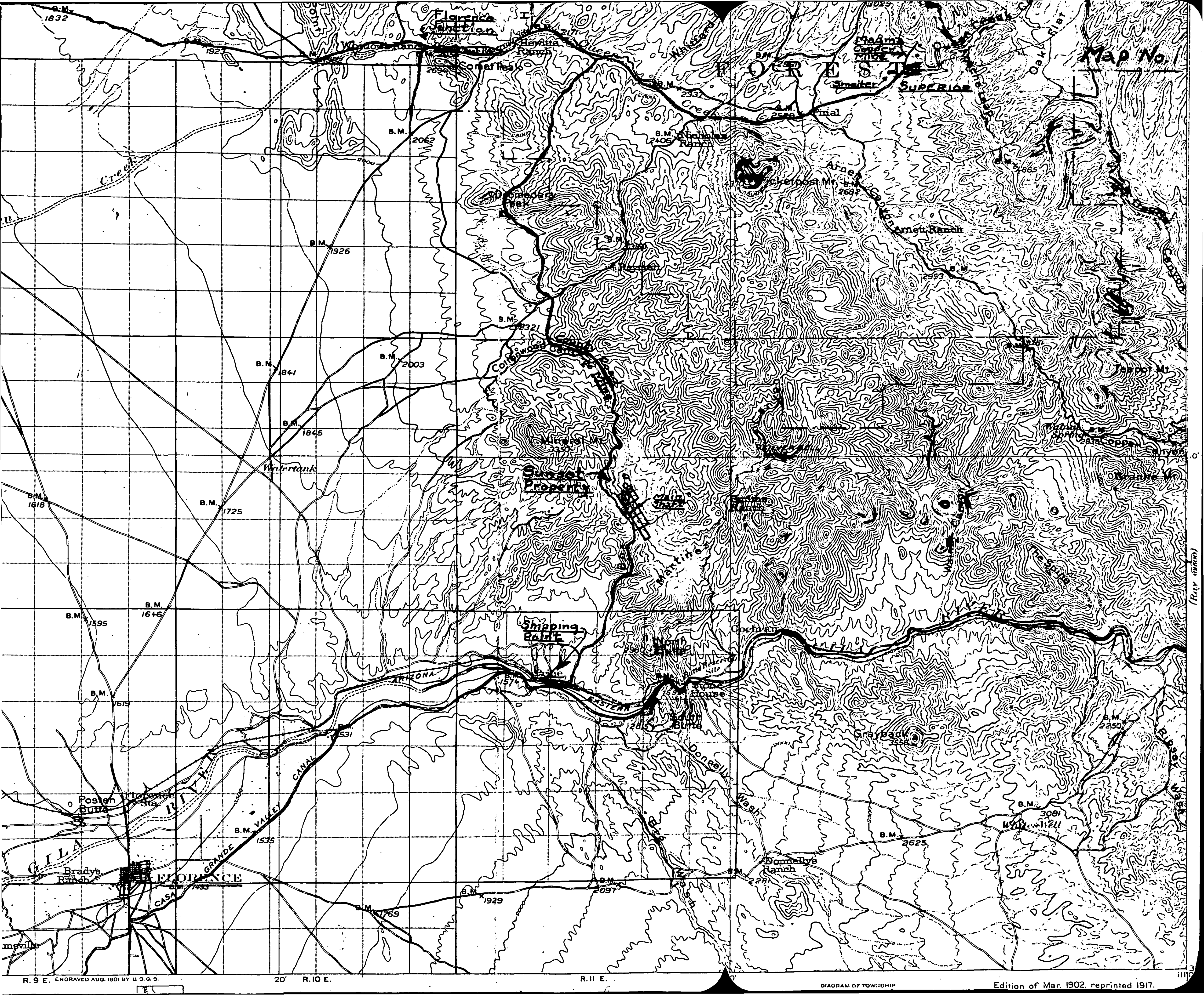
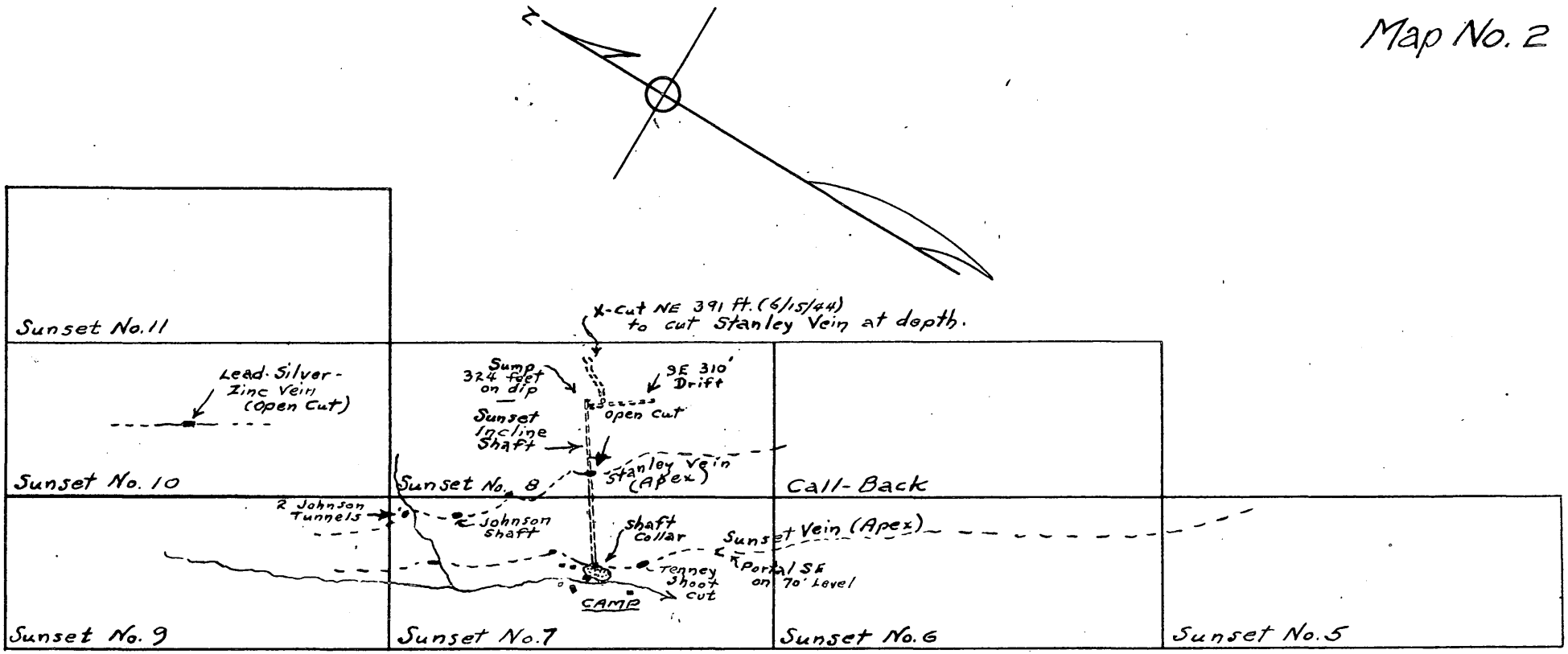
Addendum to Physical Inventory Sheet of Sunset Mine Report
As of October 1, 1944:

Brought forward from preceding page (Aug. 2, 1943):		$58,400.00
New underground workings since 8/2/43		4,900.00
Crosscut 310' level, 220' @ $15	$3,300.00	
SE Drift " " 65' @ $15	975.00	
Stoping above 310' level, Sept.'44	625.00	
Added machinery and equipment		2,200.00
New Sullivan drill, hose, bed, etc.	$500.00	
2 used air drills	450.00	
Flexi-Airpipe (Bemis)	400.00	
Miscellaneous operating material	300.00	
Lumber & timber	550.00	
T o t a l		$65,500.00


Map No. 1
Florence Junction
Superior
Smelter
Magma Copper Mine
FOREST
Queen
Creek
Whitlow Ranch
Hewitta Ranch
Comet Peak
Picketpost Mt.
Arnett Canyon
Arnett Ranch
Oak Flat
Dromedary Peak
Cottonwood Canyon
Mineral Mt.
Sunset Property
Main Shaft
Shipping Point
Martin
North Butte
South Butte
Stone House
Graybeck
The Spine
Teapot Mt.
Copper Canyon
Granite Mt.
Ripsey Wash
Donnellys Ranch
Donnelly Wash
White Well
Watertank
Creek
ARIZONA
EASTERN
CANAL
CASA GRANDE VALLEY
GILA RIVER
Posten Butte
Florence Sta.
Bradys Ranch
FLORENCE
B.M. 1832
B.M. 1923
B.M. 2062
B.M. 2003
B.M. 1926
B.M. 1841
B.M. 1845
B.M. 1725
B.M. 1618
B.M. 1595
B.M. 1646
B.M. 1619
B.M. 1535
B.M. 1531
B.M. 1769
B.M. 1929
B.M. 2097
B.M. 2281
B.M. 2625
B.M. 3081
B.M. 2350
B.M. 2321
B.M. 2331
B.M. 2406
B.M. 2953
B.M. 2682
R. 9 E.
R. 10 E.
R. 11 E.
20'
ENGRAVED AUG. 1901 BY U.S.G.S.
DIAGRAM OF TOWNSHIP
Edition of Mar. 1902, reprinted 1917.
(Ray 48800)

Map No. 2



Sketch Map of Group of Eight Claims of

SUNSET MINING PROPERTY

Mineral Hills District, Pinal County, Arizona

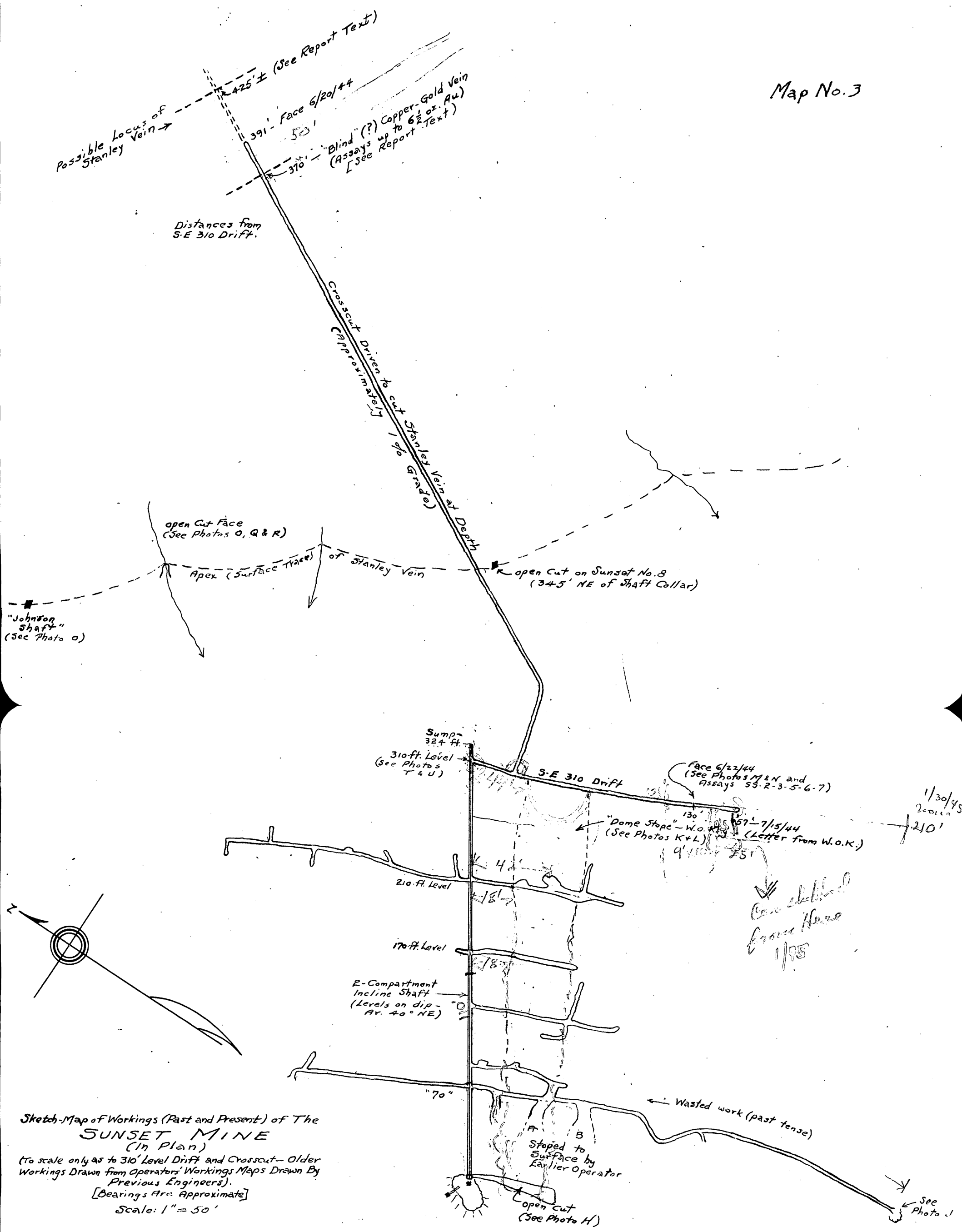
Showing Approximate Courses of Two Main Veins

Scale: 1" = 600'

(Not based on instrument survey)

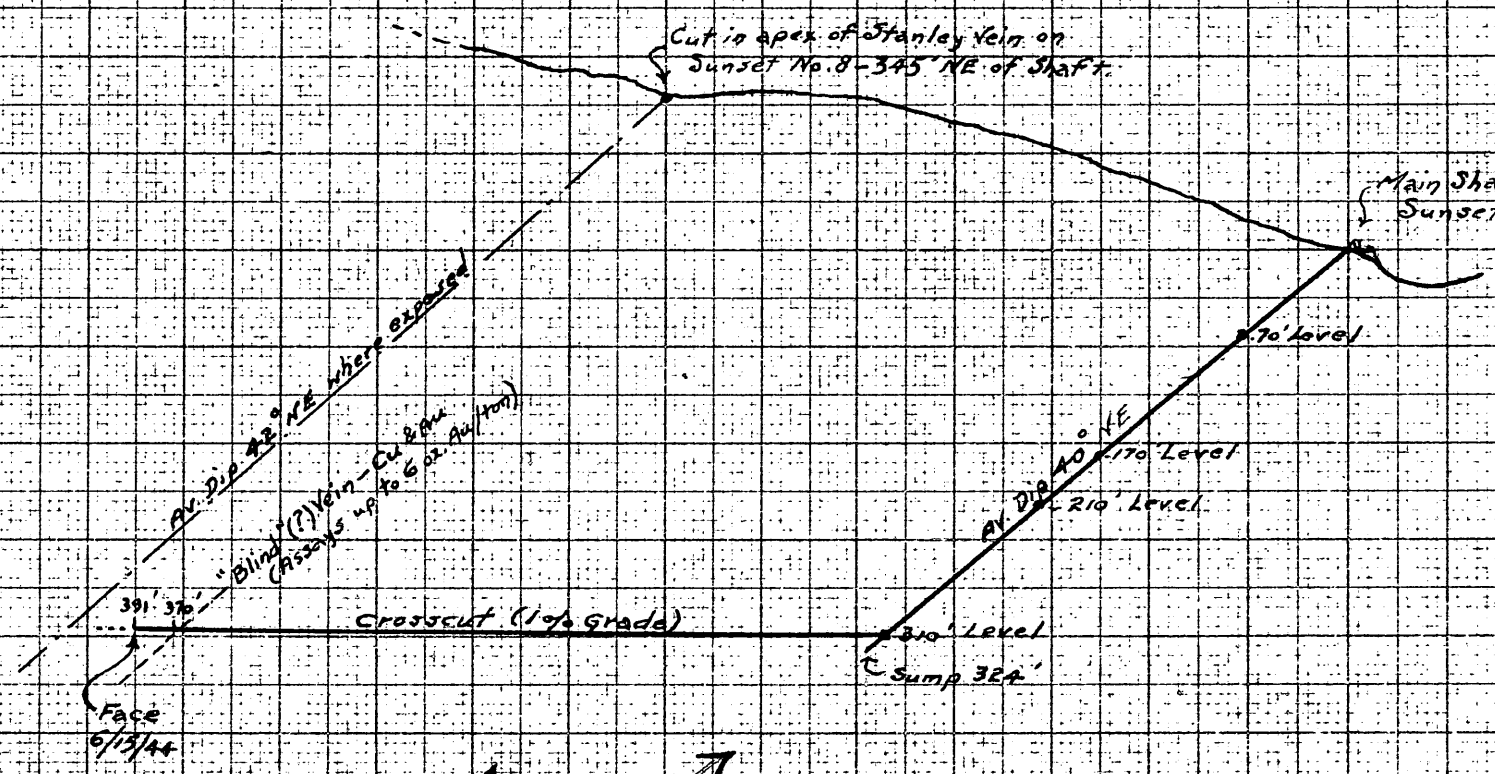
Del. A.N.C.
July 1944

Map No. 3



Sketch-Map of Workings (Past and Present) of The
SUNSET MINE
(In Plan)
(To scale only as to 310' Level Drift and Crosscut - Older Workings Drawn from Operators' Workings Maps Drawn By Previous Engineers).
[Bearings Are Approximate]
Scale: 1" = 50'

Del. A.N.C. - to accompany report - July 1944



Lower to 610 feet

Cross-Section of Part of Workings
SUNSET MINE
(Hypothetical as to the Stanley Vein)
Showing Relationship of Principal Veins
(Looking Southeast)
Scale: 1" = 100'

Del. A.H.C.

A — Main paved highway from Superior, connects with County road to Sunset Mine four miles east of Florence Junction (see Map No. 1). Picket-post Mountain in center distance. Messrs. Kay and Baiocchi flank the Buick.

B — Part of 9 miles of good County road connecting paved highway (Photo A) with Sunset Mine.

In distance on horizon below can be seen Tortilla Mountains, SW of Hayden. ↓

C — Where the County road (Photo B) reaches Sunset Mine continues down canyon (see Map No. 1) to Price, ore-shipping point. North Butte in right distance. See also Photo F. (Looking South to Gila Valley.

D — General view of topography of Sunset property — a panoramic shot from point P in Photo G, looking northeasterly (i.e., towards Superior). Note visible cropping of Sunset vein NW and SE of shaft. "T" is "Tenney Shoot" Cut — Photo I; "Z" is portal in Photo J.

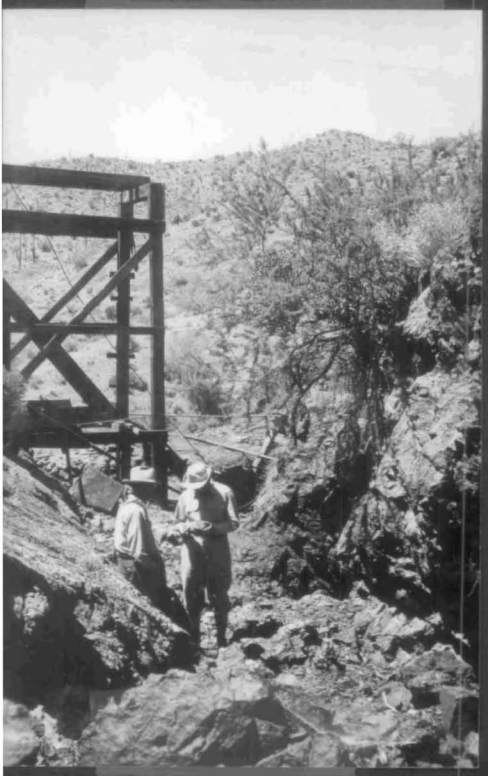
E — Closer-up panoramic view — also looking northeasterly. Hill "H" is in both views. Roof of mess-hall [illegible] Sunset shaft headframe beyond covered truck.

F – Panoramic like Photo C but from lower elevation. Cut in apex of Stanley vein on ridge at X (see Photos O to S incl.) is 345 ft. NE of collar of shaft . . . see also Photo P. (Looking southeasterly).

G – Panoram. similar to F but more to SW. County road on ridge. Photo D taken from Point P, which is cropping of a large vein on adjacent property of Arizona Mining Co.

H – Open cut SE of the head-frame shows dip and both walls of Sunset vein. (Looking NW). Gray and Baiocchi.

I – Footwall of Sunset vein exposed in open cut at top of "Tenney ore-shoot" on ridge at "T" in Photo D, 175 ft. SE of shaft.
(Left to right: Baiocchi, Kay, and Tom Gray, hoisting engineer.



J – Where the 70-ft. level drift emerged into the gulch at "Z" in Photo D. (Baiocchi and Gray)

At Shaft On 310' Level

Note the slickensided hanging wall of Sunset vein — in both views. Every exposed surface underground is alive with fluorescent calcite, under the ultra-violet light — the vein carries its own catalyst, or "ore-maker," in the $CaCO_3$.

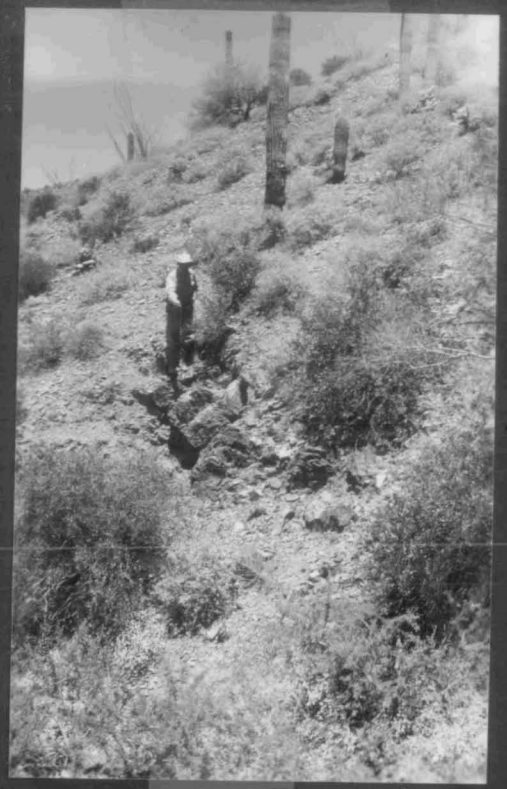
T - Baiocchi, McCliff (L) and Cassar fan the hanging-wall with ultra-violet light — CALCITE.

U - McCliff oils the Cameron pump — 14 ft. Jump below Skip is below at right.

V - "Bill" Simon, Chief Chemist of Magma Copper Co. and Stanley Kalaf, his aide, read micro-ammeter in geophysical survey of Sunset veins.

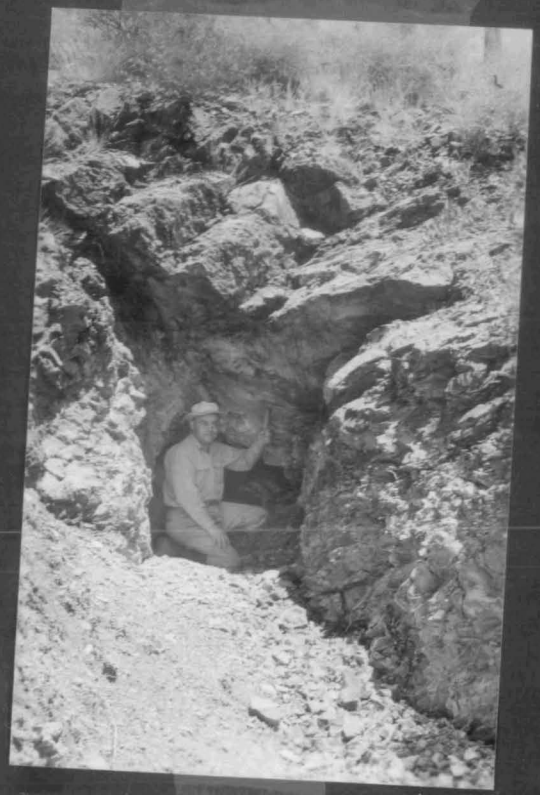
W Open cut on Lead-Zinc Silver vein on Sunset No. (see report text) Baiocchi and Cassar study the ore pile . . . see assay certificate.

X - Photo of the writer, cracking rock on ore-bin trestle (by Baiocchi) — to prove the writer was there.



Q – Strong outcrop of Stanley vein at "E", Photo O – see Photo R. Dip 42° NE. (Mr. Baiocchi holding plumb-bob).

S – Looking SW from this cut (above) across camp. Point P is same as in Photo G.



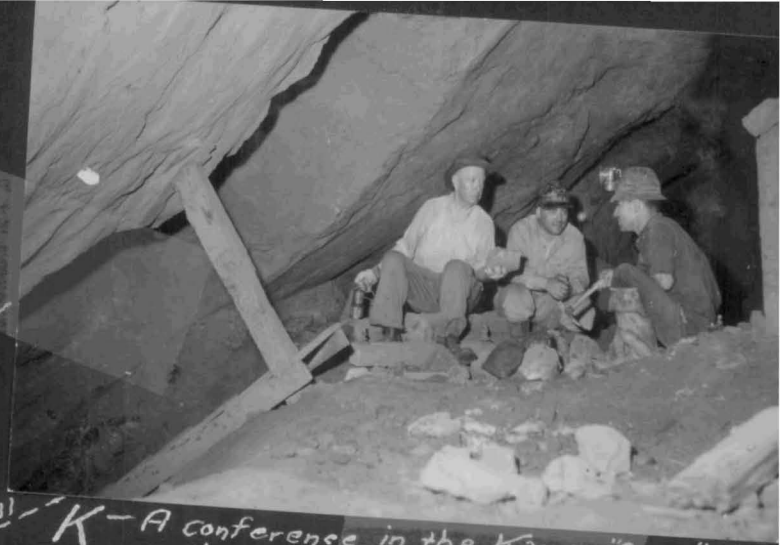
R – Pick is held against footwall gouge below where Mr. Baiocchi stands in Photo Q. Shipping ore exposed here.

O - one of two "pan" shots to show surface relationship of Stanley vein to Sunset vein. (See also Photo P). Kay at A, Kalaf at B, both photos, at croppings. (B is "Johnson shaft"). D is open cut on Stanley on Sunset No. 8. E is cut in Photos Q and R.

P - Closer view of NW hill in Photo O. "A" and "B" same as in O. At "C," in both, Mr. W. W. Simon, Chief Assayer of Magma Copper Co., stands on apex of main Sunset vein. They are 345 feet apart on surface at "D" and shaft; 175 feet in gulch at left; dip approximately parallel (see section).

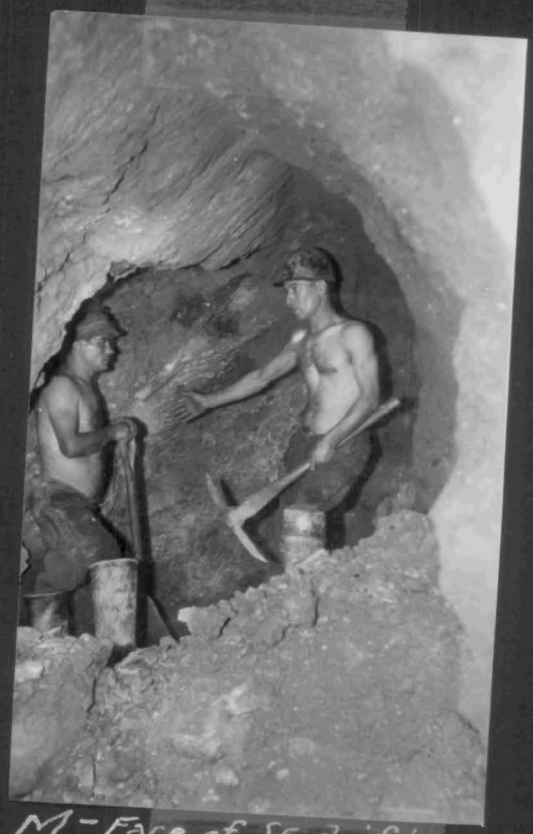
Hanging Wall

Foot Wall

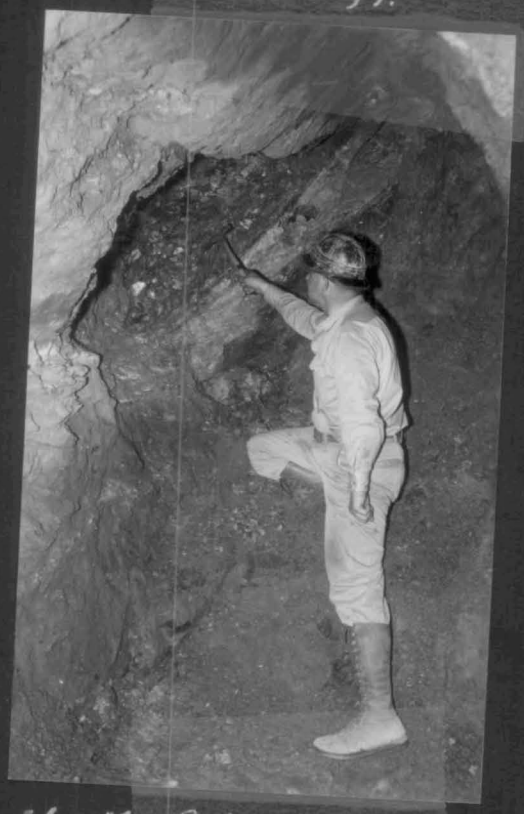


K – A conference in the Kay or "Dome" Stope on the 210-ft. level. (L to R. Messrs Kay, Baiocchi and Cassar). Note solidity of ground, here and below – freedom from timbering, use of a few stulls. All ore from this stope was shipped to the smelter (A.S.&R. Co.) at Hayden, via Price.

L – The same stope about 80 feet down – about 20 feet above the SE 310 level drift. (Baiocchi and Kay).



M – Face of SE drift on 310-ft. level, 130 feet from shaft, following shooting round. McCliff (left) has head in hole in footwall gouge exposing good-grade copper ore with covellite and black oxide plus low gold and silver content – assayed $73 per ton across 2 feet.
Note slickensides on foot wall gouge. Cassar with pick.



N – Mr. Baiocchi has a look into the same hole, shown in Photo M. Dip here is 45° NE

Amer 29222

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Report of Preliminary Examination of The

SUNSET MINE

In the Mineral Hills Mining District

Pinal County, Arizona

Purpose, Summary, Conclusions, Recommendations

To make a surface and underground study of the mining property named, owned under possessory title by the Sunset Mining Company, Inc. (a California corporation) and held under personal working bond-lease by Mr. William O. Kay of San Francisco, for several years active operator of the property as its General Manager under the said bond-lease, the writer was retained in June of 1944 by Mr. Kay and his associate, Mr. Joseph L. Baiocchi of Oakland as consulting engineer. Major objectives of the survey and study were (a) to step up broader development of, and ore-production from, its known and partially-developed main (Sunset) vein; its paralleling Stanley vein, so-called; and its discovered but as yet undeveloped intervening (also parallel) copper-gold vein; and (b) to make this report as an adjunct to a planned program for sound corporate financing of such augmented development and production, as well as to embody such recommendations as may appear advisable.

A "sub-objective" was determination by the writer whether, in the light of his findings on and under the ground, such a step-up of development, and the needful corporate financing to enable it, were advisable or otherwise---especially in the light of war requirements for copper.

To that end the writer, accompanied by Mr. Baiocchi (who jointly with Mr. Kay controls the property and the said Corporation in which its possessory title is vested) spent the ten days from June 15 to 25 in making the said examination. Reason for use of the word "preliminary" in the title is that the geology of the immediate area of the property and the contiguous copper-production areas of Superior (locus of the famous Magma copper mine) and Ray and Globe, and the ore-genesis of this and those near-by producing areas, are far too complex for any engineer or geologist to digest in any ten-day study; and that the writer's deductions and conclusions as to that will necessarily require longer and more detailed study in the future. The fact that Doctor Wilson D. Michell, Geologist for the Magma interests, is spending the better part of 1944 working out the complicated geology of the area of Superior alone, bears quite

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directly on that phase of this job---and the writer here expresses deep appreciation of the geological courtesies extended to him by Doctor Michell, and likewise by Mr. William W. Simon, Chief Assayer of the Magma Copper Company, long familiar with this property, who has done Mr. Kay's routine assaying for a long period. The writer's confidence in Mr. Simon and his work may be judged by the fact that this is the first mine examination report he ever has written using a local assayer, having previously always lugged his samples home and had them assayed by firms with which he had done business for years. Mr. Simon's long familiarity with the copper ores of this region was a distinct asset.

Summary:

The property, 11 miles southwest of Superior (airline) and 21 miles via paved highway and fairly good county dirt road (see Map No. 1) consists of eight standard lode claims held, as said, under possessory title under Federal and State mining laws. Maps Nos. 2 and 3, and the partial transverse section, plus the photographs, tell the essentials better than words. It is suggested that the reader digress to them before proceeding here.

Traversing it longitudinally are two strong copper-gold veins ---true fissures in the so-called "Pinal schist"---plus intervening lesser veins. They are designated as the Sunset Vein and the Stanley Vein; and both carry minor silver content in the ore. Between them (so far as current disclosures indicate) was recently cut, as is indicated in the partial section, a similarly-dipping vein carrying noteworthy gold values. The writer's determinative sample from the latter (see assay-report) carried one ounce per ton, and almost 2 percent copper; and General Manager Kay and Assayer W. W. Simon showed the writer recent assays carrying, in one, approximately four ounces in gold per ton, and in another six and one-half ounces---figures which caused considerable of a flurry in the Superior area.

The fourteen samples taken by the writer were for the purpose of indicating the ore-characteristics. The supplementary sheet as to the samples taken, together with the Simon certificate, is self-explanatory and more or less speaks for itself save as to the two "duds" (Samples SS-1 and SS-7).

Especial attention is invited to Samples SS-2, SS-3, SS-5 and SS-6. Shortly before the writer's examination the southeast drift on the 310-foot level encountered covellite along with the chalcopyrite, and considerable black oxide. Higher copper values naturally showed up in the assays (routine) and in the writer's samples, though gold values are minor there. The gangue carrying the covellite values is a brecciated, recemented metamorphic material with the covellite incrusted over it in flaky form. In the opinion of the writer, that drift is well into the downward extension, on its

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"rake," of the so-called "Tenney ore-shoot" which has been exposed in the open cut (see Photo I) about 175 feet southeast of the collar of the shaft. While the writer made no microscopic studies of the ores, as yet, that specific ore opened up in the main (Sunset) vein shows values indicative of primary character ("hypogenes" as called by F. L. Ransome of the U. S. Geological Survey) and also show evidence of "secondary enrichment" ("supergenes" as Mr. Ransome terms them). That is to say, the vein was enriched by deposition from both hot ascending solutions and cold down-percolating solutions. Moreover, even at the comparatively shallow depth of 310 feet there is evidence that at no very much greater depth the vein will yield more massive sulphides, and that with added depth the covellite will cease showing in its flaky form and appear in mass form---with chalcocite also showing up; likewise bornite.

The clean-cut walls of both the Sunset and Stanley veins, as they appear in the underground photos, and the daylight shots of the Stanley vein, are prima-vacie evidence of true fissures in the Pinal schist which, barring excessive faulting as yet undiscovered, should persist to great depth and permanence. Photos H and I both show that characteristic clearly in the Sunset vein. So do Photos K, L, M, N, T and U in the Sunset vein. Photos Q and R illustrate the same characteristic in the Stanley vein.

The two veins are converging as they run northwest, being 345 feet apart on the northeasterly line through the shaft and only 175 feet on the northeasterly line through the "Johnson tunnel" face. As to how far northwest of the existent workings the fissures merge, the writer does not say at this stage; but it is logical to expect that when their junction is exposed in the property's future, a considerable orebody will be found.

As to the "blind gold vein" indicated on the transverse partial section, and also on Map No. 3, and as to "possible locus of Stanley vein" thereon, the latter is predicated upon its holding its average dip as measured where it is exposed. If on the other hand its dip has steepened with depth, there is the possibility that the "blind copper-gold vein" which was cut in the crosscut on the 310-foot level could be the Stanley vein itself. A moderate amount of drifting both ways in that "blind" vein should disclose whether or not that is so; perhaps some overhand stoping in it. A winze has been suggested (since the values were found in the floor of the crosscut) but that would involve pumping and hoisting with the "tugger hoist" that is on the ground. As this is written the crosscut is being driven ahead, and soon should determine whether or not the Stanley vein is where indicated.

The two-compartment shaft and equipment associated with it leave considerable to be desired, as far as speed of operations is concerned, but for the immediate present the management is getting by with it, and can for some months step up operations both in the

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southeast drift on the 310-foot level and there stope an excellent grade of shipping ore---clear to the surface if, as is indicated, that drift is in the downward extension of the "Tenney shoot"; and also tap the Stanley vein at more than 400-foot depth on the dip, which it is logical to expect, from the character of that vein and its ore where opened up at four places on the surface, will yield good-grade shipping ore.

Also, with reference to the Stanley vein, by putting a crew of two men driving a drift southeasterly into it from a point in the gulch between the "Johnson shaft" and "Johnson tunnels" (see Map No. 2) good shipping ore can be mined from that level, very inexpensively, with an all-downhill truck haul from that drift's portal and bin.

The property's camp is well equipped as to quarters and mess facilities, and the climate is such that tent-wall "kennels" could be used pro-tem to house a stepped-up personnel.

There is more than a mile of the Sunset vein workable, as the map (No. 2) shows. The same should be true of the Stanley vein as well. And as depth is gained, the ore in both can be expected to enrich in sulphide values. It is obvious, therefore, that a long-lived mine is in the making---one which with good Scotch management can be made a consistent dividend payer.

Conclusions:

That preceding paragraph may be taken as a frank, blunt conclusion itself. The writer's opinion as to that is concurred in by numerous people in the Superior area---including both of the Magma gentlemen named---and the writer is not afraid to "stand pat" on the prediction, provided his recommendations are carried through (as he is sure that they will be by those who control and manage the property).

By mining both of the major veins, tonnage produced and shipped can be brought to a magnitude such that a backlog of operating cash can be built up to supplement operating capital which it is planned by the management to raise by appropriate corporate financing methods in the near future, with funds left over for dividends.

The day will arrive, naturally, when the existing inclined shaft and associated equipment will have to give way to a vertical operating shaft with modern electric hoisting equipment. (Electric power is as near as Florence, 13 miles southwest). However, for the immediate present the incline will have a heavy job to do, and will handle it with care and precaution. From visible indications it will have, ere long, stoped ore from three places in the mine . . . the southeast 310 drift, the Stanley vein in the crosscut, and (unless it and the Stanley are the same) the "blind copper-gold vein."

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To handle that, it will be necessary to plan carefully the routine of shooting, mucking and hoisting; but that can be done. And the mining of ore from the upper level of the Stanley vein, northwest of the "Johnson shaft" in the gulch, will be independent of work in the lower levels---can start as soon as Supervisor Spray of Pinal County gets his bulldozer on the job to cut out a usable road up the wash to the site (which Mr. Spray promised to do while I was there).

(Mr. Spray, incidentally, has another good reason, aside from his consistently friendly attitude towards the Sunset group, to keep this stretch of County road in good shape---he has a lease-option over in Martinez Canyon, three miles northeast (see Map No. 1) near the famous old Silver Bell Mine; and his recent samplings, assayed by Mr. Simon, as reported to the writer by Messrs. Kay and Simon, carried 966 ounces in silver and 68% lead---the latter in carbonate form. Which brings up the fact that the Sunset Company has a potential ace-in-the-hole in the form of a well-defined lead-silver-zinc vein about at the center of the Sunset No. 10 claim (see Map No. 2) which the writer sampled. It is noted that it sampled (see SS-8L on assay sheet) 19.8% lead. That vein strikes and dips conformably with the copper-gold fissure veins to the southwest of it; and the cropping where it is opened up with a cut (see Photo W) is high on the ridge, so that ample backs can be had by drifting northwesterly from the upper gulch. However, that vein is to be let severely alone for the present, in favor of the others. The day will come when America's lead-zinc industry will move westward, as the mining region around Joplin, Missouri, tapers off in yield; which will be the time to look into this and possibly other lead-silver ledges in the picture---especially if ore comparable with that unearthed by Supervisor Spray can be developed.

Recommendations:

In the order of their comparative importance, as the writer sees it, he deems these steps should be taken:

1. Get the southeast drift on the 310-foot level swung a bit to the northeast so that (see Photos M and N) right-side overhand stoping can be started soon. It is evident, from the photos, that the drift roof to the left is the vein's footwall gouge-seam. The ore here carries enough highgrade, as to copper content, and the covellite and black oxide are so fine and flaky, as to warrant most careful handling and cobbing. With such care in handling this ore, judging from its character where exposed, this stope should yield commensurately with, and probably better than, the so-called "Big Dome stop" mined under Mr. Kay's direction in the ore-shoot next to the northwest (shown in Photos K and L).

2. Drive the long crosscut ahead to possible intersection with the Stanley vein; and, if cut, and cut at a "lean streak" between ore-shoots, drift both ways to pick up a pay-shoot of the character

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found in these veins---then get promptly to stoping.

3. Check up, simultaneously with No. 2, on the "blind copper-gold vein" in the crosscut 370 feet from the shaft . . . with the suspicion ever to the fore that, due to dip-steepening (or possible lateral-thrust faulting) this may be the Stanley vein itself. It is noted (see Assay SS-4G) that the sample carried almost 2% copper. That sample, however, carried its copper mainly as carbonates with some chrysocolla (silicate) and showed little sulphide---whereas in the several open-cut exposures of the Stanley vein on the ridges above, and in the upper gulch to the northwest, the ore is marked by ample sulphides in its unleached denser parts, indicating that this particular vein is not the Stanley, but a paralleling narrower vein or stringer. Its high gold content will make excellent "sweetening" in a binful of copper ore, to help build that cash backlog.

4. Put a handpicked two-man crew at work in the gulch northwest of the "Johnson shaft"---opposite and facing the "Johnson tunnels---driving a drift southeasterly into the Stanley vein, just high enough above the wash to permit building a rough-neck ore bin at proper height to load by gravity into a truck. When that drift gets under the Johnson shaft it will have approximately 40 feet of backs on the vein-dip; more than 25 feet beneath the exposed face shown in Photo R; and close to 75 feet beneath the cut on the ridge on Sunset No. 8 claim---and good sulphide ore is opened up at all three points; as also in the "Johnson tunnel" across the northerly gulch from the recommended drifting site. All of which ore, recovered, will augment the shipped tonnage.

5. As expeditiously as possible, hand-sort the mixture of ore and plain rock in the main ore-bin at present---rid it of the waste dumped in during the Manager's absence, so as to eliminate it from the next smelter shipment. (In this connection, the writer points out that in assorted orepiles at various open-cuts on both major veins lie (probably) close to fifteen tons of good shipping ore---strongly sulphides---which can somehow be rounded up and conveyed to the main bin or near it. That will offset to large extent the loss and cost incidental to re-sorting the ore now in the main bin, and, as the assay-sheet indicates, "sweeten" the next shipment to appreciable extent).

6. Reverse the hoisting cable in the incline, to keep abraded spots on the drum, and install new cable-rollers at proper points as soon as possible. Also, install continuous handrail alongside the manway as an added safety measure. As a further safety measure the writer recommends setting of stulls and possible lagging as well in the "Big Dome stope," plus a ladder up it from the 310-foot level, thus making it at least a partway-up "second entry" for use in case of accident in the main shaft. While the ground is solid, as the photos (K and L) show, cave-ins do occur at such spots in mines.

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7. Get air down into the long crosscut, and also the southeast 310-level drift---and into stopes from both, as they develop---as expeditiously as possible. Good air sent thither will materially step up the work-output of personnel. Use the 200-odd feet of canvas air-pipe now on the ground, and augment it with sufficient Bemis Bag Company "Flexipipe," to hold costs down (and because sheet-steel air-pipe is hard to buy). If the small helical fan on the job now is adequate to handle sufficient air-volume, use it. If not, it will pay dividends to buy a bigger one---preferably of the high-speed centrifugal type.

8. Purchase a new air drill, to ally with the present usable one as insurance against shutdowns for repairs. The writer recommends the Sullivan Type L-57 Jackhamer---and is aware of one to be had forthwith, in San Francisco, procurable with the Company's priority certificate in hand.

9. Arrange as soon as possible with Mr. J. H. Hedges, District Engineer at Tucson for the U. S. Bureau of Mines, under the plan in past effect (and, the writer understands, again available to be done with funds earmarked for the purpose) to have some diamond-drill exploratory work done as a means of holding down costs. Primary need for that is in the face of the long crosscut, to drill straight ahead to locate and sample the Stanley vein. If not encountered in line ahead of the present face of the crosscut, where expected, one or more holes can be drilled overhead at an angle---since the dip of that vein, as indicated at the several openings along its apex, can have changed with depth. Another advisable spot for drill exploration is at the face of the southeast 310-foot level drift---ahead (southeasterly) as a check on the downward extension of the "Tenney shoot"; and, possibly, also, upward to the right into that shoot as a check-up on stoping, and downward to the left to test that lower ground for added sinking and further southeasterly drifting and stoping. (It is presumed that the shoot nearer to the shaft, which yielded good grade shipping ore from the Kay "Big Dome stope," will yield further good ore at lower levels; which means that there can be expected two workable, commercially valuable ore-shoots to the southeast of the shaft, stopable from one or more lower-level drifts, with the "Tenney shoot" stopable now from the 310 level upward). It does not appear necessary, to the writer, to do any diamond drilling in the Stanley vein at the level where the drift is recommended in the gulch due north from the camp.

10. Set the lights "green" and proceed with such speed as is possible, with funds now available, with the recommended steps . . . objective, getting shipping ore out of the property, with equipment at hand, and to the smelter, to reduce somewhat the amount of operating capital to be raised through corporate financing.

11. Begin planning <u>now</u> towards a suitably modified corporate set-up to finance a faster tempo of ore-recovery. As an initial

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step in said financing, the writer recommends a workable plan to provide a working treasury, operating fund, of not less than $50,000.00. Since the Corporation is organized under the laws of California and of file-record with the State Division of Corporations, qualified to operate as of now in Arizona, and as control and management has shifted advantageously to present administrative and executive personnel, two ways are open for such financing: (a) Increasing of present capitalization of 80,000 shares of par-value of $1.00, with 44,000 shares issued, to a level of, say, $250,000 or $300,000, same par, with authorization to sell and issue to a close "handpicked" group who are in touch with the property and its operations and have expressed desire to "sit in," 50,000 shares at par to create that fund, together with such further issuance as may be required for balance of administrative control and other equitable factors; or (b) Creation of a subsidiary, also a California corporation, to take over the existent bond-lease and other assets and, with similar financing steps, to enlist the required capital to carry ahead and step up mining tempo. That, however, is more properly a matter for discussion with the Company's legal department, by the management, rather than with the engineering.

As it stands, the mine has no definite blocked-out, sampled ore to break, sort and ship, as in older, longer-established properties. It is, however, vastly more than a mere "prospect," and conditions as found existent on and in the ground by the writer assuredly are such as to warrant such an engineering and financing program as the writer has here recommended; likewise such as to warrant reasonable expectation, in lieu of mere hope, of adequate commercial profits to the Corporation and to those who already, to the writer's knowledge, have voiced desire to "sit in."

The most casual examination of the dump at the Sunset shaft is sufficient for the estimate that in it are at least 25,000 tons of concentratable copper-gold ore; hence, as a sort of follow-through (future) step in planning ahead, the writer feels it is not too soon to begin planning erection of a simple, compact gravity-concentration plant in the main gulch below the incline. Especially since ore yet to be mined in the immediate future, via the present shaft, can be advantageously concentrated; and even flotation concentration is in the cards as a pre-shipment stage. Paying freight on gangue and included plain waste hikes up operating overhead expensively; and such a plant will pay for itself---plus dividends on its cost. Even at the present stage the property is definitely of magnitude and promise to warrant such planning ahead. Having that in mind for future development of the operating equipment, it is right now secondary to the requirement of a faster-operating two-compartment vertical shaft so located as to cut both veins at depth and permit more efficient mining with greater safety than with the existent incline and skip. And even as of the present, it is desirable to replace the old Fairbanks-Morse slow hoisting engine with a faster, more powerful one---cost of which will be included in a breakdown of

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that recommended $50,000 fund which the writer will present in the near future as a supplement to this report.

The bulk of the program herein recommended can be inaugurated and got under way with the machinery and equipment already on the property, as quickly as needful funds are made available for it.

Miscellaneous Relative Information

Local Geology:

While geological conditions here are far less complex than they are in the near-by mining areas of Superior, Ray, Globe, Miami, etc., all in the same general copper-producing region or belt, they would require so many pages of discursive text as to defeat the primary aim and purpose of this report---by clogging the document with technicalities. Hence, while it was the writer's original purpose to go into the property's geology in as much detail as his brief survey of it would permit---along with the geology of abutting ground---he has decided to curtail discussion thereof materially so as to shorten this specific report. Detailed analysis of such geology therefore will be deferred to a later report on the property, at a state of developments when it will be more necessary than here.

Suffice to say here, as already has been said in the second paragraph under "Summary," that the property is traversed longitudinally by two strong copper-gold veins, both true fissures dipping between 40° and 45° (average) northeasterly, in conformity with the "country," and that, as also previously stated, both veins are operable for at least a mile within property lines. The Stanley vein definitely dips out the northeasterly sidelines---but the Federal Mining Laws as to apex rights definitely protect the Company in its operating bond-lease. It is probable that, barring material steepening of its dip, that the Sunset vein also extends out under the northeasterly sidelines. The same is true, probably (if that be a separate vein) of the vein cut at 370 feet northeast of the incline on the 310-foot level; and the same laws hold). It also is probably equally true of the lead-zinc-silver vein apexing on the Sunset No. 10 claim---any development whereof is far in the future.

All veins cited are fissures in the formation designated as the "Pinal schist," of pre-Cambrian age; and all examined show evidences of heavy ground movement---which likewise is manifest in the marked brecciation of the ore and gangue. That is indicative of depth and permanence of the veins. All evidences of such movement examined showed up-or-down wall movement (i.e., slickensides at right-angles to the strikes of the veins---as several photographs show) and as yet the writer has found no evidence, in the workings, of any lateral ground movement (which conforms, hence, with the movements which caused the uplift of the range and paralleling ranges of the region). Nor did he find any evidence of lateral-thrust cross-faults in the workings examined.

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Which, for the purposes immediately in hand, sufficiently covers matters geological so far as concerns the property. The writer has a notion, however, that he later will "gang up" somewhat with Doctor Wilson Michell, geologist with the Magma interests (who has been an interested visitor to and student of this property) and also tap the published regional geological data of such U. S. Geological Survey writers as Frederick L. Ransome, and in a later report combine their findings with his own in a lengthy discussion of the subject thus briefly handled here.

Location and Accessibility:

These are so graphically covered by Map No. 1 of the report that reference thereto is sufficient. The property is within a few hours' driving of the majority of Arizona's most famous copper mining towns. Within an hour's drive (less for a fast chauffeur) of the County Seat of Pinal County, Florence---for consultation of county records, etc. A good driver can make Tucson, seat of the State University of Arizona with its School of Mines records, and a regional headquarters of the U. S. Bureau of Mines, in a couple of hours. The same is true of Phoenix, State Capital and center of most of the routine supplies and equipment needed. Barring cloudbursts, the county (dirt) road connecting the mine with the main State highways is always drivable; and Supervisor "Joe" Spray is a co-operative fellow in the matter of keeping that road in drivable condition with his bulldozer crews and graders.

Water Supply:

This, right now, is a real problem---even as to domestic supply. However, Manager Kay has in hand the task of deepening and improving the well in the "wash" just below the camp, and adding a suitable small pump---this for cooking and drinking uses. The mine water is used at the mess hall for washing purposes.

When a concentrating plant is added, it is probable, from indications (though at present once or twice a week pumping holds the water-level below the 210-foot level) that considerable added mine water will be available. Doctor Willard E. Kay, associated with his cousin Manager "Bill" Kay, has in hand an analysis of the mine water at the laboratories of the University of Arizona at Tucson---one object being to check it for possible fluorine content; another being to check it for milling uses "when and as."

Without having wagged a willow wand up the "wash," or waved a doodlebug, the writer is reasonably sure that reasonably shallow water wells sunk, at right points up the gulch, will produce among them enough water to augment even present low-flow mine water.

Lumber, Timber, Hardware, Etc.:

These are readily procurable as near-by as Superior, at fair

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current prices---and the Corporation holds a War Production Board priority rating adequate to meet all purchases of equipment and supplies at present, likewise under the program herein outlined and recommended. The same holds good for powder, fuse and caps, and proper storage facilities for explosives, State-inspected, are safely and handily located with respect to the workings.

Fuel:

At present this is gasoline, procurable at "non-highway-use" prices from major oil corporations. Fair storage facilities exist on the property near the workings. At present and for the immediate future it will be the fuel for the hoisting engine and the heavy-duty compressor, as well as (when used) the Sullivan stand-by portable compressor (which, it is possible, may be moved from present locus near the shaft---see Photos, it stands near main ore-bin---to the site of the planned high-level drift, in the upper gulch, in the Stanley vein). Also will be presently used for a ventilation blower engine.

Gradually, it is the plan of the management, concurred in by the writer, to shift to Diesel power---and the replacement hoist referred to under "Recommendations" will be chosen with that economy in view.

Potential Electric Power:

As already said, this is available as near as Florence, a dozen miles southwest, airline; or from the power line serving Superior. Frequency of that commercial alternating-current power, however, is 25-cycle---which demands that driven power units be of design (off-standard) to fit. It also, as is well-known throughout the parts of Arizona served thus, makes lights flicker unpleasantly---and raises hob with innumerable radio receivers, which are highly needful under partly-isolated conditions in current times.

Hence, when the time comes to move over to electric power General Manager Kay and the writer think in unison in favor of locally generated 60-cycle A-C power---with a sizeable Diesel-electric unit as its source. The later plan, moreover, will be considerably less expensive both as to first cost and as to operating cost, than will a long central-station power line; especially one delivering an undesirable A-C frequency.

Material and Equipment Now on Hand:

This is shown by the transcript of the Company's inventory of such material, machinery and equipment, which will supplement this report. As stated herein, with a couple of exceptions it will be adequate to getting the recommended program well under way.

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Climatic Conditions:

These are perfect for all-year-'round operation. As to winter months, it need only be borne in mind that southern Arizona is a world-famous winter resort. As to summer months, the desert heat is dry---hence not only endurable but, as to certain human ailments, highly beneficial. The in-between seasons are about as near climatically perfect as they come.

Maps and Photographs:

The accompanying maps are self-explanatory. So also are the photographs, with their inter-keyed captions. The writer is habitually liberal with photographs in his mine-reports, on the principle of the old Chinese proverb: "One picture is worth one thousand written words, ten thousand spoken words." Surface and underground pictures, 24 in all, were taken with the object of giving readers of the report as clear as possible an overall perspective of the property, and making it possible for them to visualize conditions at long range.

A One-Paragraph Recapitulation:

The writer (as the letter of transmittal states) found in the property more than he expected to find---and he had been led to expect to find considerable. The administration and management has its collective feet on the ground; knows how to make a development-operating dollar roll an ample distance. The showings on and under ground, as per the writer's findings, justify enlistment and expenditure, as rapidly as possible, a minimum of $50,000 as recommended, and expansion of the corporate structure to permit such. The samplings of the writer (see assay sheets, with supplementary smelter-return data) speak for themselves---remember that his samples were taken for determinative purposes, as to ore-character and typical values per ton. In short, as the situation stands today and as it soon will stand improved, the enterprise may be adjudged to be what economists term "an excellent speculative investment"---one with reasonable expectation of worth-while returns instead of mere hope.

Addison N. Clark

Oakland, California
July 20, 1 9 4 4.

Consulting Mining Engineer

Addison N. Clark

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Amplification of Assay Certificate (Following) of Mr. W. W. Simon, Chief Assayer of the Magma Copper Co., due to its abbreviation because of small-sized form used; all samples, taken by the writer in his June/'44 examination, being solely determinative and indicative of the character of ore in the several parts of the workings:

(Columns 3, 4 and 5 of the Simon certificate not repeated here)

SAMPLE	TAKEN FROM	NATURE OF SAMPLE	PER TON
1-S	Johnson Shaft in Stanley Vein	Grab from ore with red oxide (some sulphides)	$11.56
2-S	Ditto	Grab from ore showing black oxides, also sulphides	$14.80
3-S	Johnson Tunnel 250' NW Johnson Shaft	Grab: Red oxides and some sulphides	$22.37
4-S	Ditto	Grab: Heavy black oxide; sulph. & carbonates	$25.72
5-S	Face in Stanley Vein cut Shown in Photo R	Malachite, Some Azurite, Red Oxide, and Heavy Black sulphide	$42.62
6-S	Cut, Stanley V. on Sunset #8	Grab: Carbonates and Some Sulphides	$13.72
SS-1	Sunset Vein, 210 Level; Cross-fissure 30' N. of Shaft	Copper showings mainly as Carbonates--- Little Sulphide	$ 1.76
SS-2	Sunset V, Face of 310 Lev. 130 Ft. S of Shaft	Covellite, Black Oxide, Chalcopyrite: (a Grab-Sample)	$73.38
SS-3	Ditto/Across Two Feet Above Footwall Gouge-Seam	Same mineralization as in SS-2---but "spread thinner"	$14.00
SS-4G	"Blind" Cop-Gold Vein in 310 X-cut 370 ft. from Shaft	Copper mainly carbs. & Silicate; very little Sulphides	$41.80
SS-5	Grab fr. Skipload from 310 S. Face	About as in SS-3	$10.56
SS-6	Across 1 1/2 ft. fr. H-W, 310 S Face	Same as in SS-3	$46.75
SS-7	Across 2 ft. below F-W, 310 S Face	Mineralization with Carbonates (apparently)	$ 0.70
SS-8L	Orepile in Cut on Lead-Silver-Zinc Vein, Sunset #10	Much Galena plus Evidence of Zinc Content	$31.20

Mr. Addison N. Clark,
Consulting Mining Engineer,
1440 Broadway,
Oakland, California.

MAGMA COPPER COMPANY

MINE ASSAY CERTIFICATE

DATE June 23, 1944

No.	LOCATION	Cu.%	Ag. Oz.	Au. Oz.	Pb%	Zinc%	%Moisture	REMARKS
1-S	Johnson Sh/Stanley Vein	2.41	0.80	0.08	(Grab/Red Oxide Ore)			$11.56/Ton
2-S	" " " "	2.21	0.40	0.20	(" /Black " ")			$14.80/Ton
3-S	" Tun.250'NW Shaft	1.33	0.50	0.50	(Red Ox/some sulphide)			$22.37/Ton
4-S	" " " " "	5.75	0.80	0.16	(Hvy.blk.sul.& CO_3)			$25.72/Ton
5-S	S.V. " 350'SE "	11.50	2.00	0.06	(" " " & Malach.)			$42.62/Ton
6-S	Cut on SS#8,Stan.Vein	3.79	0.20	0.02	(Grab/Sul. & Carbs)			$13.72/Ton
SS-1	Sunset Vein/210' Level	0.39	0.10	0.02	(X-Fissure N of Shaft)			$ 1.76/Ton
SS-2	" " / 310' Lev.S	20.75	3.00	0.02	(Covellite & Black Ox.)			$73.38/Ton
SS-3	" " " " "	3.74	0.80	0.02	(Same/across 2 feet)			$14.00/Ton
SS-4C	X-Cut 310'Lev.370' NE	1.92	0.40	1.00	(Au.Vein, top of shoot)			$41.80/Ton
SS-5	310' Lev. S., Face	2.90	0.60	0.02	(Grab from skipload)			$10.56/Ton
SS-6	" " " "	12.78	2.00	0.02	(1½' W from H-Wall)			$45.75/Ton
SS-7	" " " "	0.20	0.10	0.02	(2' below f'wall gouge)			$ 0.70/Ton
SS-8L	Lead-Zinc vein/SS #10	0.20	0.40	0.01	19.8	3.3		$31.20/Ton

Sunset Mine Examination Samples: Cu @17¢ incl.
Prem.;Ag @ 71¢; Au @ $35; Pb @ 6½¢;
Zn @ 8¼¢.

W. W. Simon
ASSAYER

Addison N. Clark

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Smelter Returns Studied

The writer, as an adjunct to his own determinative sampling and resultant assays, as cited on the two preceding sheets, was given full and free access, by General Manager Kay, to an extensive sheaf of his own assays over a considerable period of operation. Likewise access to all of Mr. Kay's smelter returns from ore shipments during his administration. As to the former, suffice to say here that his own routine assays (all done by Mr. W. W. Simon) were of a nature to check nicely with those done by the same gentleman for the writer---with this difference: His sheaf of certificates showed far more "duds" than the two that appear in the foregoing two pages. Reason: He was sampling, often, to ascertain where NOT to strike for shipping ore; whereas the writer sought to check up as to where and what to mine.

As to smelter returns, for the scope of this report, and so as not to "choke it with columns of figures" and thus impede its purpose, from about "Pearl Harbor Day" onward his smelter returns showed a gross value in round figures of $45,000 and a net just above $22,000. That covers a total tonnage shipped (wet weight) of 1300---which averages out a net just under $17 per ton. The writer went carefully through the said sheaf of smelter return sheets (American Smelting & Refining Co., plant at Hayden) and may add that they tell their own story. They are, as Mr. Kay states, available for study by persons interested in the future potentialities of the property, as well as by officials of governmental regulatory bodies.

Ore taken under Mr. Kay's administration out of the "Big Dome stope" (shown in Photos K and L) grossed, he stated to the writer, $10,433; and the balance stoped grossed a little under $35,000. The totals cited above represent ore mined and shipped down to the vein-depth of 280 feet---since in the ore-shoot termed the "Big Dome stop" shoot his crews were in ore only from a level almost 30 feet above the 310-foot level. (There is, however, unrecovered ore in that shoot below 280 feet---the writer sat on unmined highgrade to take Photo L).

The foregoing covers this phase in about the briefest form.

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Physical Inventory of Sunset Mining Property
As of August 2, 1943 (From W. O. Kay, General
Manager, Checked by the Writer):

1	Ingersoll-Rand Compressor (Stationary)	$ 5,800.00
1	Sullivan Compressor (Portable)	3,700.00
1	Fairbanks-Morse Gas Engine and Hoist	1,500.00
4	Mine Cars	300.00
1	Stoper Drill with Shell	250.00
2	Sullivan Jackhamer drills	400.00
1	Truck, 1 1/2-Ton	500.00
2	Mine Pumps (one a Cameron, shown in Photo U) .	450.00
1	Ventilation Blower	150.00
	Drill Steel, Pipe, Hose, Rails, Etc.	1,500.00
	Tools	150.00
	Machine Shop	100.00
3	Bunk Houses	250.00
1	Mess Hall	200.00
1	Shower and Change Room	450.00
10	Cots	100.00
1	Refrigerator (Kerosene-Operated)	250.00
	Kitchen and Dining Utensils and Dishes	250.00
	Water Tanks	100.00
	Sub-Total	$ 16,400.00
	Road Improvements Within Property	2,000.00
	Underground Workings	40,000.00
	T o t a l	$ 58,400.00

Note: From the writer's examination and appraisal of the inventoried machinery and physical equipment ten and one-half months later, he considers Manager Kay's inventory, as cited above, to be a fair and conservative one.---A.N.C.

Supplement to
Sunset Mine Report
Sheet Sixteen

Addison N. Clark

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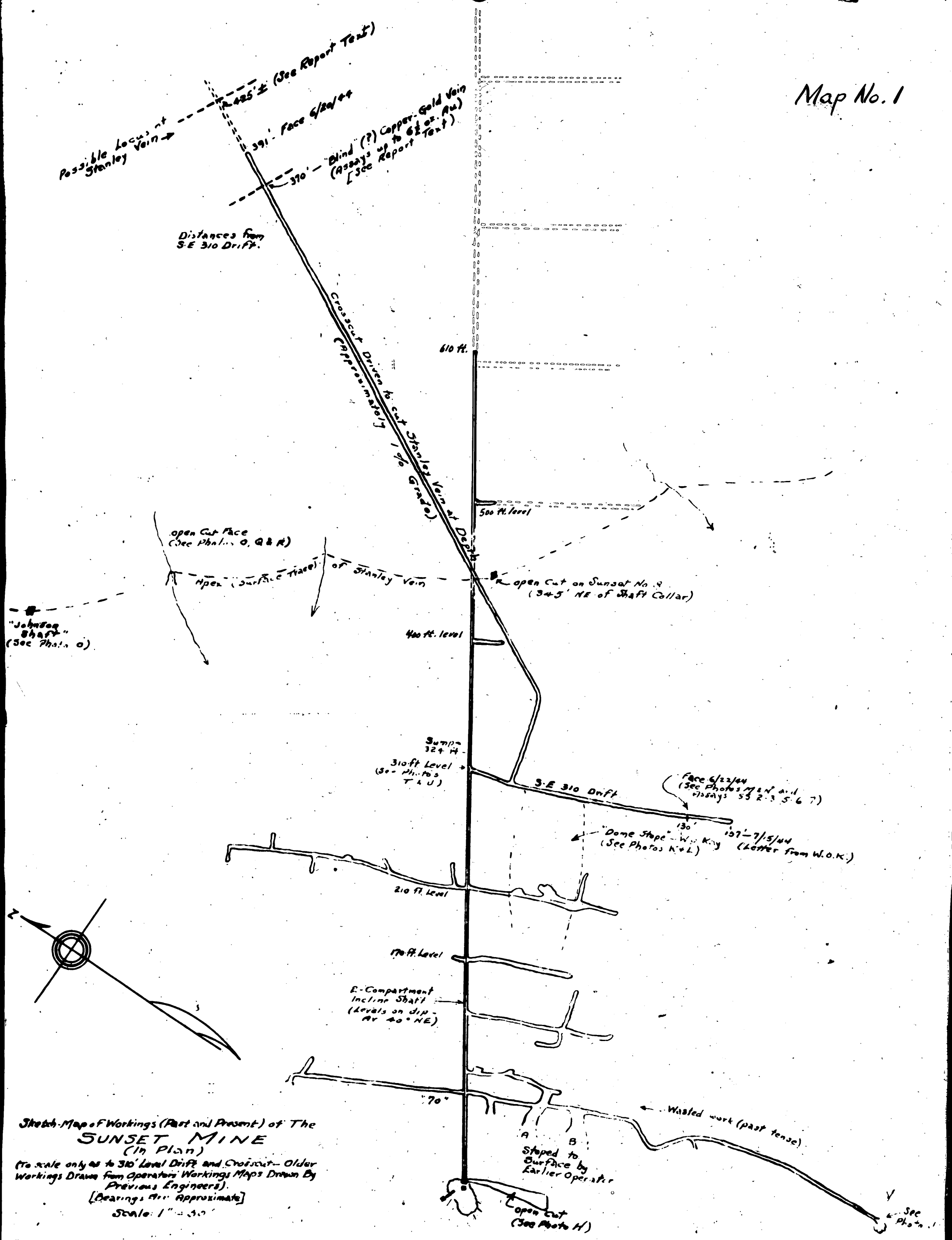
Addendum to Physical Inventory Sheet of Sunset Mine Report
As of October 1, 1944:

Brough forward from preceding page (Aug. 2, 1943):		$58,400.00
New underground workings since 8/2/43		4,900.00
Crosscut 310' level, 220' @ $15	$3,300.00	
SE Drift " " 65' @ $15	975.00	
Stoping above 310' level, Sept.'44	625.00	
Added machinery and equipment		2,200.00
New Sullivan drill, hose, bed, etc.	$ 500.00	
2 used air drills	450.00	
Flexi-Airpipe (Bemis)	400.00	
Miscellaneous operating material	300.00	
Lumber & timber	550.00	
T o t a l		$ 65,500.00

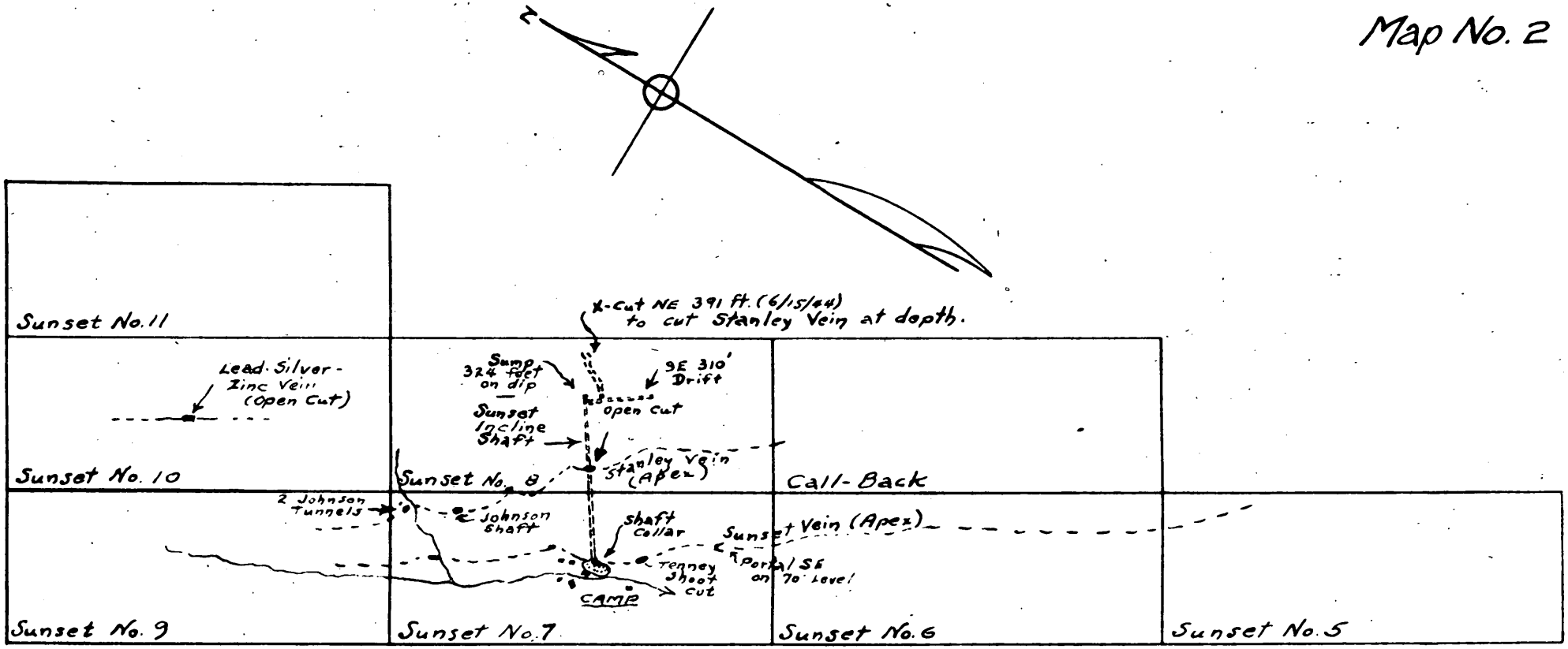
Map No. 1



Sketch-Map of Workings (Past and Present) of The
SUNSET MINE
(In Plan)
(To scale only as to 310' Level Drift and Crosscut — Older Workings Drawn from Operators' Workings Maps Drawn By Previous Engineers).
[Bearings Are Approximate]
Scale: 1" = 50'

Dwl. A.M.C. — to accompany report — July 1944
Revised: Oct. 1982.

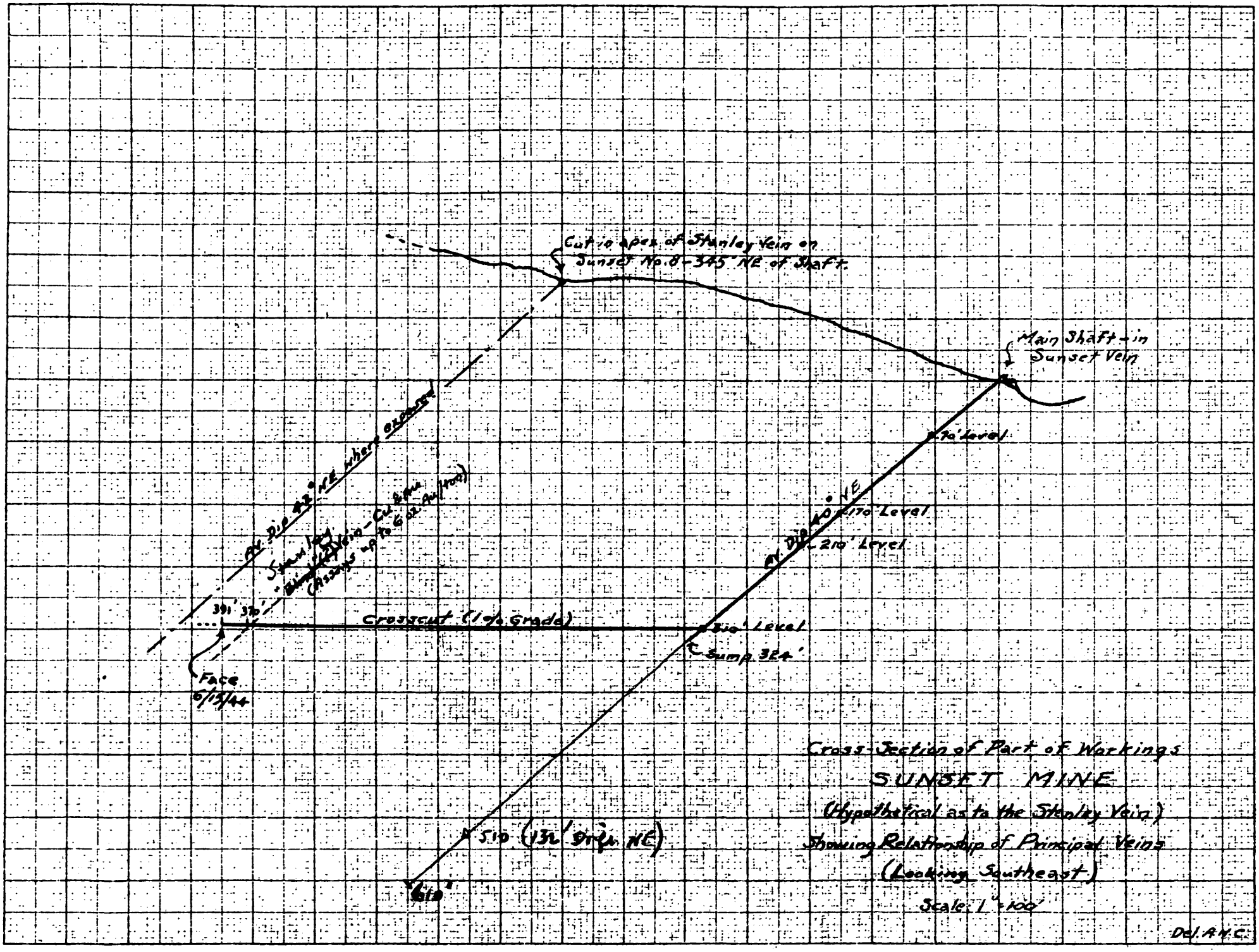
Map No. 2



Sketch Map of Group of Eight Claims of
SUNSET MINING PROPERTY
Mineral Hills District, Pinal County, Arizona
Showing Approximate Courses of Two Main Veins
Scale: 1" = 600'
(Not based on instrument survey)

Del. A.N.C.
July 1944

KEUFFEL & ESSER CO., N. Y. NO. 359-12
10 to the half inch, 10th lines heavy.
Made in U.S.A.



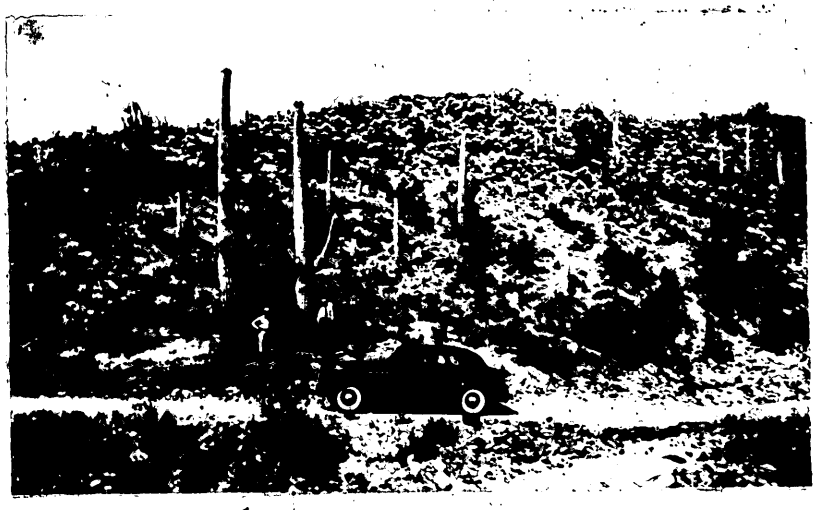


Photo A: Main paved highway from Superior, connects with County road to Sunset Mine 4 miles east of Florence Junction (see Map No. 1). Picket Post Mountain in center distance. Messrs. Kay and Baiocchi flank the Buick.

Photo B: Part of the nine miles of good dirt road (County road) connecting the paved highway (Photo A) with the Sunset Mine.

In distance on horizon below can be seen the Tortilla range of mountains south of Hayden, where Sunset ore is smelted.

Photo C: Where the County road (Photo B) reaches the Sunset Mine, continues down Box Canyon (see Map No. 1) to Price, ore-shipping point. North Butte in right distance. See also Photo F. (Looking south into Gila River valley).

Photo D: General view of topography of Sunset property---a panoramic shot from Point P in Photo G, looking NE (i.e., towards Superior). Note visible cropping of Sunset Vein NW and SE of shaft. (T---Tenney cut; Z---portal of Tenney "emergence" tunnel on 70-foot level from Sunset shaft).

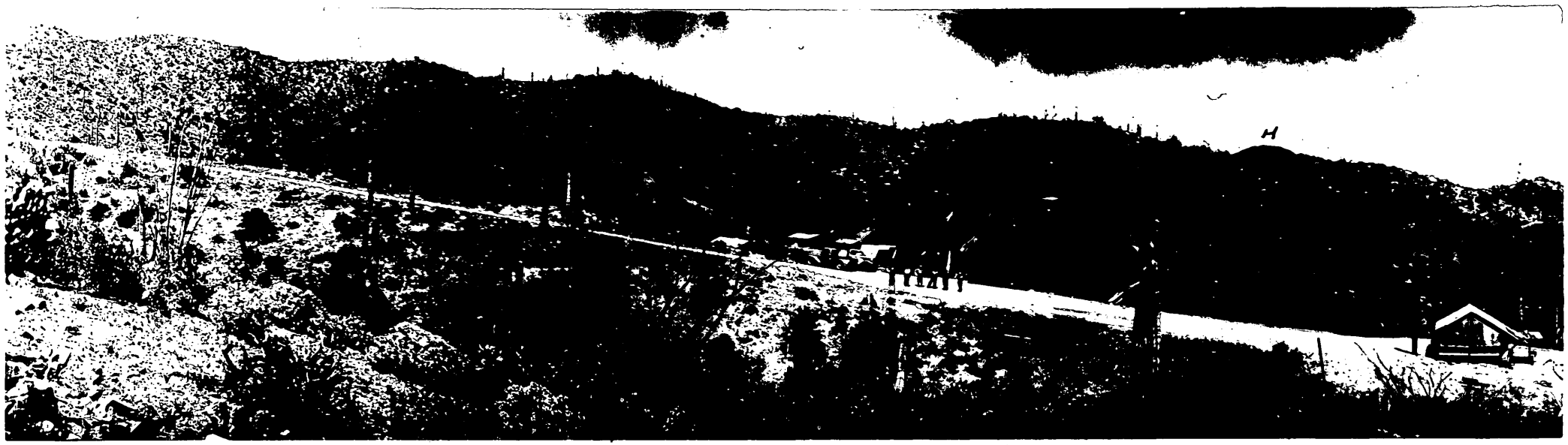


Photo E: Closer-up panoramic view---also looking NE. Hill H is in both views. Roof of mess-hall at left of camp. Sunset shaft headframe beyond covered truck.

Photo F: Panoramic like Photo C but from lower elevation---looking southeasterly. Cut in apex of Stanley Vein on ridge at X (see Photos O-S incl.) is 345 feet NE of collar of shaft . . . see also Photo P. (Manager Kay standing at X).

Photo G: Panoram sililar to F but more to SW. County road on ridge. Photo D taken from Point P, which is the propping of a large vein on adjacent property of Arizona Mining Co.

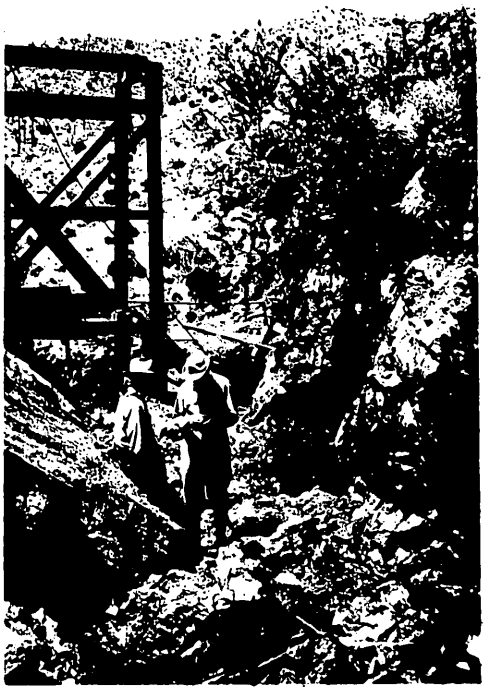


Photo H: Open cut SE of head-frame shows dip and both walls of Sunset Vein. (Looking NW). Gray and Baiocchi examining a copper-gold specimen.

Photo I: Footwall of Sunset Vein exposed in open cut at top of "Tenney ore-shoot" on ridge at T in Photo D, 175 feet SE of shaft. (Left to right: Baiocchi, Kay, and Tom Gray, hoisting engineer).

(Added note as of Oct. 6, 1944: The writer's letter of that date, bound into report ahead of letter of transmittal dated July 20, refers directly to developments in this so-called "Tenney shoot" by overhand stoping into it from the 310-foot level close to where the writer took the flashlight photos M and N in his June examination).

Photo J: Where the 70-ft. level drift emerged into gulch at Z in Photo D. (Baiocchi and Gray).

Photo K: A conference in the Kay or "Dome" stope on the 210-ft. level (L to R: Messrs. Kay, Baiocchi and Cassar). Note solidity of ground here and below---freedom from timbering, use of a few stulls. Ore recovered from this stope, shipped to the AS&R smelter at Hayden via Price, netted more than $10,000, according to Manager Kay's smelter returns examined.

Photo L: The same stope about 80 feet down; about 20 ft. above SE 310-foot level.

Photo N: Mr. Baiocchi has a look into the same hole, shown in Photo M. Dip here is 45° NE.

Photo O: Face of SE drift on 310 level, 130 ft. from shaft, following shooting round. McCliff (L) has head in hole in footwall gouge exposing good grade copper ore with covellite and black oxide, plus gold and silver content ---assayed $73/ton (see certificate). Note slickensides on footwall gouge. Cassar with pick.

Photo O: One of two "pan" shots to show surface relationship of Stanley Vein to Sunset Vein (see also Photo P). Kay at A, Kalaf at B, both photos, at croppings (B is "Johnson shaft"). D is open cut in Stanley on Sunset No. 8. E is cut in Photos Q and R.

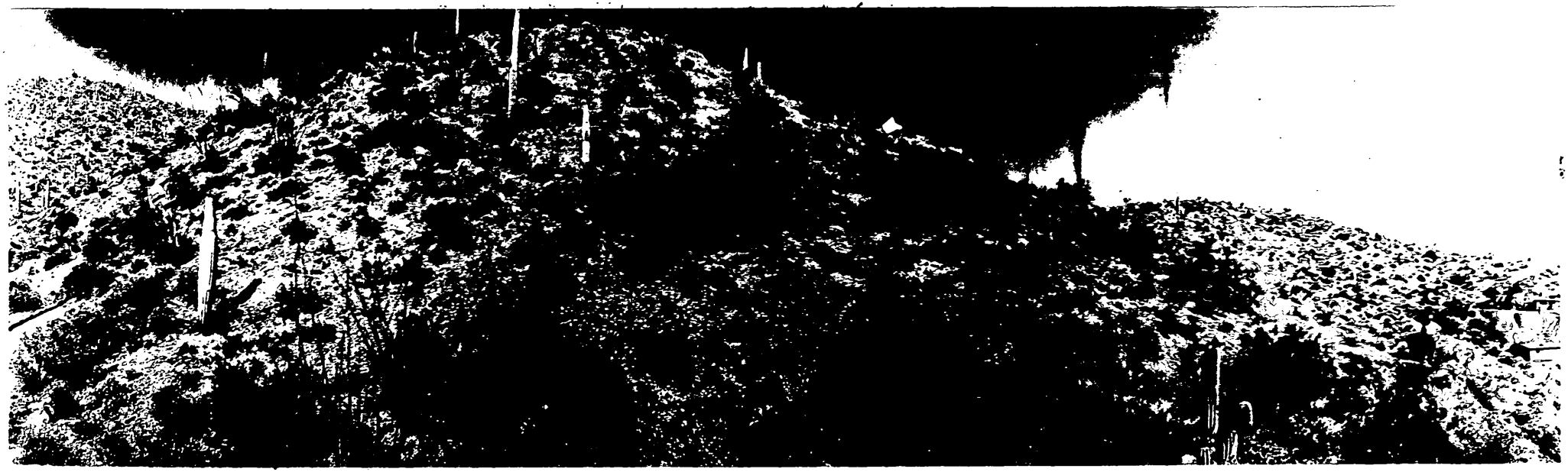


Photo P: Closer view of NW hill in Photo O. A and B same as in O At C in both is W.W.Simon, Chief Assayer of Magma Copper Co., standing on apex of main Sunset vein. They are 245 feet apart on surface at C and shaft; 175 feet apart in gulch at left; dip approximately parallel (see section).

Photo Q (left): Strong outcrop of Stanley Vein at E in Photo O---see Photo R. Dip 42 degrees NE. (Mr. Baiocchi is holding the plumb-bob).

Photo R (right): Pick is held against footwall gouge of Stanley Vein below where Mr. Baiocchi is standing in Photo Q. Shipping ore is exposed here.

Photo S (left): Looking SW from this cut (above) across camp. Point P is same as in Photo G.

Note the slickensided hanging wall of Sunset vein---in both views. Every exposed surface underground is alive (flame-red) with calcite under the ultra-violet Mineralight---the vein carries its own catalyst, or "ore-maker", in the $CaCO_3$.

AT THE SHAFT ON THE 310-FOOT LEVEL.

Photo T: Baiocchi, McCliff (L) and Cassar fan the hanging wall with ultra-violet rays and view the fiery calcite glow.

Photo U: McCliff oils up the Cameron pump that holds down the mine-water. The 14-foot sump is below at right.

Photo V: "Bill" Simon, Chief Chemist and Assayer of Magma Copper Co., and Stanley Kalaf, his aide, read micro-ammeter in geophysical survey of the Sunset veins.

Photo W: Open cut on lead-zinc-silver vein on Sunset No. 10 (see report text). Baiocchi and Cassar study the orepile---see assay certificate.

Photo X: Photo of the writer (cracking rock on ore bin trestle) by Baiocchi---to prove the writer was there!

THOMSEN LABORATORIES
Sausalito, California

dmea 2922

April 25, 1952

Mr. Paul H. Boether,
American Copper Company,
312 California Building,
Stockton, California.

Dear Sir:

Pursuant to your request for a written statement covering my various trips to your Pinal County property and my opinion as to its merits I am embodying such matters in what is actually a synopsis of what has already been conveyed to you by word of mouth.

The property embraces a block of ground approximately a mile in length with a width of about half as much. It is situated in the western foothills of Pinal Mountains, and occupies approximately the center of a small area of Pinal Schist some three miles in diameter from which the covering rocks have been removed by erosion. This small area has been subjected to a very thorough scrutiny and it is in every way similiar to the nearby copper mines, though necessarily the actual type of ore deposit presents its own characteristics and is quite diverse from that of either Miami, Ray, or its nearest neighbor, Magma.

The genesis of the ore deposits is quite simple. The bedding planes of the Schist constituted lines of weakness in the strata and in the volcanic disturbances to which the entire terrain has been subjected such lines of weakness became the seat of extensive movement with consequent shattering of the rock and the formation of extensive zones of brecciation. Such shattered rock was then infiltrated by the ore bearing magmas with consequent deposition of copper-lead zinc minerals accompanied at times by considerable quartz and at times virtually without such silicification. It follows that these zones, properly called "veins" conform in strike and dip with the Pinal Schist. Where by caprice of nature much quartz accompanied said mineralization the resultant veins crop boldly and form the only really distinctive feature of the landscape. Where said quartz is sparingly present the veins do not crop but instead are represented by intensely leached and altered vein matter from which the copper has all but vanished. Contrariwise, the quartz croppings often show in addition to the customary oxidized copper minerals vestigial remnants of primary sulphides of copper, lead and zinc, accidently preserved by an impervious envelope of silica. At this point it may be well to reiterate a statement which I have frequently made to you to the effect that when there is evidence of the former presence of copper in an outcrop the complete removal of said copper is one of the best " indications" of good ore in the zone of secondary enrichment.

Such removal of copper is everywhere in evidence in the present surface exposures of the veins in this area.

I wish to point out the salient distinctions between the nearby mines and your property. The Ray-Miami type is a mineralization of the country rock itself resulting in orebodies of vast extent and rather low copper tenor. The Magma is a true vein type far deeper in extent than either Ray or Miami and of a much higher copper tenor, however, the mineralization is largely confined to a single, principal vein, minor amounts of a relatively high zinc content coming from a supplementary vein. These veins are roughly vertical and cut the bedding planes of the Schist, while yours conform to said bedding planes.

The presence of lead and zinc minerals in the outcrops of your veins suggest, as in the case of the Magma, that we are considering the top rather than the bottom phase of ore deposition, and this observation together with the great horizontal extent of the veins augur that exploration will reveal large and permanent bodies of ore. Again, unlike Magma, you are confronted with the presence of a great many veins, at least eight having been found so far. I confidently predict that many more of the same type will be encountered for, as already stated, the surface exposure is determined by the caprice of quartz deposition, not by mineralization in general.

Another distinction between these large copper producers and your own property is the relatively large gold content everywhere encountered. It is rather phenomenal that in the shipments from the ore pocket, accidently preserved for you above the 310 level, the economic value of the gold is roughly on a par with the copper content. A high silver value, such as gave the original name of "Silver Queen" to Magma, was the result of secondary enrichment and accidental preservation of pockets of said secondary zone in what had become a leached and empoverished zone. In your case we are dealing with residual gold forming a part of the primary deposition of ore. In only one place have I seen any sign of secondary enrichment, namely in a small pocket of pure copper glance extracted from the Stanley vein just below the 310 level.

If I seem to speak with some degree of familiarity about the large nearby copper mines in making such comparisons, please bear in mind that I was part of such early Arizona development and know the surface of said properties as they were before extensive development. I traversed Ray while in the initial diamond drilling stage and before I and an associate of mine actually held a contract on the "Silver Queen" which is now Magma. In view of such familiarity I cannot help but say that in spite of the very small amount of development on your property you have every right to believe that you have the makings of a major Arizona Copper mine, and that is high praise indeed. I also believe that gold will form a more important part of the value in said ore than in any of the present Arizona producers of magnitude. To use a much abused word, I believe that your surface "indications" are as good if not better than was the case in any of the nearby copper mines.

Thus reading the history of ore deposition from the original stage through leaching and secondary enrichment I am confident that the secondary zone at or near water level will not fail to produce ores of economic value. What the primary ores will show is more dubious, but Arizona has yet to produce a single exception to the rule that such "indications" as you have mean pay ore at water level.

Below such water level I believe that you will encounter a complex of copper-lead-zinc with supplementary values in silver and, above all, gold. At still greater depth you will probably experience a gradual elimination of silver, lead and finally zinc with the orebodies taking on a simpler character and with values chiefly in gold and copper. It is not saying too much to state that the phenomenon of secondary enrichment has been the dominant factor in preparing ALL of Arizona's copper mines for man's exploitation even though extensive work in the primary zone has also disclosed primary orebodies of workable grade.

All this leads to the question: "Where may we expect this secondary zone?" To put it otherwise, how deep is "water level?" To this I must answer that no man can tell, it is only ascertainable by work. When we stood at the Sunset shaft on our first visit together I said: "It may be found very soon, or it may be down a thousand feet, or it may be deeper." On the accompanying maps that give a profile through the Sunset shaft you will see that you are even now but 400 feet vertical below the deepest point laid bare by nature's erosion. That is not very much.

Of course the cheapest way, and the fastest, to determine the depth of this sulphide zone is by the use of the diamond drill. On the other hand it is not too promising as a means of showing up ore, that is, unless it be used in a very extended and and expensive campaign. The testimony of a few cores can give a black eye to any property or can make the owner oversanguine. Orebodies are extremely irregular both as to size and value when taken by the foot and a core is a poor sampling tool compared to drift or raise. Therefore, if you elect to use the drill I would say to use it only to determine the depth to which you must go to intersect one of your veins in the sulphide zone. After that it is time to sink your shaft to that pre-determined depth and go after your ore in orthodox fashion. If you elect to do this, I further recommend that you purchase a drill, a matter of but some $2000.00, and do your own drilling. By contract, you are not able to vary your campaign as may be indicated by the drill from day to day. I also suggest that you spend some $500.00 for an assay outfit so that one of your own men can follow the "sludge" daily and report directly, thus eliminating the publicity attendant upon commercial work as well as the liability of carelessness and delay. In this manner you can do drilling at perhaps as low as $2.00 per foot or even less.

However, the cost of this work is really money lost. There is no substitute for the plan I gave you on our initial visit, namely, to sink deeper where you are. In doing this, every dollar expended is permanently well invested towards the ultimate goal of taking out pay ore. In doing such work there is nothing more important than to provide proper equipment. Your past high costs are due principally to the fact that your machinery is either inadequate as to size or else worn out. Portable equipment is very handy at the start but there is no substitute for heavy duty machinery when there is a job of any length ahead.

I would avoid all electrification. That is too expensive. Instead I would install an over-size diesel driven compressor, and put your hoist on air. Any good steam hoist can then be installed and will function very well for both raising and lowering men on power. That the electric hoist does not do, and I am a crank on underground safety. I priced a "government" "surplus" hoist, brand new, and good for 2500 feet for $1000.00. A compressor with a capacity of 650 feet of air per minute at $1500.00, and a diesel with a 140 horse power to drive same, for $4000.00. These prices are F.O.B. San Francisco. Hoist and diesel are not new but in excellent shape. These are your principal items.

With such equipment you can go to water level, and the ore will be there waiting for you, for be assured nature took care of that a long, long time ago. It is the long way to look at things, but it is the only right way. The drill will give you some facts and perhaps encouragement. This latter way will get you to your ore in shape to begin taking it out. It is the only way I personally have ever used.

If there is any additional information I may possess, be assured that it is always at your disposal.

Yours very truly,

Alfred M. Thomsen

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REGISTERED CHEMICAL ENGINEER
CERTIFICATE EXPIRES
ALFRED M. THOMSEN
DEC. 31, 19
ARIZONA, U.S.A.

AMT/HF

L. C. WYMAN
MINING ENGINEER
[redacted]
SAN FRANCISCO, CALIFORNIA
2640 Great Highway

Paul H. Boether
Lodi, California

Re: American Copper Co.

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Any equipment now on the property may be removed by the lessee for the purpose of exchange or trading to others for similar equipment. This would tend to lessen the initial financing needs. This equipment is listed as 2 compressors, gas engine and hoist, 4 mine cars, 3 rock drills and accessories, 2 mine pumps, steel rails, shop, 4 camp buildings with furniture, etc. valued at $16,400.00. Terms of the lease are not severe as there are no minimum royalty payments and the time of 25 years is ample for the development and recovery of ores which may be found.

There is also to be assigned a lease and option on property of Arizona Mining Company adjoining the Sunset covering 9 claims as listed. The purchase price of said property is $100,000.00 payable over a period of 25 years from a royalty of 10% of net smelter returns. Working requirements are similar to those of the Sunset group. At present no expenditures are to be made on this property.

These claims are located in the western foot hills of the Pinal Mountains at the center of a domal area of Pinal schist about 3 miles in diameter. The area has been subjected to extensive movement, shattering and brecciation. There are several veins showing on the surface the principal ones being the Sunset and Stanley 250' apart striking somewhat to West of North. The dip is 40 to 45 deg. to East.

In addition to surface workings the main development is on the Sunset No. 7 claim consisting of an inclined shaft 610 ft. in depth with levels at 60, 110, 150, 210, 300, 400 and 500 ft. There is also a crosscut on 310 level 425 ft. to E. believed to have intersected the Stanley vein.

These levels down to 310 ft. show a short ore shoot 30 ft. in length and up to 3 ft. in width which has been mined out and the ore shipped to the smelter. A total of 1688 tons showed the following returns and average metal content.

ASSAY

Yr.	Tons	%Copper	Oz. Silver	Oz. Gold	Returns
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	1688	.6	.66	.494	17550.08

This ore is all oxidized with the exception of a few local points, with resulting leaching of the copper mineral leaving the gold. The fairly uniform analysis would lead to the belief that other shoots of ore exist and which may be profitable in the oxidized zones should a satisfactory method of recovery of the gold be found. However, the main objective is the zone of secondary enrichment of copper, or the zone of primary sulphides. Those may occur in one or more large bodies or in a complex vein system.

To reach the possible profitable zone it appears advisable to sink the present shaft an additional 300 ft. and if found advisable do some drifting and crosscutting. While this is in progress, the present workings and surface exposures should be systematically sampled and results properly mapped.

The shaft work should be contracted and may cost up to $80.00 per ft. requiring a possible expenditure of $24,000.00. A larger compressor diesel driven should be obtained on which one of the present machines can be traded in. This applies also to the hoist which may be too small for the depth contemplated. Such equipment can be obtained on a rental basis with rentals paid applying on purchase price if found advisable to complete.

The minimum needs of capital may be summarized as $24,000.00 for the shaft, $3,000.00 to $4,000.00 for equipment. Additional funds should be available for drifting and crosscutting, the total of which cannot be ascertained at this time. The carrying out of this will depend on results obtained. This is a development project on which it is impossible to make definite estimates, the work depending on results of progress.

From the information available it is my judgement that the showings of ore are sufficient to warrant a campaign of development, conditions being very similar to those of other mines in the district. The shaft sinking is the first step in the development and if successful in locating a material sized and valuable ore body will require considerable additional financing.

Consideration has been given to the possible use of diamond drilling, but unless financed for a complete programme should not be used as the results of a small number of holes might be misleading.

Should the copper development prove unsatisfactory, there is a possibility of recovering the investment from near surface gold ores. This would require working out of ore treatment, water supply and mill construction.

The present financing should provide for not less than $60,000., 1/2 of which to be expended in acquiring necessary equipment and shaft sinking and the balance in lateral development where found advisable. Before starting any work $30,000.00 should be available.

Respectfully submitted,

L. C. Wyman

L. C. WYMAN

May 8, 1952

MAGMA COPPER COMPANY

MINE ASSAY CERTIFICATE

Sunset. Copper Silver Gold. DATE 9/22/44

No.	LOCATION	Cu.%	Ag. Oz.	Au. Oz.	Fe%	Zinc%	% Moisture	REMARKS
1.	25' - Stope	5.90	2.00	0.18				$27.80 per Ton.
								In altered diabase. Looks like you are getting close.
								Copper @ 17¢ Silver @ 71¢ Gold @ $35

F. H. Simons
ASSAYER

MAGMA COPPER COMPANY

MINE ASSAY CERTIFICATE

Sunset — Copper Silver Gold — DATE 1/10/45

No.	LOCATION	Cu.%	Ag. Oz.	Au. Oz.	Fe%	Zinc%	% Moisture	REMARKS
1	Box #7 & 8	4.60	0.15	0.22				$23.35 per Ton
								Copper @ 17¢
								Silver @ 71¢
								Gold @ 35

W. H. Simon
ASSAYER

MAGMA COPPER COMPANY

MINE ASSAY CERTIFICATE

Sunset — Copper Silver Gold — DATE 10/12/51

NO.	LOCATION	CU. %	AG. OZ.	AU. OZ.	FE. %	ZINC %	% MOISTURE	REMARKS
1		5.40	1.40	0.60				$48.18 per Ton
2		2.30	0.60	0.62				$32.74 " "
3		0.70	0.30	0.40				$14.00 " "
								Copper @ 24¢
								Silver @ 90¢
								Gold @ $35
								Charge [illegible]

G. G. Lemon
ASSAYER

166-171 Inc.

Shop No.
File No. 784 Bo

VALUES
Latest Quotation

1 oz. Gold $35
1 oz. Silver $.90¼
1 lb. Copper
1 lb. Lead
1 lb. Zinc

THIS CERTIFIES
samples submitted for assay
contain as follows:

CHAS. A. DIEHL Phone 3-4001 Phoeni:

Arizona Assay Office

FEB.28,1952

P.O

815 North First Street
MR.PAUL H.BOETHER
ROUTE 4-BOX 390
LODI, CALIF.

Short Ton - - -
Short Ton Unit -
Long Ton - - -
Long Ton Unit -

MARKS	SILVER PER TON Ozs.	SILVER PER TON Tenths	VALUE		GOLD PER TON Ozs.	GOLD PER TON 100ths	VALUE		TOTAL VALUE PER TON of Gold & Silver		PERCENTAGE % COPPER			
1-Left of Sunset shaft.	0	.7				.25	$8	.75			5.55			
2-From Tenney	0	.4				.14	4	.90			4.57			
3-East vein-running N & S.		.5				.14	4	.90			.80			
4-Vein north of house		.3				.06	2	.10			2.80			
5-Shoe box vein		.9				.31	10	.85			7.06			
6-A & MC vein		.2				.01		.35			.10			

Charges $ 15.00 Paid

Assayer ARIZONA ASSAY OFFICE

THOMSEN LABORATORIES
Sausalito, California

dmea 2922

April 25, 1952

Mr. Paul H. Boether,
American Copper Company,
312 California Building,
Stockton, California.

Dear Sir:

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The genesis of the ore deposits is quite simple. The bedding planes of the Schist constituted lines of weakness in the strata and in the volcanic disturbances to which the entire terrain has been subjected such lines of weakness became the seat of extensive movement with consequent shattering of the rock and the formation of extensive zones of brecciation. Such shattered rock was then infiltrated by the ore bearing magmas with consequent deposition of copper-lead zinc minerals accompanied at times by considerable quartz and at times virtually without such silicification. It follows that these zones, properly called "veins" conform in strike and dip with the Pinal Schist. Where by caprice of nature much quartz accompanied said mineralization the resultant veins crop boldly and form the only really distinctive feature of the landscape. Where said quartz is sparingly present the veins do not crop but instead are represented by intensely leached and altered vein matter from which the copper has all but vanished. Contrariwise, the quartz croppings often show in addition to the customary oxidized copper minerals vestigial remnants of primary sulphides of copper, lead and zinc, accidently preserved by an impervious envelope of silica. At this point it may be well to reiterate a statement which I have frequently made to you to the effect that when there is evidence of the former presence of copper in an outcrop the complete removal of said copper is one of the best " indications" of good ore in the zone of secondary enrichment.

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The minimum needs of capital may be summarized as $24,000.00 for the shaft, $3,000.00 to $4,000.00 for equipment. Additional funds should be available for drifting and crosscutting, the total of which cannot be ascertained at this time. The carrying out of this will depend on results obtained. This is a development project on which it is impossible to make definite estimates, the work depending on results of progress.

From the information available it is my judgement that the showings of ore are sufficient to warrant a campaign of development, conditions being very similar to those of other mines in the district. The shaft sinking is the first step in the development and if successful in locating a material sized and valuable ore body will require considerable additional financing.

Consideration has been given to the possible use of diamond drilling, but unless financed for a complete programme should not be used as the results of a small number of holes might be misleading.

Should the copper development prove unsatisfactory, there is a possibility of recovering the investment from near surface gold ores. This would require working out of ore treatment, water supply and mill construction.

The present financing should provide for not less than $60,000., 1/2 of which to be expended in acquiring necessary equipment and shaft sinking and the balance in lateral development where found advisable. Before starting any work $30,000.00 should be available.

Respectfully submitted,

L. C. Wyman

L. C. WYMAN

May 8, 1952

MAGMA COPPER COMPANY

MINE ASSAY CERTIFICATE

Sunset. Copper Silver Gold. DATE 9/22/44

No.	LOCATION	Cu.%	Ag. Oz.	Au. Oz.	Fe%	Zinc%	% Moisture	REMARKS
1.	25' - Stope	5.90	2.00	0.18				$27.80 per Ton.
								Inaltered diabase. Looks like you are getting close.
								Copper @ 17¢ Silver @ 71¢ Gold @ $35

H. W. Simmons
ASSAYER

MAGMA COPPER COMPANY

MINE ASSAY CERTIFICATE

Sunset — Copper Silver Gold — DATE 1/16/45

No.	LOCATION	Cu.%	Ag. Oz.	Au. Oz.	Fe%	Zinc%	% Moisture	REMARKS
1	Bin #748	4.60	0.16	0.22				$23.35 per Ton
								Copper @ 17¢
								Silver @ 71¢
								Gold @ 35

W. H. Simon
ASSAYER

MAGMA COPPER COMPANY

MINE ASSAY CERTIFICATE

Sunset Copper Silver Gold DATE 10/12/51

NO.	LOCATION	CU. %	AG. OZ.	AU. OZ.	FE. %	ZINC %	% MOISTURE	REMARKS
---	---	---	---	$				
1		5.40	1.40	0.60				$48.18 per Ton
2		2.30	0.60	0.62				$32.74 " "
3		0.70	0.30	0.40				$14.00 " "
								Copper @ 24¢
								Silver @ 90¢
								Gold @ $35
								Charge

K. H. Lemon
ASSAYER

166-171 Inc.

Shop No.
File No. 784 Bo

VALUES
Latest Quotation

1 oz. Gold $35
1 oz. Silver $.90½
1 lb. Copper
1 lb. Lead
1 lb. Zinc

THIS CERTIFIES
samples submitted for assay contain as follows:

CHAS. A. DIEHL Phone 3-4001 Phoeni:

Arizona Assay Office

FEB.28,1952

P. O

815 North First Street
MR.PAUL H.BOETHER
ROUTE 4-BOX 390
LODI, CALIF.

Short Ton - - -
Short Ton Unit -
Long Ton - - -
Long Ton Unit -

MARKS	SILVER PER TON Ozs.	SILVER PER TON Tenths	VALUE	GOLD PER TON Ozs.	GOLD PER TON 100ths	VALUE	TOTAL VALUE PER TON of Gold & Silver	PERCENTAGE % COPPER
1-Left of Sunset shaft.	0	.7			.25	$8.75		5.55
2-From Tenney	0	.4			.14	4.90		4.57
3-East vein-running N & S.		.5			.14	4.90		.80
4-Vein north of house		.3			.06	2.10		2.80
5-Shoe box vein		.9			.31	10.85		7.06
6-A & MC vein		.2			.01	.35		.10

Charges $ 15.00 Paid

Assayer ARIZONA ASSAY OFFICE

dmll 2922

Addison N. Plank

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Report of Preliminary Examination of The

SUNSET MINE

In the Mineral Hills Mining District

Pinal County, Arizona

Purpose, Summary, Conclusions, Recommendations

To make a surface and underground study of the mining property named, owned under possessory title by the Sunset Mining Company, Inc. (a California corporation) and held under personal working bond-lease by Mr. William O. Kay of San Francisco, for several years active operator of the property as its General Manager under the said bond-lease, the writer was retained in June of 1944 by Mr. Kay and his associate, Mr. Joseph L. Baiocchi of Oakland as consulting engineer. Major objectives of the survey and study were (a) to step up broader development of, and ore-production from, its known and partially-developed main (Sunset) vein; its paralleling Stanley vein, so-called; and its discovered but as yet undeveloped intervening (also parallel) copper-gold vein; and (b) to make this report as an adjunct to a planned program for sound corporate financing of such augmented development and production, as well as to embody such recommendations as may appear advisable.

A "sub-objective" was determination by the writer whether, in the light of his findings on and under the ground, such a step-up of development, and the needful corporate financing to enable it, were advisable or otherwise---especially in the light of war requirements for copper.

To that end the writer, accompanied by Mr. Baiocchi (who jointly with Mr. Kay controls the property and the said Corporation in which its possessory title is vested) spent the ten days from June 15 to 25 in making the said examination. Reason for use of the word "preliminary" in the title is that the geology of the immediate area of the property and the contiguous copper-production areas of Superior (locus of the famous Magma copper mine) and Ray and Globe, and the ore-genesis of this and those near-by producing areas, are far too complex for any engineer or geologist to digest in any ten-day study; and that the writer's deductions and conclusions as to that will necessarily require longer and more detailed study in the future. The fact that Doctor Wilson D. Michell, Geologist for the Magma interests, is spending the better part of 1944 working out the complicated geology of the area of Superior alone, bears quite

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directly on that phase of this job---and the writer here expresses deep appreciation of the geological courtesies extended to him by Doctor Michell, and likewise by Mr. William W. Simon, Chief Assayer of the Magma Copper Company, long familiar with this property, who has done Mr. Kay's routine assaying for a long period. The writer's confidence in Mr. Simon and his work may be judged by the fact that this is the first mine examination report he ever has written using a local assayer, having previously always lugged his samples home and had them assayed by firms with which he had done business for years. Mr. Simon's long familiarity with the copper ores of this region was a distinct asset.

Summary:

The property, 11 miles southwest of Superior (airline) and 21 miles via paved highway and fairly good county dirt road (see Map No. 1) consists of eight standard lode claims held, as said, under possessory title under Federal and State mining laws. Maps Nos. 2 and 3, and the partial transverse section, plus the photographs, tell the essentials better than words. It is suggested that the reader digress to them before proceeding here.

Traversing it longitudinally are two strong copper-gold veins ---true fissures in the so-called "Pinal schist"---plus intervening lesser veins. They are designated as the Sunset Vein and the Stanley Vein; and both carry minor silver content in the ore. Between them (so far as current disclosures indicate) was recently cut, as is indicated in the partial section, a similarly-dipping vein carrying noteworthy gold values. The writer's determinative sample from the latter (see assay-report) carried one ounce per ton, and almost 2 percent copper; and General Manager Kay and Assayer W. W. Simon showed the writer recent assays carrying, in one, approximately four ounces in gold per ton, and in another six and one-half ounces---figures which caused considerable of a flurry in the Superior area.

The fourteen samples taken by the writer were for the purpose of indicating the ore-characteristics. The supplementary sheet as to the samples taken, together with the Simon certificate, is self-explanatory and more or less speaks for itself save as to the two "duds" (Samples SS-1 and SS-7).

Especial attention is invited to Samples SS-2, SS-3, SS-5 and SS-6. Shortly before the writer's examination the southeast drift on the 310-foot level encountered covellite along with the chalcopyrite, and considerable black oxide. Higher copper values naturally showed up in the assays (routine) and in the writer's samples, though gold values are minor there. The gangue carrying the covellite values is a brecciated, recemented metamorphic material with the covellite incrusted over it in flaky form. In the opinion of the writer, that drift is well into the downward extension, on its

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"rake," of the so-called "Tenney ore-shoot" which has been exposed in the open cut (see Photo I) about 175 feet southeast of the collar of the shaft. While the writer made no microscopic studies of the ores, as yet, that specific ore opened up in the main (Sunset) vein shows values indicative of primary character ("hypogenes" as called by F. L. Ransome of the U. S. Geological Survey) and also show evidence of "secondary enrichment" ("supergenes" as Mr. Ransome terms them). That is to say, the vein was enriched by deposition from both hot ascending solutions and cold down-percolating solutions. Moreover, even at the comparatively shallow depth of 310 feet there is evidence that at no very much greater depth the vein will yield more massive sulphides, and that with added depth the covellite will cease showing in its flaky form and appear in mass form---with chalcocite also showing up; likewise bornite.

The clean-cut walls of both the Sunset and Stanley veins, as they appear in the underground photos, and the daylight shots of the Stanley vein, are prima-vacie evidence of true fissures in the Pinal schist which, barring excessive faulting as yet undiscovered, should persist to great depth and permanence. Photos H and I both show that characteristic clearly in the Sunset vein. So do Photos K, L, M, N, T and U in the Sunset vein. Photos Q and R illustrate the same characteristic in the Stanley vein.

The two veins are converging as they run northwest, being 345 feet apart on the northeasterly line through the shaft and only 175 feet on the northeasterly line through the "Johnson tunnel" face. As to how far northwest of the existent workings the fissures merge, the writer does not say at this stage; but it is logical to expect that when their junction is exposed in the property's future, a considerable orebody will be found.

As to the "blind gold vein" indicated on the transverse partial section, and also on Map No. 3, and as to "possible locus of Stanley vein" thereon, the latter is predicated upon its holding its average dip as measured where it is exposed. If on the other hand its dip has steepened with depth, there is the possibility that the "blind copper-gold vein" which was cut in the crosscut on the 310-foot level could be the Stanley vein itself. A moderate amount of drifting both ways in that "blind" vein should disclose whether or not that is so; perhaps some overhand stoping in it. A winze has been suggested (since the values were found in the floor of the crosscut) but that would involve pumping and hoisting with the "tugger hoist" that is on the ground. As this is written the crosscut is being driven ahead, and soon should determine whether or not the Stanley vein is where indicated.

The two-compartment shaft and equipment associated with it leave considerable to be desired, as far as speed of operations is concerned, but for the immediate present the management is getting by with it, and can for some months step up operations both in the

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southeast drift on the 310-foot level and there stope an excellent grade of shipping ore---clear to the surface if, as is indicated, that drift is in the downward extension of the "Tenney shoot"; and also tap the Stanley vein at more than 400-foot depth on the dip, which it is logical to expect, from the character of that vein and its ore where opened up at four places on the surface, will yield good-grade shipping ore.

Also, with reference to the Stanley vein, by putting a crew of two men driving a drift southeasterly into it from a point in the gulch between the "Johnson shaft" and "Johnson tunnels" (see Map No. 2) good shipping ore can be mined from that level, very inexpensively, with an all-downhill truck haul from that drift's portal and bin.

The property's camp is well equipped as to quarters and mess facilities, and the climate is such that tent-wall "kennels" could be used pro-tem to house a stepped-up personnel.

There is more than a mile of the Sunset vein workable, as the map (No. 2) shows. The same should be true of the Stanley vein as well. And as depth is gained, the ore in both can be expected to enrich in sulphide values. It is obvious, therefore, that a long-lived mine is in the making---one which with good Scotch management can be made a consistent dividend payer.

Conclusions:

That preceding paragraph may be taken as a frank, blunt conclusion itself. The writer's opinion as to that is concurred in by numerous people in the Superior area---including both of the Magma gentlemen named---and the writer is not afraid to "stand pat" on the prediction, provided his recommendations are carried through (as he is sure that they will be by those who control and manage the property).

By mining both of the major veins, tonnage produced and shipped can be brought to a magnitude such that a backlog of operating cash can be built up to supplement operating capital which it is planned by the management to raise by appropriate corporate financing methods in the near future, with funds left over for dividends.

The day will arrive, naturally, when the existing inclined shaft and associated equipment will have to give way to a vertical operating shaft with modern electric hoisting equipment. (Electric power is as near as Florence, 13 miles southwest). However, for the immediate present the incline will have a heavy job to do, and will handle it with care and precaution. From visible indications it will have, ere long, stoped ore from three places in the mine . . . the southeast 310 drift, the Stanley vein in the crosscut, and (unless it and the Stanley are the same) the "blind copper-gold vein."

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To handle that, it will be necessary to plan carefully the routine of shooting, mucking and hoisting; but that can be done. And the mining of ore from the upper level of the Stanley vein, northwest of the "Johnson shaft" in the gulch, will be independent of work in the lower levels---can start as soon as Supervisor Spray of Pinal County gets his bulldozer on the job to cut out a usable road up the wash to the site (which Mr. Spray promised to do while I was there).

(Mr. Spray, incidentally, has another good reason, aside from his consistently friendly attitude towards the Sunset group, to keep this stretch of County road in good shape---he has a lease-option over in Martinez Canyon, three miles northeast (see Map No. 1) near the famous old Silver Bell Mine; and his recent samplings, assayed by Mr. Simon, as reported to the writer by Messrs. Kay and Simon, carried 966 ounces in silver and 68% lead---the latter in carbonate form. Which brings up the fact that the Sunset Company has a potential ace-in-the-hole in the form of a well-defined lead-silver-zinc vein about at the center of the Sunset No. 10 claim (see Map No. 2) which the writer sampled. It is noted that it sampled (see SS-8L on assay sheet) 19.8% lead. That vein strikes and dips conformably with the copper-gold fissure veins to the southwest of it; and the cropping where it is opened up with a cut (see Photo W) is high on the ridge, so that ample backs can be had by drifting northwesterly from the upper gulch. However, that vein is to be let severely alone for the present, in favor of the others. The day will come when America's lead-zinc industry will move westward, as the mining region around Joplin, Missouri, tapers off in yield; which will be the time to look into this and possibly other lead-silver ledges in the picture---especially if ore comparable with that unearthed by Supervisor Spray can be developed.

Recommendations:

In the order of their comparative importance, as the writer sees it, he deems these steps should be taken:

1. Get the southeast drift on the 310-foot level swung a bit to the northeast so that (see Photos M and N) right-side overhand stoping can be started soon. It is evident, from the photos, that the drift roof to the left is the vein's footwall gouge-seam. The ore here carries enough highgrade, as to copper content, and the covellite and black oxide are so fine and flaky, as to warrant most careful handling and cobbing. With such care in handling this ore, judging from its character where exposed, this stope should yield commensurately with, and probably better than, the so-called "Big Dome stop" mined under Mr. Kay's direction in the ore-shoot next to the northwest (shown in Photos K and L).

2. Drive the long crosscut ahead to possible intersection with the Stanley vein; and, if cut, and cut at a "lean streak" between ore-shoots, drift both ways to pick up a pay-shoot of the character

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found in these veins---then get promptly to stoping.

3. Check up, simultaneously with No. 2, on the "blind copper-gold vein" in the crosscut 370 feet from the shaft . . . with the suspicion ever to the fore that, due to dip-steepening (or possible lateral-thrust faulting) this may be the Stanley vein itself. It is noted (see Assay SS-4G) that the sample carried almost 2% copper. That sample, however, carried its copper mainly as carbonates with some chrysocolla (silicate) and showed little sulphide---whereas in the several open-cut exposures of the Stanley vein on the ridges above, and in the upper gulch to the northwest, the ore is marked by ample sulphides in its unleached denser parts, indicating that this particular vein is not the Stanley, but a paralleling narrower vein or stringer. Its high gold content will make excellent "sweetening" in a binful of copper ore, to help build that cash backlog.

4. Put a handpicked two-man crew at work in the gulch northwest of the "Johnson shaft"---opposite and facing the "Johnson tunnels---driving a drift southeasterly into the Stanley vein, just high enough above the wash to permit building a rough-neck ore bin at proper height to load by gravity into a truck. When that drift gets under the Johnson shaft it will have approximately 40 feet of backs on the vein-dip; more than 25 feet beneath the exposed face shown in Photo R; and close to 75 feet beneath the cut on the ridge on Sunset No. 8 claim---and good sulphide ore is opened up at all three points; as also in the "Johnson tunnel" across the northerly gulch from the recommended drifting site. All of which ore, recovered, will augment the shipped tonnage.

5. As expeditiously as possible, hand-sort the mixture of ore and plain rock in the main ore-bin at present---rid it of the waste dumped in during the Manager's absence, so as to eliminate it from the next smelter shipment. (In this connection, the writer points out that in assorted orepiles at various open-cuts on both major veins lie (probably) close to fifteen tons of good shipping ore---strongly sulphides---which can somehow be rounded up and conveyed to the main bin or near it. That will offset to large extent the loss and cost incidental to re-sorting the ore now in the main bin, and, as the assay-sheet indicates, "sweeten" the next shipment to appreciable extent).

6. Reverse the hoisting cable in the incline, to keep abraded spots on the drum, and install new cable-rollers at proper points as soon as possible. Also, install continuous handrail alongside the manway as an added safety measure. As a further safety measure the writer recommends setting of stulls and possible lagging as well in the "Big Dome stope," plus a ladder up it from the 310-foot level, thus making it at least a partway-up "second entry" for use in case of accident in the main shaft. While the ground is solid, as the photos (K and L) show, cave-ins do occur at such spots in mines.

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7. Get air down into the long crosscut, and also the southeast 310-level drift---and into stopes from both, as they develop---as expeditiously as possible. Good air sent thither will materially step up the work-output of personnel. Use the 200-odd feet of canvas air-pipe now on the ground, and augment it with sufficient Bemis Bag Company "Flexipipe," to hold costs down (and because sheet-steel air-pipe is hard to buy). If the small helical fan on the job now is adequate to handle sufficient air-volume, use it. If not, it will pay dividends to buy a bigger one---preferably of the high-speed centrifugal type.

8. Purchase a new air drill, to ally with the present usable one as insurance against shutdowns for repairs. The writer recommends the Sullivan Type L-57 Jackhamer---and is aware of one to be had forthwith, in San Francisco, procurable with the Company's priority certificate in hand.

9. Arrange as soon as possible with Mr. J. H. Hedges, District Engineer at Tucson for the U. S. Bureau of Mines, under the plan in past effect (and, the writer understands, again available to be done with funds earmarked for the purpose) to have some diamond-drill exploratory work done as a means of holding down costs. Primary need for that is in the face of the long crosscut, to drill straight ahead to locate and sample the Stanley vein. If not encountered in line ahead of the present face of the crosscut, where expected, one or more holes can be drilled overhead at an angle---since the dip of that vein, as indicated at the several openings along its apex, can have changed with depth. Another advisable spot for drill exploration is at the face of the southeast 310-foot level drift---ahead (southeasterly) as a check on the downward extension of the "Tenney shoot"; and, possibly, also, upward to the right into that shoot as a check-up on stoping, and downward to the left to test that lower ground for added sinking and further southeasterly drifting and stoping. (It is presumed that the shoot nearer to the shaft, which yielded good grade shipping ore from the Kay "Big Dome stope," will yield further good ore at lower levels; which means that there can be expected two workable, commercially valuable ore-shoots to the southeast of the shaft, stopable from one or more lower-level drifts, with the "Tenney shoot" stopable now from the 310 level upward). It does not appear necessary, to the writer, to do any diamond drilling in the Stanley vein at the level where the drift is recommended in the gulch due north from the camp.

10. Set the lights "green" and proceed with such speed as is possible, with funds now available, with the recommended steps . . . objective, getting shipping ore out of the property, with equipment at hand, and to the smelter, to reduce somewhat the amount of operating capital to be raised through corporate financing.

11. Begin planning <u>now</u> towards a suitably modified corporate set-up to finance a faster tempo of ore-recovery. As an initial

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step in said financing, the writer recommends a workable plan to provide a working treasury, operating fund, of not less than $50,000.00. Since the Corporation is organized under the laws of California and of file-record with the State Division of Corporations, qualified to operate as of now in Arizona, and as control and management has shifted advantageously to present administrative and executive personnel, two ways are open for such financing: (a) Increasing of present capitalization of 80,000 shares of par-value of $1.00, with 44,000 shares issued, to a level of, say, $250,000 or $300,000, same par, with authorization to sell and issue to a close "handpicked" group who are in touch with the property and its operations and have expressed desire to "sit in," 50,000 shares at par to create that fund, together with such further issuance as may be required for balance of administrative control and other equitable factors; or (b) Creation of a subsidiary, also a California corporation, to take over the existent bond-lease and other assets and, with similar financing steps, to enlist the required capital to carry ahead and step up mining tempo. That, however, is more properly a matter for discussion with the Company's legal department, by the management, rather than with the engineering.

As it stands, the mine has no definite blocked-out, sampled ore to break, sort and ship, as in older, longer-established properties. It is, however, vastly more than a mere "prospect," and conditions as found existent on and in the ground by the writer assuredly are such as to warrant such an engineering and financing program as the writer has here recommended; likewise such as to warrant reasonable expectation, in lieu of mere hope, of adequate commercial profits to the Corporation and to those who already, to the writer's knowledge, have voiced desire to "sit in."

The most casual examination of the dump at the Sunset shaft is sufficient for the estimate that in it are at least 25,000 tons of concentratable copper-gold ore; hence, as a sort of follow-through (<u>future</u>) step in planning ahead, the writer feels it is not too soon to begin planning erection of a simple, compact gravity-concentration plant in the main gulch below the incline. Especially since ore yet to be mined in the immediate future, via the present shaft, can be advantageously concentrated; and even flotation concentration is in the cards as a pre-shipment stage. Paying freight on gangue and included plain waste hikes up operating overhead expensively; and such a plant will pay for itself---plus dividends on its cost. Even at the present stage the property is definitely of magnitude and promise to warrant such planning ahead. Having that in mind for future development of the operating equipment, it is right now secondary to the requirement of a faster-operating two-compartment vertical shaft so located as to cut both veins at depth and permit more efficient mining with greater safety than with the existent incline and skip. And even as of the present, it is desirable to replace the old Fairbanks-Morse slow hoisting engine with a faster, more powerful one---cost of which will be included in a breakdown of

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that recommended $50,000 fund which the writer will present in the near future as a supplement to this report.

The bulk of the program herein recommended can be inaugurated and got under way with the machinery and equipment already on the property, as quickly as needful funds are made available for it.

Miscellaneous Relative Information

Local Geology:

While geological conditions here are far less complex than they are in the near-by mining areas of Superior, Ray, Globe, Miami, etc., all in the same general copper-producing region or belt, they would require so many pages of discursive text as to defeat the primary aim and purpose of this report---by clogging the document with technicalities. Hence, while it was the writer's original purpose to go into the property's geology in as much detail as his brief survey of it would permit---along with the geology of abutting ground---he has decided to curtail discussion thereof materially so as to shorten this specific report. Detailed analysis of such geology therefore will be deferred to a later report on the property, at a state of developments when it will be more necessary than here.

Suffice to say here, as already has been said in the second paragraph under "Summary," that the property is traversed longitudinally by two strong copper-gold veins, both true fissures dipping between 40° and 45° (average) northeasterly, in conformity with the "country," and that, as also previously stated, both veins are operable for at least a mile within property lines. The Stanley vein definitely dips out the northeasterly sidelines---but the Federal Mining Laws as to apex rights definitely protect the Company in its operating bond-lease. It is probable that, barring material steepening of its dip, that the Sunset vein also extends out under the northeasterly sidelines. The same is true, probably (if that be a separate vein) of the vein cut at 370 feet northeast of the incline on the 310-foot level; and the same laws hold). It also is probably equally true of the lead-zinc-silver vein apexing on the Sunset No. 10 claim---any development whereof is far in the future.

All veins cited are fissures in the formation designated as the "Pinal schist," of pre-Cambrian age; and all examined show evidences of heavy ground movement---which likewise is manifest in the marked brecciation of the ore and gangue. That is indicative of depth and permanence of the veins. All evidences of such movement examined showed up-or-down wall movement (i.e., slickensides at right-angles to the strikes of the veins---as several photographs show) and as yet the writer has found no evidence, in the workings, of any lateral ground movement (which conforms, hence, with the movements which caused the uplift of the range and paralleling ranges of the region). Nor did he find any evidence of lateral-thrust cross-faults in the workings examined.

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Which, for the purposes immediately in hand, sufficiently covers matters geological so far as concerns the property. The writer has a notion, however, that he later will "gang up" somewhat with Doctor Wilson Michell, geologist with the Magma interests (who has been an interested visitor to and student of this property) and also tap the published regional geological data of such U. S. Geological Survey writers as Frederick L. Ransome, and in a later report combine their findings with his own in a lengthy discussion of the subject thus briefly handled here.

Location and Accessibility:

These are so graphically covered by Map No. 1 of the report that reference thereto is sufficient. The property is within a few hours' driving of the majority of Arizona's most famous copper mining towns. Within an hour's drive (less for a fast chauffeur) of the County Seat of Pinal County, Florence---for consultation of county records, etc. A good driver can make Tucson, seat of the State University of Arizona with its School of Mines records, and a regional headquarters of the U. S. Bureau of Mines, in a couple of hours. The same is true of Phoenix, State Capital and center of most of the routine supplies and equipment needed. Barring cloudbursts, the county (dirt) road connecting the mine with the main State highways is always drivable; and Supervisor "Joe" Spray is a co-operative fellow in the matter of keeping that road in drivable condition with his bulldozer crews and graders.

Water Supply:

This, right now, is a real problem---even as to domestic supply. However, Manager Kay has in hand the task of deepening and improving the well in the "wash" just below the camp, and adding a suitable small pump---this for cooking and drinking uses. The mine water is used at the mess hall for washing purposes.

When a concentrating plant is added, it is probable, from indications (though at present once or twice a week pumping holds the water-level below the 210-foot level) that considerable added mine water will be available. Doctor Willard E. Kay, associated with his cousin Manager "Bill" Kay, has in hand an analysis of the mine water at the laboratories of the University of Arizona at Tucson---one object being to check it for possible fluorine content; another being to check it for milling uses "when and as."

Without having wagged a willow wand up the "wash," or waved a doodlebug, the writer is reasonably sure that reasonably shallow water wells sunk, at right points up the gulch, will produce among them enough water to augment even present low-flow mine water.

Lumber, Timber, Hardware, Etc.:

These are readily procurable as near-by as Superior, at fair

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current prices---and the Corporation holds a War Production Board priority rating adequate to meet all purchases of equipment and supplies at present, likewise under the program herein outlined and recommended. The same holds good for powder, fuse and caps, and proper storage facilities for explosives, State-inspected, are safely and handily located with respect to the workings.

Fuel:

At present this is gasoline, procurable at "non-highway-use" prices from major oil corporations. Fair storage facilities exist on the property near the workings. At present and for the immediate future it will be the fuel for the hoisting engine and the heavy-duty compressor, as well as (when used) the Sullivan stand-by portable compressor (which, it is possible, may be moved from present locus near the shaft---see Photos, it stands near main ore-bin---to the site of the planned high-level drift, in the upper gulch, in the Stanley vein). Also will be presently used for a ventilation blower engine.

Gradually, it is the plan of the management, concurred in by the writer, to shift to Diesel power---and the replacement hoist referred to under "Recommendations" will be chosen with that economy in view.

Potential Electric Power:

As already said, this is available as near as Florence, a dozen miles southwest, airline; or from the power line serving Superior. Frequency of that commercial alternating-current power, however, is 25-cycle---which demands that driven power units be of design (off-standard) to fit. It also, as is well-known throughout the parts of Arizona served thus, makes lights flicker unpleasantly---and raises hob with innumerable radio receivers, which are highly needful under partly-isolated conditions in current times.

Hence, when the time comes to move over to electric power General Manager Kay and the writer think in unison in favor of locally generated 60-cycle A-C power---with a sizeable Diesel-electric unit as its source. The later plan, moreover, will be considerably less expensive both as to first cost and as to operating cost, than will a long central-station power line; especially one delivering an undesirable A-C frequency.

Material and Equipment Now on Hand:

This is shown by the transcript of the Company's inventory of such material, machinery and equipment, which will supplement this report. As stated herein, with a couple of exceptions it will be adequate to getting the recommended program well under way.

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Climatic Conditions:

These are perfect for all-year-'round operation. As to winter months, it need only be borne in mind that southern Arizona is a world-famous winter resort. As to summer months, the desert heat is dry---hence not only endurable but, as to certain human ailments, highly beneficial. The in-between seasons are about as near climatically perfect as they come.

Maps and Photographs:

The accompanying maps are self-explanatory. So also are the photographs, with their inter-keyed captions. The writer is habitually liberal with photographs in his mine-reports, on the principle of the old Chinese proverb: "One picture is worth one thousand written words, ten thousand spoken words." Surface and underground pictures, 24 in all, were taken with the object of giving readers of the report as clear as possible an overall perspective of the property, and making it possible for them to visualize conditions at long range.

A One-Paragraph Recapitulation:

The writer (as the letter of transmittal states) found in the property more than he expected to find---and he had been led to expect to find considerable. The administration and management has its collective feet on the ground; knows how to make a development-operating dollar roll an ample distance. The showings on and under ground, as per the writer's findings, justify enlistment and expenditure, as rapidly as possible, a minimum of $50,000 as recommended, and expansion of the corporate structure to permit such. The samplings of the writer (see assay sheets, with supplementary smelter-return data) speak for themselves---remember that his samples were taken for determinative purposes, as to ore-character and typical values per ton. In short, as the situation stands today and as it soon will stand improved, the enterprise may be adjudged to be what economists term "an excellent speculative investment"---one with reasonable expectation of worth-while returns instead of mere hope.

Addison N. Clark

Oakland, California
July 20, 1 9 4 4.

Consulting Mining Engineer

Addison N. Clark

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Amplification of Assay Certificate (Following) of Mr. W. W. Simon, Chief Assayer of the Magma Copper Co., due to its abbreviation because of small-sized form used; all samples, taken by the writer in his June/'44 examination, being solely determinative and indicative of the character of ore in the several parts of the workings:

(Columns 3, 4 and 5 of the Simon certificate not repeated here)

SAMPLE	TAKEN FROM	NATURE OF SAMPLE	PER TON
1-S	Johnson Shaft in Stanley Vein	Grab from ore with red oxide (some sulphides)	$11.56
2-S	Ditto	Grab from ore showing black oxides, also sulphides	$14.80
3-S	Johnson Tunnel 250' NW Johnson Shaft	Grab: Red oxides and some sulphides	$22.37
4-S	Ditto	Grab: Heavy black oxide; sulph. & carbonates	$25.72
5-S	Face in Stanley Vein cut Shown in Photo R	Malachite, Some Azurite, Red Oxide, and Heavy Black sulphide	$42.62
6-S	Cut, Stanley V. on Sunset #8	Grab: Carbonates and Some Sulphides	$13.72
SS-1	Sunset Vein, 210 Level; Cross-fissure 30' N. of Shaft	Copper showings mainly as Carbonates--- Little Sulphide	$ 1.76
SS-2	Sunset V, Face of 310 Lev. 130 Ft. S of Shaft	Covellite, Black Oxide, Chalcopyrite: (a Grab-Sample)	$73.38
SS-3	Ditto/Across Two Feet Above Footwall Gouge-Seam	Same mineralization as in SS-2---but "spread thinner"	$14.00
SS-4G	"Blind" Cop-Gold Vein in 310 X-cut 370 ft. from Shaft	Copper mainly carbs. & Silicate; very little Sulphides	$41.80
SS-5	Grab fr. Skipload from 310 S. Face	About as in SS-3	$10.56
SS-6	Across 1 1/2 ft. fr. H-W, 310 S Face	Same as in SS-3	$46.75
SS-7	Across 2 ft. below F-W, 310 S Face	Mineralization with Carbonates (apparently)	$ 0.70
SS-8L	Orepile in Cut on Lead-Silver-Zinc Vein, Sunset #10	Much Galena plus Evidence of Zinc Content	$31.20

Mr. Addison N. Clark,
Consulting Mining Engineer,
1440 Broadway,
Oakland, California.

MAGMA COPPER COMPANY

MINE ASSAY CERTIFICATE

DATE June 23, 1944

No.	LOCATION	Cu.%	Ag. Oz.	Au. Oz.	Pb.%	Zinc%	%Moisture	REMARKS
1-S	Johnson Sh/Stanley Vein	2.41	0.80	0.08	(Grab/Red Oxide Ore)			$11.56/Ton
2-S	" " " "	2.21	0.40	0.20	(" /Black " ")			$14.80/Ton
3-S	" Tun.250'NW Shaft	1.33	0.50	0.50	(Red Ox/some sulphide)			$22.37/Ton
4-S	" " " " "	5.75	0.80	0.16	(Hvy.blk.sul.& CO_2)			$25.72/Ton
5-S	S.V. " 350'SE "	11.50	2.00	0.06	(" " " & Malach.)			$42.62/Ton
6-S	Cut on SS#8,Stan.Vein	3.79	0.20	0.02	(Grab/Sul. & Carbs)			$13.72/Ton
SS-1	Sunset Vein/210' Level	0.39	0.10	0.02	(X-Fissure N of Shaft)			$ 1.76/Ton
SS-2	" " / 310' Lev.S	20.75	3.00	0.02	(Covellite & Black Ox.)			$73.38/Ton
SS-3	" " " " "	3.74	0.80	0.02	(Same/across 2 feet)			$14.00/Ton
SS-4C	X-Cut 310'Lev.370' NE	1.92	0.40	1.00	(Au.Vein, top of shoot)			$41.80/Ton
SS-5	310' Lev. S., Face	2.90	0.60	0.02	(Grab from skipload)			$10.56/Ton
SS-6	" " " "	12.78	2.00	0.02	(1½' W from H-Wall)			$45.75/Ton
SS-7	" " " "	0.20	0.10	0.02	(2' below f'wall gouge)			$ 0.70/Ton
SS-8L	Lead-Zinc vein/SS #10	0.20	0.40	0.01	19.8	3.3		$31.20/Ton

Sunset Mine Examination Samples: Cu @17¢ incl.
Prem.;Ag @ 71¢; Au @ $35; Pb @ 6½¢;
Zn @ 8¼¢.

W. W. Simon
ASSAYER

Addison N. Clark
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Smelter Returns Studied

The writer, as an adjunct to his own determinative sampling and resultant assays, as cited on the two preceding sheets, was given full and free access, by General Manager Kay, to an extensive sheaf of his own assays over a considerable period of operation. Likewise access to all of Mr. Kay's smelter returns from ore shipments during his administration. As to the former, suffice to say here that his own routine assays (all done by Mr. W. W. Simon) were of a nature to check nicely with those done by the same gentleman for the writer---with this difference: His sheaf of certificates showed far more "duds" than the two that appear in the foregoing two pages. Reason: He was sampling, often, to ascertain where NOT to strike for shipping ore; whereas the writer sought to check up as to where and what to mine.

As to smelter returns, for the scope of this report, and so as not to "choke it with columns of figures" and thus impede its purpose, from about "Pearl Harbor Day" onward his smelter returns showed a gross value in round figures of $45,000 and a net just above $22,000. That covers a total tonnage shipped (wet weight) of 1300---which averages out a net just under $17 per ton. The writer went carefully through the said sheaf of smelter return sheets (American Smelting & Refining Co., plant at Hayden) and may add that they tell their own story. They are, as Mr. Kay states, available for study by persons interested in the future potentialities of the property, as well as by officials of governmental regulatory bodies.

Ore taken under Mr. Kay's administration out of the "Big Dome stope" (shown in Photos K and L) grossed, he stated to the writer, $10,433; and the balance stoped grossed a little under $35,000. The totals cited above represent ore mined and shipped down to the vein-depth of 280 feet---since in the ore-shoot termed the "Big Dome stop" shoot his crews were in ore only from a level almost 30 feet above the 310-foot level. (There is, however, unrecovered ore in that shoot below 280 feet---the writer sat on unmined highgrade to take Photo L).

The foregoing covers this phase in about the briefest form.

Addison N. Clark

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Physical Inventory of Sunset Mining Property
As of August 2, 1943 (From W. O. Kay, General
Manager, Checked by the Writer):

1	Ingersoll-Rand Compressor (Stationary)	$ 5,800.00
1	Sullivan Compressor (Portable)	3,700.00
1	Fairbanks-Morse Gas Engine and Hoist	1,500.00
4	Mine Cars	300.00
1	Stoper Drill with Shell	250.00
2	Sullivan Jackhamer drills	400.00
1	Truck, 1 1/2-Ton	500.00
2	Mine Pumps (one a Cameron, shown in Photo U)	450.00
1	Ventilation Blower	150.00
	Drill Steel, Pipe, Hose, Rails, Etc.	1,500.00
	Tools	150.00
	Machine Shop	100.00
3	Bunk Houses	250.00
1	Mess Hall	200.00
1	Shower and Change Room	450.00
10	Cots	100.00
1	Refrigerator (Kerosene-Operated)	250.00
	Kitchen and Dining Utensils and Dishes	250.00
	Water Tanks	100.00
	Sub-Total	$ 16,400.00
	Road Improvements Within Property	2,000.00
	Underground Workings	40,000.00
	T o t a l	$ 58,400.00

Note: From the writer's examination and appraisal of the inventoried machinery and physical equipment ten and one-half months later, he considers Manager Kay's inventory, as cited above, to be a fair and conservative one.---A.N.C.

Supplement to
Sunset Mine Report
Sheet Sixteen

Addison N. Clark

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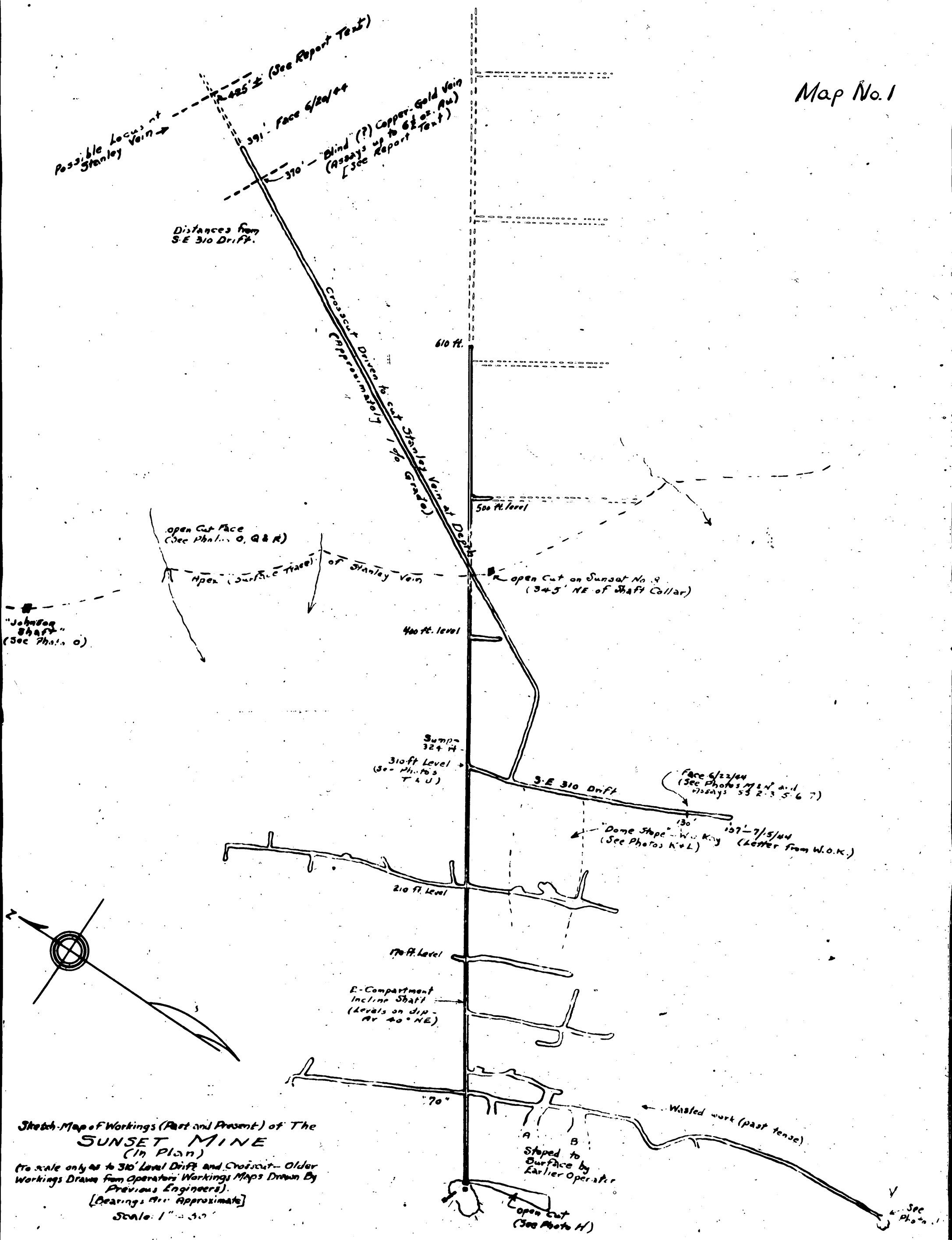
Addendum to Physical Inventory Sheet of Sunset Mine Report
As of October 1, 1944:

Brough forward from preceding page (Aug. 2, 1943):		$58,400.00
New underground workings since 8/2/43		4,900.00
Crosscut 310' level, 220' @ $15	$3,300.00	
SE Drift " " 65' @ $15	975.00	
Stoping above 310' level, Sept.'44	625.00	
Added machinery and equipment		2,200.00
New Sullivan drill, hose, bed, etc.	$ 500.00	
2 used air drills	450.00	
Flexi-Airpipe (Bemis)	400.00	
Miscellaneous operating material	300.00	
Lumber & timber	550.00	
T o t a l		$ 65,500.00

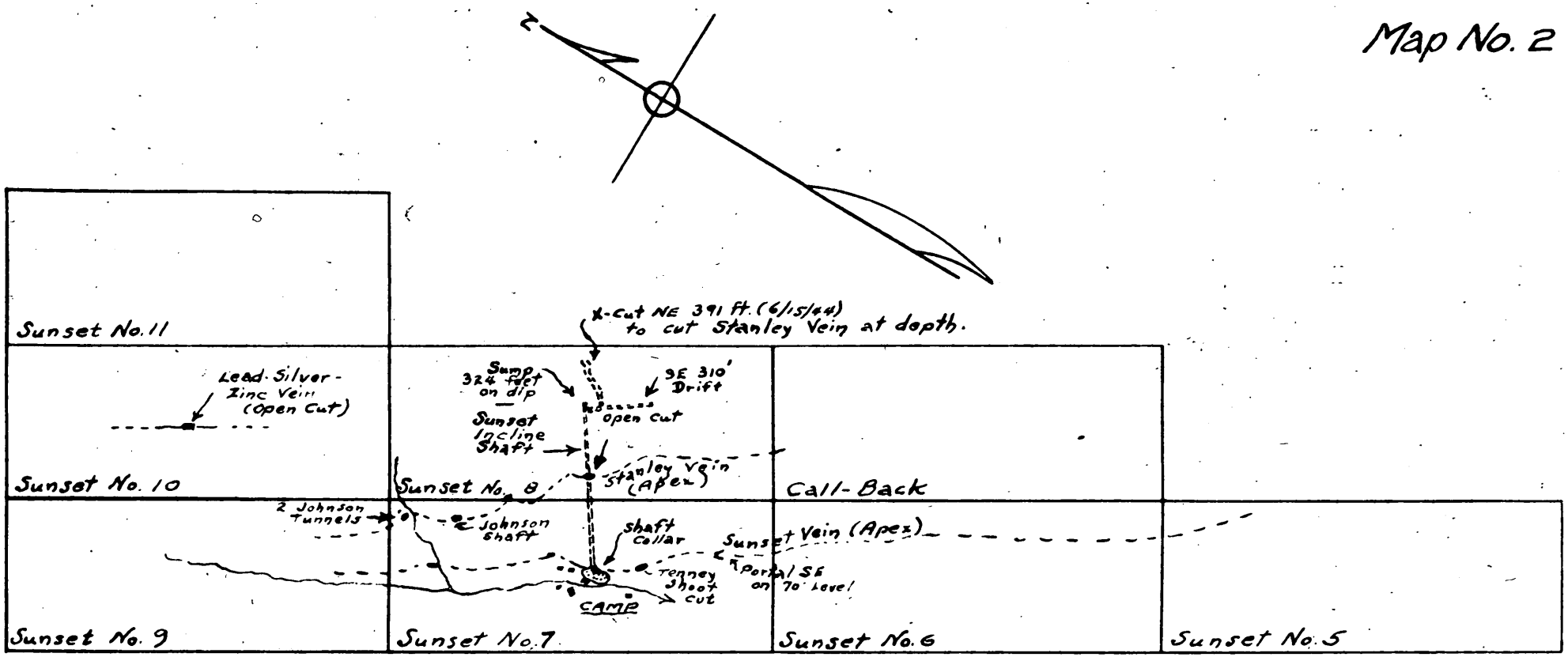
Map No. 1



Sketch-Map of Workings (Past and Present) of The
SUNSET MINE
(In Plan)
(To scale only as to 310' Level Drift and Crosscut - Older Workings Drawn from Operators' Workings Maps Drawn By Previous Engineers).
[Bearings Are Approximate]
Scale: 1" = 30'

Dwl. A.N.C. - to accompany report - July 1944
Revised: Oct. 1982.

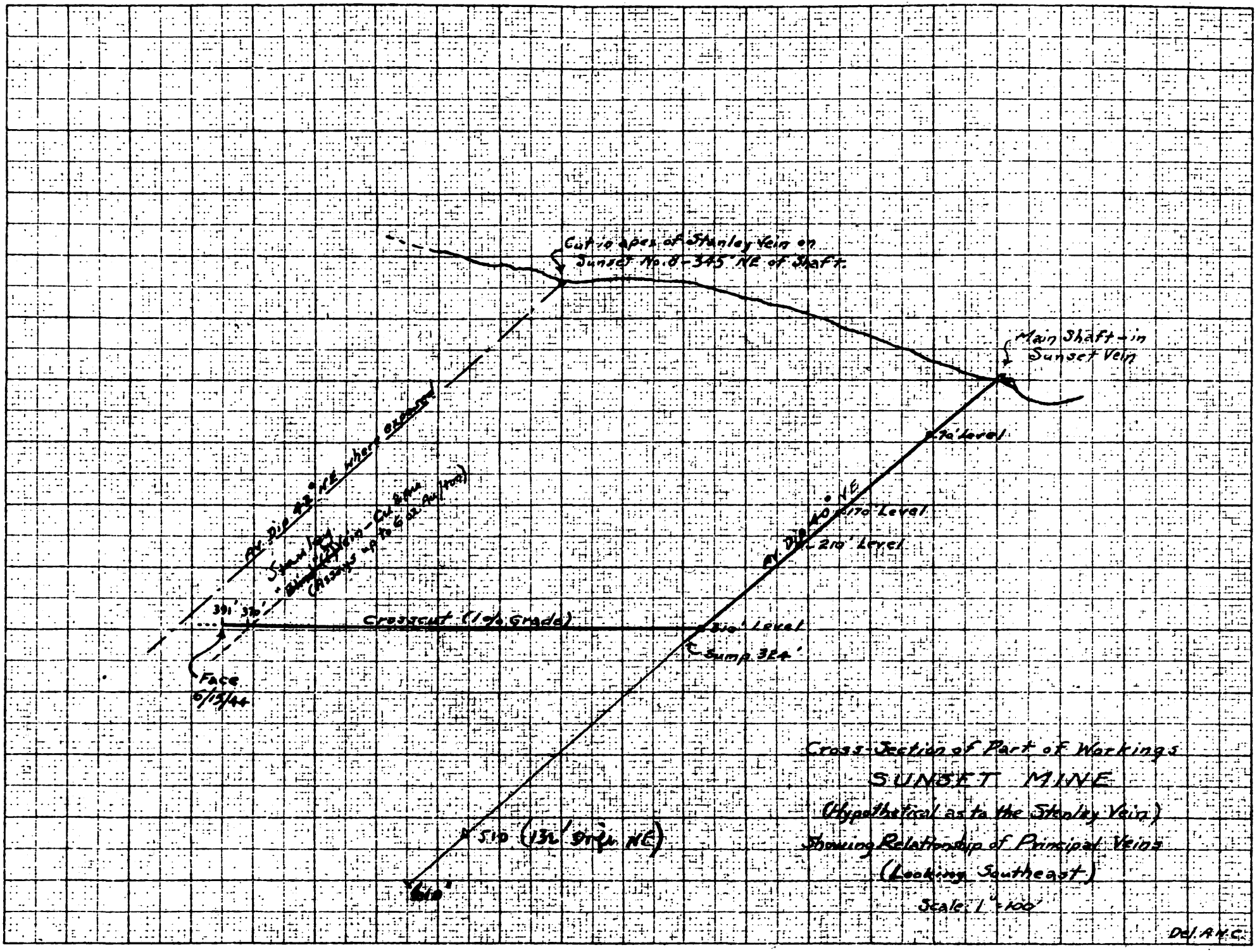
Map No. 2



Sketch Map of Group of Eight Claims of
SUNSET MINING PROPERTY
Mineral Hills District, Pinal County, Arizona
Showing Approximate Courses of Two Main Veins
Scale: 1" = 600'
(Not based on instrument survey)

Del. A.N.C.
July 1944

KEUFFEL & ESSER CO., N. Y. NO. 359-12
10 to the half inch, 10th lines heavy.
Made in U.S.A.



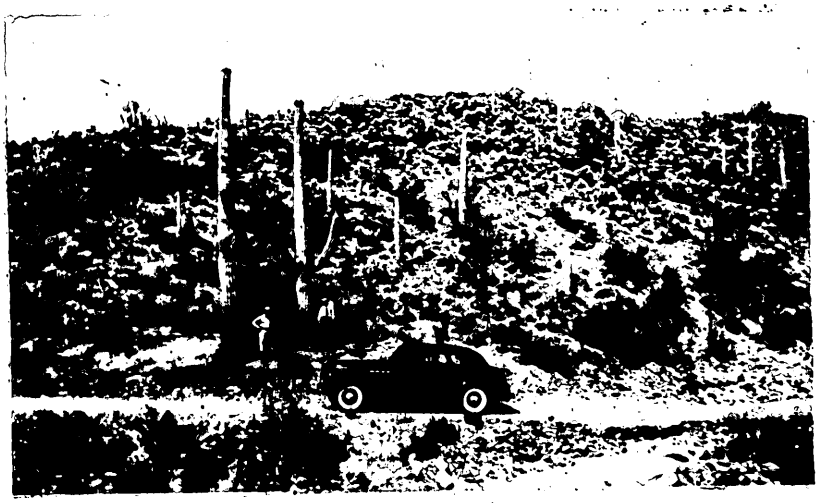


Photo A: Main paved highway from Superior, connects with County road to Sunset Mine 4 miles east of Florence Junction (see Map No. 1). Picket Post Mountain in center distance. Messrs. Kay and Baiocchi flank the Buick.

Photo B: Part of the nine miles of good dirt road (County road) connecting the paved highway (Photo A) with the Sunset Mine.

In distance on horizon below can be seen the Tortilla range of mountains south of Hayden, where Sunset ore is smelted.

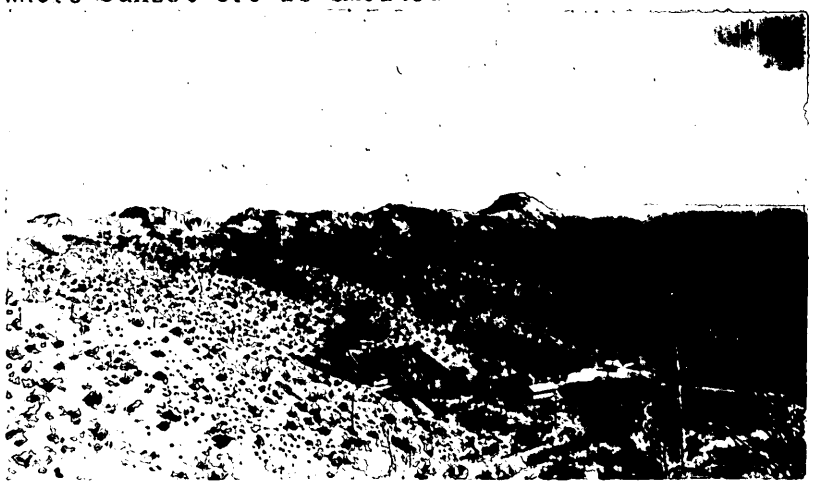


Photo C: Where the County road (Photo B) reaches the Sunset Mine, continues down Box Canyon (see Map No. 1) to Price, ore-shipping point. North Butte in right distance. See also Photo F. (Looking south into Gila River valley).

Photo D: General view of topography of Sunset property---a panoramic shot from Point P in Photo G, looking NE (i.e., towards Superior). Note visible cropping of Sunset Vein NW and SE of shaft. (T---Tenney cut; Z---portal of Tenney "emergence" tunnel on 70-foot level from Sunset shaft).

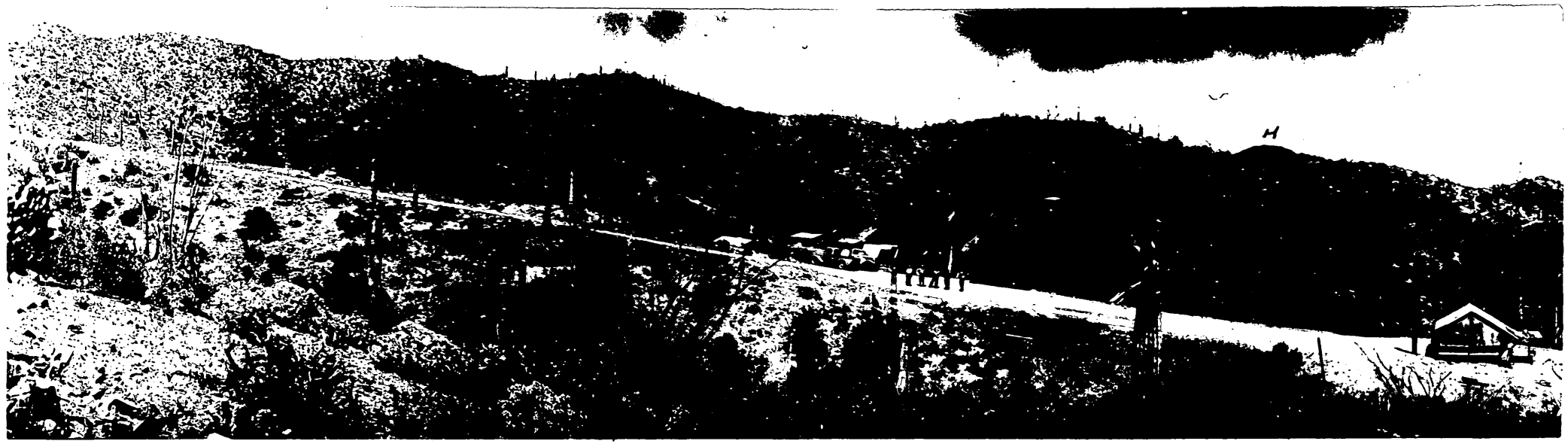


Photo E: Closer-up panoramic view---also looking NE. Hill H is in both views. Roof of mess-hall at left of camp. Sunset shaft headframe beyond covered truck.

Photo F: Panoramic like Photo C but from lower elevation---looking southeasterly. Cut in apex of Stanley Vein on ridge at X (see Photos O-S incl.) is 345 feet NE of collar of shaft . . . see also Photo P. (Manager Kay standing at X).

Photo G: Panoram sililar to F but more to SW. County road on ridge. Photo D taken from Point P, which is the cropping of a large vein on adjacent property of Arizona Mining Co.

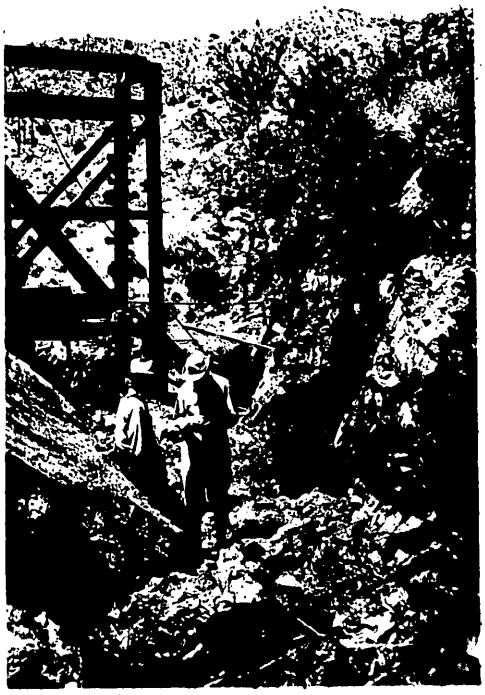


Photo H: Open cut SE of head-frame shows dip and both walls of Sunset Vein. (Looking NW). Gray and Baiocchi examining a copper-gold specimen.

Photo I: Footwall of Sunset Vein exposed in open cut at top of "Tenney ore-shoot" on ridge at T in Photo D, 175 feet SE of shaft. (Left to right: Baiocchi, Kay, and Tom Gray, hoisting engineer).

(Added note as of Oct. 6, 1944: The writer's letter of that date, bound into report ahead of letter of transmittal dated July 20, refers directly to developments in this so-called "Tenney shoot" by overhand stoping into it from the 310-foot level close to where the writer took the flashlight photos M and N in his June examination).

Photo J: Where the 70-ft. level drift emerged into gulch at Z in Photo D. (Baiocchi and Gray).

Photo K: A conference in the Kay or "Dome" stope on the 210-ft. level (L to R: Messrs. Kay, Baiocchi and Cassar). Note solidity of ground here and below---freedom from timbering, use of a few stulls. Ore recovered from this stope, shipped to the AS&R smelter at Hayden via Price, netted more than $10,000, according to Manager Kay's smelter returns examined.

Photo L: The same stope about 80 feet down; about 20 ft. above SE 310-foot level.

Photo N: Mr. Baiocchi has a look into the same hole, shown in Photo M. Dip here is 45° NE.

Photo M: Face of SE drift on 310 level, 130 ft. from shaft, following shooting round. McCliff (L) has head in hole in footwall gouge exposing good grade copper ore with covellite and black oxide, plus gold and silver content ---assayed $73/ton (see certificate). Note slickensides on footwall gouge. Cassar with pick.

Photo O: One of two "pan" shots to show surface relationship of Stanley Vein to Sunset Vein (see also Photo P). Kay at A, Kalaf at B, both photos, at croppings (B is "Johnson shaft"). D is open cut in Stanley on Sunset No. 8. E is cut in Photos Q and R.

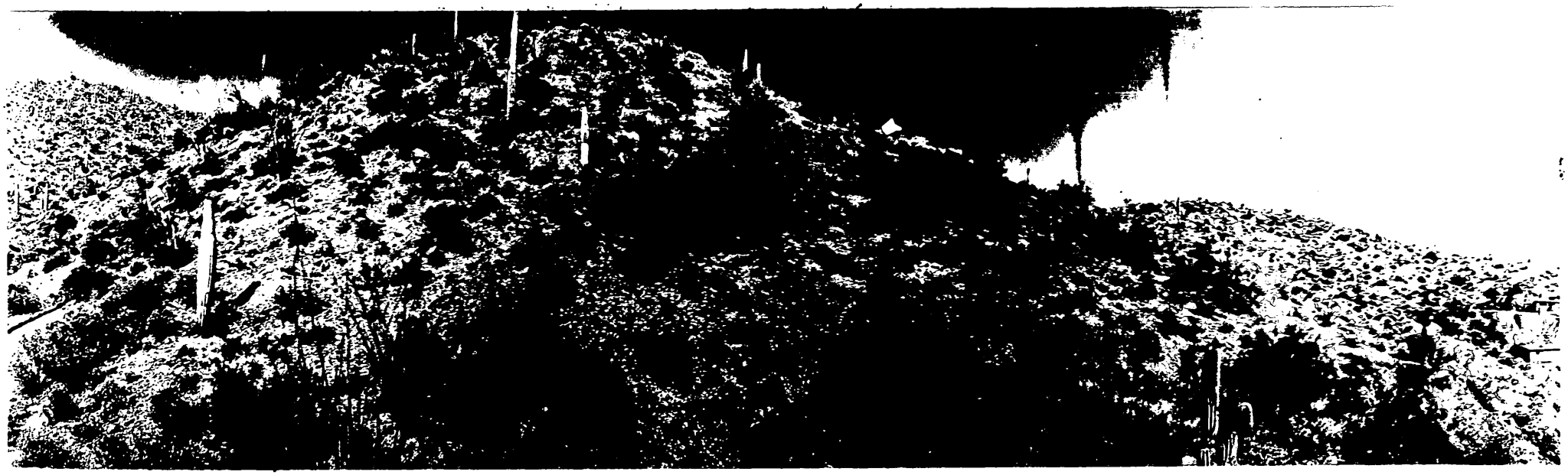


Photo P: Closer view of NW hill in Photo O. A and B same as in O At C in both is W.W.Simon, Chief Assayer of Magma Copper Co., standing on apex of main Sunset vein. They are 245 feet apart on surface at C and shaft; 175 feet apart in gulch at left; dip approximately parallel (see section).

Photo Q (left): Strong outcrop of Stanley Vein at E in Photo O---see Photo R. Dip 42 degrees NE. (Mr. Baiocchi is holding the plumb-bob).

Photo R (right): Pick is held against footwall gouge of Stanley Vein below where Mr. Baiocchi is standing in Photo Q. Shipping ore is exposed here.

Photo S (left): Looking SW from this cut (above) across camp. Point P is same as in Photo G.

Note the slickensided hanging wall of Sunset vein---in both views. Every exposed surface underground is alive (flame-red) with calcite under the ultra-violet Mineralight---the vein carries its own catalyst, or "ore-maker", in the $CaCO_3$.

AT THE SHAFT ON THE 310-FOOT LEVEL.

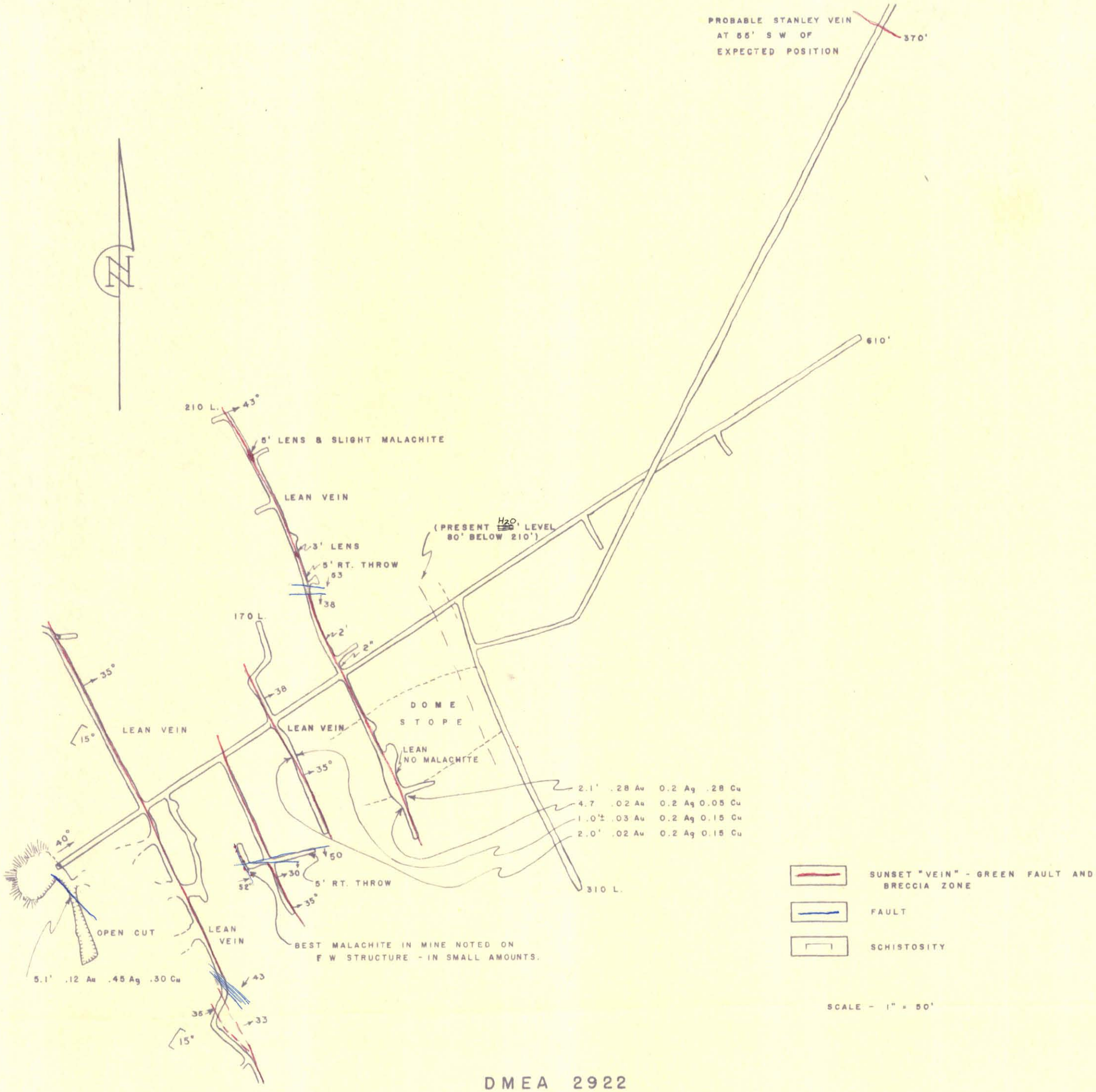
Photo T: Baiocchi, McCliff (L) and Cassar fan the hanging wall with ultra-violet rays and view the fiery calcite glow.

Photo U: McCliff oils up the Cameron pump that holds down the mine-water. The 14-foot sump is below at right.

Photo V: "Bill" Simon, Chief Chemist and Assayer of Magma Copper Co., and Stanley Kalaf, his aide, read micro-ammeter in geophysical survey of the Sunset veins.

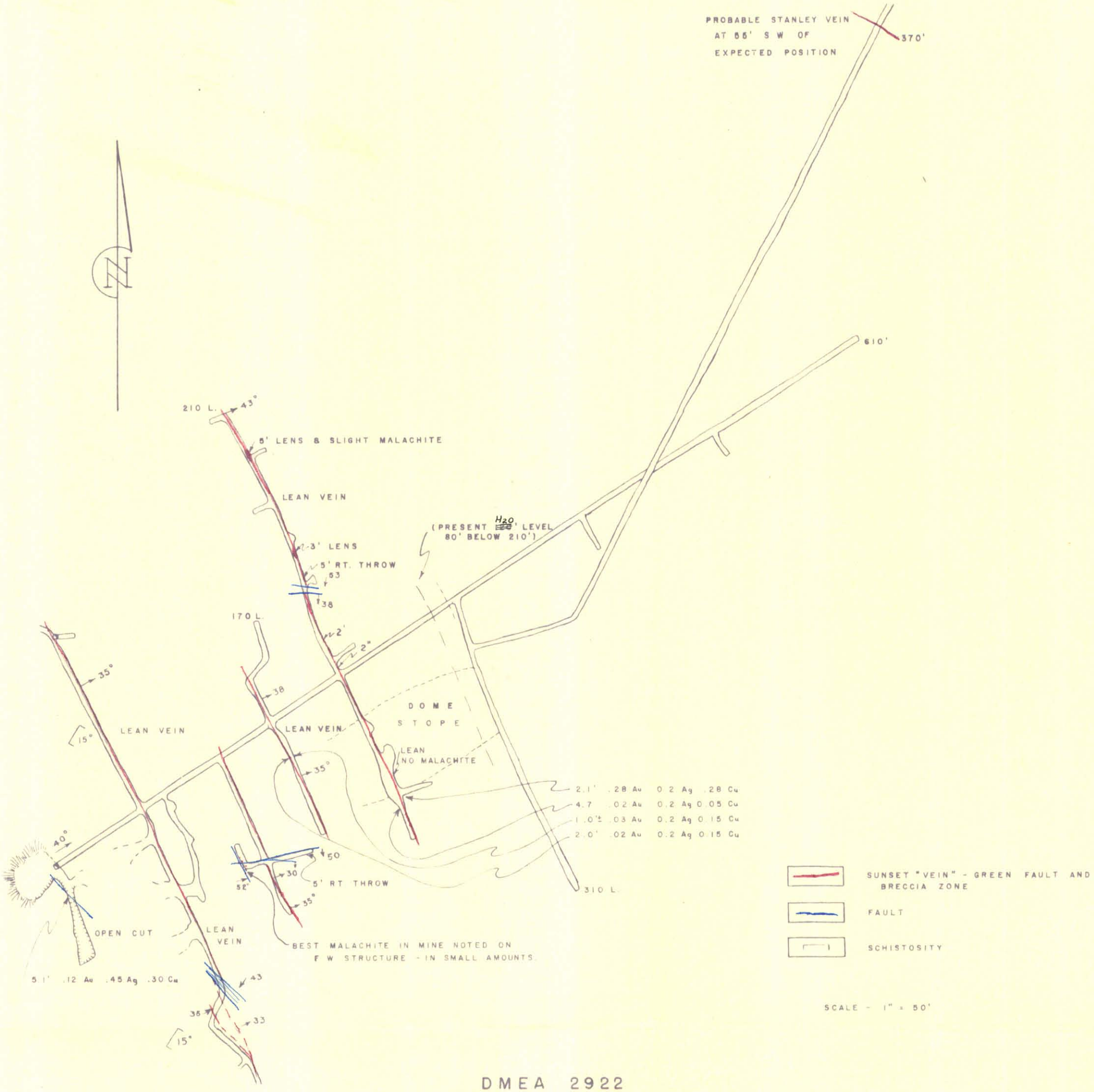
Photo W: Open cut on lead-zinc-silver vein on Sunset No. 10 (see report text). Baiocchi and Cassar study the orepile---see assay certificate.

Photo X: Photo of the writer (cracking rock on ore bin trestle) by Baiocchi---to prove the writer was there.



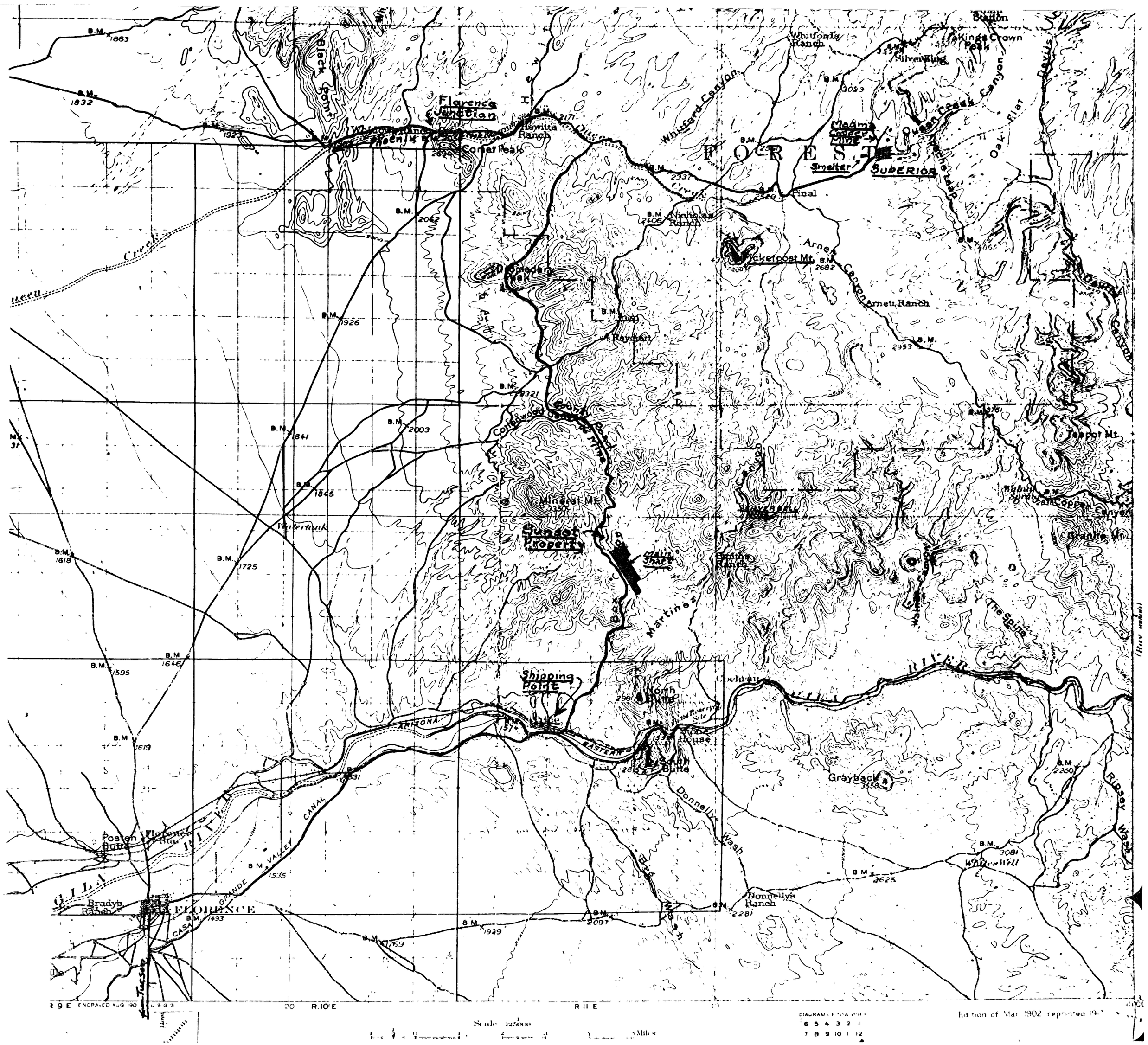
DMEA 2922

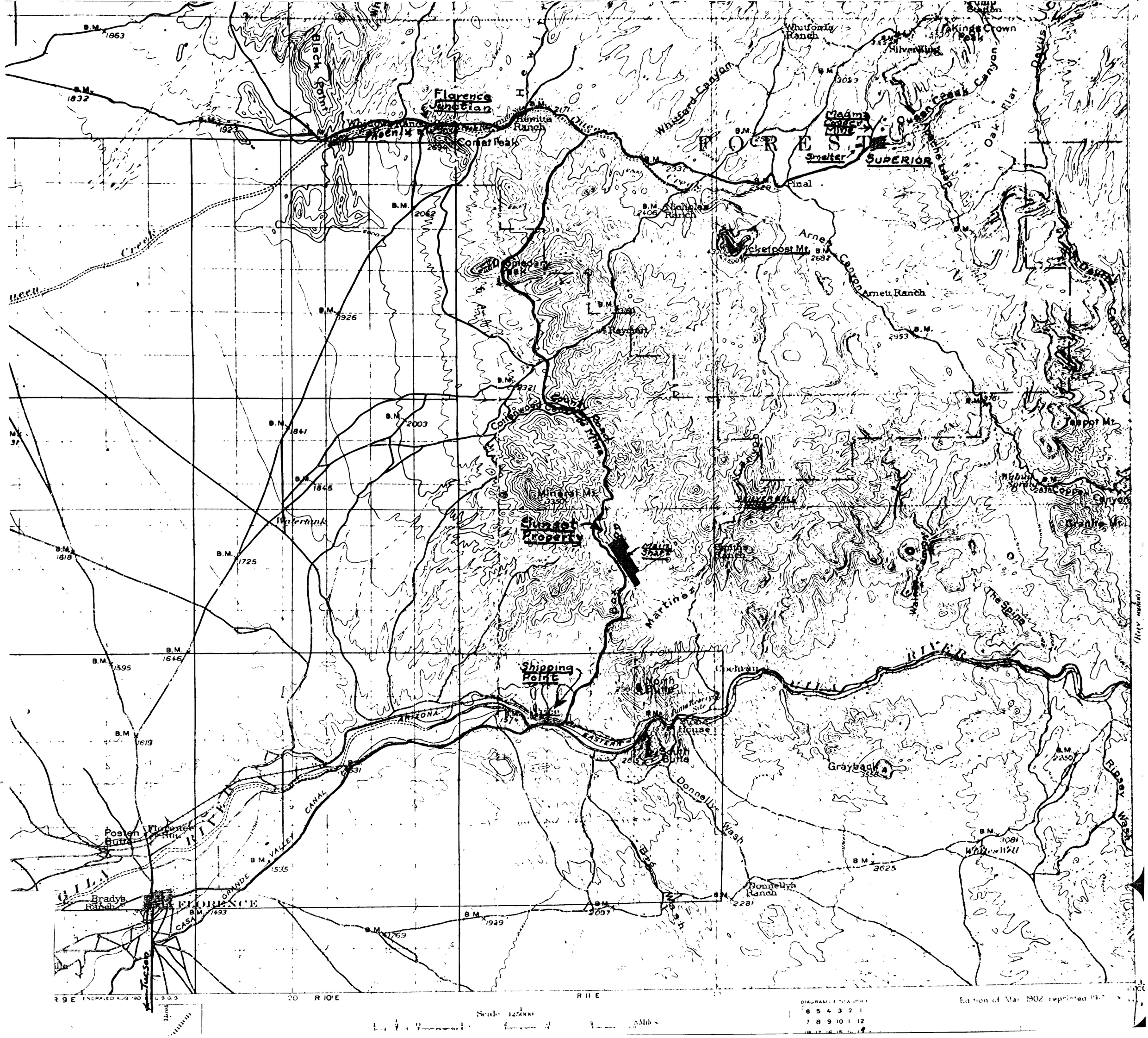
FIGURE 1. - GEOLOGIC AND SAMPLE MAP OF SUNSET MINE WORKINGS



DMEA 2922

FIGURE 1. - GEOLOGIC AND SAMPLE MAP OF SUNSET MINE WORKINGS


Florence Junction
Phoenix
Comet Peak
Black Point
Whitford Canyon
Queen Creek Canyon
Oak Flat
Davis
Magma Copper Mine
Smelter
SUPERIOR
FOREST
Final
Arnett Canyon
Arnett Ranch
Picketpost Mt.
Dominion Peak
Rayson
Mineral Mt.
Sunset Property
Main Shaft
Martinez
Teapot Mt.
Copper Canyon
Granite Mt.
The Spine
Shipping Point
Cochran
North Butte
South Butte
Grayback
Donnelly Wash
Donnelly's Ranch
Ripsey Wash
Arizona Eastern
Gila River
Poston Butte
Florence
Brady's Ranch
Casa Grande Valley Canal
Tucson
Scale 1:250000
Miles
Edition of Mar. 1902 reprinted 19


Florence Junction
Whitford Ranch
Phoenix
Hewitt Ranch
Comet Peak
Whitford Canyon
Whitford Ranch
Takings Crown Peak
Silver King
Queen Creek Canyon
Oak Flat
Magma Copper Mine
Smelter
SUPERIOR
Pinal
Arnett Canyon
Arnett Ranch
Ticketpost Mt.
Black Point
Mineral Mt.
Sunset Property
Main Shaft
Martinez
Shipping Point
Hoodoo
Hoodoo House
Eastern Butte
Donnelly Wash
Donnelly's Ranch
Grayback
Ripsey Wash
The Spine
Copper Canyon
Brandis Mt.
Poston Butte
Florence Site
Brady's Ranch
FLORENCE
Tucson
Casa Grande Valley Canal
Arizona Eastern
GILA RIVER
Watertank
Contention Road
Mineral Mt.
Raybary
Domingo Peak
Creek
B.M. 1863
B.M. 1832
B.M. 1923
B.M. 2062
B.M. 1926
B.M. 1841
B.M. 2003
B.M. 1845
B.M. 1725
B.M. 1618
B.M. 1595
B.M. 1646
B.M. 1619
B.M. 1535
B.M. 1493
B.M. 1769
B.M. 1929
B.M. 2097
B.M. 2281
B.M. 2625
B.M. 3081
B.M. 2250
B.M. 2682
B.M. 2953
B.M. 2337
B.M. 2406
B.M. 2171
B.M. 3029
B.M. 2824
B.M. 1574
B.M. 1531
R 9 E
20
R 10 E
R 11 E
Scale 1:25000
Miles
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