



CONTACT INFORMATION

Mining Records Curator
Arizona Geological Survey
1520 West Adams St.
Phoenix, AZ 85007
602-771-1601
<http://www.azgs.az.gov>
inquiries@azgs.az.gov

The following file is part of the

Arizona Department of Mines and Mineral Resources Mining Collection

ACCESS STATEMENT

These digitized collections are accessible for purposes of education and research. We have indicated what we know about copyright and rights of privacy, publicity, or trademark. Due to the nature of archival collections, we are not always able to identify this information. We are eager to hear from any rights owners, so that we may obtain accurate information. Upon request, we will remove material from public view while we address a rights issue.

CONSTRAINTS STATEMENT

The Arizona Geological Survey does not claim to control all rights for all materials in its collection. These rights include, but are not limited to: copyright, privacy rights, and cultural protection rights. The User hereby assumes all responsibility for obtaining any rights to use the material in excess of "fair use."

The Survey makes no intellectual property claims to the products created by individual authors in the manuscript collections, except when the author deeded those rights to the Survey or when those authors were employed by the State of Arizona and created intellectual products as a function of their official duties. The Survey does maintain property rights to the physical and digital representations of the works.

QUALITY STATEMENT

The Arizona Geological Survey is not responsible for the accuracy of the records, information, or opinions that may be contained in the files. The Survey collects, catalogs, and archives data on mineral properties regardless of its views of the veracity or accuracy of those data.

PRINTED: 06/20/2002

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES AZMILS DATA

PRIMARY NAME: RED ROVER

ALTERNATE NAMES:
BRIDAL CHAMBER

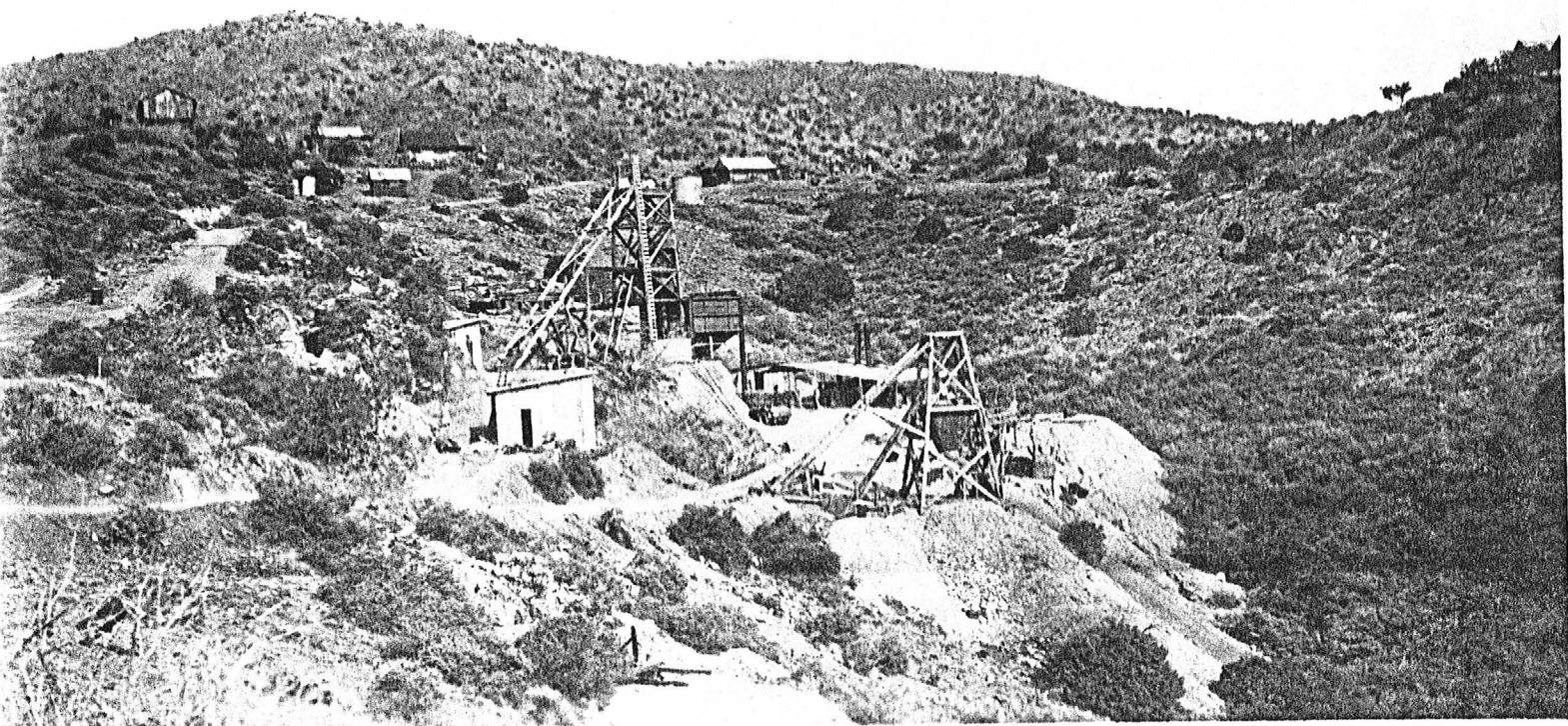
MARICOPA COUNTY MILS NUMBER: 645

LOCATION: TOWNSHIP 8 N RANGE 5 E SECTION 28 QUARTER C
LATITUDE: N 34DEG 00MIN 37SEC LONGITUDE: W 111DEG 50MIN 52SEC
TOPO MAP NAME: ROVER PEAK - 7.5 MIN

CURRENT STATUS: PAST PRODUCER

COMMODITY:
SILVER SULFIDE
COPPER SULFIDE
COPPER OXIDE
GOLD

BIBLIOGRAPHY:
USGS RED ROVER QUAD
ADMMR RED ROVER MINE FILE
ADMMR "U" FILE
ELSING M & HEINEMAN R AZBM BULL 140 P 94
ADMMR CAVE CREEK GEO. FILE
LEWIS A ENG & MINING JURNL. OCT 9, 1920 P 715
USAEC FILE 172-484 PRELIM RECONN RPT P 412
MOORE B T ET AL AZBM BULL 180, P. 260
AZ. MINE INSP. MINE START FILE 1975
ADMMR RED ROVER COLVO FILE



A-173-6

C-1950



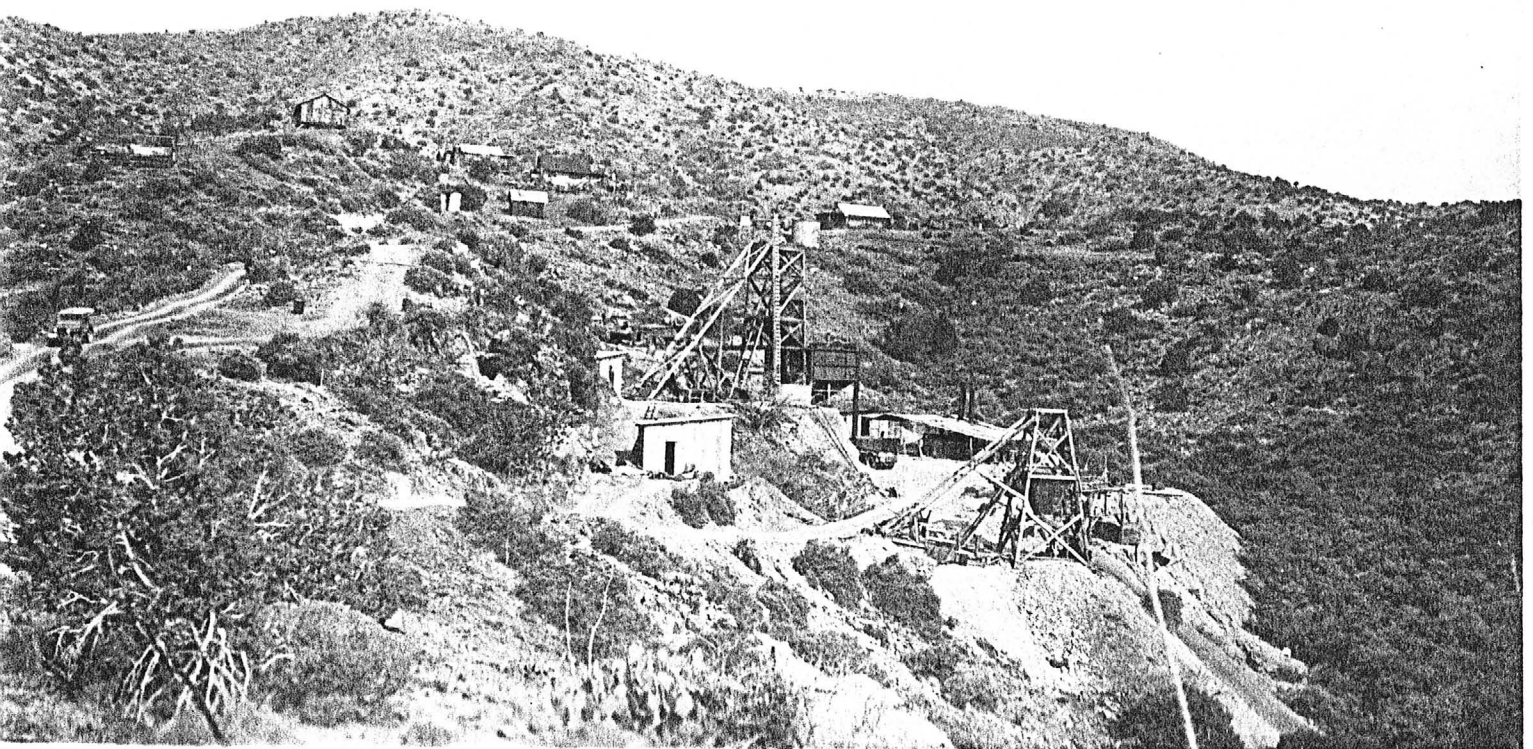
A-173-5

C-1950



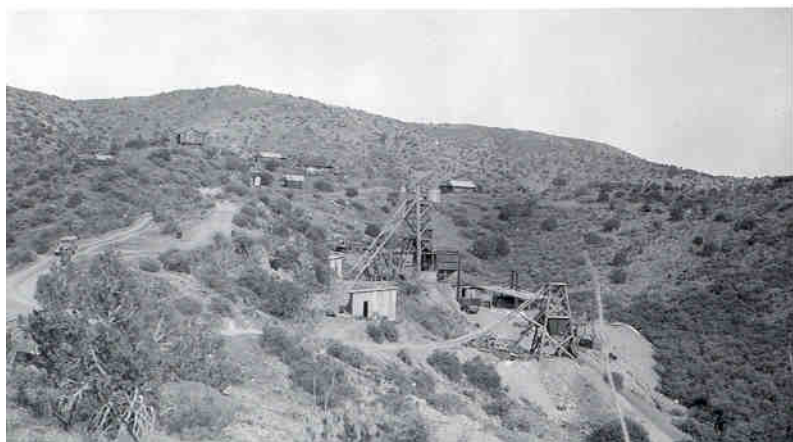
A-173-1

C-1950

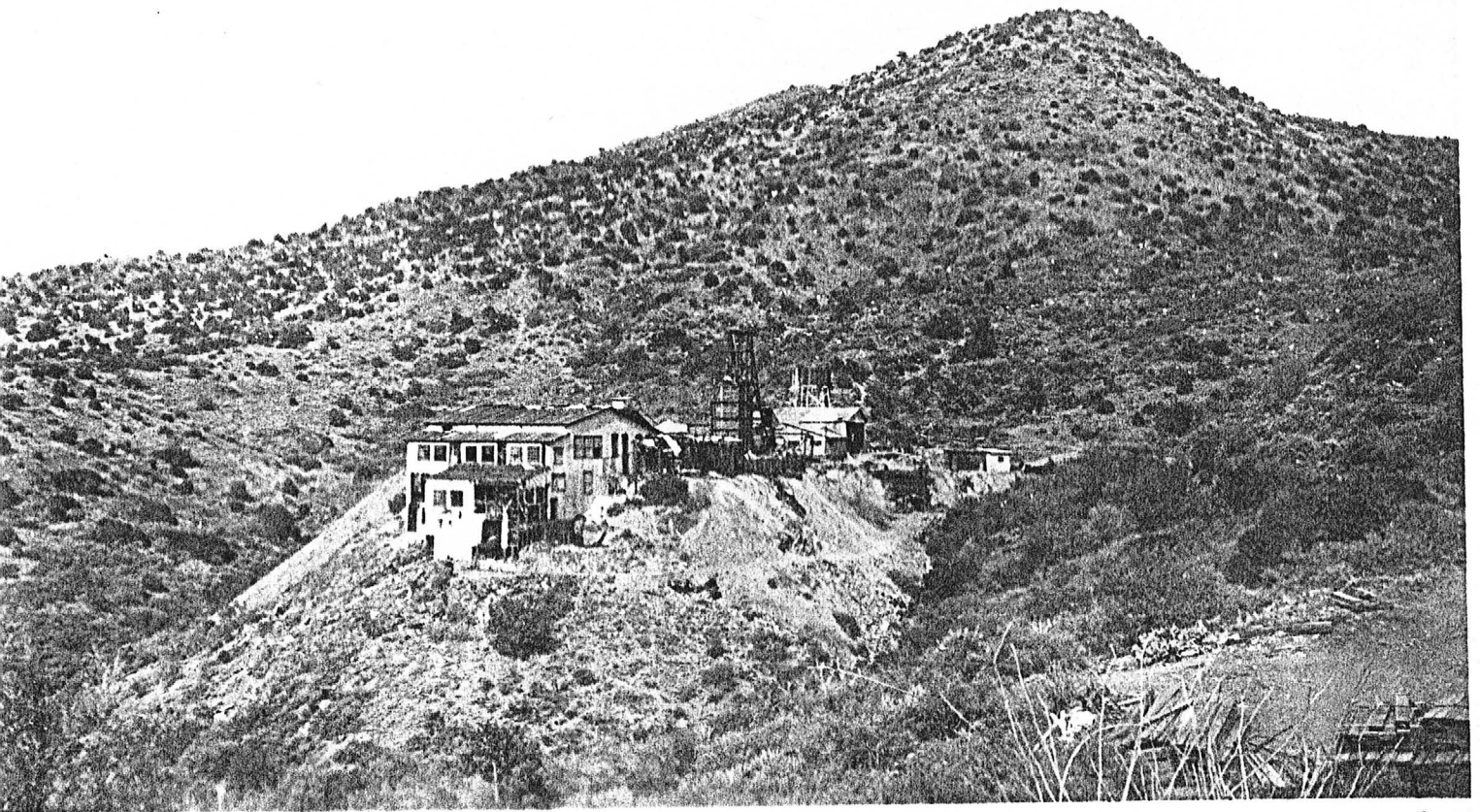


A-173-2

C-1950

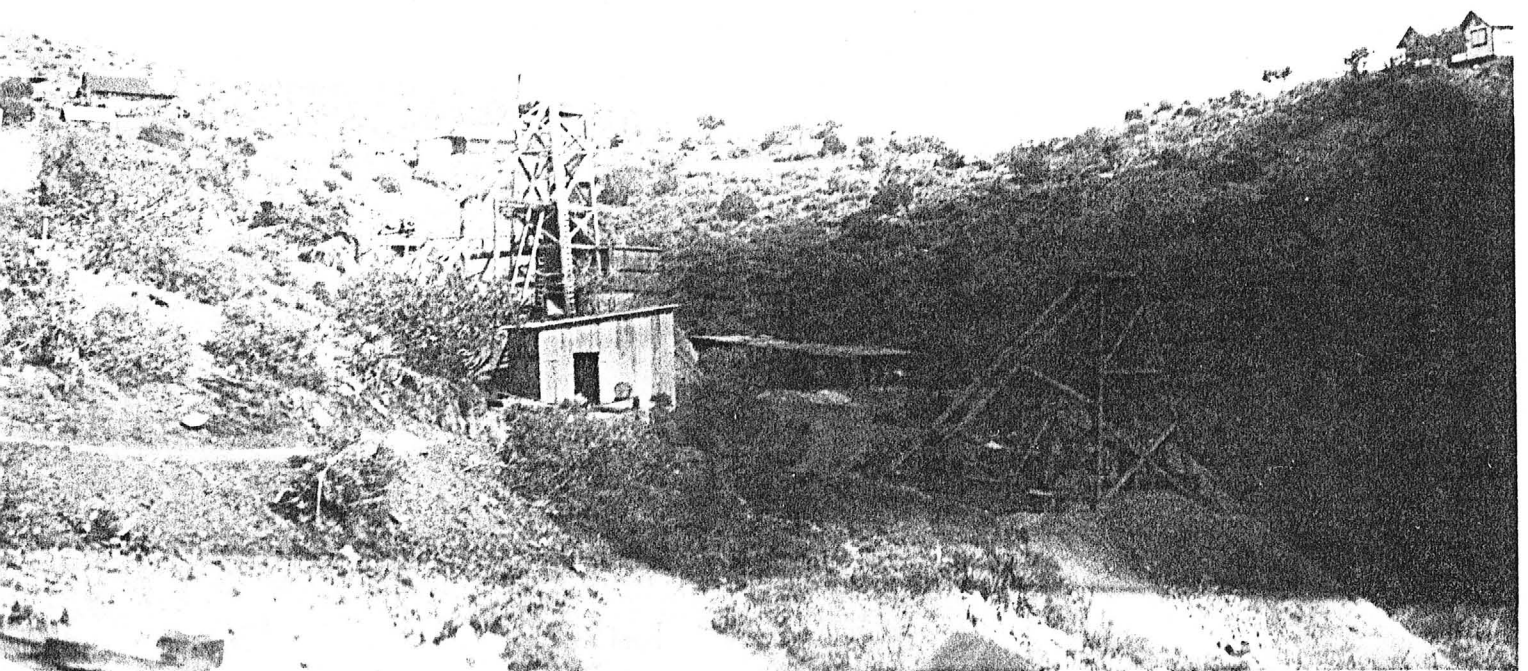






A-173-3

C-1950

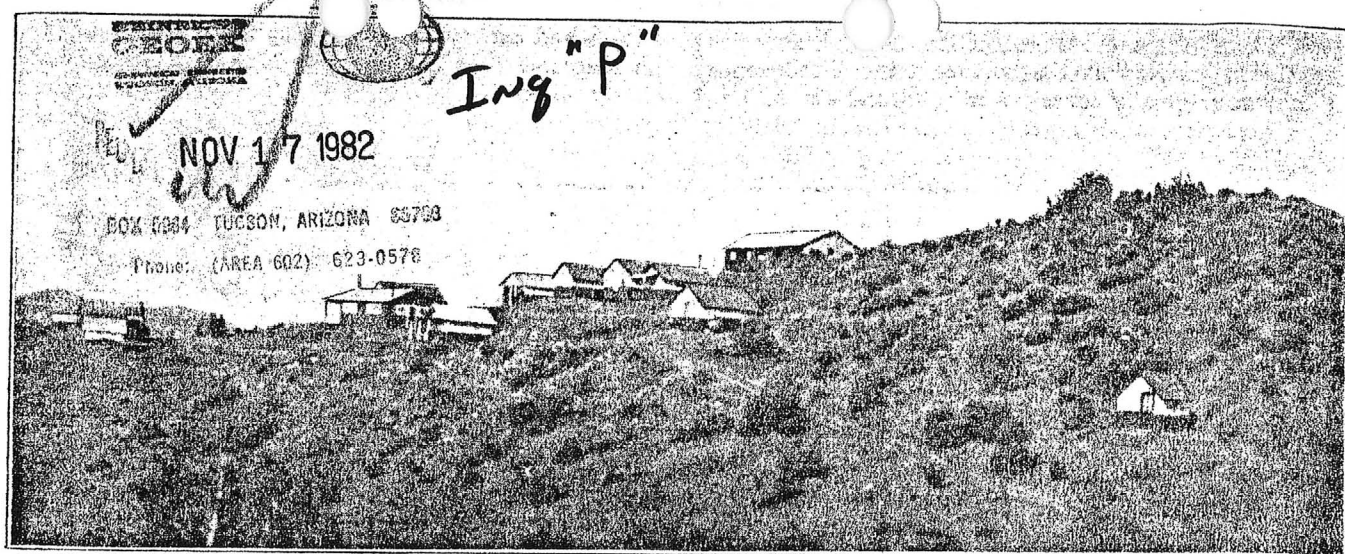


A-173-4

C-1950







CAMP AT RED ROVER MINE, CAVE CREEK DISTRICT

Ore Deposits of Cave Creek District, in Arizona

Geology of Area Twenty-eight Miles North of Phoenix Described—Only Deposit Developed of Present Importance That of Red Rover Mine—Characteristics of Principal Type of Outcrops Discussed

BY ALFRED STRONG LEWIS

Written for *Engineering and Mining Journal*

WITHIN the last two years I have made several professional trips to the Cave Creek mining district, in Maricopa County, Ariz., for Eastern clients holding mining interests therein. In passing over and through the district, and in connection with my examination of certain specific properties, I was greatly impressed by the appearance of the general surface conditions, and therefore determined to make a careful examination, with the purpose of preparing a geological map of the district. This article is based on such survey and examination.

First I made a thorough search of all possible sources for information relating to the district, but found nothing except that its northeast corner was included in the quadrangle covered by the Bradshaw folio of the U. S. Geological Survey. Careful study was made of the Government geological maps and other data relating to the developed districts both north and south of the Cave Creek district, in which the same surface conditions are disclosed as I found to exist in the latter.

MAPPING THE DISTRICT

Having completed the study of the adjoining territory I proceeded to examine the Cave Creek district about July 1, 1919, and by Oct. 1, 1919, I had gone over all of the country which had exposures of the older pre-Cambrian formation. I found large areas within the district to be covered by volcanic agglomerate, which was not mineralized and was therefore of no economic importance. These areas I simply sketched in and did not attempt to differentiate. The final results of my work are embodied in the geological map on page 714.

The Cave Creek district is twenty-eight miles due north of Phoenix, Ariz. The road leading out of Phoenix is paved for the first eight miles and from that point passes through the Paradise Valley with

slight grades. The elevation of the district varies from 2,100 ft. in the lowest part of the basin to a maximum of 5,000 ft. at the higher peaks. The main outlet for the drainage of the entire district is Cave Creek, which has an average fall of 200 ft. to the mile. At its headwaters near the Red Rover mine it has an elevation of about 4,000 ft. and twenty miles from here it emerges into the desert at an elevation of 2,000 ft.

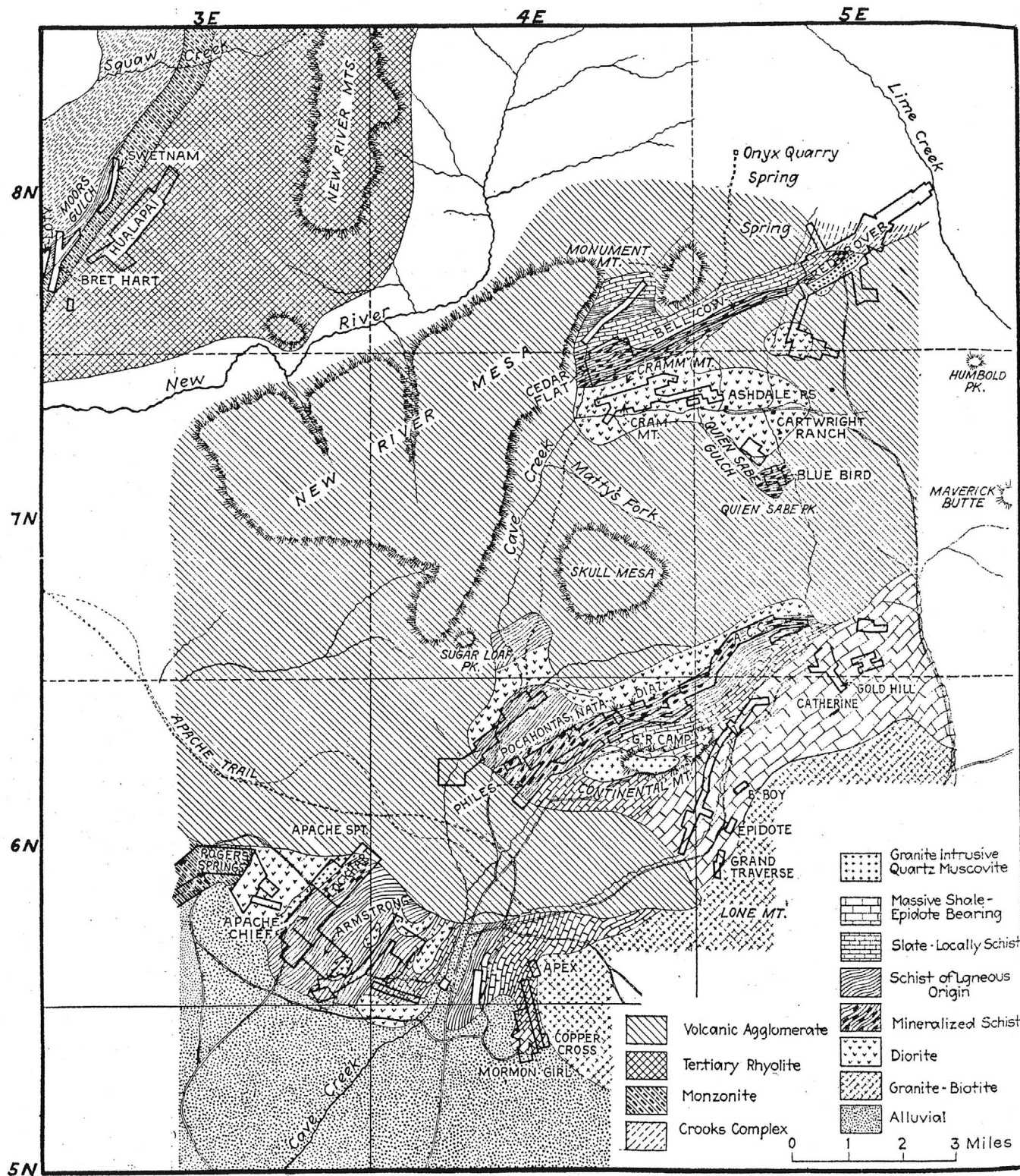
EVIDENCES OF GREAT EROSION APPARENT

Following up Cave Creek, a rim of low mountains is first encountered through which the stream has cut its course. This rim forms the southern boundary of the district. These mountains are abruptly covered at the base of their southern slope by the alluvial material of Paradise Valley. At the foot of the northern slope they are covered by volcanic agglomerate, which covers a basin-like area about three miles wide, feathering out to the east, but widening to the west. High ridges and mesas then succeed one another for several miles. Cave Creek has cut a deep gorge in this part of its course. The ridges and mesas finally give place to open country with an average elevation of about 3,500 ft. and the creek branches out into numerous small washes and ravines. Erosion has been very great, as evidenced by the great depth of the fill in Paradise and Salt River valleys. These hills, which now stand out alone and disconnected, were once part of an enormous mountain system extending from the interior of Mexico diagonally across Arizona and continuing through Nevada. Many thousands of feet have been torn from this mountain system by powerful forces of nature operating through millions of years. This material has been washed down into the great chasms at their feet. The chasms have been filled and leveled into broad valleys of great agricultural activity, and the once lofty peaks have been

dwarfed and diminished into low hills of insignificant size. These tremendous destructive natural agencies have finally exposed at the surface mineralized zones which were originally concealed at profound depth.

The geological ages represented in the district by

agglomerate, are for the most part in their original position and are non-mineral bearing as far as known. The Paleozoic beds elsewhere developed in Arizona are entirely absent here. Rocks of igneous origin, however, represent volcanic activity in many geologic periods.



RECONNAISSANCE MAP OF AREAL GEOLOGY OF CAVE CREEK MINING DISTRICT, MARICOPA COUNTY, ARIZ.

sedimentary deposits are confined to the oldest and the youngest of all exposures in Arizona. The pre-Cambrian sediments, which have been highly altered, metamorphosed, folded and finally compressed into shales, slates, and schists, are mineral bearing, but the Tertiary (or Quaternary) deposits composed of volcanic

Granites of Algonkian age are present; siliceous porphyries originally bedded in pre-Cambrian oceanic sediments, and now forming nearly vertical zones of schist; later granite intrusions in the schists diagonal to its strike; greenstone bedded with the schists and diorites in large marginal masses as well as small and

original
known.
na are
wever,
eriods.

large dikes irregularly intruded into the schists; and narrow granite porphyry dikes developed for miles in length and running with the strike of the schists, some highly sericitized, some highly siliceous.¹ At certain points as many as six of these dikes running remarkably parallel and spaced from 300 to 600 ft. apart are exposed.

Upon the southeastern margin of the districts is exposed a coarse-grained biotite granite batholith which covers an area of about 2,000 square miles. The granite weathers into peculiar shaped boulders which have almost the identical appearance of the boulder batholith granite exposures of Butte, Mont. The batholith, if of post-Paleozoic age, may have doomed and broken up the Paleozoic beds, rendering them easy prey to the erosive action of the Verde and Salt rivers. Deformation is evidenced by highly contorted rocks in many localities, as well as the change in the strike of the schist zones. There is a remarkable persistency in this strike. The normal strike seems to be N 42° E, and the deformed strike in almost all cases is N 60° E.

QUARTZ LENSES AND STRINGERS PROMINENT IN SCHISTS

At certain points the schists contain large and small lenses, stringers, and bands of jasper and quartz. Some of these lenses are prominently developed. They are usually from 10 to 50 ft. wide and from 200 to 500 ft. long. They do not occur in straight lines, but are offset in a somewhat regular manner and occur in the softer, more highly sericitized and bleached zones of schist and usually in proximity to the acid-porphyry dikes. Throughout these mineralized zones are distributed many small outcroppings of copper, silver, and gold minerals.

The exposures in the Cave Creek district are similar to those found at the surface in the proven districts of Arizona. An examination of the ore outcrops throughout the district discloses clearly the fact that, in the main, the gold, copper, and silver have been leached, leaving occasional shoots or kidneys of ore which have escaped leaching by reason of some topographical or other condition unfavorable to leaching. Such residual oreshoots are found to carry values in gold, silver, and copper running from \$10 to \$60 per ton.

RED ROVER DEPOSIT ONLY ONE OF IMPORTANCE TO DATE

There is only one property in the district which has done sufficient development work to uncover anything worthy of the term "ore deposit." This property, known as the Red Rover mine, is in the schist zone. The deposit at the surface is in an irregular inclined seam and shows copper carbonates carrying as high as 2,000 oz. of silver per ton. The ore occurs as lenses in the schist and has been developed so far to a depth of 500 ft. A very interesting occurrence is to be seen in the shaft which passes through about 30 ft. of schist impregnated with native copper in the form of thin scales, bright and wonderfully distinct until tarnished by exposure to the air. The principal deposit opened up on the 300- and 500-ft. level shows masses 3 to 4 ft. wide, of copper glance carrying 400 to 700 oz. silver

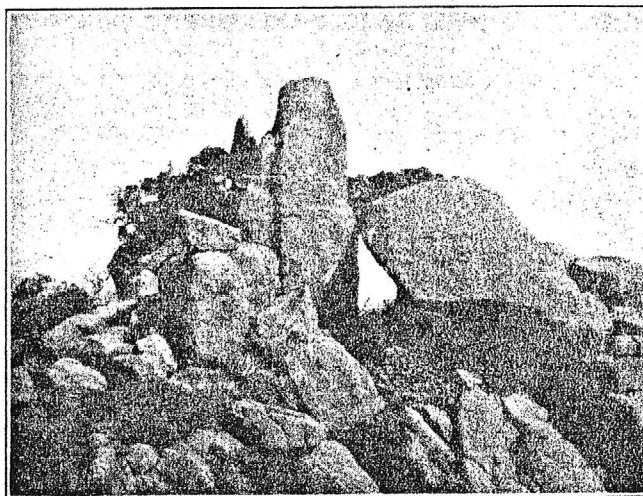
per ton. The other properties in the district have nothing but outcrops to recommend them.

It has been stated many times in recent mining literature that the mines of the future must be found by the application of geological deduction based upon surface and other data available. It therefore seems proper to describe the general characteristics of the principal types of outcrops exposed in this district. For convenient description the district can be divided into three zones.

COPPER CARBONATES FREQUENT ALONG BATHOLITH CONTACT

The first zone is from one mile to two miles wide and borders the northwestern contact of the granite batholith. It is composed of highly metamorphosed banded shales. Blocky epidote rock is extensively developed in this zone, and in places there are ledges composed of epidote, quartz, and dolomite intimately mixed. This zone gives place to slates along its western margin. Copper carbonates carrying several dollars per ton in gold and silver outcrop at many points within this zone, always in association with quartz or epidote.

The Mormon Girl deposit, in this zone, is formed in contact with and just above an inclined foot wall of



GRANITE POINT—A PREHISTORIC "LOOKOUT" IN THE
CAVE CREEK DISTRICT

barren quartz. This quartz is 6 to 8 ft. thick and represents two generations of silicification, one of white quartz, which has been crushed into angular fragments, and the other a dark quartz, which has been deposited around the irregular fragments of the white quartz making the present hard compact foot wall. This foot wall is smooth, continuous, and unbroken. On top of it has been deposited copper-gold-silver-bearing quartz of an average value of \$40 per ton and from 4 to 5 ft. thick. A few hundred feet below this the ore disappears.

LITTLE COPPER IN SECOND ZONE

The second zone begins at the edge or border of the slates and extends to the contact of diorite and igneous complex. It is several miles wide and is all schist. Within this belt is a narrow, highly mineralized area that is exposed for about fifteen miles and is 600 to 1,200 ft. wide. It consists of highly altered soft sericitized schist in places highly twisted and contorted. In coloring it ranges from pearly white through the various shades of yellow and occasionally is deep red. In

¹The Pre-Cambrian rocks are designated on the accompanying map as "Schist of Igneous Origin," "Mineralized Schist" and "Crooks Complex." The latter formation, shown in the northwestern corner of the map, is the equivalent of the formation so named by the U. S. Geological Survey, in the Folio of the Bradshaw Mountain Quadrangle. It comprises irregular bands of diorite, granite, aplite and schist, with some breccia.—Editor.

other places, it is bleached or gray and full of innumerable quartz stringers. Very little copper is in evidence in the outcrops, but several location cuts exposed copper stain a few feet beneath the surface.

Elsewhere in this area many huge silicified outcrops occur, showing jasper and siliceous hematite. In connection with these there are innumerable outcroppings of carbonate, oxide, and some sulphide of copper occurring in patches or irregular impregnations.

The third zone lies along the contact of the schist and the diorite and other igneous intrusions and is the western part of the mineralized section of the district. There are several brecciated siliceous zones, from 50 to 300 ft. wide and of undetermined extent, which contain ore averaging \$2 to \$5 in gold per ton. Ore averaging as high as \$12 per ton has been taken from narrower enriched channels within the main low-grade orebodies.

In the diorite there are many outcrops showing strong shearing action. In these zones impregnations of copper carbonates are common. One of these at a depth of 225 ft. was crosscut for 30 ft., showing chalcopryrite and bornite disseminated in a hard greenish diorite which carried 1 to 3 per cent copper.

Dimensions and Area of the United States

The gross area of the United States is 3,026,789 square miles. The land area amounts to 2,973,774 square miles, and the water area—exclusive of the area in the Great Lakes, the Atlantic, the Pacific, and the Gulf of Mexico within the three-mile limit—amounts to 53,015 square miles. These and other data determined or compiled by the U. S. Geological Survey, to show the limits of the continental United States, contain some interesting facts.

The southernmost point of the mainland is Cape Sable, Fla., which is in latitude 25° 07' and longitude 81° 05'. The extreme southern point of Texas is in latitude 25° 50' and longitude 97° 24'. Cape Sable is therefore forty-nine miles farther south than the most southern point in Texas.

A small detached land area of northern Minnesota at longitude 95° 09' extends northward to latitude 49° 23'.

The easternmost point of the United States is West Quoddy Head, near Eastport, Me., in longitude 66° 57' and latitude 44° 49'; the westernmost point is Cape Alva, Wash., in latitude 48° 10', which extends into the Pacific Ocean to longitude 124° 45'.

From the southernmost point in Texas due north to the forty-ninth parallel, the boundary between the United States and Canada, the distance is 1,598 miles. From West Quoddy Head due west to the Pacific Ocean the distance is 2,807 miles. The shortest distance from the Atlantic to the Pacific across the United States is between points near Charleston, S. C., and San Diego, Cal., and is 2,152 miles.

The length of the Canadian boundary line from the Atlantic to the Pacific is 3,898 miles. The length of the Mexican boundary from the Gulf to the Pacific is 1,744 miles. The length of the Atlantic coast line is 5,560 miles and that of the Pacific coast line is 2,730 miles. The Gulf of Mexico borders the United States for 3,640

central states that are actually in the same latitude. This reason, one who is asked which extends south, Florida or Texas, is very likely to say "but, as stated, the mainland of Florida is near miles farther south than the southernmost point in Texas. For the same reason errors are likely to be in estimating position or extent in longitude. Few that the island of Cuba, for example, if traced directly north, would extend from New York to Indiana, or that Havana is farther west than Cleveland, Ohio, or that the Panama Canal is due south of Philadelphia, Pa., or that Nome, Alaska, is farther west than Hawaii.

Ontario's Metalliferous Production Increased

Returns received by the Ontario Department of Mines for the six months ending June 30, 1920, are tabulated below, and for purposes of comparison the quantities and values are given for the corresponding period in 1919. Tons throughout are short tons of 2,000

Product	Quality		Value
	1920	1919	
Gold, oz.	277,656	231,729	\$5,690,504
Silver, oz.	4,474,322	5,744,172	5,077,028
Platinum metals, oz.	184.45	30.08	12,443
Cobalt (metallic), lb.	113,239	59,337	266,045
Nickel (metallic), lb.	4,854,979	5,147,745	1,696,687
Nickel oxide, lb.	3,491,544	5,503	814,370
Cobalt oxide, lb.	388,318	202,912	645,783
Other cobalt compounds, lb.	1,417	26,289	1,029
Nickel sulphate and carbonate, lb.	159,183	133,732	15,308
Lead, pig, lb.	749,820	1,481,204	71,006
Copper sulphate, lb.	89,939		4,497
Copper, blister, lb.	2,918,153	3,080,492	470,949
Nickel in matte exported tons	9,527	7,072	5,338,120
Copper in matte exported (a) tons	4,434	4,341	1,241,520
Iron ore, exported (b) tons	2,189	5,804	18,512
Iron, pig (c) tons	28,771	24,095	738,079
Totals			22,101,580

(a) Copper in matte was valued at 13c. and nickel at 14c. in 1919. For 1920 the values have been placed at 28c. per lb. respectively. The total matte produced was 15,030 tons of nickel and 7,705 tons of copper.

(b) Total shipments of iron ore were 13,962 short tons.

(c) Total output of pig iron was 321,826 tons, valued at 22.9c. per ton. Figures in the table represent proportional parts of Ontario ore.

The aggregate output from metalliferous smelters, and refining works of the Province of Ontario for the six months ended June 30 shows a considerable increase in value over the 1919 figures. For the first time since 1903, when the Cobalt silver camp was discovered, the output of gold exceeds that of silver in value. The new electrolytic refinery of the American Nickel Corporation is now in operation at Deschenes, near Ottawa.

Japan's Mining Industry Slack

Japanese mining industry, in which more capital is invested than in any other line of activity in Chosen, experienced an unusual slump during 1919. The Mitsubishi Iron Foundry, at Yawata, was forced to reduce its output, as was the Suan mine, worked by the Seoul Mining Co. The Kapsan copper mine, worked by the Kuhara M. Co., also experienced a slump. The reasons for this were difficulties experienced in the matter of transportation through the outbreak of the war among the cattle and which tot.

er; however, the compressor is operated only during the summer months, when there is no excess of waste-heat steam.

In two of the plants new reciprocating steam blowing engines have been installed since the turbos were installed, so that the latter may be kept shut down for emergencies.

It appears from Mr. Gore's graph that his compressor, when working at its rated capacity of 4,000 cu.ft. per minute at 15 lb. pressure, requires about 4,600 lb. of steam per hour at 150 lb. gage and 100 deg. F. superheat and with a vacuum of 4 in. absolute and barometer reading 28.1 in. This is equivalent to 1.92 lb. of steam per 100 cu.ft. of air delivered, or, at 30 in. barometer, would be about 1.94 lb. of steam. Under these air and steam conditions I would expect a good reciprocating engine equipment of this capacity to deliver 100 cu.ft. of air from 1.25 lb. of steam. A larger reciprocating unit would do better. Also, larger turbo compressors, when working at their rated capacity and at high vacuum, will more nearly approach the performance of reciprocating blowing engines. However, the economy of a turbo falls off rapidly at loads less than its rated capacity, whereas a reciprocating blowing engine maintains its economy fairly uniformly over a wide range in capacity.

The turbo compressor has advantages, as pointed out by Mr. Gore; however, for furnishing air for copper converter plants, where the amount required usually varies widely, and when the cost of generating steam is of consequence, it will often be found that these advantages are not of sufficient importance to be worthy of great financial consideration. A. G. MCGREGOR, Warren, Ariz.

The Cave Creek District, Arizona

I have just finished reading an article on the Cave Creek District, north of Phoenix, by Mr. Lewis in the *Engineering and Mining Journal* of Oct. 9. I made an examination of the Red Rover mine for the owner, Frank A. Gillispe, in September, 1920, going into the geology of this deposit in great detail, and I believe that Mr. Lewis is mistaken in his analysis. I will quote from our report.

Geology: The Red Rover mine is situated in an area of sedimentary rocks which have been intruded by a dark greenish diabase and is overlain in part by a thick flow of rhyolite.

To the south of the Bridal Chamber on the opposite side of the gulch is a granitic schist which has a strike of N 40 deg. E and dips 52 deg. to the north. Upon this granitic schist lies a series of sedimentary rocks. In order from the granitic schist upward and to the north they are red to brown sandy slate showing much jasper, a sandy slate, a white crystalline limestone, a sandy slate, a white crystalline limestone, a variegated brownish limestone, a sandy slate, arkostic sandstone, slates, a conglomerate and a highly metamorphosed slate. Under ground part of these same sedimentary rocks are found, and in addition there is a large area of a dark greenish diabase which has been introduced.

"In the vicinity of the vertical shaft the sedimentary rocks are covered by a rhyolitic flow which forms in a half moon to the south of the shaft. The surrounding mountains are capped with a heavy basaltic flow."

"The granitic schist has the appearance of having been faulted against the sedimentary rocks. The sedi-

ments show effect of great pressure which has produced a schistosity in all of the sediments which has an almost vertical dip and strikes to the northeast. The sedimentary rocks have all been very much metamorphosed by the compressive force.

"Ore bodies: The principal orebodies occur in a fissure which follows very closely a stratum of crushed variegated limestone. With the exception of a short distance near the west end of the ore drift south of the shaft on the 500-ft. level, the hanging wall of the ore is the bedding plane of a fine-grained sandy slate which overlies the variegated limestone, and the foot wall of the ore is a white crystalline limestone. In the vicinity of the ore the crushed variegated limestone is completely silicified. On the surface the diabase is seen in contact with the ore to the west of the inclined shaft."

The orebodies are some distance from the granitic schists and have no connection with them.

Los Angeles, Cal.

RUSH T. SILL.

Boxite or Boozite

As an early contributor to *Engineering and Mining Journal*, in fact as long ago as 1883, I feel that I want to enter a protest against the use of its columns as a means for disseminating the principles of the proper use of language.

In the issue of Oct. 2 your correspondent, and with the well-chosen pseudonym (for we all know how light of weight is aluminum), takes a whack at the philologists by interrogating their authority. Unfortunately, he apparently does not know that bauxite, or beauxite, is not, I believe, found at Bozeman, Mont., although corundum is, nearby: that this hydroxide derives its name, not from Bozeman, Mont., but from the original locality, Baux, near the old Roman town of Arles, southern France, and that most, if not all, of the authorities (and I do not add an inclosed interrogation) agree that the mineral be pronounced as is the name of the French locality, with the added *lithos* or ite. I never could understand how box could come out of baux or beaux.

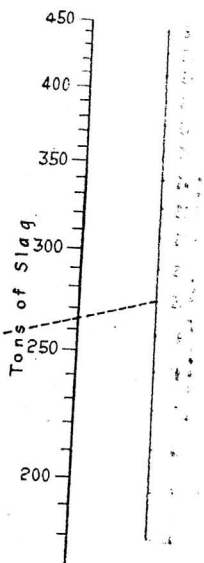
He then adds: "But who ever heard it called that? Why, even professors of mineralogy," etc. Well, I have very generally heard it pronounced correctly. To be sure, I have also heard boxite, but by a very few persons who are not supposed to know better, and hence were excusable. However, my preceptors of years ago pronounced it as indicated by Murray, the Standard, the Imperial, et al., wherein I appear to have been more fortunate than Al. U. Minum. And it was never my misfortune to have my teachers make lapses in English like e. g. "Ain't it fine?" but I am told that there are some guilty ones even today. But Al. U. Minum does not in his communication venture to tell us how he pronounces bauxite.

I refer your correspondent to my article in the *New York Sun* of Nov. 23, 1919, and if he really is in search of some "choice bits" of deviation from the straight and narrow path of good English, to the *Cleveland daily papers*.

JOHN EYERMAN.

[The derivation of the word bauxite has been familiar to us since our earliest infancy, and we are perfect in French, as in all other languages; yet in America we (ourselves) pronounce it "boxite." We like to make ourselves intelligible, and the Anglicization of the pronunciation of words of foreign origin is an established linguistic principle. The discussion is closed.—EDITOR.]

the chart is confused
of your readers to
solve the same prob-
lem in order to show
their construction
1: (a) The form



BLAST FURNACE
LAG

problem. (b) To
be used. (c) To
to obtain.
VALADEZ,
ertrudis Mine

compressors

d "A New High
on page 717 of
nent, "Although
ably in excess of
planted cumber-
ts, considerable
for the machine
fers to for his
I believe that

plants in the
compressor has
per converter
0,000 to 30,000
essure of from
of these plants
fter operating
gh steam con-
steam is used
he waste-heat
hydro-electric

Notice Of PUBLIC AUCTION SALE

Pursuant to authority contained in Section 6331 of the Internal Revenue Code, the property described below has been seized for nonpayment of delinquent internal revenue taxes due from

Leon W. and Gretchen G. Isom, 8671 E. Thomas Rd., Scottsdale, Arizona

The property will be sold in accordance with the provisions of Section 6335 of the Internal Revenue Code, and the regulations thereunder, at public auction.

DATE OF SALE June 29th 19 65

TIME OF SALE 10:30 A.M. ~~XXX~~

PLACE OF SALE 42 South Center Street, Mesa, Arizona

DESCRIPTION OF PROPERTY

Parcel No. 1

The East $\frac{1}{2}$ of Red Rover #14, lying within the Megazine Mining District, designated by the Surveyor General as a portion of survey's #3569, 3577-A, 3577-B, & 2784, U. S. Patents whereof are recorded in book 171 of Deeds, page 158, & Docket 3829 page 7. Recorded 10/3/62

Parcel No. 2

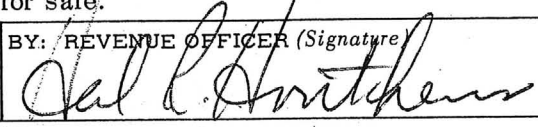
Red Rover Copper #12, lying within the Megazine Mining District, designated by the Surveyor General as a portion of survey's #3569, 3577-A, 3577-B, & 2784, U. S. Patents whereof are recorded in book 171 of Deeds, page 158, & Docket 3829 page 7. Recorded 10/3/62

PROPERTY MAY BE INSPECTED AT: 42 South Center St., Mesa, Arizona

PAYMENT TERMS: ☒ FULL payment required upon acceptance of highest bid ~~XXXXX DEFERRED payment XXXXX~~

TYPE OF REMITTANCE: All payments must be by cash, certified check, cashier's or treasurer's check or by a U. S. postal, bank, express or telegraph money order. Make checks and money orders payable to "Internal Revenue Service."

TITLE OFFERED: Only the right, title, and interest of Leon W. & Gretchen G. Isom
in and to the property will be offered for sale.

DISTRICT DIRECTOR OF INTERNAL REVENUE	BY: REVENUE OFFICER (Signature) 	DATE <u>6-10-65</u>
George D. Patterson		
ADDRESS FOR INFORMATION CONCERNING SALE <u>42 South Center St., Mesa, Arizona</u>		PHONE <u>261-4344</u>



Mr. B.A. Gillespie

~~20 South Central Ave.~~

Phoenix, Arizona



Reason for non-delivery:

Moved-left no address ☒

Unknown ☐

No such number ☐

Refused ☐

Unclaimed ☐

Deceased ☐

Initials: Rt. No:

[Handwritten signature]

ARIZONA DEPARTMENT OF MINERAL RESOURCES
MINERAL BUILDING, FAIRGROUNDS
PHOENIX, ARIZONA

July 11, 1958

To the Owner or Operator of the Arizona Mining Property named below:

Red Rover Mine (Maricopa County)	copper
(Property)	(ore)

We have an old listing of the above property which we would like to have brought up to date.

Please fill out the enclosed Mine Owner's Report form with as complete detail as possible and attach copies of reports, maps, assay returns, shipment returns or other data which you have not sent us before and which might interest a prospective buyer in looking at the property.

Frank P. Knight

FRANK P. KNIGHT,
Director.

Enc: Mine Owner's Report

See: Arizona Mining Journal March 1918 p. 23
June 1919 p. 63

(geology file) Cave Creek District

RED ROVER

MARICOPA COUNTY

RRB WR 9/21/84: Bill Brauner (sp?) reports that he now has an option on the Red Rover Mine, Maricopa County. He is looking for a process to leach ore containing 10% oxide copper and 30 - 40 oz/ton silver. I suggested direct shipping to a smelter but he said that he had already talked to Inspiration and to Mr. Robertson at Phelps Dodge and he doesn't like the deals they offered.

~~NJN WR 12/28/1984: It was reported that the city of Scottsdale has purchased part of the Red Rover (f) Maricopa County for water rights and plans to build a pipeline to the northern limits of the city in the Cave Creek area.~~ *Not true according to owner Tozier, 6/86*

NJN WR 3/1/85: Laksir Napier reported he had been out to the Red Rover (f) Maricopa County. The property is for sale. The owners are asking \$400,000 for the surface (290 acres) and \$200,000 for the minerals and mining operation.

RRB WR 4/5/85: Robert Hale reports that about 5 years ago he bought the E $\frac{1}{2}$ Red Rover Copper #14 and all of Red Rover Copper #12, patented claims at the Red Rover Mine, Maricopa County. I located them on the map for him so he could find them on ground. He reports that he has recently had several unsolicited offers to purchase them.

DO NOT REPRODUCE THIS PAGE

RED ROVER MINE

T8N R5E Sec. 21, 22, 27, 28 & 33

MARICOPA COUNTY
Cave Creek District

10/2/80 Mr. Henry McNeil reported to Ann Turney that he was no longer associated with the Red Rover Mine and that it had been sold. He did not know who the new owners were.

KAP WR 2/13/81: Mr. Tozier of Red Rover Mine, Magazine District, Maricopa and Yavapai County, reported he is again moving the property to escrow. This time with a company that is planning a sub-division. He indicated that he was not much more hopeful of "this deal" closing than previous ones.

MG WR 4/30/82: Provided file information on the Trinity Mine (Yavapai County) to Dr. Charles Tyner, 6638 E. Earl Dr., Scottsdale, AZ 85251; phone 949-0448. He reports that he has invested in the Red Rover Mine and is looking for other investors.

KAP WR 8/13/82: Mr. Tozier reported that he has leased the Red Rover Mine, Magazine District, Maricopa County to Cave Creek Mines on a month-by-month basis. He reported Cave Creek Mines had not done much on the property. He is trying to determine how much water the mine could make and if a viable water supply could be developed for sale.

RRB WR 4/27/84: Allen Fecht reports that he has bought the Red Rover Mine, Cave Creek District, Maricopa County (12 patented claims) for \$1000 per acre. He reports vein widths of 30 feet.

RRB WR 6/15/84: Allen Fecht (c) and Dave Fisher of Ternion Ltd, 6125 E. Indian School Road, N. 139, Scottsdale, Arizona 85251 (602) 990-8956 report that they are now using a MAP Silver Probe at their Red Rover Mine, Magazine District, Maricopa Co. Mr. Fecht said that they have improved the road to the property and have done some dozer work to expose the vein. He reports that they have run several hundred assays with the probe and they yesterday 58 samples were run with a low of 135 oz/ton silver and a high of 165 oz/ton. Their geologist should be on site next week.

Do Not Reproduce

The Red Rover mine has been closed due to the lack of finances. GW QR 4-8-71

Phone call from Dale Kittel, Anamax, April 28, 1975 - Anamax has acquired this property ~~through~~ ^{for} an exchange with the Forest Service, according to Mr. Kittel.

Tom Duncan, 10025 N. 13th Place, 997-4586, brought in a high grade sample of copper-silver from the Red Rover in Maricopa County. His son Richard works at the Red Rover for Pat McNeal who leases the property. The mine had irregularly shipped to the Inspiration smelter which is not now accepting custom material from small producers. We checked Mr. Duncan's specimen on the spectroscope which showed significant quantities of silver, copper, zinc and cadmium. Suggested they contact Tonto Mining and Milling in Tonto Basin. Talked with Dale Kittel, Land Manager, Anamax Mining Company, regarding their ownership of the Red Rover Mine in Maricopa County. Anamax purchased the Red Rover #7,6,15 from a Mr. Sipes and will trade the property to the Forest Service as part of a much larger exchange by which Anamax will acquire needed land for their Helvetia project. Of the over 3600 acres Anamax will give to the Forest Service, only a small amount is patented mining properties. KAP WR 5/20,21/75

Visited the Red Rover mine but found no one. GW WR 11/7/75

It is reported that Mr. Tozier, owner of the Red Rover mine, has presented the mine to Desert Realty office in Carefree for sale. There are about 300 acres of patented land. GW WR 3/12/76

lessee

WR KAP 4/21/78 - Henry McNeil, ~~owner~~-operator of Red Rover Mine, Cave Creek Dist., called to thank the Department for referring him to Dave Rabb. He is continuing. 5/30/78 sef

5/1/79 - Lawrence M. Tozier, Box 494, Cave Creek, AZ came into office today and stated that he is the owner of the Red Rover Mine. He owns claims #1,2,3,4,5 16,17,18,20 White Star #1 & 2 and Gold Coin #1. a.t.

KP/WR 9/5/78 - Henry McNeil, working at the Red Rover Mine, Mag. Dist. feels he has proven the floatation tailings on the property contain significant gold chlorides and the tailings contain about 0.25 tr. oz./ton in gold. He is treating material by leaching with sodium thiosulphate then precipitating the gold and smelting the precipitate. He is going to run a 500 ton bulk sample incrementally. 6/6/79 a.p.

CJH WR 3/7/80: George Councilman, Well Drilling Contractor, P.O. Box 185, Cave Creek, Arizona 85331, and Ray Wregitt, Desert Gem Trailer Park, Box 467, Salome, Arizona 85348. These men hold joint ownership in the Red Rover Mine, Maricopa County.

Do Not Reproduce

L. W. Isom, 1107 W. Osborne Rd., Phoenix, holds the Red Rover 12 & 14 patented claims and several others with E. L. Meggat (Red Rock 1-4, Red Rover 8-11, 13, 22, Golden Con. 1, White Star 1-2). The Toziers hold the Red Rover 1-5, 16-20, 25, 26, 30-37. Leon Isom said that Western Equities was helping O'Neil with equipment at the Red Rover. No shipping was done recently. According to Isom he and some other plan to open up the old 65' shaft on the Red Rover No. 12 where a two foot vein of ore occurred in a lime rill formation. Mr. Isom will furnish us with a claim map and ownership lines later on. LAS - conference with A.W. Isom - 12-15-65

Visited Mr. Maurice Castagne, Manager of Orphan Mine, he said Western Equities have dropped the Senator Mine project, but are involved in the Red Rover operation with Mr. Henry P. McNeill and intend to do some exploration both from surface and underground. FTJ WR 5-14-66

It was reported that Henry McNeill was still doing development work and sporadic mining in the Red Rover at Cave Creek. He had made a few small lot shipments of excellent copper-silver ore one that was quite high grade (few hundred pounds) most of these were from the 85 level which has been "gophered" in places. McNeill is also prospecting deeper. Western Equities Corp. has reorganized their exploration to Westec Corp. which still holds an option on the claims and is doing a little exploration. The road is very bad. LAS WR 9-30-66

M. M. Coggins, Field Engineer, Western Equities (now Westec) at the Red Rover, Cave Creek is repairing an old incline 40 feet west of the one McNeill is working in. They now have reached 240 feet and expect to continue to the 360 ft. level or the bottom. They have been along the 300 ft. level, for some distance and this needs much repair. It follows the footwall of the ore which roughly parallels a basic dike (probably diabase). It is hoped to reach the main old workings to the NE before long. LAS WR 10-7-66

Active Mine List April 1967 - 3 men

Bruner said Paul Kayser is going to finance Westec to explore the Red Rover. FTJ WR 5-17-68

Rumored that Henry McNeill was again working the Red Rover mine, presumably with money from outside Arizona. FTJ WR 5-1-70

Went to the Red Rover mine 24 miles northeast of Cave Creek. Met Mr. Tozier, the owner, he said Pat McNeill has had it leased for the past 5 years and has worked intermittently as finances permitted. Presently Ohrbach of Salt Lake is advancing the money for driving a crosscut into an heretofore unexplored portion of the vein within about 150 feet of a 350 ft. inclined shaft. From 4-6 men are employed, one of whom is sorting an old dump from which Mr. Tozier says they ship a few truckloads each month to the Inspiration smelter. He also figured they would be into the ore by mid-Jan. 1971 at which time they intend to winze on the vein. GW WR 12-11-70

Went to the Red Rover, but the gate was locked. Found Mr. Tozier's house in Cave Creek. His daughter said he was gone and that the mine hadn't operated for several months as Ohrbach had refused finances. GW WR 4-5-71

RED ROVER MINE

Do Not Reproduce

MARICOPA COUNTY
CAVE CREEK

Leon Issam of Scottsdale reportedly purchased the patented claims at the Red Rover, Cave Creek Dist., Maricopa Co. He recently has been reported to have sold them to a land development group.

LEWIS A. SMITH - WR - 10-19-62

RED ROVER MINE

EXHIBIT "A"

General

1. NATURE OF BUSINESS:

Mining and milling silver and copper ore.

2. LOAN:

(b) Full statement of Necessity for loan:-

This loan is requested for the purpose of extending the known surface ore bodies in preparation to stoping and leaching, and other beneficiation for the recovery of copper and silver.

EXHIBIT "A"

1.

2.

3.

4. HISTORY, MANAGEMENT, ETC:

The Red Rover Mine was discovered by Mexicans in the early days and worked for the high grade silver ore on the surface. The grade was such that the ore was burro packed to El Paso.

Dr. Craig and Mr. Messenger then held the Red Rover.

The Gillespies bought the property from the above people, and incorporated under the name of the Red Rover Copper Company. The Red Rover Copper Company is entirely owned by the Gillespie family.

There is no receivership, no reorganization, no bankruptcy; the property is clear.

The Gillespies have worked the property, and have leased it out. For a year ending in February 1941, they mined and milled considerable ore.

Practical mining men had been put in charge of the property, but perhaps the work was not done in right place, or the mill was a little large to keep going without doing development work. All in all, the management has been better than most prospects have had.

The Gillespies plan to put a technically, educated mining engineer in charge of development work if the loan is approved.

x

EXHIBIT "A"

8. OPERATION:-

- (a) Operations are not at this time being carried on.
- (b) Milling started May 19, 1940.

Milling stopped February 18, 1941.

The price of copper was 12¢ at this time. Mining was done from the vertical shaft, and there were no available waste and ore bins at the collar of the shaft, so that waste in the night shift went through the mill.

Development was not kept up to the pace of ore extraction so that the stopes were cut out to too great a width.

There are now waste and ore bins at the collar of the shaft.

It is also probable that we were doing the work in the wrong place without undercutting the veins at a lower level with drifts, and raises.

EXHIBIT "B"

Ed. Power

A.

B.

C. GEOLOGY AND TOPOGRAPHY

The detailed geology has never been platted. However, Harold W. Yost, who is responsible for the technical data herein, has gone over the surface and underground workings several times, and can give a fairly accurate idea of the geology, as follows:

The hill on which survey station "C" is located and which is just north of the Maricopa-Yavapai counties line, (see Topographic Map) is a porphyry intrusion which intrudes from the north, in a slanting position, and is underlain by granite. There is a small block of porphyry on the 500 level of the vertical shaft. The porphyry is fresh and unaltered.

To the west and south of this porphyry hill is a mass of highly altered limestone with many, many diabase sills from a few feet to fifty feet in thickness. These diabase sills stand at any angle from nearly flat to vertical and generally strike in a north easterly direction. In the vertical shaft, the ore bodies between the 900 level to above the 500 level are associated with the diabase sills.

Underlying the granite which is to the South and west of the porphyry hill is a schist, and the ore bodies above mentioned are in this schist.

The 500 level is in limestones almost up to the bornite vein.

Limestone makes up the surface rock to the south of the mill. The oxidized copper which outcrop on the surface are in this limestone. The silver in the oxidized ores occurs as embolite and cerargyrite. In the bornite vein, the silver mineral is stromeyerite.

To the west of the Apfield fault the surface rock is an altered granite with many streaks of hematite. This area should be prospected for copper in depth.

There is, however, considerable altered limestone to west of the Apfield fault as is shown in the tunnel whose portal is 300 feet southwest of the mill.

D. EXISTING DEVELOPMENT.

1. Complete surveyed maps are available for the mine workings, and are up to date.

180' southwest of the collar of the incline shaft is a virgin copper outcrop.

The composite map shows the approximate location of this outcrop. I, Harold W. Yost neglected to take a sample at this point, and this should have been done because it is in limestone and is in place and

Red River

is about the best looking exposure on the property.

Assay		%	Ozs.	
No.	Width	Cu.	Ag.	Description
1	3'	0.61	4.8	Partly Oxidized
2	3'	1.50	20.2	Partly Oxidized
3	4'	1.12	4.4	Oxidized
4	12 1/2'	1.22	3.6	Oxidized
5	8'	2.94	19.8	Oxidized
6	---	8.8	20.1	Oxidized

Samples #3 and #4 will run together making a width of close to 30'. Owing to a cave it was impossible to sample the full width.

No. 6 sample was picked at random and shows what can be done by merely hand sorting. This sample came from the open cut.

All samples except #6 were milled, and represent true average samples.

Sample #4 was at the mouth of the tunnel on the surface and included considerable dirt that fell onto the canvas.

3. State type of mine.

Most of the work contemplated will be from an adit at present about 300' in length. This adit is accessible but will have to be cleaned out a little and tracked.

4. List present equipment on property and describe condition.

There is a good blacksmith shop that can be moved over to the proposed workings. There are two drifters, a few jackhammers, a 340' compressor, a good 100 ton flotation mill with crushers and ball mill, a gasoline hoist at the Gillespie Ranch near Gila Bend, complete assay offices, houses, pumps etc., etc. All of the above is in fair shape.

E. Proposed Development:

1. Sink 70' on surface exposure 180' east of collar of incline. Drift 100'.

Continue the long adit 160' to the south, and raise up to the surface under samples #3 and #4. Will give about 60' of back.

Raise into the Bridal Chamber to handle the ore therefrom.

Drift on vein at samples No. 1 and No. 2.

There is some very good ore in the open cut, and some drifting should open up a 1,000 tons of shipping ore. We would have to take some of the money from the tunnel development to do this.

See Page

Cost of producing and marketing the hand picked ore should be around \$15.00 per tons.

Cost of leaching the copper and extracting to silver should not be more than \$4.00 per ton because most of the ore will be near the surface.

2. Recent daily production, and future estimated production if loan is granted.

The mill handles 100 tons of ore per day from the vertical shaft. We believe we can produce 100 tons per day after developing the mine as shown above.

There should be about 20 tons per day of shipping ore during the development period.

3. The workings will be dry.

- F. The product produced will be sorted and shipped to a customs smelter at first, and later the product will be heap leached for the copper, and the silver cyanided.

Mining and sorting ore	\$ 5.00
Loading and trucking	4.00
R. R. Haul	2.50
Smelting	<u>3.50</u>
Total	\$15.00

G. WATER SUPPLY

The vertical shaft makes about 80 gallons per minute. It is firm water.

H. POWER

Diesel power will finally be used. The development will be done by gasoline power.

I. COST-STATE PAST

No costs are available for either mining or milling. However, it would not be applicable since the work was done in a 900' shaft.

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

FILED

APR 21 1965

Mine RED ROVER Date March 22, 1965
District CAVE CREEK DIST. MARICOPA COUNTY Engineer Lewis A. Smith

Subject: Mine Visit and Conference with ^{Henry} ~~Kenny~~ McNeil 3/22/65.

*Not confirmed by
Mr. McNeil. E I definitely
talked with McNeil he don't
remember (S.A.)*

PROPERTY: 15 patented and 30 unpatented claims.

LOCATION: Approx. Secs. 27-28, T8N, R5E.

ACCESS: The mine is 23.2 miles from Cave Creek P. O. Travel 8.2 miles on
^{HORSESHOE} Horseshoe Dam paved road, thence left for 5.4 miles to Camp Creek, thence 5 miles, on
a graded dirt road, to the Red Rover mine turn off, (2 miles E of 7 Springs), thence
4.6 miles over a very rough road to the mine.

WORK: The main Red Rover vertical shaft is reportedly over 900 feet deep, but
at present is mainly under water. Many thousand feet of underground laterals are re-
ported. It is now largely inaccessible. Present work is being done from an inclined
shaft, some 550 to 600 feet SW of the main shaft. The shaft is inclined at about 60
degrees NE and is a timbered single compartment ~~to~~ opening and is about 4½x5 feet. It
has been reconditioned down to the 180-foot level and is open below this, for a short
distance. On the 75 foot level, a short way to the NE a small square set stope has been
begun. According to McNeil the ground is heavy and must be square-setted in order to
hold it. The ore from this stope looks good and consists of high altered-schist or
dolomitic limestone that has been stained, contorted and intensely shattered. It con-
tains abundant purplish-red to red limonite, green copper oxides (mainly malachite &
chrysocolla) and what apparently is earthy cuprite. According to McNeil the main silver
mineral is cerargyrite and some embolite was observed. While work so far has not been
conclusive enough to say definitely, the ore seems to be in a lense, (in this district
the ore typically occurs in lenses at schist or dolomite rolls or where cross-structures
cross the veins). McNeil said that future plans call for the driving of a drift (or
cross-cut) on the 180 foot level (200 foot Main Shaft level), to intersect an old gold
stope that lies near the granite contact, and in which there is supposed to be unmined
good gold ore. The ore is hoisted by a 1-ton skip and stored in a bin. The hoist is
directly driven by a truck motor, and has a 1½x1 foot drum. The hoist cable is about
3/8 to ½-inch in diameter. An old five-yard dump truck hauls the ore to a storage
pile, nearby. Six men are working, 2 underground, 2 sorting dumps, and a cook and
McNeil's son, besides him. Timber for mine purposes is being salvaged from the old mill
and it appears to be in good condition.

PRODUCTION: During the past few months about 3500 tons of ore have been shipped to
Inspiration Smelter at Miami. While the shipment results have not been totaled and
weighted, McNeil said that the overall average net-smelter returns would approximate
\$22 per ton, plus \$2.63 flux allowance. (This according to McNeil is about an even
break). Of the 3500 tons all but 32 tons was sorted from old dumps. The dump material
in place, is said to run as much as \$45 per ton. Two small lots, 6 and 12 tons, respec-
tively, are said to have yielded \$25.50 and \$27.00 respectively. According to McNeil the
ore, so far, has shown a ratio of 4 oz. silver to the ton for each percent of copper,
although in high grade spots it is considerably larger. He said that at the 75-foot
level and between the 180-200 level, enrichment of both copper and silver seems to have
occurred. The ore being mined on the 75-foot level shows considerable cuprite (earthy
variety), "cuprite" limonite and "relief" limonite, all of which are commonly derived
from chalcocite, or argentite or both, or under special conditions bornite.

MINERALS: The minerals seen by various observers include bornite, chalcopyrite (probably much pyrite) stromyerite, chalcocite, (probably argentite), chrysocolla, malachite, cuprite and locally galena and anglesite (in a separate vein), cerargyrite (AgCl) and embolite (Ag (Cl,Br)). Accessory, or gangue, minerals include epidote, chlorite, quartz and abundant limonite. According to Alfred Strong Lewis' report (files) one of the 4 main veins carried three feet of chalcocite and 400-700 oz. silver to the ton and that stromyerite, cerargyrite and embolite were observed. Native copper was also reported in a 30-foot wide zone in the Main Shaft area. One "vein" according to McNeil is reported to have carried excellent gold values (200 level). This vein is said to be transverse to the 4 main veins, and was stoped many years ago.

GEOLOGY: According to Lewis, and others the Red Rover mineralized belt generally strikes about NW-65-70 deg. E and consists of schists and dolomitic limestone in an area that is about 5 miles long and 1000 to 3000 feet wide. This is bordered on the SE by intrusive diorite (or quartz diorite) and granite, the latter in a narrow belt that forms the SE border of the mineralized zone. At the Red Rover the mineralized zone is narrower than further SW as at the Cram Mountains, and is cut off on the NE by the Crooks Complex (diorite and other igneous rocks). The schist and dolomitic limestone at the mine are intensely shattered, distorted and altered. They are invaded by numerous sills and dikes of diabase that is reported to be associated with ore deposition. The diabase ranges from flat to nearly vertical in attitude. The diabase attitude could be, locally, a good indication as to the schist-limestone attitudes, from place to place. 100 feet north of the inclined shaft is a diabase sill that is shattered, epidotized, and iron stained and lies on the schistosity trend. Next to it is a purplish-black, highly altered rock, a few tens of feet wide, that looks like good gossan. A shallow cut has been started in this to determine its width and copper and possible silver content. The rock shows some ghost bedding structure from limestone and this zone, according to McNeil shows good silver values on the 75-foot level. A walk across the mineralized zone shows a wide variation of alteration and staining in alternating bands. Some bands near veins show "good" limonite that could be indicative of local prospectable areas beneath. Cross structures, of which 2 main ones are recorded, are also reportedly mineralized, one carrying mainly gold values. Other data is in early reports in the files. Mr. McNeil said as soon as he has time he will bring his files down here for copy.

Mr. Smith says the two Tozier men and Mr. McNeil are partners of the Red Rover Mining Co., Box 494, Cave Creek. Mr. McNeil is supposedly the Gen. Mgr. or Supt.

incorrect - see below:

7-1-65 - FTJ

Mr. Henry P. McNeill, was in the office and states he has 5 men working on a split check arrangement. They have a lease-option arrangement with the owners on part of the Red Rover holdings, and are doing business as Red Rover Mng. Co., Box 494, Cave Creek, Arizona.

MAGMA COPPER COMPANY
Superior, Arizona

August 29, 1942

Gillespie Land & Irrigation Company
and Red Rover Copper Company,
20 South Central Avenue,
Phoenix, Arizona.

Att: Mr. F. C. Hoepfner

Gentlemen:

As per your request of August 28th, I am detailing below the shipments as made by the Gillespie Land & Irrigation Company and the Red Rover Copper Company, for the years 1939-40-41. As will be noticed, the ~~tonnage~~ and content of the ore is separated from the concentrates in the event the question should arise as to the type of material the copper produced was taken from.

	<u>DRY TONS</u>	<u>CU LBS</u>	<u>AG OZS</u>	<u>AU OZS</u>
<u>1939</u>				
Gillespie L & I Co. - Ore	353.2	44713.	11400.77	8.842
" " " " - Conc.	203.2	64732.	19237.17	4.078
<u>1940</u>				
Gillespie L & I Co. - Ore	165.1	13656.	3426.75	3.441
" " " " - Conc.	533.3	100015.	24319.54	9.221
Red Rover Cop. Co. - Conc.	78.7	10374.	2680.48	.787
<u>1941</u>				
Red Rover Cop. Co. - Conc.	<u>287.9</u>	<u>56508.</u>	<u>11392.40</u>	<u>5.759</u>
Total	1621.4	289998. - 970	72457.11 44,69	32.128 .022

With kindest regards, I am

Yours very truly,

Signed, J. R. Mays,

J. R. Mays,
Auditor.

JRM/L

RED ROVER SHIPMENTS

Shipping Ore ---- 1929, by Moore & Pickett, 92 cars, 55 tons to
the car ---- 5060 tons.

Shipping Ore ---- July 7, 1934 to October 9, 1935

145,665 lbs. Copper
34,947 ozs. Silver

\$ 9,140.84

\$36,049.67

\$45,190.51

$\$.062 / lb \times 145,665$
 $1.03 / oz \times 34,947$

26,900

32,000

68,900 $\pm 14\%$

$\pm 9\%$

Dry tons -- 1830
Actual returns

\$25,832.76

$\$ 14\%$

Ed Rover

DATE: January 18, 1985
TO: Mr. F. J. Menzer, Chief Geologist ✓
FROM: J. A. Waegli, Geologist
SUBJECT: Arizona Department of Mineral Resources
List of Flux Properties

In early October, 1984, Mr. John Robertson, Ore Buyer for Phelps Dodge Corporation, requested that the Arizona Department of Mineral Resources (ADMR) compile a list of properties in the state that could produce material grading +80% SiO₂ and +1/3 O/T Au. In response, Mr. Nyal Niemuth, Mineral Resources Specialist with the ADMR, compiled a list of 16 properties (attached) that he feels are capable of producing +70% SiO₂ with \$100.00 metal credits. (He stated that he did not know of any mines capable of meeting Mr. Robertson's criteria.)

November 19-21 were spent in Phoenix examining ADMR files to obtain information on each of the mines. Mr. J. E. DuHamel of Western Exploration screened their files and compiled the resulting information in a memo dated November 27 (attached). Based on his memo, pertinent reports were copied from the Western Exploration files on December 3 and 4.

The following is a listing of these 16 properties arranged in order by quad number. A brief description of each property is given, with information on current activity and a summary of past work conducted by Phelps Dodge Corporation. Recommendations based on information compiled to date are also given. Table 1 summarizes information compiled in this report.

8. RICHIN BAR (Figure 2): Yavapai County, T.10N., R.2E.,
Sec. 36, AZ 247

The Richin Bar mine is on a north-striking Precambrian vein that dips steeply westward. Wall rocks include schist, diorite, and granite, with schist being the most common. Gangue minerals include massive, glassy quartz, with some tourmaline and carbonate. The ore is oxidized to the 200-foot level but locally shows pyrite, chalcopryrite, galena, and sphalerite. Ore shoots were generally lenticular, the largest stope being approximately 65-feet long, 55-feet high and 14-feet wide (Wilson, et al, 1934).

Between 1905 and 1908, the Richin Bar reportedly produced 8,000 tons of ore grading \$6.00 (0.3 O/T in gold (Wilson, et al, 1934). There has apparently been an additional 24,000 tons produced since then.

According to ADMR, the current owners (as of October, 1984) are the heirs of Velma D. Seaman, in care of Velma D. Martin and V. F. Andrew. There has been no recent production or exploration.

The property was examined by P. C. Benedict of the United Verde Copper Company in March, 1928. He concluded that a significant amount of the precious metal mineralization is secondary and that only one ore shoot had any remaining potential. He recommended that the property receive no further consideration.

It appears that the Richin Bar mine has very little remaining potential. The presence of lead and zinc in the ore would hinder its use as flux. No further work is warranted.

9. RED ROVER (Figure 3): Maricopa County, T.8N., R.5E.,
Sec. 28, AZ 248

According to a report by E. V. Ciancanelli, of Western Exploration, mineralization at the Red Rover mine occurs in a northeast trending fault zone that dips 60°NW. The fault is between Precambrian schist and Laramide latite porphyry. Ore minerals include bornite, chalcopryrite, tetrahedrite, chalcocite, cuprite, cerargyrite, and possibly gold. Mineralization occurs in a jasperoid vein that occupies the fault zone and in the footwall of diabase dikes in schist. The jasperoid vein apparently varies in width from a few feet up to approximately 30 feet.

The mine was worked primarily in the 1930's and 1940's and has seen only limited exploration and production since then. Some gob from old stopes was shipped to Inspiration at Miami in the late 1960's. According to ADMR files, Mr. Bill Brauner obtained an option on the property in mid-1984. He apparently talked with

John Robertson about shipping flux to Phelps Dodge but did not like the terms of our standard flux contract.

The property was examined by E. V. Ciancanelli of Western Exploration in June, 1967. He recommended mapping and geochemical sampling of the area around the Red Rover with particular attention toward massive sulfide alteration and mineralization.

Later in June, 1967, J. Olaf Sund wrote a memo in response to Ciancanelli's recommendations. He concluded that there is little potential for massive sulfide mineralization in the area. Instead, mineralization would be confined to fissure zones such as the Red Rover. He recommended that activity at the Red Rover be monitored.

Data obtained on the Red Rover from the ADMR and Western Exploration are very limited. Neither the amount and grade of past production nor the present ore reserve potential are known. Therefore, it is recommended that either the owners, or the current lease holder be contacted to obtain more information. Following this contact, a field examination should be scheduled on a medium priority basis.

10. SUNRISE MINE (Figure 4): Maricopa County, T.7N., R.7W., Sec. 33, AZ 266

This deposit was worked mainly from 1927 through 1934. Mineralization is contained in a 10-20 foot wide stockwork vein with lenticular quartz veins, a few inches to a few feet wide thick, in schist. The vein strikes N20°E and dips 45°NW. Granitic porphyry occurs on the hanging wall and schist on the footwall (Wilson, et al, 1934).

Ore shoots occur where the vein flattens and is intersected by transverse fractures. Gangue minerals include quartz, limonite, hematite, and occasional pyrite. Gold is free and generally associated with iron oxides. The gold to silver ratio is reported to be 4:1 (Wilson, et al, 1934).

Production during three months of 1934 was reported to be 600 tons at \$24.00/ton in gold (0.69 O/T). More recently, a lease has been taken on the property by Mr. Ted Housley of Wickenburg. A 1981 report by Ken Phillips of the ADMR lists underground reserves as 5,000 tons at \$44.60/ton Au (0.1 O/T). During a February, 1984 visit by Ken Phillips, Mr. Housley was cyanide heap leaching dump material which he said averaged 0.1 O/T Au. Recoveries of 80% were expected.

As noted in J. E. DuHamel's memo, the property was sampled by L. E. Reber in 1931 for the United Verde Copper Company and by

GEOLOGY AND TOPOGRAPHY

The detailed geology has never been platted. However, Harold W. Yost, who is responsible for the technical data herein, has gone over the surface and underground workings several times, and can give a fairly accurate idea of the geology, as follows:

The hill on which survey station "C" is located and which is just north of the Maricopa-Yavapai counties line, (see Topographic Map) is a porphyry intrusion which intrudes from the north, in a slanting position, and is underlain by granite. There is a small block of porphyry on the 500 level of the vertical shaft. The porphyry is fresh and unaltered.

To the west and south of this porphyry hill is a mass of highly altered limestone with many, many diabase sills from a few feet to fifty feet in thickness. These diabase sills stand at any angle from nearly flat to vertical and generally strike in a north easterly direction. In the vertical shaft, the ore bodies between the 900 level to above the 500 level are associated with the diabase sills.

Underlying the granite which is to the south and west of the porphyry hill is a schist, and the ore bodies above mentioned are in this schist.

The 500 level is in limestones almost up to the bornite vein.

Limestone makes up the surface rock to the south of the mill. The oxidized copper which out-crop on the surface are in this limestone. The silver in the oxidized ores occurs as embolite and cerargyrite. In the bornite vein, the silver mineral is stromeyerite.

To the west of the Apfield fault the surface rock is an altered granite with many streaks of hematite. This area should be prospected for copper in depth.

There is, however, considerable altered limestone to west of the Apfield fault as is shown in the tunnel whose portal is 300 feet southwest of the mill.

C
O
P
Y

See 'Look to Riches'

pp 121-376

ARIZONA DEPARTMENT OF MINERAL RESOURCES
Mineral Building, Fairgrounds
Phoenix, Arizona

1. Information from: Lawrence M. TOZIER
Address: P. O. Box 494, Cave Creek, Arizona 85331
2. Mine: RED ROVER 3. No. of Claims - Patented 12
Unpatented _____
4. Location: 23 Miles north of Cave Creek, Arizona.
21, 22, 27
5. Sec 28 & 33 Tp 8 N Range 5 E 6. Mining District Cave Creek (Maricopa County)
7. Owner: Lawrence M. Tozier (Red Rover #1,2,3,4,5,16,17,18 & 20)
8. Address: P.O. Box 494, Cave Creek, Arizona 85331
9. Operating Co.: None
10. Address: _____
11. President: _____ 12. Gen. Mgr.: _____
13. Principal Metals: Gold, Silver, Copper 14. No. Employed: _____
15. Mill, Type & Capacity: Experimental leach plant belonging to Pat McNeil.
16. Present Operations: (a) Down ☒ (b) Assessment work ☐ (c) Exploration ☐
(d) Production ☐ (e) Rate _____ tpd.
17. New Work Planned: Property is reported to be in escrow and is being sold
to a George Councilman, et al. of Cave Creek (P.O. Box 185). South African
gold mining money is rumored to be involved.
18. Misl. Notes: _____
The surface plant installed by Westec in the 1960's
has been sold and is being removed from the property.

Date: May 10, 1980



(Signature) Ken A. Phillips (Field Engineer)

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

VERBAL INFORMATION SUMMARY (SHORT FORM)

May be Reproduced

May Be Inserted Into Mine File Or Added To "Rumor Page"

1. Information from: Bob Cobllo

Address: _____

2. Phone: _____

3. Mine: Red Rover

4. ADMMR Mine File: RED ROVER

5. County: Maricopa

6. MILS Number #645

7. Operational Status: _____

8. Summary of information received, comments, etc.: _____

Bob Cobllo is trying to encourage some activity at the Red Rover Mine.

He found core from five 1000 foot holes stored on the property. The

drilling was reportedly done by "Preussag". The drilling was likely in

1983.

A search of directories yielded: Preussag Inc., Suite 418, 111 Richmond

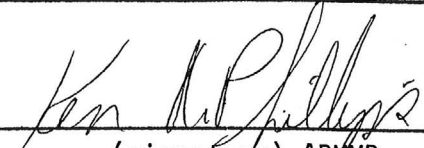
Street West, Toronto, Ontario M5H 2G4, phone (416) 863-0381 as the

likely company. They are the North American subsidiary of Preussag

Aktiengesellschaft Metall of West Germany, a major base metal mining

and smelting firm.

Date: January 24, 1989


(signature) ADMMR

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine Red Rover

Date January 22, 1963

District Cave Creek Dist., Maricopa Co.

Engineer Lewis A. Smith

Subject: Interview with Lawrence M. Tozier, 20 E. 7th St., Tempe (WO 7-6543)

Mr. Tozier purchased 300 acres of patented ground and 600 acres of unpatented ground from De Long and Associates who had previously bought the mine from Barney Gillespie. 80 acres were retained by De Long. Mr. Tozier said he had been informed that the mine water ran 11 ounces of silver to the gallon, which would appear excessive. He stated that the shaft, reportedly 900 feet in depth, had water to within 300 feet of the surface. The shaft collar area is now in poor shape.

Mr. Metcalfe stated that Joseph Tozier of San Juan Capistrano, California and General Delivery, Cave Creek had purchased the patented claims of the Red Rover and was now fixing the road and living quarters. Mr. Tozier, according to Metcalfe, plans to ship some of the better flux ore, later on in October to Hayden. A trip will be made to the mine when operations are underway.

LAS - Memo. Interview with Bill W. Metcalfe, Vice President, Brownell Realty Co., Cave Creek (P. O. Box 2, PH Hunter 8-3221). Sept. 28, 1964.

Pat McNeill - had been working at the Lane Mine - now operating the Red Rover Mine in Maricopa County.

EGW WR 3/19/65

Notes: Lawrence Tozier of State Real Estate Co. says they are working on mine.

WAR PRODUCTION BOARD

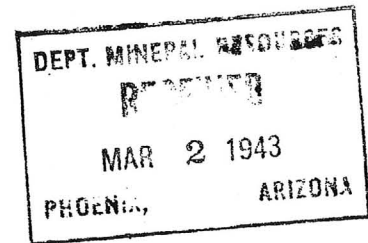
WASHINGTON, D. C.

February 26, 1943

IN REPLY REFER TO:

4H - MJE

Mr. J. S. Coupal
Director
Department of Mineral Resources
413 Home Builders Bldg.
Phoenix, Arizona



Dear Mr. Coupal:

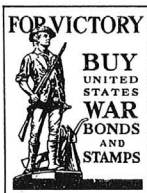
This is in reply to your letter of February 16 relative to the Red Rover Mine.

We have received the copy of Mr. Ira Wagon's report which accompanied the application for a loan from Reconstruction Finance Corporation.

We thank you for sending this report.

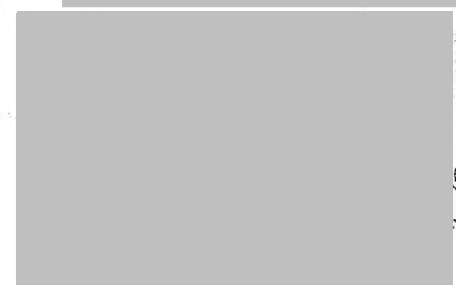
Very truly yours,

F. H. Hayes
Assistant Chief
Primary Production Branch
Copper Division



*BA Gillespie, Pres
Red Rover Copper Co.
L.P. 3-11*

*Mineral
Industrial
News 4/1947*



3-47

7' 31' -

Haule Gost - M. E. &

Dr. Wagon "

& perhaps Geo. French - family
with Sheldon Davis

Conferred with Johnson
F. C. Horpman -

& rep. C. -

&

"B" loan with
special feature
to Australia -

20 & Central Highway

United States Senate

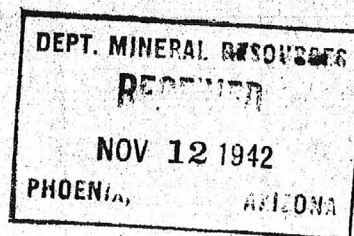
MEMORANDUM

Nov. 9, 1942

I have had no answer to either of my
memos on the Red Rover and the
Copper Branch, WEB asked me again this
afternoon about it, Can you call
Gillespie on the phone and get the
lowdown?

WEB would like them to file for a
Class C for sampling the mine.

Bill



February 16, 1943

Mr. F. H. Hayes
Assistant Chief
Primary Production Branch
Copper Division
War Production Board
Washington, D. C.

Dear Mr. Hayes:

Subject: Red Rover Mine
Maricopa County, Arizona
4H-FHH

Thank you for your letter of February 8 to Earl Hastings which has been turned over to me for my attention.

A field examination of the Red Rover Mine was not made by our Department, but I have talked with F. C. Hoepfner, 20 South Central Avenue, Phoenix, and he has given me a copy of a report on the Red Rover made by Ira Wagoner in November.

Hoepfner stated that last week one of the engineers from the RFC Mine Loan Division in Phoenix made an examination of the property. I believe that this report can be obtained by you from the RFC Mine Loan Division in Washington.

With best wishes and kindest regards, I am

Very truly yours,

J. S. Coupal, Director

JSC:kk

January 20, 1943

MEMORANDUM

RFC MINE LOAN DOCKET NO. B-ND-4729
RED ROVER COPPER COMPANY
B. A. Gillespie
20 South Central Ave.
Phoenix, Arizona

TO: W. C. Broadgate

FROM: J. S. Coupal

I have just had a call from Mr. Hoepfner, who is handling the business for this company, stating that he had received an inquiry for additional information on this loan from Mr. Tully on December 19 and had replied giving the information on January 5.

He now asks for immediate action but I informed him that due to his delay in furnishing the information he may be somewhat delayed in receiving the action he desires.

WAR PRODUCTION BOARD

WASHINGTON, D. C.

February 8, 1943

IN REPLY REFER TO:

4H-FHH

Mr. Earl F. Hastings
Department of Mineral Resources
413 Homebuilders Building
Phoenix, Arizona

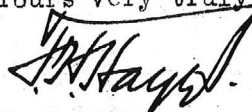
Subject: Red Rover Mine, Maricopa County,
Arizona

Dear Earl:

I understand that engineers of your Bureau made a field examination of the Red Rover Mine about November, 1942.

I should like to have a copy of that report and any other information on the property as a possible copper producer.

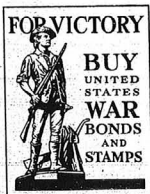
Yours very truly



F. H. Hayes
Assistant Chief
Primary Production Branch
Copper Division

Best regards.

Forpperson



*Recd. 1943
See Wagon
Last visit
Johnny R7C*

December 31, 1942

MEMORANDUM

RED ROVER

TO: Bill Broadgate

FROM: Earl F. Hastings

I note that you were somewhat disgusted that the above company did not file under a "C" loan. They seem to have very definite ideas about how to handle their business and also seem to believe that they have the only application in Washington. At least they keep calling up to find out what action has been taken.

If they should refile under a "C" loan please let me know and get them off my neck.

14
December 22, 1942

MEMORANDUM

SUBJECT: Red Rover

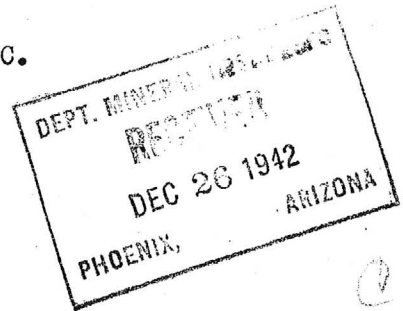
TO: Bill Broadgate

FROM: J. S. Cougal

I have phoned Mr. Hoepfner who has been taking care of Red Rover matters and told him how he weakened our position in Washington by supplying us with misinformation regarding the time that his application was sent and the delay in getting a reply.

Regarding the type of application, the application was made for a "B" loan rather than a "C", as their engineers claimed sufficient ore was showing above the water to justify a "B" loan. They went ahead with their plans irrespective of our suggestions.

Washington, D.C.
Dec. 22, 1942



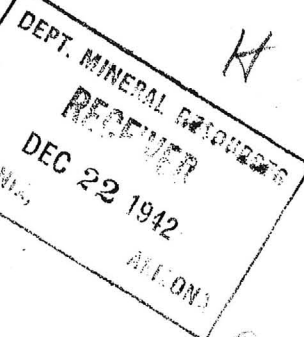
SUBJECT: Mine Loans,
Red Rover
Gillespie

I am afraid from what I hear that these people made a mistake by not taking our advice and filing for a C loan.

I gather that the B application is not entirely satisfactory in its showings.

Bill Broadgate

H
Washington, D.C.
Dec. 17, 1942



SUBJECT: Red Rover

I wish these grippers would tell the truth and I would get in less trouble. Rather than having been in a month, the Red Rover application arrived at the RFC Dec. 8 and an acknowledgement went out Dec. 11th.

It is now being assigned to an engineer. I have referred the matter to the ~~WPA~~ WPB Copper Branch so they can get together on it, with RFC.

I am interested to know why a B loan was filed rather than the C loan the Copper Branch was interested in. They have heard nothing since the last memo I got from our office telling about the engineers going out to look at the mine.

Bill Broadgate

December 15, 1942

MEMORANDUM

RED ROVER

TO W. C. Broadgate

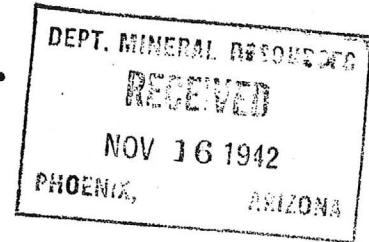
FROM: Earl F. Hastings

B. A. Gillespie, president of the Red Rover Copper Company, forwarded a \$20,000 loan application by air mail special delivery about one month ago. They called today to see if we could get some information as to the disposition of their application. They have heard nothing, not even an acknowledgment of receipt of the application.

In as much as the WPB seemed, according to your memorandums, quite interested in the Red Rover it was considered you might wish to chase it down.

MEMO TO J.S.COUPAL
CC/ W. B. Gohring, RFC.

Washington, D.C.
Nov. 14, 1942



SUBJECT: CLASS C LOAN
Red Rover Mine

I am pleased that you finally got some action on this as the Copper Branch has inquired about it several times, being interested in a sampling job.

I note from the memo of Nov. 12th that it is contemplated to dewater and sample the whole mine at a cost to exceed \$5,000.

I believe that the Copper Branch figured that the mine might be sampled above the water as a preliminary indication, thus keeping the expenditure within the \$5,000 limit and going on from there afterward if justified.

However, Messers Yost and Wagner in consultation with Bill Gohring should certainly be able to decide which course is most expedient.

If it is decided to go the whole way at a cost to exceed the \$5,000 ceiling placed on C loans, make out the application on the form used for General Mining Loans and in a covering letter state that this loan is being applied for for the same purposes as a C loan (the detail will appear in the application and supporting data of course) and that the application is being made under the authority of "subparagraph 2 of the fourth paragraph of section 5d of the Reconstruction Finance Corporation Act, as amended".

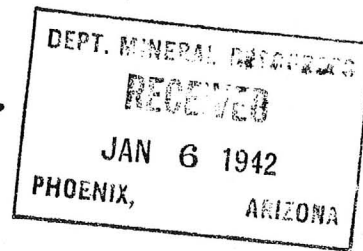
This is more or less in line with our previous memos on this subject but I checked with the Legal section RFC this morning to make sure this procedure is OK.

At the same time, I believe it would be a good idea for you to let me know when the application goes in as it is a little divergent from the usual and it might be well to check it through.

Bill Broadgate

CC/WPB

Washington, D.C.
Jan. 4, 1942



SUBJECT: Mine Loans,
Red Rover

The Red Rover was asked for additional information in a letter from RFC on the 19th.

I know that the Red Rover people think they know their own business, and I believe that the best way with them is to let them ride on what they have done. Gillespie is nearly as far as business goes, and Hoppner is an old nuisance, so I don't blame you, Earl, for wanting them off your neck.

After all, we advised ~~hhe~~ to file for a C loan, and if they wanted to file under B, let them take potluck. I hope they get by.

The reason why I recommended the C loan was that the WPB had been studying the case and asked me, as you know by previous memos, to have them file for a C loan so that enough data could be gathered to support a bigger program. The information they had was that not enough ore could be shown above the water to support a project and the idea was to get a picture of the whole mine.

I just thought that, as WPB must finally OK any project of any size and has been in communication with RFC on the property, it would have been a good idea to follow the indicated program.

I never knew either Hoppner or Gillespie to follow advice and they are certainly too old to start now.

Maybe it will work out OK. I certainly should not say that they "definitely" should file for a C loan now they have taken this step, as they MIGHT get by. They always can start over if they get turned down.

Bill Broadgate

November 12, 1942

MEMORANDUM

SUBJECT: Red Rover Mine
War Production Board Request

TO: W. C. Broadgate

FROM: J. S. Coupal

I have called several times by phone F. C. Hoepfner, 20 South Central, Phoenix, who represents the Gillespie interests on the Red Rover Mine. Each time he promised to get the information to me but each time he failed.

I have just called on him personally and find the following: Harold Yost, Mining Engineer, Ira Wagner, Mining Engineer, and perhaps George French, former mine operator of the Sheldon Mine, Yavapai County, will go to the property tomorrow to prepare report and data for a mine loan.

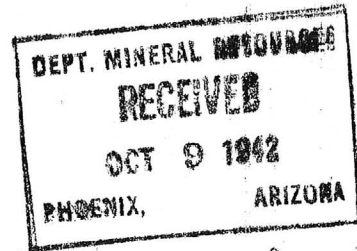
It was stated to me that in a conference with Bill Gohring, Hoepfner had been advised to make out a "B" loan application due to the fact that the cost of unwatering the mine is estimated at between \$15,000 to \$18,000 more or less.

I phoned Bill Gohring on my return to the office after talking with Hoepfner and asked him if those were his instructions to Hoepfner. Gohring stated he did not know exactly what form the application should be made in as it was quite certain that a "C" loan of \$5,000 would not do the job; that technically it could not be called a "B" loan because it requires essentially an accessibility loan and is not a development loan.

I suggested to Mr. Gohring that the loan should be made as a general mine loan stating specifically that the loan was applied for in conformity to the 5-d-2 clause in the Reconstruction Finance Corporation Amendment.

It may be several days before the report will be ready. If there is any special form in which such an application should be made, will you please advise me in a memorandum on this particular subject, and as I am to be out of the office for the next week, that is, until November 20, I suggest that you air mail a copy of this memorandum to William B. Gohring, 325 Heard Building, Phoenix.

Washington, D.C.
Oct. 7, 1942



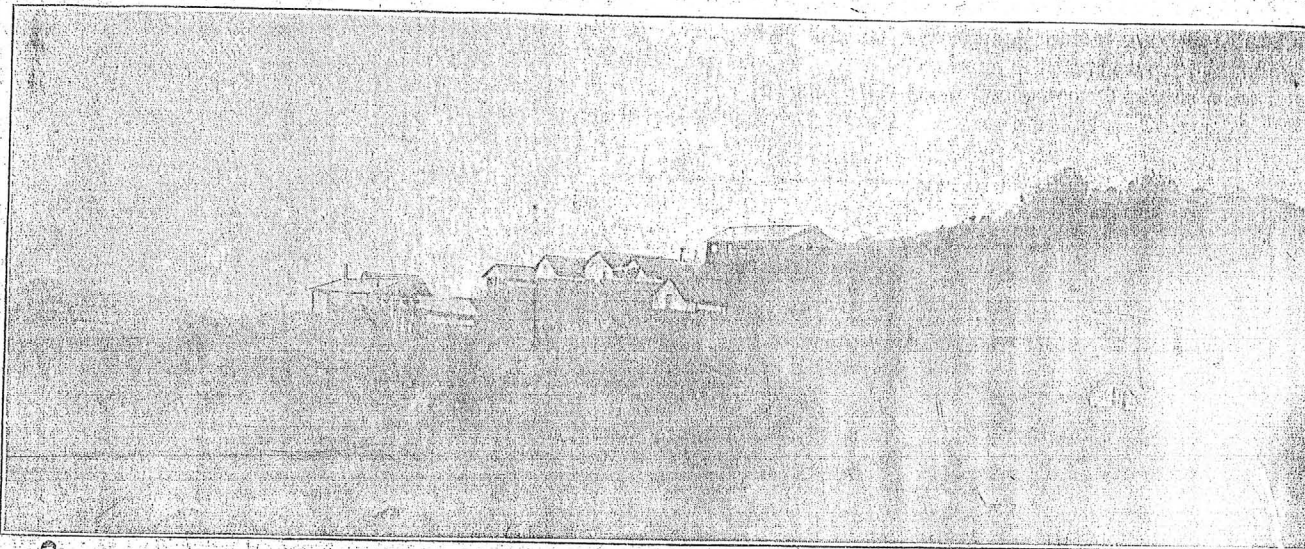
SUBJECT: Class C Loan
Red Rover
Gillespie

The WPB Copper Branch is very anxious to get this mine started and will welcome anything that can be done to get them to file for a C loan if they have not already either done so or got private capital for unwatering and sampling, and if they have filed for a C loan, to get it passed at the first opportunity.

Unfortunately, I understand, that although the mine was in operation a year ago, they made no assay maps.

Bill Broadgate

*Call
Hoffman /
" Elect Co.
He says he will call
to see us -
JTC*



CAMP AT RED ROVER MINE, CAVE CREEK DISTRICT

Ore Deposits of Cave Creek District, in Arizona abstracted

Geology of Area Twenty-eight Miles North of Phoenix Described—Only Deposit Developed of Present Importance That of Red Rover Mine—Characteristics of Principal Type of Outcrops Discussed

BY ALFRED STRONG LEWIS

Written for *Engineering and Mining Journal*

WITHIN the last two years I have made several professional trips to the Cave Creek mining district, in Maricopa County, Ariz., for Eastern clients holding mining interests therein. In passing over and through the district, and in connection with my examination of certain specific properties, I was greatly impressed by the appearance of the general surface conditions, and therefore determined to make a careful examination, with the purpose of preparing a geological map of the district. This article is based on such survey and examination.

First I made a thorough search of all possible sources for information relating to the district, but found nothing except that its northeast corner was included in the quadrangle covered by the Bradshaw folio of the U. S. Geological Survey. Careful study was made of the Government geological maps and other data relating to the developed districts both north and south of the Cave Creek district, in which the same surface conditions are disclosed as I found to exist in the latter.

MAPPING THE DISTRICT

Having completed the study of the adjoining territory I proceeded to examine the Cave Creek district about July 1, 1919, and by Oct. 1, 1919, I had gone over all of the country which had exposures of the older pre-Cambrian formation. I found large areas within the district to be covered by volcanic agglomerate, which was not mineralized and was therefore of no economic importance. These areas I simply sketched in and did not attempt to differentiate. The final results of my work are embodied in the geological map on page 714.

The Cave Creek district is twenty-eight miles due north of Phoenix, Ariz. The road leading out of Phoenix is paved for the first eight miles and from that point passes through the Paradise Valley with

slight grades. The elevation of the district varies from 2,100 ft. in the lowest part of the basin to a maximum of 5,000 ft. at the higher peaks. The main outlet for the drainage of the entire district is Cave Creek, which has an average fall of 200 ft. to the mile. At its headwaters near the Red Rover mine it has an elevation of about 4,000 ft. and twenty miles from here it emerges into the desert at an elevation of 2,000 ft.

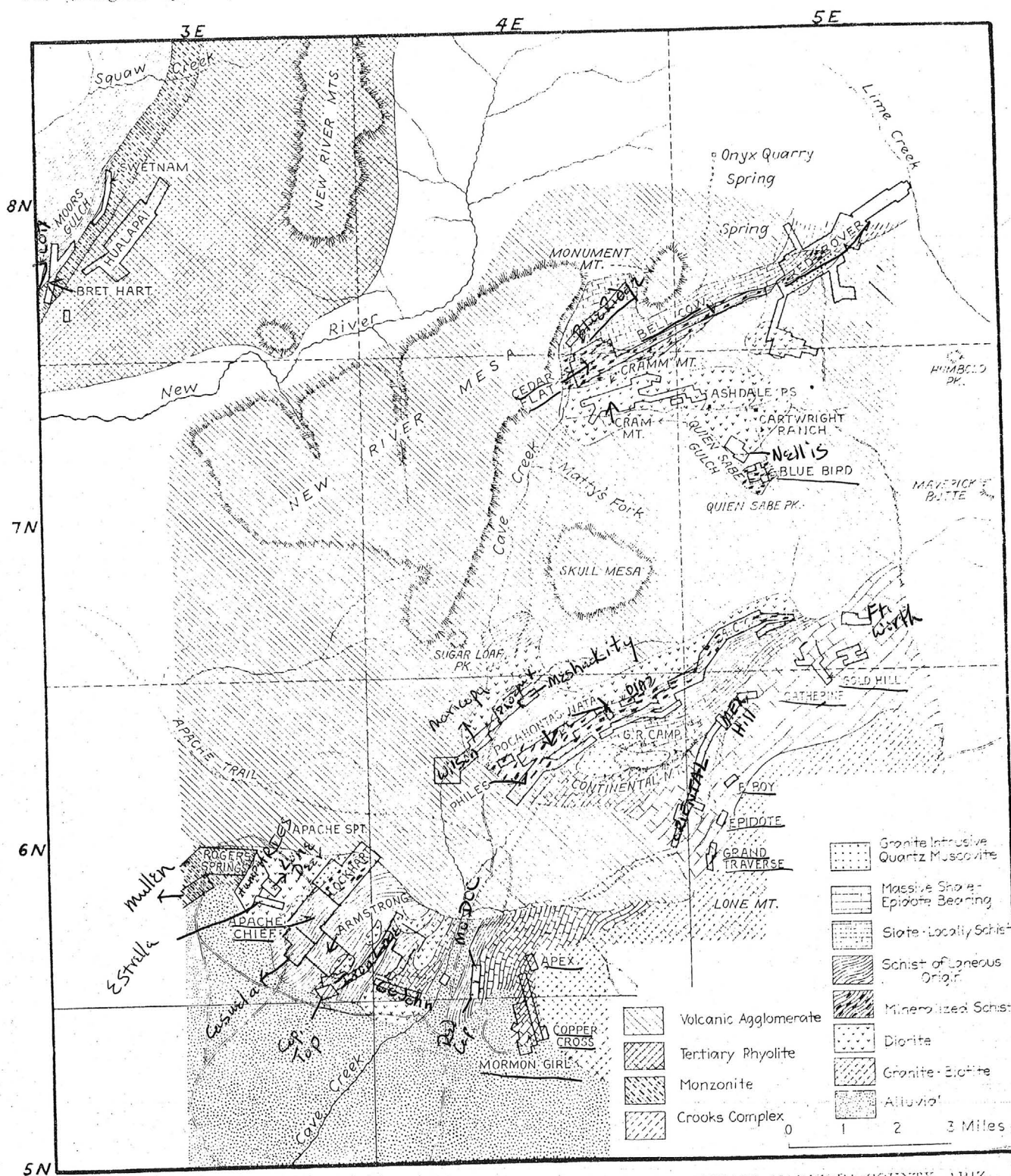
EVIDENCES OF GREAT EROSION APPARENT

Following up Cave Creek, a rim of low mountains is first encountered through which the stream has cut its course. This rim forms the southern boundary of the district. These mountains are abruptly covered at the base of their southern slope by the alluvial material of Paradise Valley. At the foot of the northern slope they are covered by volcanic agglomerate, which covers a basin-like area about three miles wide, feathering out to the east, but widening to the west. High ridges and mesas then succeed one another for several miles. Cave Creek has cut a deep gorge in this part of its course. The ridges and mesas finally give place to open country with an average elevation of about 3,500 ft. and the creek branches out into numerous small washes and ravines. Erosion has been very great, as evidenced by the great depth of the fill in Paradise and Salt River valleys. These hills, which now stand out alone and disconnected, were once part of an enormous mountain system extending from the interior of Mexico diagonally across Arizona and continuing through Nevada. Many thousands of feet have been torn from this mountain system by powerful forces of nature operating through millions of years. This material has been washed down into the great chasms at their feet. The chasms have been filled and leveled into broad valleys of great agricultural activity, and the once lofty peaks have been

dwarfed and diminished into low hills of insignificant size. These tremendous destructive natural agencies have finally exposed at the surface mineralized zones which were originally concealed at profound depth.

The geological ages represented in the district by

agglomerate, are for the most part in their original position and are non-mineral bearing as far as known. The Paleozoic beds elsewhere developed in Arizona are entirely absent here. Rocks of igneous origin, however, represent volcanic activity in many geologic periods.



RECONNAISSANCE MAP OF AREAL GEOLOGY OF CAVE CREEK MINING DISTRICT, MARICOPA COUNTY, ARIZ.

sedimentary deposits are confined to the oldest and the youngest of all exposures in Arizona. The pre-Cambrian sediments, which have been highly altered, metamorphosed, folded and finally compressed into shales, slates, and schists, are mineral bearing, but the Tertiary (or Quaternary) deposits, composed of volcanic

Granites of Algonkian age are present; siliceous porphyries originally bedded in pre-Cambrian oceanic sediments, and now forming nearly vertical zones of schist; later granite intrusions in the schists diagonal to its strike; greenstone bedded with the schists and diorites in large marginal masses as well as small and

large dikes irregularly intruded into the schists; and narrow granite porphyry dikes developed for miles in length and running with the strike of the schists, some highly sericitized, some highly siliceous.¹ At certain points as many as six of these dikes running remarkably parallel and spaced from 300 to 600 ft. apart are exposed.

Upon the southeastern margin of the districts is exposed a coarse-grained biotite granite batholith which covers an area of about 2,000 square miles. The granite weathers into peculiar shaped boulders which have almost the identical appearance of the boulder batholith granite exposures of Butte, Mont. The batholith, if of post-Paleozoic age, may have doomed and broken up the Paleozoic beds, rendering them easy prey to the erosive action of the Verde and Salt rivers. Deformation is evidenced by highly contorted rocks in many localities, as well as the change in the strike of the schist zones. There is a remarkable persistency in this strike. The normal strike seems to be N 42° E, and the deformed strike in almost all cases is N 60° E.

QUARTZ LENSES AND STRINGERS PROMINENT IN SCHISTS

At certain points the schists contain large and small lenses, stringers, and bands of jasper and quartz. Some of these lenses are prominently developed. They are usually from 10 to 50 ft. wide and from 200 to 500 ft. long. They do not occur in straight lines, but are offset in a somewhat regular manner and occur in the softer, more highly sericitized and bleached zones of schist and usually in proximity to the acid-porphyry dikes. Throughout these mineralized zones are distributed many small outcroppings of copper, silver, and gold minerals.

The exposures in the Cave Creek district are similar to those found at the surface in the proven districts of Arizona. An examination of the ore outcrops throughout the district discloses clearly the fact that, in the main, the gold, copper, and silver have been leached, leaving occasional shoots or kidneys of ore which have escaped leaching by reason of some topographical or other condition unfavorable to leaching. Such residual ore shoots are found to carry values in gold, silver, and copper running from \$10 to \$60 per ton.

RED ROVER DEPOSIT ONLY ONE OF IMPORTANCE TO DATE

There is only one property in the district which has done sufficient development work to uncover anything worthy of the term "ore deposit." This property, known as the Red Rover mine, is in the schist zone. The deposit at the surface is in an irregular inclined seam and shows copper carbonates carrying as high as 2,000 oz. of silver per ton. The ore occurs as lenses in the schist and has been developed so far to a depth of 500 ft. A very interesting occurrence is to be seen in the shaft which passes through about 30 ft. of schist impregnated with native copper in the form of thin scales, bright and wonderfully distinct until tarnished by exposure to the air. The principal deposit opened up on the 300- and 500-ft. level shows masses 3 to 4 ft. wide, of copper glance carrying 400 to 700 oz. silver

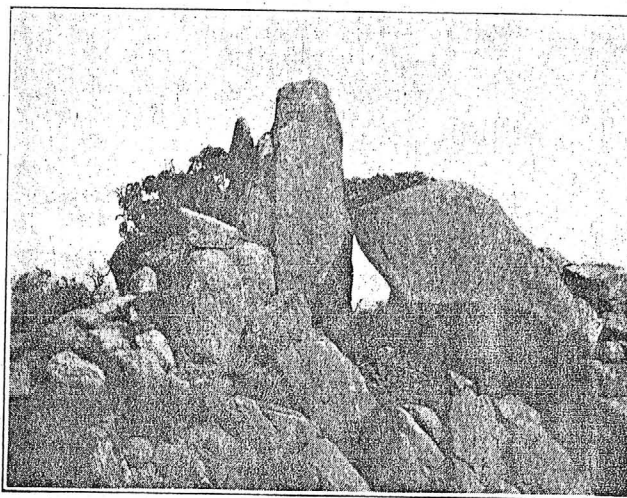
per ton. The other properties in the district have nothing but outcrops to recommend them.

It has been stated many times in recent mining literature that the mines of the future must be found by the application of geological deduction based upon surface and other data available. It therefore seems proper to describe the general characteristics of the principal types of outcrops exposed in this district. For convenient description the district can be divided into three zones.

COPPER CARBONATES FREQUENT ALONG BATHOLITH CONTACT

The first zone is from one mile to two miles wide and borders the northwestern contact of the granite batholith. It is composed of highly metamorphosed banded shales. Blocky epidote rock is extensively developed in this zone, and in places there are ledges composed of epidote, quartz, and dolomite intimately mixed. This zone gives place to slates along its western margin. Copper carbonates carrying several dollars per ton in gold and silver outcrop at many points within this zone, always in association with quartz or epidote.

The Mormon Girl deposit, in this zone, is formed in contact with and just above an inclined foot wall of



GRANITE POINT—A PREHISTORIC "LOOKOUT" IN THE CAVE CREEK DISTRICT

barren quartz. This quartz is 6 to 8 ft. thick and represents two generations of silicification, one of white quartz, which has been crushed into angular fragments, and the other a dark quartz, which has been deposited around the irregular fragments of the white quartz making the present hard compact foot wall. This foot wall is smooth, continuous, and unbroken. On top of it has been deposited copper-gold-silver-bearing quartz of an average value of \$40 per ton and from 4 to 5 ft. thick. A few hundred feet below this the ore disappears.

LITTLE COPPER IN SECOND ZONE

The second zone begins at the edge or border of the slates and extends to the contact of diorite and igneous complex. It is several miles wide and is all schist. Within this belt is a narrow, highly mineralized area that is exposed for about fifteen miles and is 600 to 1,200 ft. wide. It consists of highly altered soft sericitized schist in places highly twisted and contorted. In coloring it ranges from pearly white through the various shades of yellow and occasionally is deep red. In

¹The Pre-Cambrian rocks are designated on the accompanying map as "Schist of Igneous Origin," "Mineralized Schist" and "Crooks Complex." The latter formation, shown in the northwestern corner of the map, is the equivalent of the formation so named by the U. S. Geological Survey, in the Folio of the Bradshaw Mountain Quadrangle. It comprises irregular bands of diorite, granite, aplite and schist, with some breccia.—Editor.

other places, it is bleached or gray and full of innumerable quartz stringers. Very little copper is in evidence in the outcrops, but several location cuts exposed copper stain a few feet beneath the surface.

Elsewhere in this area many huge silicified outcrops occur, showing jasper and siliceous hematite. In connection with these there are innumerable outcroppings of carbonate, oxide, and some sulphide of copper occurring in patches or irregular impregnations.

The third zone lies along the contact of the schist and the diorite and other igneous intrusions and is the western part of the mineralized section of the district. There are several brecciated siliceous zones, from 50 to 300 ft. wide and of undetermined extent, which contain ore averaging \$2 to \$5 in gold per ton. Ore averaging as high as \$12 per ton has been taken from narrower enriched channels within the main low-grade orebodies.

In the diorite there are many outcrops showing strong shearing action. In these zones impregnations of copper carbonates are common. One of these at a depth of 225 ft. was crosscut for 30 ft., showing chalcopyrite and bornite disseminated in a hard greenish diorite which carried 1 to 3 per cent copper.

Dimensions and Area of the United States

The gross area of the United States is 3,026,789 square miles. The land area amounts to 2,973,774 square miles, and the water area—exclusive of the area in the Great Lakes, the Atlantic, the Pacific, and the Gulf of Mexico within the three-mile limit—amounts to 53,015 square miles. These and other data determined or compiled by the U. S. Geological Survey, to show the limits of the continental United States, contain some interesting facts.

The southernmost point of the mainland is Cape Sable, Fla., which is in latitude 25° 07' and longitude 81° 05'. The extreme southern point of Texas is in latitude 25° 50' and longitude 97° 24'. Cape Sable is therefore forty-nine miles farther south than the most southern point in Texas.

A small detached land area of northern Minnesota at longitude 95° 09' extends northward to latitude 49° 23'.

The easternmost point of the United States is West Quoddy Head, near Eastport, Me., in longitude 66° 57' and latitude 44° 49'; the westernmost point is Cape Alva, Wash., in latitude 48° 10', which extends into the Pacific Ocean to longitude 124° 45'.

From the southernmost point in Texas due north to the forty-ninth parallel, the boundary between the United States and Canada, the distance is 1,598 miles. From West Quoddy Head due west to the Pacific Ocean the distance is 2,807 miles. The shortest distance from the Atlantic to the Pacific across the United States is between points near Charleston, S. C., and San Diego, Cal., and is 2,152 miles.

The length of the Canadian boundary line from the Atlantic to the Pacific is 3,898 miles. The length of the Mexican boundary from the Gulf to the Pacific is 1,744 miles. The length of the Atlantic coast line is 5,560 miles and that of the Pacific coast line is 2,730 miles. The Gulf of Mexico borders the United States for 3,640 miles.

Nearly all maps of the United States show the parallels of latitude as curved lines and are likely to lead the ordinary observer to believe that certain eastern or western states are farther north than some of the

central states that are actually in the same latitude. For this reason, one who is asked which extends farther south, Florida or Texas, is very likely to say "Texas," but, as stated, the mainland of Florida is nearly fifty miles farther south than the southernmost point in Texas. For the same reason errors are likely to be made in estimating position or extent in longitude. Few realize that the island of Cuba, for example, if transposed directly north, would extend from New York City to Indiana, or that Havana is farther west than Cleveland, Ohio, or that the Panama Canal is due south of Pittsburgh, Pa., or that Nome, Alaska, is farther west than Hawaii.

Ontario's Metalliferous Production Increasing

Returns received by the Ontario Department of Mines for the six months ending June 30, 1920, are tabulated below, and for purposes of comparison the quantities and values are given for the corresponding period in 1919. Tons throughout are short tons of 2,000 lb.

Product	Quality		Value	
	1920	1919	1920	1919
Gold, oz.	277,656	231,729	\$5,690,504	\$4,666,759
Silver, oz.	4,474,322	5,744,172	5,077,028	5,951,362
Platinum metals, oz.	184.45	30.08	12,443	1,805
Cobalt (metallic), lb.	113,239	59,337	266,045	93,157
Nickel (metallic) lb.	4,854,979	5,147,745	1,696,687	1,825,347
Nickel oxide, lb.	3,491,544	5,503	814,070	1,567
Cobalt oxide, lb.	388,318	202,912	645,783	301,791
Other cobalt compounds, lb.	1,417	26,289	1,029	16,164
Nickel sulphate and carbonate, lb.	159,183	133,732	15,308	15,531
Lead, pig, lb.	749,820	1,481,204	71,006	54,802
Copper sulphate, lb.	89,939		4,497	
Copper, blister, lb.	2,918,153	3,080,492	470,949	452,055
Nickel in matte exported tons	9,527	7,072	5,338,120	3,535,915
Copper in matte exported (a) tons.	4,434	4,341	1,241,520	1,128,753
Iron ore, exported (b) tons.	2,189	5,804	18,512	44,309
Iron, pig (c) tons.	28,771	24,095	738,079	670,512
Totals			22,101,580	18,759,829

(a) Copper in matte was valued at 13c. and nickel at 25c. per lb. in 1919. For 1920 the values have been placed at 14 and 28c. per lb. respectively. The total matte produced contained 15,030 tons of nickel and 7,705 tons of copper.

(b) Total shipments of iron ore were 13,962 short tons, worth \$74,073.

(c) Total output of pig iron was 321,826 tons, valued at \$8,255,916. Figures in the table represent proportional product from Ontario ore.

The aggregate output from metalliferous mines, smelters, and refining works of the Province of Ontario for the six months ended June 30 shows a considerable increase in value over the 1919 figures. For the first time since 1903, when the Cobalt silver camp was discovered, the output of gold exceeds that of silver in value. The new electrolytic refinery of the British America Nickel Corporation is now in operation at Deschenes, near Ottawa.

Japan's Mining Industry Slack

Japanese mining industry, in which more American capital is invested than in any other line of business activity in Chosen, experienced an unusual slackness during 1919. The Mitsubishi Iron Foundry, at Kyomipo, was forced to reduce its output, as was also the Suan mine, worked by the Seoul Mining Co., and the Kapsan copper mine, worked by the Kuhara Mining Co. The reasons for this were difficulties experienced in the matter of transportation through the outbreak of rinderpest among the cattle and which totally stopped all transport, and the heavy death rate among the miners from cholera. The continual rise in the cost of supplies and living expenses gave added cause for the reduced output.

1911, v. X

From: "Mines Handbook"

Red Rover mine
Maricopa Co.

RED ROVER COPPER MINING CO.

ARIZONA.

Office and mine: Phoenix, Maricopa Co., Ariz. Organized circa July, 1909, under laws of Arizona, with capitalization \$1,000,000, shares \$1 par. Lands 12 claims known as the Red Rover group, 15 miles north of Camp Creek and 50 miles north of Phoenix, the nearest rail point. The mine has a 200' tunnel and a 200' incline shaft, with about one-half mile of workings, showing a 10' ore body between limestone and porphyry, carrying a 3' paystreak estimated to average 10% copper, 6 to 60 oz. silver and \$20 gold per ton, and ore has been secured assaying up to 27% copper and 306 oz. silver per ton. The Red Rover mine, discovered 1882, has shipped, from shallow workings, about \$200,000 worth of high grade ore, running about 15 to 25% copper, with values mainly in silver chlorides, one carload of 20 tons netting \$41,000, with no allowance made for copper contents. Company was said, early 1911, to plan a mill.

1912-1913, v. XI

RED ROVER COPPER MINING CO.

ARIZONA

Office and mine: Phoenix, Maricopa Co., Ariz. Dr. R. N. Craig, pres.; J. Applefield, vice-pres.; R. M. de Gex, treas. and gen. mgr. Organized July, 1909, under laws of Arizona, capitalization \$1,000,000, shares \$1 par. Lands, 12 claims, known as the Red Rover Group, 15 miles north of Camp creek and 50 miles north of Phoenix, the nearest rail point. The mine has a 200' tunnel and a 370' incline shaft, with about 1 mile of workings, showing a 10 to 16' orebody between limestone and porphyry, carrying a 3' paystreak estimated to average 10% copper, 6 to 60 oz. silver and \$20 gold per ton. The Red Rover mine, discovered 1882, has shipped from shallow workings about \$200,000 worth of high-grade ore, running about 15 to 25% copper, with values mainly in silver chlorides, 1 carload of 20 tons netting \$41,000, with no allowance made for copper contents. The vein on the Reliance-Montana claims is 4 to 15' wide with an average of 7'. Production for 1912 was 300 tons of ore averaging 10% copper and 90 oz. silver and yielding nearly \$40,000. A carload shipped Aug., 1913, is said to have sampled 57.6% copper and 1,421 oz. silver.

1920, v. XIV

RED ROVER COPPER CO.

ARIZONA

Reorganized, 1917, as Red Rover Mining Co., which see.

RED ROVER MINING CO.

ARIZONA

Address: care of B. A. Gillespie, mgr., Phoenix, Maricopa Co., Ariz. Is a reorganization of the Red Rover Copper Co.

Lands: 12 claims, known as the Red Rover Group, 12 miles north of Camp Creek and 50 miles N. E. of Phoenix, the nearest rail point.

Development: by 10,000' of underground workings, including a 200' tunnel and a 500' incline shaft, showing a 10 to 16' orebody between limestone and porphyry, carrying a 3' paystreak estimated to average 10% copper, 6 to 60 oz. silver.

The Red Rover mine, discovered 1882, has shipped from shallow workings about \$200,000 worth of high-grade ore, running about 15 to 25% copper, with value mainly in silver chloride, 1 carload of 20 tons netting \$41,000, with no allowance made for copper content.

Production: for 1913-14 was 440 tons of ore. Has been steadily developing since 1918, with about 25 men employed. Is a meritorious development proposition.

1931, v. XVIII

RED RO

The Red Rover mine, discovered 1882, has shipped from shallow

ARIZONA DEPT. OF MINES & MINERAL RESOURCES
STATE OFFICE BUILDING
416 W. CONGRESS, ROOM 161
TUCSON, ARIZONA 85701

1942, v. XXI

1235
Mr. B. A. Gillespie,
Phoenix, Arizona

Dear Sir:

As per your request I have made an examination of the RED ROVER MINE and beg to submit herewith a report on conditions as I have found them.

PURPOSE OF REPORT:

This report is not written so much to present a picture of the property to those unfamiliar with it, as to present opinions on which further procedure can be based, to those already familiar with the mine.

CLAIMS AND LOCATION:

The RED ROVER MINE consists of 56 patented mining claims located at the northern boundry of Maricopa County, Arizona. It is 54 miles north from Phoenix, Arizona the nearest present railroad point, and is reached by the Cave Creek and Camp Creek road from Phoenix. Title is held by the Red Rover Mining Company.

GEOLOGY:

The Red Rover orebodies are a replacement in Yavapai Schist. It is beyond the scope of this report to present any lengthy or detailed description of those rocks classed under the general heading of Yavapai Schists, but a breif description or definition is necessary.

The Yavapai Schist formation comprises a series of pre-Cambrian sediments and igneous rocks, which have been compressed, folded, metamorphosed and altered into schists and metamorphic rocks of various types and phases. The planes of schistosity are now nearly vertical, with steep dips to the west on the western side of the anticline of the fold, and to the east on the eastern side. Their general strike is northeast-southwest, and their thickness has been calculated to be between 4000 and 7000 feet. The various phases of the schist require some study and descrip-

ption, as the chemical and mechanical make-up of one phase, as compared to another, often makes the one phase more receptive to mineralizing replacement. The series contains many phases. A light colored silvery phyllite or sericite schist is the more normal phase, but gradations occur through feldspathic phases to mica schists, hornblende schists and amphibolites, to very basic diabasic phases. Bands of quartzite and conglomerate also occur in the series. The sericitic phase has been classed as originally sedimentary. The feldspathic, and also the diabasic phases were probably originally igneous rocks. The hornblende or amphibolitic phases are of doubtful origin. They may represent complete recrystallization of silicious ferro-magnesian limestone, or they may equally well be derived from basic igneous rocks. The series also contains quartzite "dikes", standing with the schistosity, but originally sandstone beds. Conglomerate beds, now standing almost vertical, occur occasionally in the series. These beds contain rounded and water worn particles of pre-existent formations, and are a considerable proof of the original sedimentary character of much of this series.

At the RED ROVER itself many of the phases of the schist occur, most of them altered and silicified beyond recognition. It has been the opinion of some examining engineers that the mineralization at the Red Rover was in an altered limestone bed, inferring that such limestone was a sediment laid down on top of the schist, would be of shallow thickness, and could not hold important primary or secondarily enriched orebodies. This is a natural and easily made mis-assumption for an engineer who is not broadly experienced with the Yavapai schist in its various types and phases. I believe I can state positively, that this formation, often mistaken for a limestone, while it may have been a limestone bed before the section causing schistosity, is merely a phase of Yavapai Schist, it has been

subject to the same folding and compression common to the schist formation, and will maintain its continuity to considerable depth. Chemically it has been almost completely silicified, and now contains only one or two percent of lime.

I have observed this identical character of rock in other locations in the schist belt, where it is structurally impossible for it to be anything else but a phase of the Yavapai schist. Further development at the Red Rover will show the same structural relationship.

The Red Rover development shows a very complex confusion of dikes, faults, and original phase variations, impossible to untangle until there has been considerably more development. Many dikes occur, both pre-mineral and post-mineral, the latter probably mostly representing the conduits of extrusive flows, which subsequently covered the district. There was much faulting, both before and after the mineralization, although there are no known post-mineral faults that have resulted in great displacements.

The dike-fault complex has a very confusing effect on any attempt to locate the trend of the orebodies, especially in the upper zones. In the first place we have the phase variations of the original schist, with the fact that some phases were more susceptible to mineralizing replacement than others. Then we have faults displacing these phases but which also opened channels for primary mineralizing solutions, and we also have pre-mineral dikes, more impervious than the susceptible schist, which acted as dams to the primary solutions. Finally we have faults displacing to some slight extent the ore as primarily formed.

The entire process was repeated during the secondary period. The faults and some of the dikes formed channels for the descending solutions, causing local

zation of secondary precipitation. Others formed dams, blocking off portions of the ore to leaching action, and leaving isolated remnants of ore, such as found on the upper levels.

It can readily be seen that the situation is so complex that extensive development will be required before it can be worked out in detail.

Important orebodies have been formed as replacements in Yavapai schist, such as those at Jerome. Other orebodies of this type have proven to be small and disappointing. To make extensive bodies of commercial ore we should look for evidence of strong and extensive general mineralization; evidence that such mineralization contained copper, at least in localities; evidence of a mineralizing intrusive probably of the acid type, monzonite, rhyolite, or quartz porphyry; evidence of extensive leaching with its consequent secondarily enriched zone; evidence of residual values in gold or silver; and possibly, evidence of some formation to confine the mineralization.

All these factors are proven in the surface and underground showing at the Red Rover. A crosscut tunnel near the surface, and the upper levels, show one area alone, over 100 feet wide, extensively mineralized and leached, with residual values in gold or silver; and possibly, evidence of some formation to confine the mineralization.

All these factors are proven in the surface and underground showing at the Red Rover. Acrosscut tunnel near the surface, and the upper levels, show one area alone, over 100 feet wide, extensively mineralized and leached, with residual values in copper and silver, often high grade. On the 700 level an acid dike occurs which I believe to be a tongue of a mineralizing intrusive. There are numerous rhyolite dikes in the vicinity. Leaching has been exceptionally extensive, even

to the 700 level, and the many impervious dikes may easily cause a concentration of the mineralization.

DEVELOPMENT:

While there has been considerable development at the Red Rover as measured in feet, it has been nowhere near commensurate with the work required to outline orebodies in a formation of this sort, or even to discover the many orebodies that may exist in the extensive favorable formation. The main shaft is 860 feet deep with levels on the 860, 700, 500, 300 and 200. Three hundred feet to the south is an old incline shaft on the ore 360 feet deep. The two shafts are connected through drifts and stopes at about the 300 level. In the vicinity of the old incline shaft there is a strong surface cropping of copper-silver ore that has been worked to a considerable extent, probably 200 cars of high grade copper-silver ore having been mined and shipped. This zone is over 100 feet wide, strikes northeast - southwest and dips about 45% to the west. It is also cut by a southeast crosscut from the 500 level of the main shaft. The high grade ore occurs in irregular small bodies, and consists of remnants and enriched spots as mentioned above.

A tunnel from the surface, about 300 feet long, in the vicinity of the old shaft, reaches a maximum depth of about 100 feet. This tunnel is across the formation and shows an excellent crosscut of the surface conditions. There are strong gossan croppings of the copper type, extensively leached areas, dikes and faults, and remnants of high grade ore.

In the main shaft a south crosscut on the 500 level encounters the ore zone. It is still extensively leached and mining has been confined to the remnants as in the surface workings. A crosscut to the north has not proceeded far enough to encounter any known ore formation.

On the 700 level there is little work to the south, under the dip of the known ore zone, but a crosscut has been run about 250 feet to the north. This encountered what is apparently a different orebody. This orebody strikes north 20 degrees east, with the schist, but dips about 70 degrees to the east. The mineralization is about 100 feet wide and consists of leached areas and secondarily enriched spots containing chalcocite. Apparently the crosscut is very close to the top of the secondary zone. A 30 foot winze in the center of this formation, with a crosscut at the bottom was full of water, but the report is that there is a great improvement in the values during that 30 feet, with more chalcocite and more permanency showing in the crosscut at the bottom. The following samples were taken near this location:

The following samples were taken from the surface dumps:

#4. Sample from dump of old workings. Not an average of the dump, but not specimen pieces: Copper 9.07%, Silver 22.8 oz; gold tr.

#5. Specimen from dump, apparently rich silver ore: Copper 9.4%; Silver 146.8 oz; gold .01 oz.

#6. Specimen from dump of typical well replaced schist. Oxidized = Copper 12.22%; Silver 18.8 oz; gold tr.

Area of copper stained material near floor of crosscut west of winze: Copper 2.31%; silver 3.5 oz. Gold tr.

Streak of ore showing chalcocite, about 5 feet wide in roof over winze: Copper 11.25% Silver 17.5 oz; gold trace.

On the 860 level a crosscut was run to cut the ore as shown on the 700 level.

The formation here is an entirely different phase of the schist - much more basic.

The ore was never encountered. It could hardly be expected to be encountered

with the work done, even if the ore merely maintains its normal strike and dip, and should there be some displacement by post-mineral faulting, which is probable, there would be even less likelihood of encountering this ore without further work.

A raise has been started from the 860 level to connect with the winze from the 700. This will have to show the contact with the ore at some point, and will give valuable information as to its trend.

In general there has been a tendency to step faulting north and east, which could easily account for some displacement.

There has been no work to the south on the 860 level.

GENERAL DISCUSSION:-

Some questions of natural interest to those interested in the property might be enumerated as follows:

- (1) Is the orebody cut on the 300 and 500 level, and which connects with the surface workings, the same as the orebody cut on the 700.
- (2) What has happened to the orebody on the 700 that it was not cut on the 860 level.
- (3) At what depth can a secondarily enriched zone be expected and how extensive will it be.
- (4) What evidence is there that still further ore zones will be encountered.
- (5) What further development is advised in order to prove the maximum amount of ore with the least expenditure.

In answer to question #1 I believe there are two different orebodies, or at least separate ore lenses, possibly in the same general mineral zone. The known ore on the 500 does not line up with the known ore on the 700 and they dip in opposite directions. While faulting might account for the difference it seems more

probable that they are separate ore bodies. In answer to question #2 if the orebody cut on the 700 does not extend very far to the south, and actually has its apparent dip of 70 degrees to the east, it would hardly be cut by the present work on the 860. Such work would be underneath it and would require an easterly crosscut to cut it. Some fault displacement may also have increased this distance. I would expect the top of the secondary zone to be quite uneven because of the channeling caused by the dikes and faults. The ore in the vicinity of the winze on the 700 is beginning to show chalcocite and evidence of secondary enrichment. It also shows oxidation and leaching. Another 50 to 75 feet in depth there, should encounter the real secondary zone. This zone should be of unusual thickness because of the great thickness of the leached and partially leached zone above, and the fact that there has been a large amount of erosion, which has kept fairly even pace with the leaching action.

As to the evidence of further ore zones there is a large amount of very favorable territory. The section is generally extensively mineralized, and further ore zones should be encountered with sufficient development.

DEVELOPMENT ADVISED:

The raise being run from the 860 to connect with the ore shown in the winze from the 700 is an important piece of work. It should be completed first and will give valuable information as to the downward trend of that ore. I would also advise three flat diamond drill holes from the face of the 860 level to prospect the territory ahead, and to both sides, ahead. The exact course of these holes can be determined better after the work ^{on} the 860 level is properly mapped.

Another piece of development adviseable would be a drift from the 860 station, 200 feet on a course south 65 degrees west. From this point flat diamond drill holes should be run on each side at right angles to the drift. This should give valuable information as to the relative position of the two probable orebodies.

MINING FACILITIES:

While the property is rather inaccessibly located, if a large mine is proven this difficulty can be largely eliminated. It is possible to drive a two-mile crosscut tunnel from Lime Creek, near the Verde River, cutting the red Rover at 1800 feet depth, and giving an easier outlet down the valley of the Verde to Fort McDowell and Mesa. Such a tunnel would crosscut the general trend of the schists, and would be most interesting from a prospecting point of view.

The present mine workings make about 50 gallons of water per minute. More extensive development will probably double this. There is thus no scarcity of water at the mine itself for all operations.

Under present conditions ore is hauled and loaded on cars at Phoenix for \$4.00 per ton.

The property is equipped with all equipment necessary to carry on an extensive line of development. The shaft is in good shape, and such development does not present any special difficulties.

CONCLUSION:

In conclusion it is my opinion that the RED Rover warrants extensive developments with view to opening up a rich secondary zone, and below that, an extensive primary zone of moderate grade commercial ore.

March 25, 1935.

Respectfully submitted,

Mining Engineer.

C. H. Lanning

RED ROVER Mine file
maricopa County

REPORT

on the

Leasing Operations

at the

RED ROVER COPPER COMPANY PROPERTY

Magazine Mining District

Maricopa County, Arizona

By

ARTHUR HOULE, E.M.

October, 1934

from

Sophronia
Bennett

R E P O R T

on the

LEASING OPERATIONS

of

MINE OPERATORS, INC.

Lessees of the

RED ROVER COPPER COMPANY

Magazine Mining District

Maricopa County, Arizona

* * * *

by

ARTHUR HOULE, E. M.

October, 1934

REPORT
on the
Leasing Operations

at the

RED ROVER COPPER COMPANY PROPERTY

Magazine Mining District

Maricopa County, Arizona

THE PROPERTY

The Red Rover Copper Company has been leased for a five-year period to a leasing company known as Mine Operators, Inc. The lease operations, directed by E. N. Moores and R. A. Maguire of Mine Operators, Inc., were started early in 1934 to rehabilitate the plant and the underground equipment and workings of the Red Rover Copper Company holdings comprising 37 patented mining claims situated in the northeast corner of Maricopa County, Arizona. The district is called the Magazine Mining district, and is located between Cave creek and Lime creek.

The mining claims cover mineral showings of copper-silver ores which have been partially prospected and developed during the past fifty years. The property is reached by a good, well-graded gravel road running northward from Phoenix, Arizona. All but four miles of this road is state highway and is maintained in excellent condition for automobile traffic by the state of Arizona. The distance from Phoenix is slightly in excess of 50 miles.

The altitude at the mining property varies from 3900 to 4300 feet above sea level.. Climatic conditions are nearly ideal. Operations can be conducted throughout the year under excellent weather conditions.

The surrounding country is a semi-arid desert where water is scarce; however, mining operations have developed a supply of 100 gallons of water per minute, which must be pumped from the lowest operating mine level now open. This mine water is used for all purposes in and around the mines and mining camp location.

The surface vegetation is mesquite, shrubs and grasses.

Fuel oil supplies the power produced by a Diesel type engine plant and all materials necessary to mine operations are hauled by truck to and from Phoenix, Arizona.

The plant and equipment of the Red Rover Copper Company have been re-conditioned and overhauled so that underground operations necessary to mining and development work, also unwatering the mine, are being carried on without unusual difficulties.

HISTORY

The original mining locations were made in 1883 to cover gossan outcrops in limestone showing copper and silver stains. Shipments of rich copper ores were made at irregular intervals since 1883. Because of difficult transportation problems the property was more often idle than operating. The claims were allowed to lapse in 1903, and relocated in 1906. In 1916, the Red Rover Copper Company of the Gillespie interests of Tulsa, Oklahoma, acquired the property and carried on an extensive campaign of development. To do this work good mining equipment and machinery was installed, and made it possible to conduct operations in a creditable manner.

A new vertical shaft of 2½ compartments was sunk to a depth of 860 feet, and drifts were driven on the 360, 500 and 700 foot levels. On the 360 and 500 foot levels connections were made by drifting to the old workings in and around an old inclined shaft, 360 feet deep, which served for the mining operations conducted near surface under the gossan showings.

Around the old inclined shaft workings, kidneys and small bodies of ores rich in silver and copper were found, mined, and shipped to the smelters. The ores too low in values to permit shipment by trucking or hauling are the silicious, oxidized type showing copper carbonates and silicates. The average grade of this ore was estimated to carry 3% copper and 8 to 12 ounces silver per ton.

An attempt was made to recover these values on the ground by leaching with ferrous sulphate and electrical precipitation. It was not successful and a second effort to concentrate these oxidized ores by sulphidizing and combined gravity and flotation treatment was also tried without success.

The Red Rover Copper Company in August, 1929 leased its holdings to Mr. E. N. Moores, who began ore shipments in December, 1929, and in subsequent months to May, 1930 shipped in excess of 2,000 tons of ore averaging 6% copper and 40 ounces silver per ton. Operations then ceased because of low metal prices, also because of too severe lease terms to permit successful operations.

The property was closed down and in the hands of watchmen until 1934. Early in 1934, under a new lease agreement entered into between the Red Rover Copper Company and the Mine Operators, Inc., a considerable sum of money has been spent to reopen the main shaft and connecting drifts to the old workings so that development of ores and their production could again proceed.

The job of reopening has been difficult because of caved conditions around the shaft and in the old connecting drifts. These connections will be made soon and work can then proceed under the safe practice required by the state inspection department.

The main shaft has been unwatered and repaired to the 700 foot level, and development work started. The face of the North drift, 700' level, has been advanced to follow drill hole #3 on this level which was bored during the year 1927. Drill cores from this hole disclosed oxidized copper ores, carbonates, oxides and native or metallic copper. The North drift was driven so that this mineral showing could be thoroughly explored in order to determine if possible the chances for opening up silver-bearing copper rich enough to permit shipping under the present lease agreement.

The mineralized ground on the 700' level is without doubt for the most part still in the oxide and leached ore zone, and any occurrence of pay ore found on this level will occur as kidneys or residual masses so protected by ground conditions from leaching by downward circulating solutions that an ore showing similar to the ore body found and mined out between the 300 and 500 foot level will again be developed.

The type and character of the ores on the 500' level and above do justify a serious effort to search for similar orebodies on the 700' level, and, of course, deeper levels.

The entire development program under the lease terms could be justified only by the profit to accrue from the mining of known ore reserves.

Unfortunately at this time no measurable pay ore reserve tonnages are available. The oxidized ore zone, or gossan capping from surface to the 180 foot level, offers a small speculative chance if and when production can be obtained on rich ores from the lower levels. The west end of this surface outcrop was pretty thoroughly explored by the diggings in and around the inclined shaft area.

Any new ore finds will be made in the portion of the outcrop near the boarding house, and its eastern extension from that point. To explore in this section of the outcrop will not be expensive. However, it is purely a speculative chance, because at no point along this outcrop is shipping ore in evidence.

After new connections or passage ways have connected up the 500' level with the 360 and 240 foot levels, new prospecting northeastward in the limestone can be undertaken in the ground above the 240 foot level. This is the section that merits further prospecting on the limestone side of the contact. The probable extent of the ore-bearing series of limestone is 500 feet long and 100 or more feet wide. It is capped on surface by sandstone and shale.

The cheapest and best means for prospecting this zone will be from the Incline shaft where hoisting facilities are available, in the event that operations on the 700 foot level have not disclosed a shipping grade of ore.

If ore extraction proceeds from the bottom levels the near surface ores could be transferred to the 360' level of the main shaft and then hoisted to surface. The inclined shaft hoist and equipment would be used only in case no work was being done from the main shaft.

GEOLOGY

The basement rock is schist. Overlying the schist is limestone, shales and sandstones. The schist-limestone contact is marked by a fault striking N 50° E. The contact zone is well marked on surface and throughout the underground workings. The dip is approximately 55° northwest.

The surface outcrop of the contact fault is very pronounced and is marked by the gulch situated between the schist hill on which the Gillespie house is located on the south, and the copper-stained limestone ridge running N E from the Appfield shaft, inclined shaft, boarding house and bunk house.

All of the limestone, sandstones and shales have been intruded by dykes and sills of diabase and mineralization of the limestone and sedimentary series are without question due to these intrusions, and ore occurrences in depth will be found close to limestone-diabase contacts, also as replacement type of ore deposit in the limestone.

Residual ore kidneys from which shipments have been made to date definitely follow the limestone-schist contact, or limestone-diabase-schist contact. Oxidation along this contact zone has been very pronounced and good iron gossan or leached ore showings are evident, indicating downward leaching and percolation with the usual concentration of copper and silver values to be expected at depth. The recently mined ore shoot (during the years 1929 to 1930) from the 360 to 500 foot level is the best evidence that rich ore will come in when the permanent zone of primary sulphide is found. Above the primary ore will occur the secondary and concentrated ores of the glance or chalcocite type rich in silver and copper.

The high grade silver ores produced in the early history of the mine resulted from leaching and concentration. The richest silver values are generally deposited near surface, but copper values leached out would be carried to much greater depth.

It is probable that the primary ores or sulphide ores will be chalcopryite and bornite ores of copper with good values in silver. Gold values are usually not important in the primary ores.

The richer silver ores near surface and iron leached zone should be assayed for gold values in all cases. This type of material has been overlooked and underestimated in most leached ore deposits.

THE RED ROVER VEIN

The Red Rover vein, well marked on surface, has been exposed and drifted on on all levels from surface to the 500' level of the main shaft.

The drift on the 360 and 500' level is well marked by gouge, copper and iron staining, residual iron, and one residual kidney of good ore.

The continuation downward of this vein is marked by iron and copper staining which cuts across the shaft slightly above the 600 foot level, and is again shown in the recent continuation of the north crosscut following drill hole #3 on the 700' level. The vein is exposed also in the northwest drift on the 700' level and marked by ledge matter with good copper indications.

In my opinion, a small amount of new development work should be done on the 700' level to determine the extent of these newly exposed mineral showings preliminary to planning a more extensive campaign if conditions as to metal prices and ore showings improve. At this time, the new mineral showings justify driving 150 feet of new prospect work on the 700 foot level.

NEW OPTION AND LEASING AGREEMENT

The terms of the leasing agreement which now govern operations, together with the very low price obtainable for copper and silver, emphasizes the fact that the only hope for success in this operation will be in uncovering ores unusually rich in copper and silver on the 700 foot level. It is impossible to predict this occurrence, but if it does occur, the ore showing will again be in the form of residual ore and would demand that development operations be carried on at greater depth.

In my judgment this operating procedure should not be undertaken under the present lease agreement unless an option to purchase at a figure within reason is obtainable. The option to purchase should be based upon the profit possibilities of the property and not upon the cost of plant, equipment, development and experimental work performed to date.

The option price to purchase should not be in excess of \$100,000, with a five-year's option period. The expenditure of \$12,000 per year for development and upkeep is reasonable and amply protects the owner.

Any ores produced and shipped should pay not to exceed 10% royalty after all transportation and smelter deductions have been made.

All royalty payments should apply on the purchase price.

SUMMARY: -- CONCLUSIONS

The Red Rover vein is persistent in depth and to the lowest depth exposed gives strong indications of leaching of values and redeposition at greater depth, therefore indicating a zone of secondary enrichment where very high grade bodies of copper-silver ore will be eventually found by deeper development. Residual lenses such as are found between the 360 and 500 foot levels are confirmatory evidence.

The new mineral exposures on the 700' level add to the evidence of leaching and downward percolation of copper values by the type of leached ore zone and low grade oxidized ore now being uncovered on this level.

The entire 700' level as now developed shows a much wider lime belt at this level. It is therefore probable that replacement of limestone by ore-bearing solutions could be extensively carried on at this level and deeper levels. The Red Rover vein in the two points exposed, the north cross-cut and the northwest crosscut, is definitely stronger in mineral indications and could come into rich ore at this level as residual masses. However, enriched ore at greater depth can surely be expected.

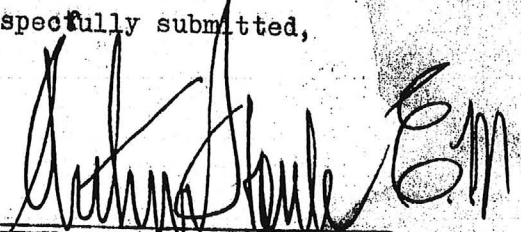
New work on the 700' level should be limited to confirmatory development work so that work at deeper levels could be accurately planned if and when a new lease agreement and option to purchase the property under fair terms are negotiated.

The present and probable price of copper metal during the next five years is not high enough to warrant the belief that ore shipments will be valuable because of average copper content. At most a 10% copper ore would barely pay the cost of mining. Therefore, any future profit from leasing operations must depend upon a high silver content in the ores shipped.

At this time there are no ores of shipping grade in sight, therefore, the lease operation is purely a development proposition and under these conditions I advise negotiating an option to purchase on fair and reasonable terms, before undertaking any new development work at greater depth. If such an option to purchase is obtained then the problem of financing deeper development work can be undertaken on a sound basis.

The mineral showings now exposed do indicate deep-seated high grade ores of copper and silver in payable quantities and a development campaign is warranted only in the event an option to purchase at a reasonable price is obtained.

Respectfully submitted,


ARTHUR HOULE, E. M.



RED ROVER COPPER COMPANY
MAGAZINE MINING DISTRICT
MARICOPA COUNTY, ARIZONA

SHOWING COMPOSITE PLAN OF
ALL LEVELS FROM MAIN AND
INCLINE SHAFTS

Surveyed April, 1927 by HARRY E. JONES
Phoenix - Arizona

*This photostat made
at Ruth Nevada
7/26/34*