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Buckeye

7 November 1980

Mr. S. E. Patterson
1708 E. Oregon
Phoenix, Arizona 85016

Re: Mining Properties

Dear Mr. Patterson:

The following properties were shown to a Canadian Mining Company November 2 and 3 1980: Pinkham, Rural - Buckeye, Little Chief and Arizona - Montana.

Because of the limited area of the claim groups and the numerous small vein systems the Cypress Resources Corporation would propose the following exploration program:

1. Complete surface geology by a grid system,
2. Core drill the vein systems,
3. Dewater, provide accessibility, maps and sample underground workings,
4. Analyse and generate a feasibility study,
5. Determine availability of surrounding property.

It is the opinion of Cypress, the Arizona - Montana claims are of little value as a mill site due to limited tailings disposal area. However if there is valuable mineral therein, they will be reconsidered by the Cypress geologist.

Because of the lack of information on blocked out ore in sight for the above mentioned claims, an expensive drilling and exploration program must be initiated. Between 90 and 120 days will be required to accomplish the exploration and feasibility.

This program would begin within the next 30 days which will complete all necessary assessment work for the 1980-81 year.

Please consider the following purchase proposal:

$ 1,000.00 for 90 days exploration option	$ 1,000.00
$100,000.00 upon formal contract signatures	10,000.00
$ 1,000.00 each month for 12 months	12,000.00
$ 25,000.00 at the end of the first year	25,000.00
$ 1,000.00 each month for 12 months	12,000.00
$ 25,000.00 for the next 6 months	25,000.00
$ 25,000.00 for the next 6 months	25,000.00
Payments to escalate from here.	
Total to be received 3 years and 3 months.	$$100,000.00
(Average of $2,820.50 / month)	

Very Truly Yours,

Douglas K. Martin

cc. E. Mueller

F. Dudley and New York associates, who
will build 100-ton mill. Large tonnage sil-
ver ore already available in stopes and
[illegible] Mahl owners with Dudley are

RICH STRIKE OF WIRE [illegible] M. R. DUDLEY LEEZ FOR [illegible]

0 ounces a ton

8.2 oz per ton on the dump ~~[illegible]~~

$ 300,000

ALL 3 MINES ARE WITHIN 1 MI FROM EACH OTHER - 1910 [illegible] OF KING MAS

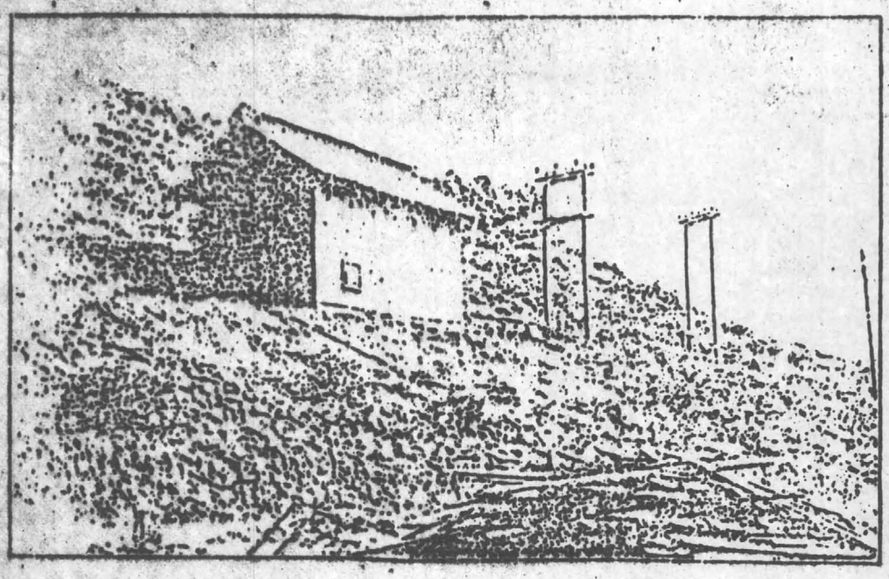
Good Ore Bodies

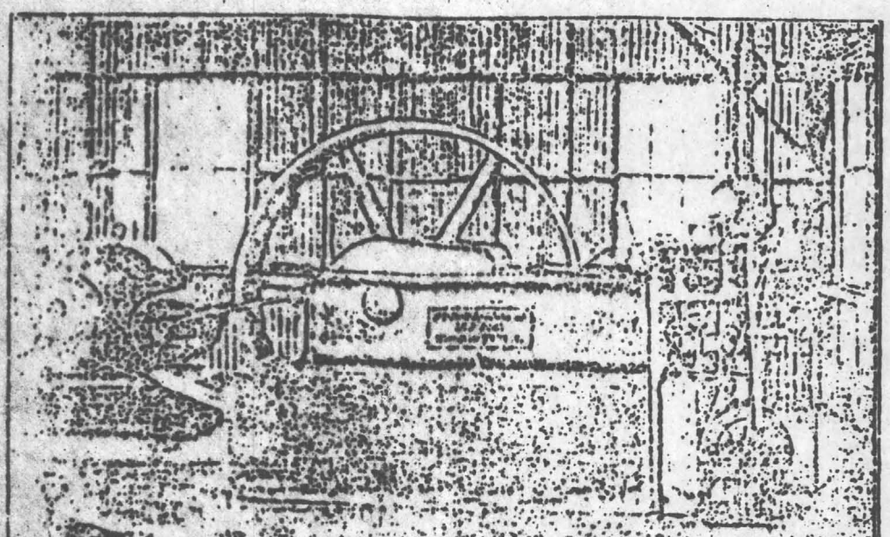
CONTINUES AT RURAL

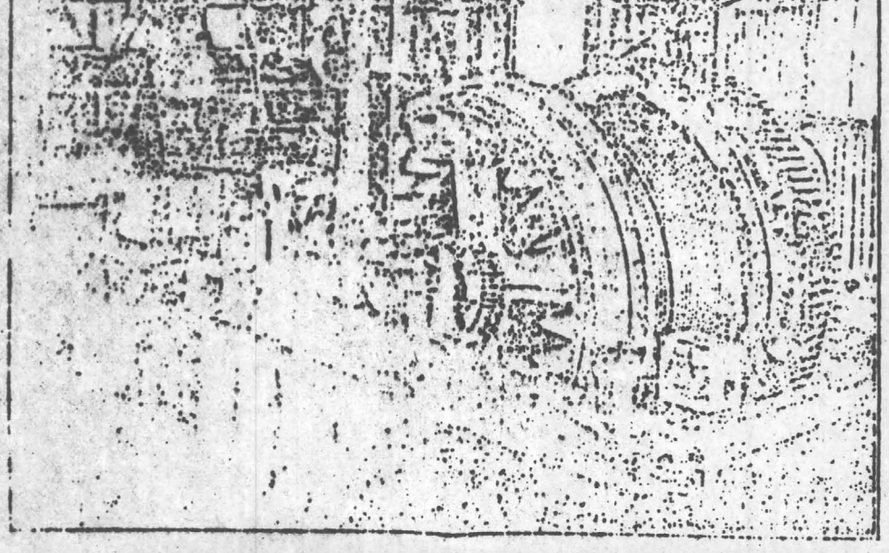
New York people. These mines yielded rich silver ore years ago. They were recently examined by W. W. Widdawson

ON THE RURAL GROUP

hoist and compressor. A 100-ton mill is to be erected as







...ently Equipped Electric Power House, With Compressor and Electric Hoist at Royal-Buckeye Mine

properties that may be in dispute. W. Ridenour, who acted as head of the Ki man party, is of the opinion that the pr erty secured is of great importance. was estimated that the copper show in the outcrops and on the dumps ha value of approximately $800,000 net.

Indians were called in and made m locations, the red men staying with t claims for some time back. Just what status of the Indians will be held to h yet to be decided by the Interior Dep ment, which has to be applied to to g them proper standing in the matter making mineral locations. Some of th Indians have gone into the Diamond Cr section, where they are said to have m locations on excellent copper outcrops.

COPPER AGE

Paul White, in charge of the Cop Age, near Chloride, has had several m at work on that property this week clea ing up and fixing up some timbers the tunnels. It is reported that the C per Age will reopen at an early date. T mine has been a big producer.

Globe-Miami District

ARIZONA COMMERCIAL.

No mining company operating in Globe-Miami district has made more sa factory progress this year in develop its property than the Arizona Commer Mining company, and at the same ti has maintained production at about 1 tons daily.

The mine shows a greater tonnage ore blocked out than ever before, and p duction is coming from every level fr the seventh to the fifteenth, inclusive.

Rapid progress is being made in ou ing the new shaft, which when compl and equipped will be the main produc shaft. A depth of more than 700 feet been reached in sinking and the open of the shaft is being expedited by rai from several levels. It is expected t the new shaft including skip pockets, be completed and fully equipped by m March.

SUPERIOR AND BOSTON

The stockholders of the Superior Boston Copper company of Globe, met cently for the election of five director serve for the ensuing year.

The directors chosen are: Garret M J. B. Hardon, W. F. Fitzgerald, J. Barry and T. R. Drummond. They meet in Boston at an early date to ch their officers.

Very satisfactory progress was m during the past year in the developmen the company's mining property in this trict, under the personal direction of M ager T. R. Drummond. The scheme braced diamond drilling and other ex sive exploration work.

An important strike of ore was made cently in the foot wall vein, on the 4 foot level. This vein where cross-cut seven feet wide, and carries four feet glance ore assaying 24 per cent cop and 92 ounces of silver.

IRON CAP COPPER CO.

In a bulletin to the stockholders of

reopening of the old Rural and
mining properties by the Rural
Inc., has resulted in much activity
ural Park, where these properties
e real producers of the camp until
er depression in the nineties. Dur-
time they were in commission,
ts of upwards of $500,000 were
and the specimens of silver taken
the mines were among the most
al ever taken from old Mother
Today there is hardly a mineral
in the world that does not contain
men of this ore. Solid masses of
resembling a retort, have been
from which radiated beautiful
of wire silver, some of these sil-
ses rising to a height of five and
es from the base. Others laced
k together in fantastic shapes.
f the specimens showed the wires
in calcite, the dazzling white
showing through the bluish tinged
Few specimens of silver ever
rom a mine in the world exceeded
luxury, and thousands of dollars
gh graded from the mine during
ons.

w months ago the Rural and Buck-
operties were purchased by M. B.
for himself and New York asso-
fter W. W. Widdowson, a promi-
ing engineer, who now has charge
consulting work on all of the Dud-
perties, had made a favorable re-
the properties following an ex-
examination.

mplete electrically driven mining
nt has been installed and an excel-
dway built direct to the property.
double compartment shaft is well
nd will be rapidly driven to the
t level. Laterals will be carried
n this shaft, which is on the Buck-
und, through the Rural and the
developed throughout its ore
area. It is intended also to drive
s into adjoining ground where
was taken many years ago.

Rural-Buckeye vein shows big and
n its outcrop, but the larger part
vein has never been entered by
drift, the old owners looking only
high grade that was usually found
mallest part of the property. Re-
rk shows that even the richer ores
t all extracted, as specimens of
ful richness have been found in the
rks, and assays as high as 5,000
were taken from the bottom of the
ral shaft and from the Buckeye
level. Along this level splendid
ore was found, and in the dumps
tonnage was sampled that will give
urns by modern milling process.

Widdowson is now making tests for
which will be of 100 tons capacity
ern in every respect. So far
ore is estimated in sight available
the mill in operation until develop-
re carried on below the permanent
in the ore.

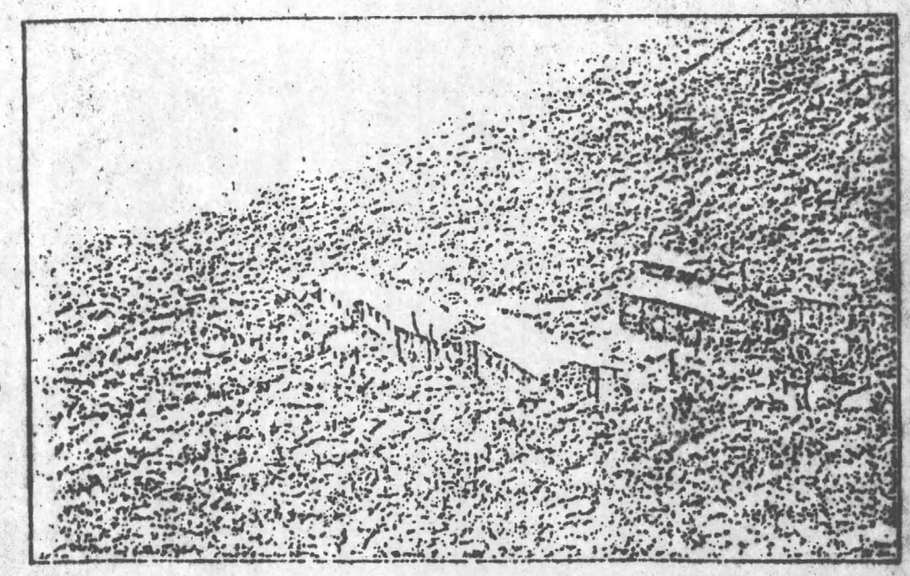
amp is well established in a most
nt place, where a well of excellent
as been developed. The company
financed and has a splendid man-
t. M. B. Dudley is general man-
and W. W. Widdowson, consulting
r.

TO WALLAPAI RESERVATION

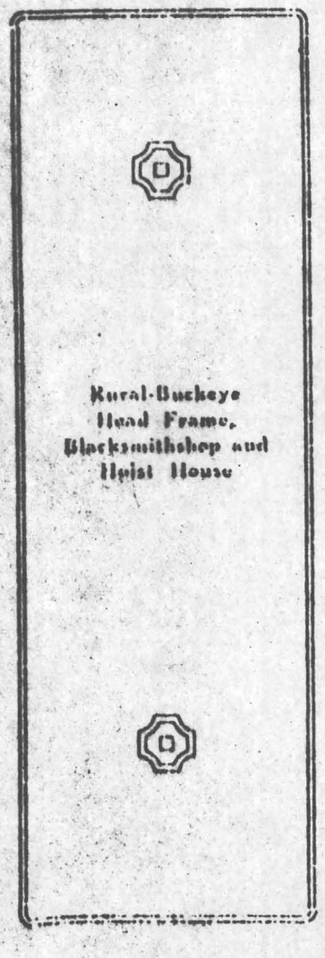
f the greatest rushes into new ter-
hat Mohave county has ever wit
was when the Wallapai Indian
ploration and location.

The opening of the Wallapai reservation to the prospector has been looked forward to for many years, the general belief being that large veins or deposits of copper were found, especially in that portion of the reserve in Coconino county. Considerable ore was shipped from some of the deposits and it is said that fully 1000 tons of ore are available on the one property that was a bone of contention. This claim was filed on by several people and
sult from the fact that mineral and specific time was considered in making the locations. The country there is well mineralized, the exposures of copper being extensive. It is probable that other deposits will be found beneath the lime and other sedementary cap rocks, but it will take time and considerable prospecting to bring it forth.

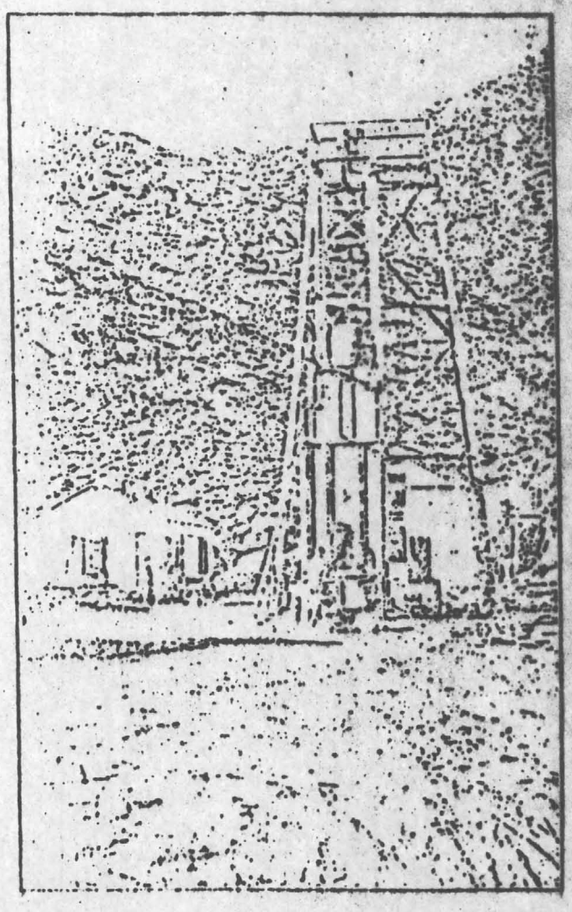
Kingman people report having secured 35 claims on the reserve over which there cannot be dispute and are in no other



Rural-Buckeye Camp



Rural-Buckeye
Head Frame,
Blacksmithshop and
Hoist House



MINERAL PARK

The Rich Silver District of th Which Is Now "Coming R

HILE the discovery of mineral in the region of Mineral Park dates back to the days of the Aztecs, when the wonderful old ruler of that sect, Montezuma, sent his warriors into all parts of the in and desert for gold, silver, copper and portant gem stones, yet it was not until at real mining became important in that Mohave county. Prospectors from Pioche, t. went in there and made a number of nt discoveries. Among these men were Sherman, brother of C. K. Sherman, now dent of Kingman, who with "Keystone" discovered the Keystone mine and did the ork in the camp. The reported discovery silver ore in Mohave county brought many and prospectors from the Nevada and amps, as well as from northern California, on Mineral Park boasted fully 500 souls. eystone mine was taken over by the late Steen, one time sheriff of this county, P. ins, a deputy sheriff and later a member territorial legislature, and others of the a party. These men sunk a shaft to a of 100 feet and opened the ore body for istance extracting some of the richest ore as ever taken from the mines of the coun- ils ore carried values in gold and silver and d values in copper. The operators realized nds of dollars from the mines and finally d of their interests to New York people.

ortly after the discovery of the Keystone Grounds, then a young fellow, discovered ne Star, now known as the Golden Star. mine was operated by O. F. Kuenzer and on a lease and a large amount of ore ship- Wales and also milled at the neral Park mill. Mr. Grounds here also worked the mine tak- tendid ore therefrom. The last nt from the property that went ies netted $500 a ton. This was d by team to the Colorado river edyville, by steamer to Yuma o San Francisco over the newly ed Southern Pacific railroad. reight paid on this ore was enor- and only the richest ore of the t could stand the expense. a concentrating plant was erect- handle the ore from the mine, was found that the values could e saved by the process. The sil- alues in the ore were in the form ay and brittle silver. The writer d in this mill and found that a tension float would take off running over $1,000 to the ton he management refused to allow experiments to be made on the Frue vanners of the old style used to concentrate this ruby This Golden Star mine was re- taken over by the Dudley in- ts and is to be equipped and the rty further exploited. We believe the shaft y 200 feet on the vein. And yet it produced nds of dollars in silver and gold.

Other mines that were discovered at that were the Rattlesnake, now the Home Pay- the Quick Relief, now part of the Keystone Stock and Ewing, now part of the Keystone te; the Retort, now part of the Rural proper- he Fairfield, also part of the Keystone; the e Baden and others. Later the Metallic Az- was found by the late Thomas J. Christie. discovery was an accident. Mr. Christie hunting a horse which he proposed riding to estone and while searching the hillsides over ione Wash he found the float that eventually him to the rich outcrop on the vein. The ter part of this ore was extracted and ship- to San Francisco for treatment. Tons of it ed values as high as $8 per pound in silver. vein appeared to be a gash, or it possibly ed, the owner digging it out at a depth of t 60 feet. Below this there is a big vein carries values in copper, but so far none of igh grade found in the outcrop on the orig- location has ever been found at depth.

The Queen Bee was found in the early eigh- and after producing a large amount of ship- ore became dormant owing to the low price in white metal. It was one of the most im- nt shippers of the district for a number of r and its ores were quite rich in both gold silver. This mine was recently taken over the Dudley interests from James Uncapher The Rural, Buckeye, Setting Sun, Lady Day, silver mines were found in the outcrops Dalgoma from the first. The Argo, which recently passed into the hands of the Dudley interests, was found along in the early nineties and was operated by Thomas McNeely. The ores were heavy in lead and carried silver values. This vein is high up on Sherman's Peak and the ore had to be packed from it to the wagon road at the base of the mountain.

Some years ago the mining of turquoise was one of the most active industries of the camp, but the market soon became glutted with low grade stones and the sale of the semi-gems became less and less and the mining of them became unprofitable. It is in and around these turquoise deposits that old hammers and axes of the Aztecs may be found and evidences of their work are everywhere. The operations must have been carried on by these peoples several hundred years ago, as the Indians have no record of their occupancy of the country, although they have traditions running back to the time when white men came in from the San Francisco mountain country to trade with them. This, it would appear was before the great volcano, as the whites came no more after that wonderful outpouring of lava, which is part of the Indian traditions. The Mohave's even go back to the time of the gathering up of the tribesmen and their journey to the City of Mexico, and of their return after Cortez conquered the country. Many of the hammers and axes are in a very fair state of preservation. Just north of the Ark the main work done by the Aztecs is still visible, a shaft having been sunk to a depth of about 40 feet in the hard material.

Mineral Park became the county seat of Mohave county about 1876, the seat of government being at Cerbat prior to that time. A vote was taken throughout the county, but there being no registration of voters the word of the election officers had to be taken as to the number of votes. The vote of Cedar Valley was the deciding factor in the election. Cedar cast four votes, but these votes were placed in a Preston and Merrill yeast powder can and when they reached the county seat they had risen to 40 and Mineral Park won. Preston and Merrill yeast powder had the greatest rising properties of any powder on the market and the boys pointed to its leavening effect on even the ballots of Cedar precinct.

During the early life of Mineral Park miners and prospectors were harrassed by the Indians and many a prospector was killed in the hills by these savages. Even in the early eighties the Indians were feared by the prospectors, until Gen. Crook brought a number of the chiefs to Fort Whipple and threatened them with a visitation by the Apache, did they desist from attacking a white man when they found alone in the hills.

The gradually dwindling price of silver curtailed production until the past several years, only a small amount of work being carried on in the mines. The building of mills at the Keystone and George Washington revived mining to some extent, but still the price of the metal remained too low to attract attention to silver mining. The sudden rise of the metal within the past six months has brought the attention of the mining world to the possibilities of silver and the knowledge that Mineral Park mines have wonderful potentialities for production of the white metal has brought in many investors. Among the most prominent of these and one who has secured the largest es- tate of mining ground is M. B. D ley has been in the mining gam 18 years and with a partner w the famous Hilltop property ne tain, Nevada. This property, a development campaign, was sol Exploration company, of, London tors of a million dollars. Th more than $2 000,000 last year, partner also located the Copper 30 miles from Hilltop, which th of. This property produced mor last year in placer gold.

Mr. Dudley became attrac county about two years ago, and looked over the country, wonderful mineral possibilities vest. As the months passed a of the country grew his desire good things that he saw caus more and more of his good h with his New York associates largest mining property owne He also purchased for his New Daisell mines, at Cerbat, which ing importance as a big millin the purchases at Mineral Par Besides the Rural, Buckeye, Queen Bee, Mr. Dudley and a quired title to 30 other mining work of unwatering the Rural installation of machinery, the b appointed camp, and the develop erties has caused everyone ou ground in that territory to fe his leavening coin. The C. O. properties in the S try have also been t be unwatered and one of these have ducers of silver. I erties so far taken ful potentialities fo

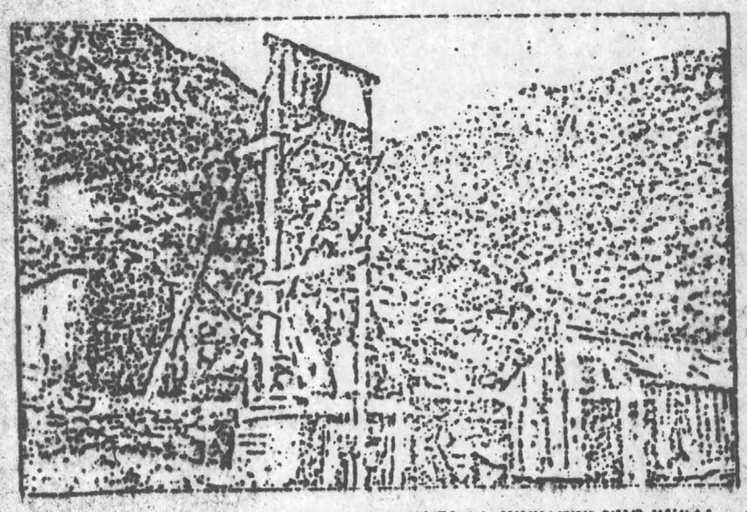
The Washington company is operati Park field, having F. E. C. Derry a company is operat oil flotation and i had excellent resu property is opened and drifts for mar The greater part drifts are in ore, exceptionally high completion of the out for the proper come one of the la camp.

The Kays have mines that have o bilities second to One of the mines width of copper should surely be developed. per zone, to the east and south

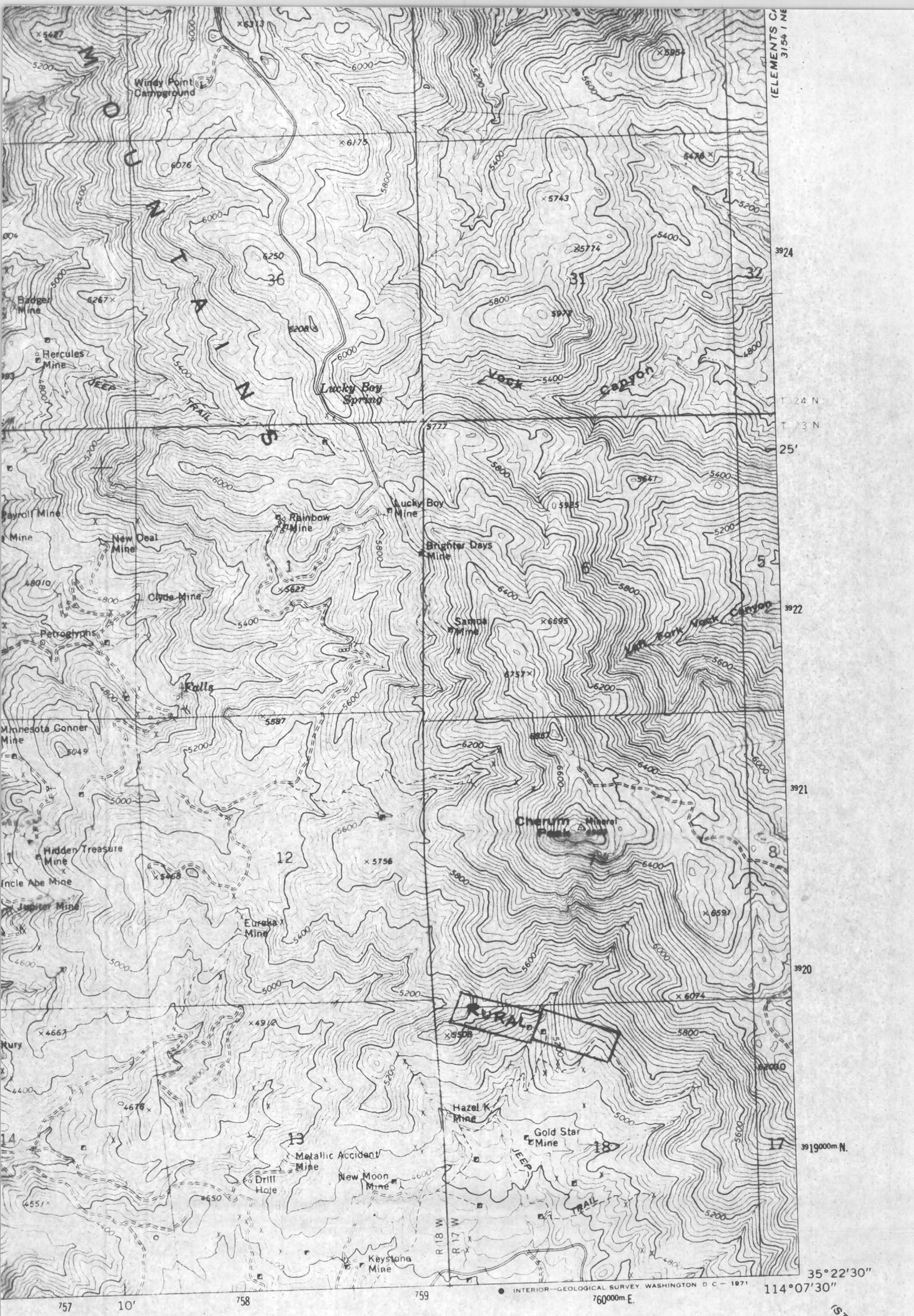
The south part of Min copper bearing, indications th underlie the deposits of turq Only a small amount of real d done on the deposits, althou much rich native and sulphi ed. Recent work on this dep light good bodies of the mat will have to be drilled to gre of the work has been carried pect the territory. A few h to a depth of 60 or 70 feet into at 45 foot and continu depth.

Farther to the south is t tonio, on which a shaft has 200 level. At one time it plant in operation, but lack interferences compelled it carried values in gold, silver day ought to be a going pr same general material as th ther to the north.

The Ithica, Baden Bad other properties give evide A look over the plat will idea of the large number of and when it is realized th values that predicate good idea of the importance of th



TEMPORARY PROSPECTOR'S HOIST ERECTED TO UNWATER THE RURAL.



CHLORIDE, ARIZ.

NW/4 CHLORIDE 15' QUADRANGLE

N3522.5—W11407.5/7.5

1968

Chloride
(BM 4009)
Silver Hill
Wash
Tennessee
Grave
BM 3955
BM 3871
BM 3743
Schuylkill Mine
Distaff Mine
Tennessee Mine
North Georgia Mine
New Jersey Mine
New Tennessee Mine
South Georgia Mine
Powell Mine
Johnny Bull Mine
Well
New Deal Mine
Clyde Mine
Petroglyphs
Silver Age Mine
Falls
Altata Mine
Minnesota Gonner Mine
Manzanita Mine
Blackfoot Mine
Lone Jack Mine
Uncle Abe Mine
Hidden Treasure Mine
Jupiter Mine
Copper Age Mine
Towne Mine
Midnight Mine
Pinkham Mine
Old Comanche Mine
Twentieth Century Mine
Water Tank
Eureka Mine
Lucky Boy Mine
Brighter Days Mine
Sahara Mine
Van Ark Nock Canyon
Chief Mine
Mineral
Hazel K Mine
Gold Star Mine
Metallic Accident Mine
Drill Hole
New Moon Mine
Keystone Mine
FEET
12'30"
(CERBAT)

stockton Hill

Mr Rotheimel [.04 .02 dump 6 oz 12 oz 8 oz Ag]

" Little chief Pingham 3 claims

" chief engineer

.035 Gold 6-8 oz Ag dumps

Surface pitted - 1974 Donald Ross Geo.

3 to 4 tons dump

Shipped dumps March 176000 lbs 88 tons Douglas Phelps Dodge 8.20 oz Ag

.04 Au 1.73% Cu

$ 11,000 freight

Tax free exchange?

Rural - Buckeye Mines

Highlights

Little Chief Chief Engineer Group

150,000 Located and for years held by E. Ross Householder, E.M., Mohave County Engineer, Pioneer Mining Engineer, Legislat

50 acres The main workings consist of Two 80' shafts and 300 feet of drifting and a 550' cross

hief tunnel.

ngineer The shafts have been caved and the tunnel

t is open only for the first two hundred feet.

raction From the original reports and examination

laim of the old workings and oral information from the locals the Little Chief contains a known ore shoot as evidenced by the lease operations and working shafts covering a horizontal area of 700 feet.

The Little Chief is sidelined on the north by the Banner Mine of US Smelting And Refining Company of Salt Lake City, Utah.

Chief Engineer 3 has a tunnel with several hundred feet of drifting and has entered a dike

veinflow grade gold-silver milling ore. This tunnel is still open.

The Chief Engineer 2 has a 90 shaft on the Banner vein showing good silver-gold values in a quartz gangue.

Contains 3,000 feet of Banner vein, very productive ve

" 10,000 **Arizona / Montana** ½ interest

30 acres Contains a quartz vein about 3 feet in width

deeded -striking east to west. Bordered on the north by mill site of Great Land of the Tennessee property. Montana vein intersects Molly Gibson

veinon its property. The Arizona shaft with drift is now completely caved.

Very little development

2 Patented.

Packing 213.10 Acres Patented
555 acres Mineral R
total 768.1 acres in mine group

Highlights

Mrs. Fred

$250,000 — **Pinkham** — 3/4 int. Rothermel — 1/4 int. Babcock

20.66 acres deeded + 0 Acres Mineral Rights

Geologist estimates 8,000 tons of dump, 4 to 8 ounces silver on dump (main dump area)
4 unexplored veins - little or no development work on these other veins, vein averages about 10' in wid
Pinkham Annex - recorded with BLM
1 cross cut tunnel and several small shafts
Property to the south is held by Indrum Corp & El Paso Nat. Gas

Rural - Buckeye

300,000 — 10.44 acres deeded + 0 Acre Mineral Rights

3,300' of Rural vein
1 700' tunnel with upraise and winze
700' level runs off of winze
Rural contains 200' shaft and 110' tunnel wit 50' winze
Property to west is held by Exxon and to the north, south and east is held by Duval Corp (subsidiary of Pennzoil)
Duval has been drilling south of the mine property near the New Moon
Silver and gold ore visible in tunnel level and in the stopes
Very little development on the Rural Patented
There are several additional undeveloped veins on the Rural and Buckeye.
Work is presently being done in area where main working vein is intersected by exp. width another vein - contains rich silver and gold streak
Rural No. 2 is patented, Buckeye is Mineral Survey No. 1165 Also contains Rural Extension, Rural Annex, Rural Annex 1 unpatented lode claims - all recorded with BLM.
Over 1 mile of veins
Rural Annex has a strong, well defined vein structure.
Bladed road access from open pit

Highlights

Copper Chief (Darling Mine)

300,000 — 5 Patented 10 unpatented lode claims

101 Acres deeded + 200 Acres mineral Rights — Copper Chief No. 1 has open cut showing Scheelite ore

Copper Chief 3 has Chlorite Schist showing Copper Carbonate and Silver mineralization.

Copper and silver showings on east side of claim group

Contains large reserve of limestone and epidote-actinolite rock

Mining engineer report available on examination of west area of claim group - Tungsten.

Last Production was in 1956 for Tungsten Prospect for land exchange with U.S. Government

$100,000 — **Bee**

20.66 Acres deeded plus 200 Acres mineral rights — 1 Patented 10 Lode Claims

2 gold veins - main vein averages .39 oz. Gold across 30" width and 5 foot vein .18 oz. gold (Average of samples)

(8' width) large quartz vein carrying Copper sulfides and silver - being developed as it is a desirable siliceous ore for flux. 15 miles from copper smelter

3 silver veins on patented claim showing silver, lead and zinc.

thoroughly examined by mining engineer and is presently under active exploration and development by same mining company.

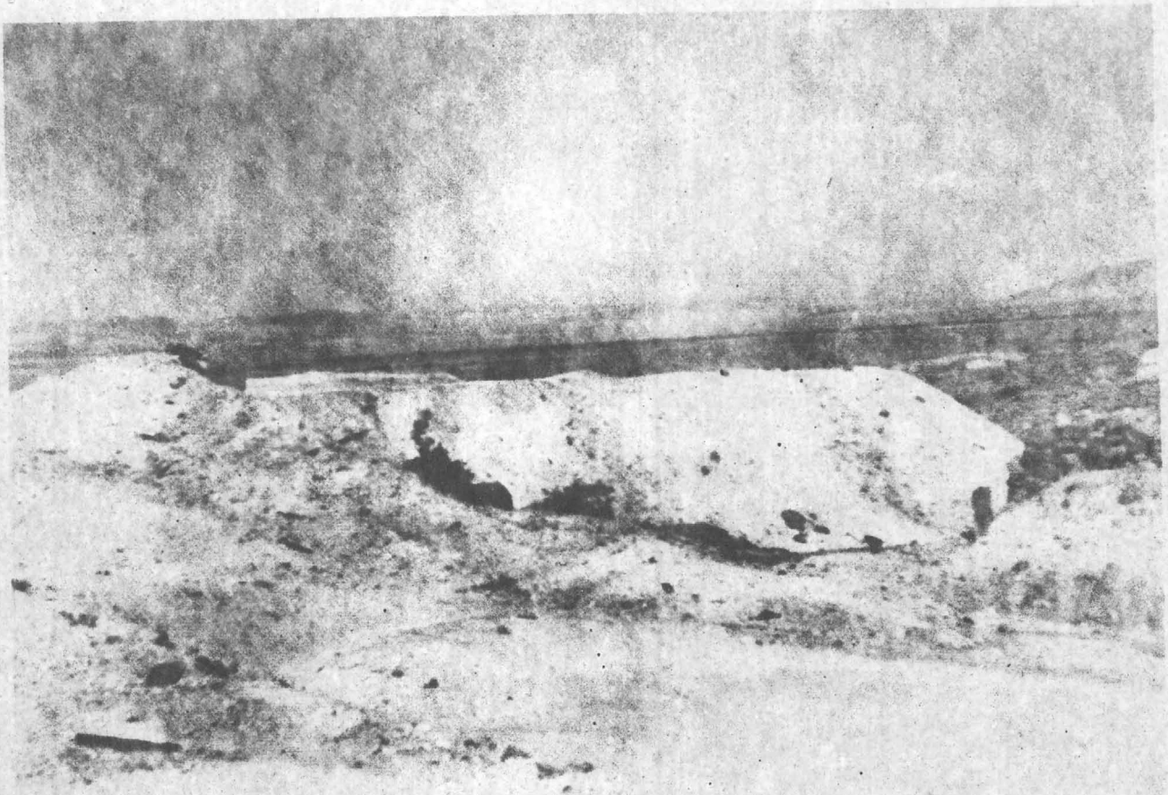
One vein shows Wulfenite crystals, over 1 mile of veins

$50,000 — **Hazelwood** 1 Patented

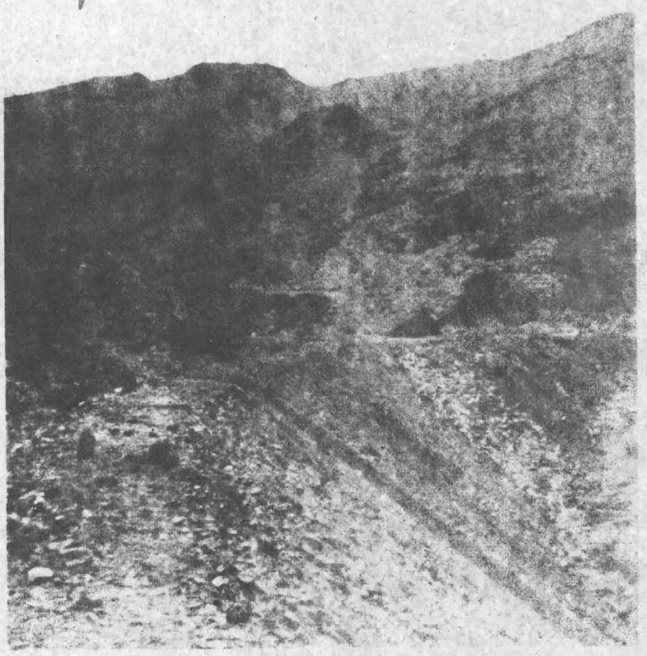
20.4 Acres deeded — Tunnel and open cut show mineralized quartz vein two to four feet in width, old well on property, beautiful scenery.

Several samples taken from property showed green horn silver - identified by Anthony Lane, mining engineer.

Major claim of claim group - has permanent access.



PINKHAM



COPPER CHIEF

RURAL

MS 2456

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

THE ARIZONA DEPARTMENT OF MINERAL RESOURCES MAKES NO REPRESENTATION AS TO THE ACCURACY OF THE CONTENTS OF THESE DOCUMENTS.

Mine: Rural — Date: April 8, 1976

District: Mineral Park, Mohave County — Engineer: Ken A. Phillips

Subject: Present status

Owner: John Rothermel, 3016 W. Mercer Lane, Phoenix, 942-4470.

Claims: Rural (patented), Rural Anex, Rural Anex #1, Rural Extension (3 unpatented)

Location: One and one-half miles northeast of Mineral Park near the south base of Cherum Peak (Schrader, 1909, p. 83) NE¼NW¼ S. 18 T23N R17W (USGS Chloride Quad)

Commodity: Silver (gold, copper, zinc and lead)

Minerals: Dominant vein minerals; pyrite, arsenopyrite and quartz with subordinate chalcopyrite, sphalerite and galena. Silver was reported to occur primarily as native silver along with argentite and cerargyrite (Schrader, 1909, p. 83; Bastin, 1923, p. 24)

Geology: Country rock is medium-grained gneissic biotite granite and associated schist. It is intruded by dikes of granite porphyry. The mineralization occurs in a fissure vein 2-8 feet in width. The vein strikes west of north and dips 80° south. The mineralization is believed associated with a dike of the granite porphyry, most of which occur nearly to the north. The deposit has contained ore shoots ranging from 4 to 20 feet in width, which consist mostly of pyrite and chalcopyrite with parallel streaks of arsenopyrite, black oxide on manganese, gray chert and quartz. (Schrader, 1909, p. 84).

Past production: The only reported production was 152.282 short tons of silver-gold ore averaging 315.31 oz. Ag/ton and 6.41 oz Au per ton in 1886-87 (Bastin, 1924, p. 24)

Present activity: John Rothermel reported that he has sampled the surface of the vein by small pits in 50 foot intervals over approximately 300 feet of exposure. Six samples ranged from 60-90 oz Ag/ton and 0.01 Au/ton. The vein is reported to pinch and swell from 2 to 8 feet in width.

References:

Schrader, F.C.; 1909, Mineral Deposits of the Cerbat Range, Black Mts. and Grand Wash Cliffs, Mohave County, Arizona; U.S. Geol. Survey Bull. 397, 226 p.

Bastin, Edson S., 1923; Origin of Certain Rich Silver Ores Near Chloride and Kingman, Arizona, in Contribtuions to Economic Geology; U.S. Geol. Survey Bull. 750, p. 17-39

NO TAILINGS

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astern part of the district,
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ion of about 5,300 feet, or
good wagon road extends
is made by a good trail
by Stephen A. Tyler, the
1905, but only necessary

The mine is developed mainly by two crosscut tunnels and drifts, mostly situated within a vertical range of 100 feet, principally on the Gold Eagle claim.

The country rock is pre-Cambrian medium-grained gneissoid biotite granite. The vein strikes N. 37° W. and dips about 75° SW., into the mountains. It has a width of about 40 feet and seems to consist mainly of an altered and partly replaced crushed and recemented aplitic dike. The entire width is claimed to be low-grade ore, but the values occur chiefly in the first 6 or 7 feet of the hanging-wall side of the dike and are best near its contact with the granite. The hanging wall also carries 6 inches to 2 feet of slickensided gouge, between which and the country rock occurs quartz breccia containing some ore.

The mine produces gold-silver-lead ore. The principal ore minerals consist of galena and cerusite. The last carload shipped at the time of the writer's visit averaged gold 3.16 ounces to the ton, silver 8 ounces to the ton, and lead 17.5 per cent. At last accounts the mine is reported to be sold to a Los Angeles company.

LADY BUG MINE.

The Lady Bug, an old mine, is about half a mile southeast of the Tyler mine, close to the Tyler camp, at an elevation of about 5,000 feet. It was located in 1886 by Isaac Conkey, the owner, now residing at Mineral Park. It is developed principally by a 63-foot shaft, 100 or more feet of drifts, and a number of surface openings on the vein.

The country rock is pre-Cambrian biotite granite, the same as at the Tyler mine, and it is to a considerable extent intruded by the granite porphyry of Mineral Park. The vein is reported to be 7 to 8 feet thick. It lies nearly parallel with the Tyler vein, but differs from it in being composed of a gangue which is mainly quartz. The ore contains principally silver chloride and gold with a little galena. A considerable portion of the ore mined is reported to have averaged $300 to $500 a ton. The production is reported to be $6,000.

RURAL AND BUCKEYE MINES.

The Rural and Buckeye mines are in the northeastern part of the district, 1½ miles northeast of Mineral Park, near the south base of Cherum Peak, at an elevation of about 5,000 feet. They are reached by wagon road. They are situated but a few hundred feet apart on the same vein, the Rural being on the west and the Buckeye on the east side of the same gulch. The Rural is owned by E. F. Thompson, of Kingman, and the Buckeye by C. E. Lovett and others, of Denver, Colo.

The Rural is developed principally by a 200-foot shaft, about 100 feet of drift, and a winze. The drift extends westward, its face being about 110 feet distant from the shaft. The shaft contains some water. The Buckeye is developed principally by about 750 feet of drift, extending in an easterly direction. Toward the face of the drift the vein is faulted off to the northeast by a lateral throw of about 75 feet.

The country rock is medium-grained gneissoid biotite granite and associated schist. It is intruded by dikes of granite porphyry. The deposits occur in a fissure vein which is 2 to 4 feet in width in the Rural and attains a maximum of 8 feet in the Buckeye. In the Rural it dips about 80° S. and in the Buckeye about 70° N. In both mines it is associated with a dike of the granite porphyry, masses of which occur to the northeast near by. The gangue is quartz and is generally "frozen" to the walls. It shows ore shoots ranging from 4 to 20 feet in width, which consist mostly of pyrite and chalcopyrite, with parallel streaks of arsenopyrite, black oxide of manganese, gray chert, and quartz, the quartz being more prominent in the Buckeye than in the Rural mine.

The ore contains silver, gold, and copper, with high silver and gold values. The display of ores from these mines, containing masses of solid silver and beautiful specimens of wire silver, is said to have been awarded the silver medal at the Louisiana Purchase Exposition.

The production, exact figures of which are not available, is reported to mount well into thousands of dollars in silver and gold, and much good ore is said to be available in the mines.

WINDY POINT MINE.

The Windy Point mine is in the northeastern part of the district, about a mile northeast of Mineral Park, on open sloping or hilly ground, at an elevation of about 4,800 feet. It is owned by the Arizona Gold Mining and Metallurgical Company, with headquarters at Kingman. It is developed mainly by a 105-foot shaft and a small amount of drift. The shaft starts in gneiss, but soon enters the granite. The mine is newly equipped with a gasoline hoist and electric drills.

The country rock is the pre-Cambrian gneissoid biotite granite and black amphibolite schist. The granite is less dark and micaceous than at the Rural and Buckeye mines. The structure or sheeting strikes N. 85° W. and dips about 75° S. Both the granite and the schist are more or less sericitized and impregnated with pyrite and arsenopyrite near the vein. About 50 feet from the vein, on its

Mineral Park properties taken over by M. F. Dudley and New York associates, who

60 ounces A TON

8.2 oz per ton on the dump ~~ATO~~

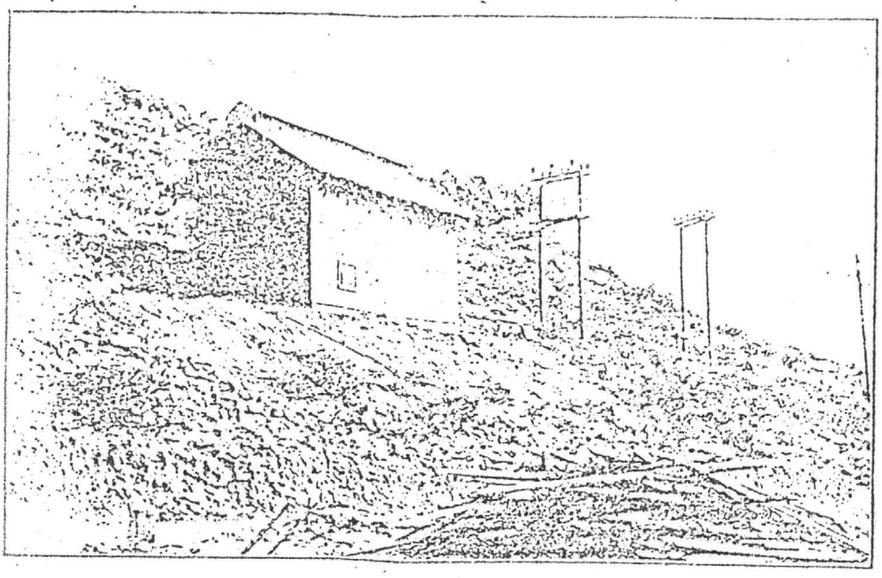
$ 300,000

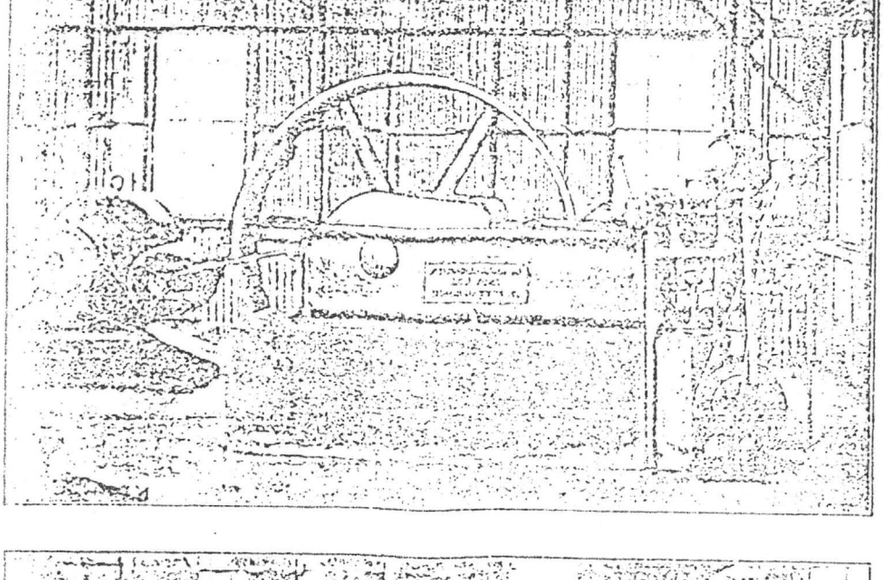
ALL 3 MINES ARE WITHIN 1 MI FROM EACH OTHER – 10 MILES N OF KINGMAN

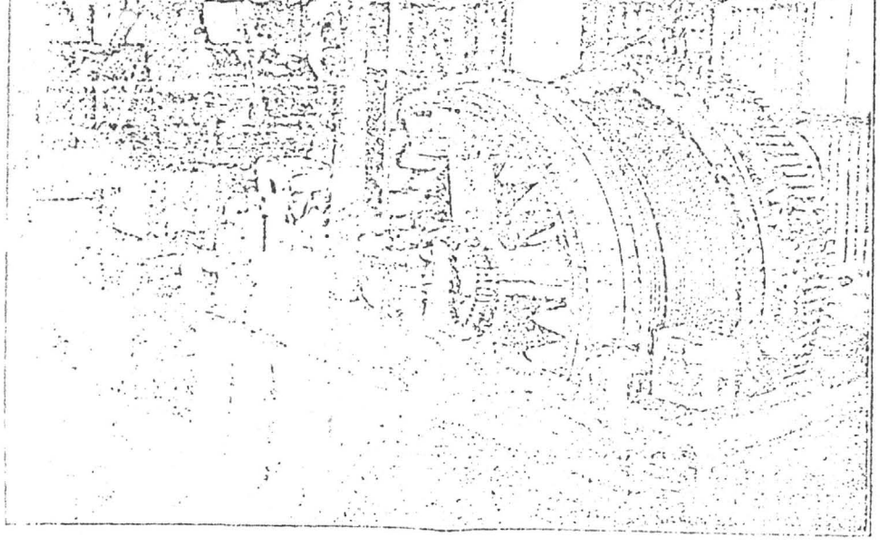
rely put all other mines of the
p is the shade when it came to
Mr. Dudley intends to clear

Buckeye shaft for the purpose of
clearing it of water and making it
easier to keep operations under way

RURAL URL DUDI







Modernly Equipped Electric Power House, With Compressor and Electric Hoist at Rural-Buckeye Mine

properties that may be in dispute. W. F Ridenour, who acted as head of the Kinp man party, is of the opinion that the prop erty secured is of great importance. was estimated that the copper showin in the outcrops and on the dumps had value of approximately $800,000 net.

Indians were called in and made mar locations, the red men staying with the claims for some time back. Just what th status of the Indians will be held to be yet to be decided by the Interior Depar ment, which has to be applied to to giv them proper standing in the matter c making mineral locations. Some of thes Indians have gone into the Diamond Cree section, where they are said to have mad locations on excellent copper outcrops.

COPPER AGE

Paul White, in charge of the Coppe Age, near Chloride, has had several me at work on that property this week clear ing up and fixing up some timbers i the tunnels. It is reported that the Cop per Age will reopen at an early date. Th mine has been a big producer.

Globe-Miami District

ARIZONA COMMERCIAL

No mining company operating in th Globe-Miami district has made more satis factory progress this year in developing its property than the Arizona Commercia Mining company, and at the same time has maintained production at about 25 tons daily.

The mine shows a greater tonnage o ore blocked out than ever before, and pro duction is coming from every level fron the seventh to the fifteenth, inclusive.

Rapid progress is being made in open ing the new shaft, which when complete and equipped will be the main productio shaft. A depth of more than 700 feet ha been reached in sinking and the openin of the shaft is being expedited by raisin from several levels. It is expected tha the new shaft including skip pockets, wil be completed and fully equipped by nex March.

SUPERIOR AND BOSTON

The stockholders of the Superior and Boston Copper company of Globe, met re cently for the election of five directors to serve for the ensuing year.

The directors chosen are: Garret Mott J. B. Hardon, W. F. Fitzgerald, J. F Barry and T. R. Drummond. They wil meet in Boston at an early date to choose their officers.

Very satisfactory progress was made during the past year in the development o the company's mining property in this dis trict, under the personal direction of Man ager T. R. Drummond. The scheme em braced diamond drilling and other exten sive exploration work.

An important strike of ore was made re cently in the foot wall vein, on the 400 foot level. This vein where crosscut, is seven feet wide, and carries four feet of glance ore assaying 24 per cent copper and 92 ounces of silver.

IRON CAP COPPER CO.

In a bulletin to the stockholders of the

RAL AND BUCKEYE REOPEN

reopening of the old Rural and e mining properties by the Rural Inc., has resulted in much activity eral Park, where these properties e red producers of the camp until er depression in the nineties. Dur- time they were in commission, ds of upwards of $500,000 were and the specimens of silver taken he mines were among the most al ever taken from old Mother Today there is hardly a mineral in the world that does not contain men of this ore. Solid masses of resembling a retort, have been from which radiated beautiful of wire silver, some of these sil- sses rising to a height of five and es from the base. Others laced k together in fantastic shapes. f the specimens showed the wires in calcite, the dazzling white howing through the bluish tinged Few specimens of silver ever rera a mine in the world exceeded laxury, and thousands of dollars gh graded from the mine during ons.

w months ago the Rural and Buck- operties were purchased by M. B. for himself and New York asso- fter W. W. Widdowson, a promi- ning engineer, who now has charge consulting work on all of the Dud- perties, had made a favorable re- the properties following an ex- examination.

mplete electrically driven mining ent has been installed and an excel- dway built direct to the property. double compartment shaft is well nd will be rapidly driven to the t level. Laterals will be carried n this shaft, which is on the Buck- und, through the Rural and the developed throughout its ore area. It is intended also to drive s into adjoining ground where was taken many years ago.

Rural-Buckeye vein shows big and n its outcrop, but the larger part vein has never been entered by drift, the old owners looking only high grade that was usually found mallest part of the property. Re- rk shows that even the richer ores t all extracted, as specimens of ful richness have been found in the cks, and assays as high as 5,000 were taken from the bottom of the ral shaft and from the Buckeye level. Along this level splendid ore was found, and in the dumps tonnage was sampled that will give rns by modern milling process.

Widdowson is now making tests for which will be of 100 tons capacity dern in every respect. So far ore is estimated in sight available the mill in operation until develop- re carried on below the permanent in the ore.

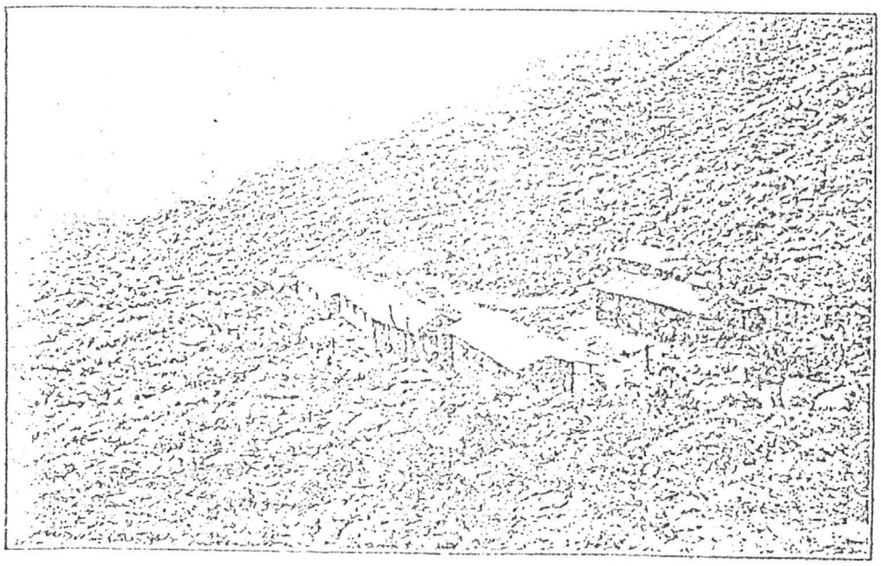
amp is well established in a most nt place, where a well of excellent as been developed. The company financed and has a splendid man- M. B. Dudley is general man- nd W. W. Widdowson, consulting e.

TO WALLAPAI RESERVATION

f the greatest rushes into new ter- hat Mohave county has ever wit was when the Wallapai Indian reservation was opened to mineral exploration and location.

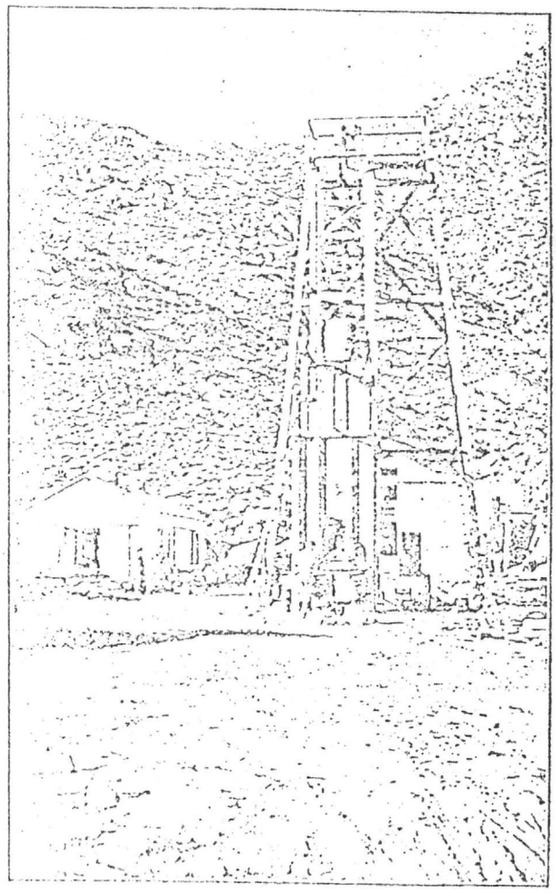
The opening of the Wallapai reservation to the prospector has been looked forward to for many years, the general belief being that large veins or deposits of copper were found, especially in that portion of the reserve in Coconino county. Considerable ore was shipped from some of the desopits and it is said that fully 1000 tons of ore are available on the one property that was a bone of contention. This claim was filed on by several people and it is probable that some litigation will result from the fact that Montain and Pacific time was considered in making the locations. The country there is well mineralized, the exposures of copper being extensive. It is probable that other deposits will be found beneath the lime and other sedementary cap rocks, but it will take time and considerable prospecting to bring it forth.

Kingman people report having secured 35 claims on the reserve over which there cannot be dispute and are in on other



Rural-Buckeye Camp

Rural-Buckeye Head Frame, Blacksmithshop and Hoist House



MINERAL PARK

The Rich Silver District of the ... Which Is Now "Coming Ba

HILE the discovery of mineral in the region of Mineral Park dates back to the days of the Aztecs, when the wonderful old ruler of that sect, Montezent his warriors into all parts of the in and desert for gold, silver, copper and portant gem stones, yet it was not until at real mining became important in that Mohave county. Prospectors from Pioche, t went in there and made a number of nt discoveries. Among these men were Sherman, brother of C. E. Sherman, now dent of Kingman, who with "Keystone" discovered the Keystone mine and did the ork in the camp. The reported discovery silver ore in Mohave county brought many and prospectors from the Nevada and amps, as well as from northern California, on Mineral Park boasted fully 500 souls. eystone mine was taken over by the late Steen, one time sheriff of this county, P. ins, a deputy sheriff and later a member territorial legislature, and others of the n party. These men sunk a shaft to a of 100 feet and opened the ore body for istance extracting some of the richest ore as ever taken from the mines of the coun- his ore carried values in gold and silver and d values in copper. The operators realized nds of dollars from the mines and finally ed of their interests to New York people.

ortly after the discovery of the Keystone Grounds, then a young fellow, discovered ne Star, now known as the Golden Star. mine was operated by O. F. Kuencer and on a lease and a large amount of ore ship- Wales and also milled at the neral Park mill. Mr. Grounds hers also worked the mine tak- lendid ore therefrom. The last nt from the property that went ies netted $800 a ton. This was d by team to the Colorado river rdyville, by steamer to Yuma o San Francisco over the newly ted Southern Pacific railroad. reight paid on this ore was enor- and only the richest ore of the t could stand the expense. a concentrating plant was erect- handle the ore from the mine, was found that the values could e saved by the process. The sil- lues in the ore were in the form by and brittle silver. The writer d in this mill and found that a tension float would take off s running over $4,000 to the ton he management refused to allow xperiments to be made on the Frue vanners of the old style used to concentrate this ruby This Golden Star mine was re- taken over by the Dudley in- ts and is to be equipped and the rty further exploited. We believe the shaft y 200 feet on the vein. And yet it produced ands of dollars in silver and gold.

Other mines that were discovered at that were the Rattlesnake, now the Home Pas- the Quick Relief, now the Katie; the Ithica; Stark and Ewing, now part of the Keystone e; the Retort, now part of the Rural proper- he Fairfield, also part of the Keystone; the n Baden and others. Later the Metallic Ac- t was found by the late Thomas J. Christie. discovery was an accident. Mr. Christie hunting a horse which he proposed riding to bstone and while searching the hillsides over lum Wash he found the float that eventually him to the rich outcrop on the vein. The ter part of this ore was extracted and ship- to San Francisco for treatment. Tons of it ed values as high as $8 per pound in silver. vein appeared to be a gash, or it possibly ed, the owner digging it out at a depth of 60 feet. Below this there is a big vein carries values in copper, but so far none of igh grade found in the outcrop on the orig- location has ever been found at depth.

The Queen Bee was found in the early eigh- and after producing a large amount of ship- ore became dormant owing to the low price he white metal. It was one of the most im- nt shippers of the district for a number of rs and its ores were quite rich in both gold silver. This mine was recently taken over he Dudley interests from James Uncapher

The Rural, Buckeye, Setting Sun, Lady Bug, many other mines were found in the eighties more shippers from the first. The Arge- which recently passed into the hands of the Dudley interests, was found along in the early nineties and was operated by Thomas McNeely. The ores were heavy in lead and carried silver values. This vein is high up on Sherum's Peak and the ore had to be packed from it to the wagon road at the base of the mountain.

Some years ago the mining of turquoise was one of the most active industries of the camp, but the market soon became glutted with low grade stones and the sale of the semi-gems became less and less and the mining of them became unprofitable. It is in and around these turquoise deposits that old hammers and axes of the Aztecs may be found and evidences of their work are everywhere. The operations must have been carried on by these peoples several hundred years ago, as the Indians have no record of their occupancy of the country, although they have traditions running back to the time when white men came in from the San Francisco mountain country to trade with them. This, it would appear was before the great volcano, as the whites came no more after that wonderful outpouring of lava, which is part of the Indian tradition. The Mohave's even go back to the time of the gathering up of the tribesmen and their journey to the City of Mexico, and of their return after Cortez conquered the country. Many of the hammers and axes are in a very fair state of preservation. Just north of the Ark the main work done by the Aztecs is still visible, a shaft having been sunk to a depth of about 40 feet in the hard material.

Mineral Park became the county seat of Mohave county about 1876, the seat of government being at Cerbat prior to that time. A vote was taken throughout the county, but there being no registration of voters the word of the election officers had to be taken as to the number of votes. The vote of Cedar Valley was the deciding factor in the election. Cedar cast four votes, but these votes were placed in a Preston and Merrill yeast powder can and when they reached the county seat they had risen to 40 and Mineral Park won. Preston and Merrill yeast powder had the greatest rising properties of any powder on the market and the boys pointed to its leavening effect on even the ballots of Cedar precinct.

During the early life of Mineral Park miners and prospectors were harrassed by the Indians and many a prospector was killed in the hills by these savages. Even in the early eighties the Indians were feared by the prospectors, until Gen. Crook brought a number of the chiefs to Fort Whipple and threatened them with a visitation by the Apache, did they desist from attacking a white man when they found alone in the hills.

The gradually dwindling price of silver curtailed production until the past several years, only a small amount of work being carried on in the mines. The building of mills at the Keystone and George Washington revived mining to some extent, but still the price of the metal remained too low to attract attention to silver mining. The sudden rise of the metal within the past six months has brought the attention of the mining world to the possibilities of silver and the knowledge that Mineral Park mines have wonderful potentialities for production of the white metal has brought in many investors. Among the most prominent of these and one who has secured the largest estate of mining ground is M. B. Dud ley has been in the mining game 18 years and with a partner was the famous Hilltop property near tain, Nevada. This property, afte development campaign, was sold Exploration company, of London, f ters of a million dollars. The more than $2 000,000 last year. M partner also located the Copper Ca 30 miles from Hilltop, which they of. This property produced more last year in placer gold.

Mr. Dudley became attracte county about two years ago, hav and looked over the country, an wonderful mineral possibilities pr vest. As the months passed and of the country grew his desire fo good things that he saw caused more and more of his good hard with his New York associates he largest mining property owners He also purchased for his New Yo Daisell mines, at Cerbat, which a ing importance as a big milling p the purchases at Mineral Park Besides the Rural, Buckeye, Gold Queen Bee, Mr. Dudley and asso quired title to 30 other mining p work of unwatering the Rural an installation of machinery, the buil appointed camp, and the developm erties has caused everyone ownin ground in that territory to feel his leavening coin. The C. O. D. properties in the Stoc try have also been tak be unwatered and o one of these have b ducers of silver. In f erties so far taken ov ful potentialities for o

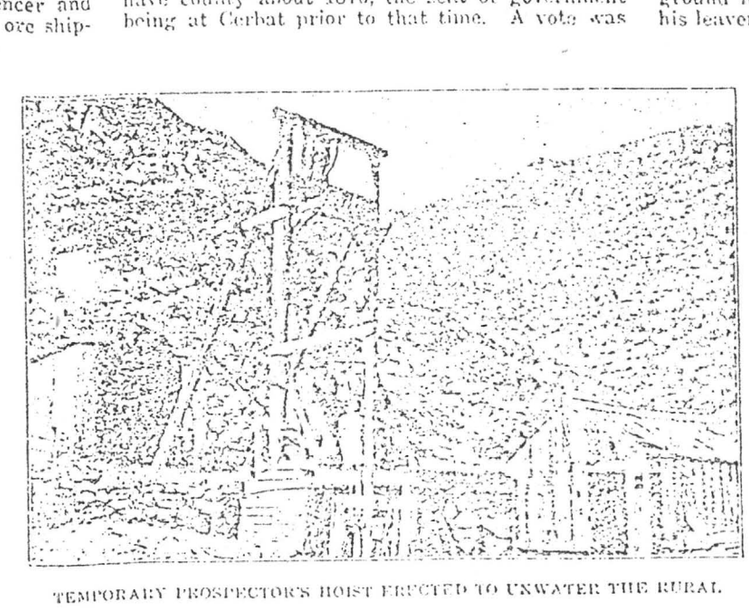
The Washington A company is operating Park field, having bee F. E. G. Berry and company is operating oil flotation and is r had excellent results property is opened by and drifts for many l The greater part of drifts are in ore, son exceptionally high va completion of the wo out for the property come one of the large camp.

The Kays have so mines that have ore p bilities second to no One of the mines width of copper bea should surely be developed. Th per zone, to the east and south of

The south part of Minera copper bearing, indications that underlie the deposits of turquoi Only a small amount of real deve done on the deposits, although ranch rich native and sulphides ed. Recent work on this deposi light good bodies of the materia will have to be drilled to greate of the work has been carried to pect the territory. A few hole to a depth of 60 or 70 feet an into at 45 feet and continued depth.

Farther to the south is the tonio, on which a shaft has be 200 level. At one time it ha plant in operation, but lack of interferences compelled its d carried values in gold, silver a day ought to be a going prope same general material as the G ther to the north.

The Ithica, Baden Baden, other properties give evidence o A look over the plat will give idea of the large number of loc and when it is realized that values that predicate good thin idea of the importance of that s



TEMPORARY PROSPECTOR'S HOIST ERECTED TO UNWATER THE RURAL

RURAL—(Kingman)—Preparing for installation of 100-ton mill, with electrical equipment. Bunkhouses for 50 men being built. Constructing new road for motor truck transportation. Rich wire silver taken from bottom of shaft. Situated at Mineral Park.

UIP RURAL MINE HEADFRAME-HOIST

OCT 20 1913

e new headframe for the Rural has been completed and will be as soon as the machinery can otten in. Some of the electric hinery has been received at King- and the balance will be here Mon- This will be forwarded by train Keystone siding, thence to the mine truck. All foundations have been in and little time will be lost in installing of the plant. As soon the machinery is in commission ing will be resumed on the new pendicular shaft and a depth of feet attained as soon as possible. work of unwatering the old Buck- shaft is in progress and the mine being cleared of debris and caves llow of the opening up and extrac- of mill ores.

he Buckeye is under the manage- of W. W. Widdowson, consult- engineer for M. B. Dudley and as- ates.

AL AND BUCKEYE OPEN

Rural and Buckeye mines recently ed by New York capitalists fur- n agreeable surprise to those who lined to doubt the stories of ously rich ore taken from the mines. surprise came when the mines were ered and found to contain bodies to $50 ore still in place, as well as ge quantities of very rich silver.

RAL AND BUCKEYE INSTALL MACHINERY

OCT 17 1913

he Rural and Buckeye mines are connected up with the big power from the plant of the Desert Pow- nd Water company at Kingman as soon as the new machinery has gotten in place the work of un- ring the Buckeye mine will be way. An 800-cubic foot com- sor, hoist and other machinery has out to the mine and is being in- led. The cement bases have been and are in readiness to receive machinery.

e new shaft, which is to be the working shaft on both Rural and keye, has reached a depth of 70 this work having been carried hand to this point. Beginning week the new hoist will be in

mission and the work will be car- on with power drills. Within the four months the shaft should be 500 level, the present objective. that point the territory of the l, Buckeye and another property be thoroughly exploited. The will be under the immediate sup- ion of W. W. Widdowson, who is ted from New York early next

OCT 19 1913

All the machinery has been installed at the Buckeye-Rural property, at Mineral Park, and the sinking of the new shaft will be under way by Monday of next week. The juice was turned on yesterday and the machinery was tried out today. The new Buckeye shaft will be sunk with three shifts of miners. The old Buckeye will be unwatered, a new Cameron No. 6 pump having been installed to replace the gasoline pump now in use. With the water reduced to the 150 level a drift will be carried into Rural ground and that propety exploited. The new pump is expected to drain the mine and allow of sinking the new shaft without water impediment. As soon as the Rural vein is tapped by the deep level the Buckeye tunnel will be driven farther on the vein to ascertain if there are other ore shoots worth while. The Buckeye vein to the east of the main workings shows great width and is fairly well mineralized. The new shaft has reached a depth of nearly 100 feet, this work having been carried on by hand.

WELL EQUIPPED FOR DEVELOPMENT

Kingman

One of the finest plants of machinery in the state has been put in commission at the Rural-Buckeye mines, at Mineral Park. The plant consists of an electrically driven hoist, compressor of 800 cubic feet capacity, Cameron pump, automatic drill sharpener and everything needed in and about a well regulated mining property. The shaft is equipped with a big gallows frame and all possible safeguards. This shaft is now down close to 100 feet and is timbered up double-compartment with heavy timbers.

OCT 18 1913

The camp buildings are comfortable and commodious, there being separate sleeping quarters for the men and a general assembly or reading room. An excellent boarding house, office and other buildings make up the camp. The best water in the Mineral Park basin has been developed on the property and will be conveyed to a large tank on the sidehill above the camp, where pressure for fire or other purposes may be obtained. The camp is one of the best situated and ideal places in the county, lying picturesquely below the towering Sherum's Peak.

This property was operated many years ago and thousands of tons of rich silver ore was taken out and shipped to the smelters. So rich was some of the ore that thousands of dollars in specimens were taken from the property by people having mineral cabinets. These specimens adorn practically every cabinet in the world, no collection of minerals being complete without a silver specimen from these mines. With greater depth it is expected that another big shoot of the same character of ore will be opened, and the thousands of tons of mill ore will become available. It is one of the properties taken over some time ago by M. B. Dudley and associates, W. W. Widdowson being the consulting engineer and under whose directions the equipment and development of the property is being carried on. Within a few weeks the same company expect to have equipment on other properties of the big group and will have sinking under way to great depth under the old ore bodies.

RURAL-BUCKEYE MINE DEVELOPMENT WORK

The main working shaft on the Buckeye mine is being pushed rapidly downward and within the next thirty days it is expected that it will be deep enough to begin the crosscut to the Rural mine, and unwatering that property so that exploration may be carried on there. The old Buckeye shaft and the old works are almost clear of water. As soon as the mine has been drained men will be put to work clearing it of debris and catching up the bad places. Two crosscuts are under way from main tunnel level on the Buckeye to intersect other claims paralleling the property. The drift is being driven a head and the face is now in a new shoot of high grade ore. This ore will be driven on and all the ground east will be opened at this depth. The property is looking better than at any time since the old work was discontinued some years ago.

completely unwatered. [illegible] shaft which was sunk to a depth of 170 feet below the old tunnel level, was found to be small and in such poor condition that it was thought inadvisable to use it. A new vertical two compartment shaft is now being sunk in the footwall and to date has reached a depth of 130 feet. When this shaft has reached the depth of the old workings a crosscut will be run to the ledge and connection made with the old workings after which the sinking of the shaft will be continued to 500 feet or more.

In the old workings which have been unwatered there are three levels at approximate depths of 70, 123 and 170 feet. These levels have been opened up to the east to a considerable distance, just how far has not yet been ascertained, as in places there is much caving. Considerable stoping has been done, especially from the 125 ft. level, which appears to have been stoped right up to the tunnel level. These stopes have been filled with ore that at the present price of silver is greatly above what is considered good milling ore. From samples taken it is estimated that this stope filling will average 40 ozs. silver and with good gold values.

The ledge on this level, so far examined, averaged from 4 to 6 feet.

On the lowest level there are several small stopes in which the fill it is estimated will average about the same as in the large stope above.

To the west of the shaft but little work appears to have been done and no stoping. The ledge here is of an approximate width of 6 feet and well mineralized, ruby silver predominating.

After connecting the old workings with the new shaft a development program will be undertaken. The lowest level will be drifted west on the ledge to connect with the old Rural shaft, where a recent examination shows there is a six foot ledge of very rich ore which assays well into the hundreds. During the examination much specimen rock was encountered, a sample of which assayed over 5100 ozs. silver and 3 ozs. gold. It is for the purpose of opening up this high grade ore body in the old workings that development work to the west is being vigorously prosecuted.

Rural Buckeye

MS 1165	Buckeye	11/11/74	17, 13, 21, 7 & 2	✓ 431-658-59
MS 3637 (Lone Silver)		11/24/77	23N 17W Sec 18-24	528 628-631
MS 525	Rural mill Site	3/14/76	14 - 23N 18W	✓ 318-235-236
	Rural Annex	3/14/76		✓ 318 237-238
	✓ ✓ #1	3/14/76		✓ 318 239
	Rural Annex	3/20/76		✓ 318-761-2
	Rural Ext	3/20/76		✓ 318-763-4
	Punkham Annex	11/14/79		✓ 594-636-39

23 N 17 W

Sect 3	no listings	
4	no listing	
10	Apollo	588-954-55
7	Mnt Side - (J W Jordan)	605-222-23
6, 7	Lightening Rod 1 & 2 (Jordan)	605-224-27
7	Cherum Summit (A. Clark)	615-307-10
24	Joshua #1 (Logsdon, W.O)	536-455
24	Rainy Day ✓ ✓	608-258-259
24	Joshua #1 Amc-58195	608-260-61
24	Venture (Harper C)	625-635-636
	Lounder ✓	637-639
	Carlos ✓	640-641
	Rainy Day (Logsdon)	663-824-25

23N 18W

13, 14	Copper Queen (Rural)		572-336-38
	Hope 1 & 2 - Jeffry, "K",	Jeff	572-336-38
14	Lulu C (Rural) Mac 1-19		✓ ✓
	Morning Sun - Nellie C. - Queen Kay - Red 51		
	Punkham Annex (Hollaund p)		594-636-39

Production Figures * Verified Early Production
Chief Engineer (Little Chief) Rural - Buckeye,
Pinkham Mines

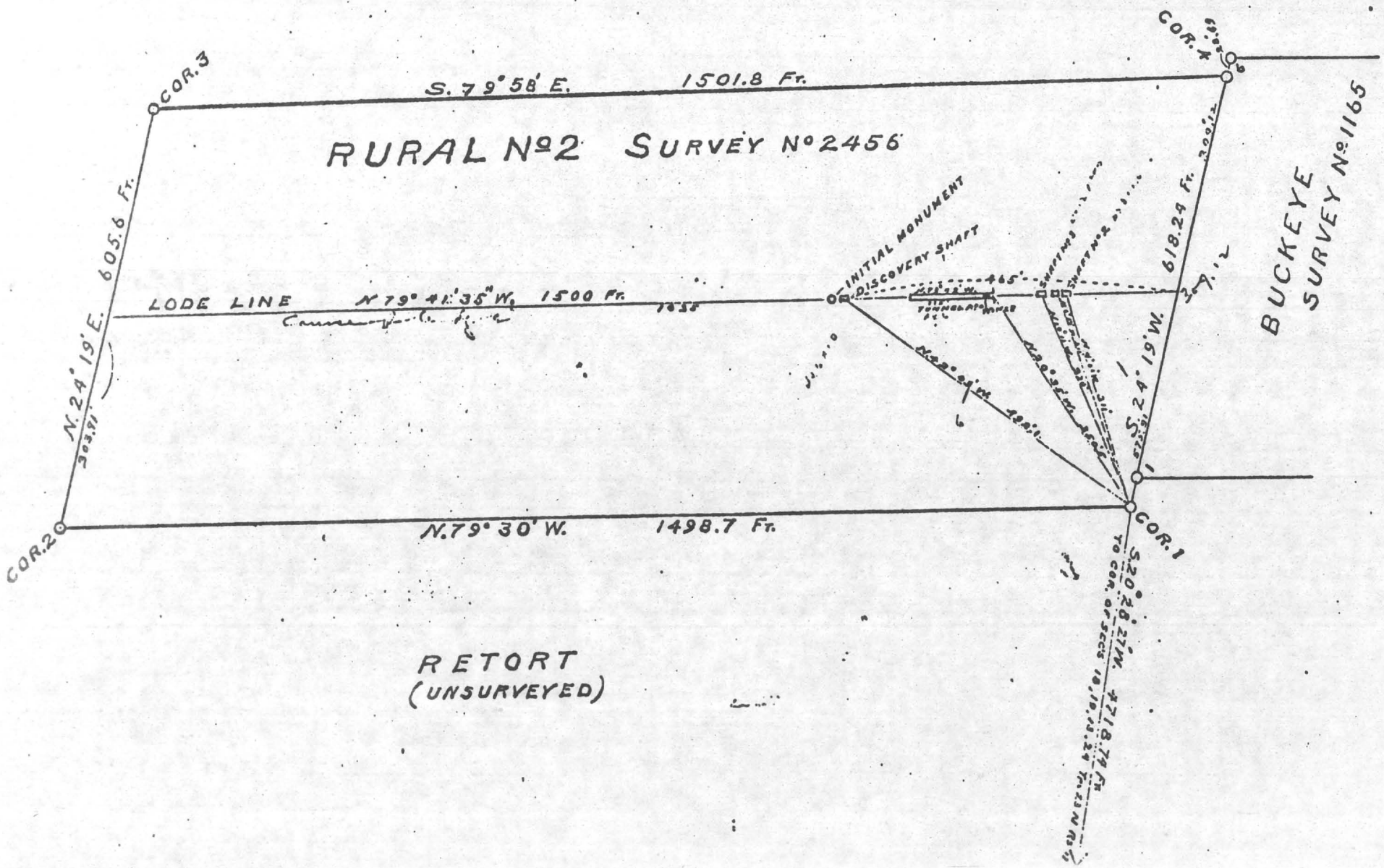
RURAL	976.13 ozs Gold 48,016.04 ozs Silver	Patented
Little Chief	391.00 ozs Gold. 68,351 ozs Silver	Unpatented
Pinkham	56.0 ozs Gold 14,695 ozs Silver	Patented

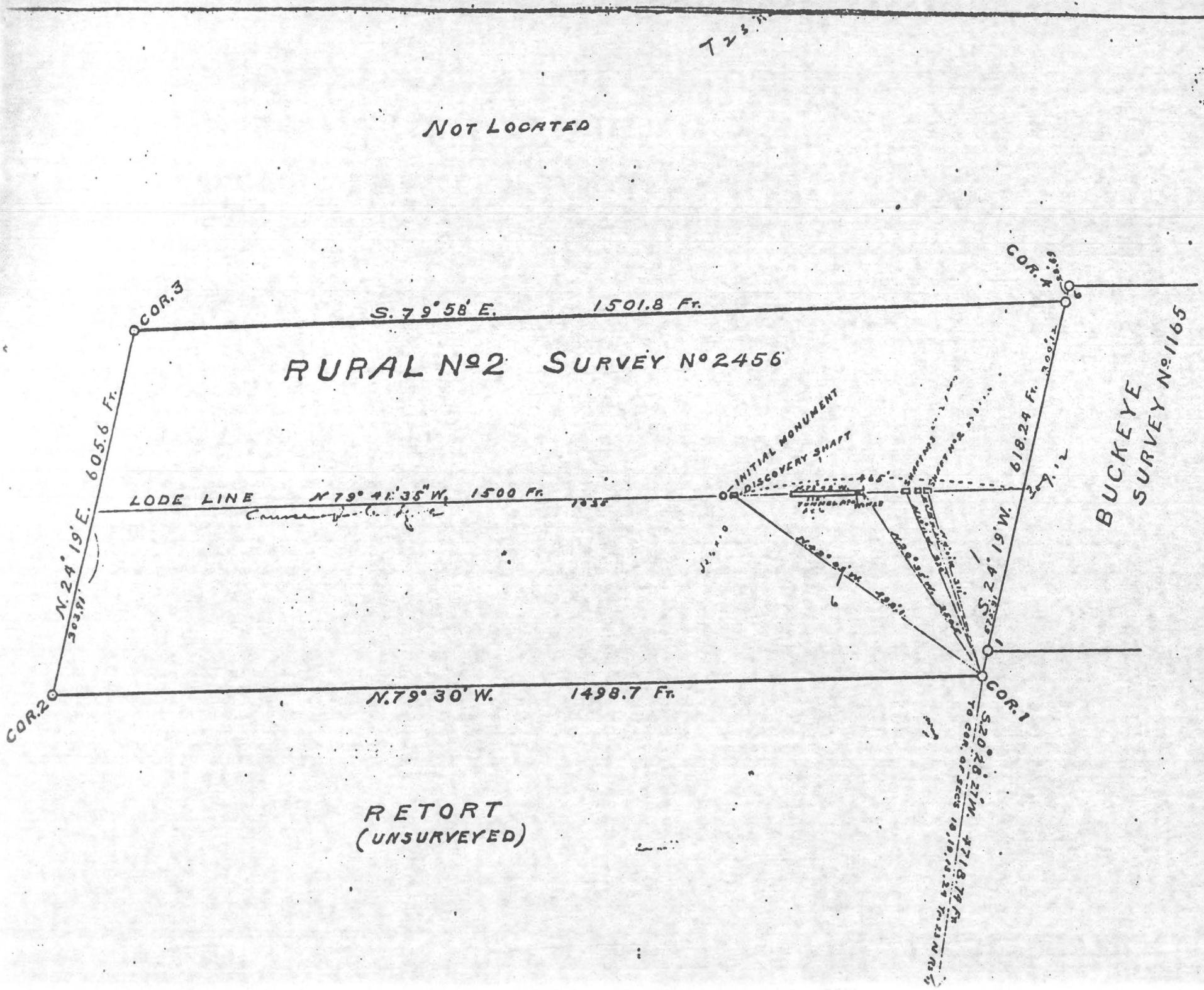
Total Silver Production	131,062.04 ozs
Total Gold Production	1,423.13 ozs.

Silver at 16.00 per ounce	$ 2,096,992
Gold at $640 per ounce	$ 910,803
Total Gold, Silver Production	$ 3,007,795

T 23 N

NOT LOCATED




NOT LOCATED
COR. 3
S. 79° 58' E.
1501.8 Ft.
COR. 4
RURAL Nº2 SURVEY Nº2456
N. 24° 19' E.
605.6 Ft.
LODE LINE
N 79° 41' 35" W.
1500 Ft.
INITIAL MONUMENT
DISCOVERY SHAFT
618.24 Ft.
S. 24° 19' W.
BUCKEYE
SURVEY Nº1165
COR. 2
N. 79° 30' W.
1498.7 Ft.
COR. 1
RETORT
(UNSURVEYED)

The Rural is developed principally by a 200-foot shaft, about 100 feet of drift, and a winze. The drift extends westward, its face being about 110 feet distant from the shaft. The shaft contains some water. The Buckeye is developed principally by about 750 feet of drift, extending in an easterly direction. Toward the face of the drift the vein is faulted off to the northeast by a lateral throw of about 75 feet.

The country rock is medium-grained gneissoid biotite granite and associated schist. It is intruded by dikes of granite porphyry. The deposits occur in a fissure vein which is 2 to 4 feet in width in the Rural and attains a maximum of 8 feet in the Buckeye. In the Rural it dips about 80° S. and in the Buckeye about 70° N. In both mines it is associated with a dike of the granite porphyry, masses of which occur to the northeast near by. The gangue is quartz and is generally "frozen" to the walls. It shows ore shoots ranging from 4 to 20 feet in width, which consist mostly of pyrite and chalcopyrite, with parallel streaks of arsenopyrite, black oxide of manganese, gray chert, and quartz, the quartz being more prominent in the Buckeye than in the Rural mine.

The ore contains silver, gold, and copper, with high silver and gold values. The display of ores from these mines, containing masses of solid silver and beautiful specimens of wire silver, is said to have been awarded the silver medal at the Louisiana Purchase Exposition.

The production, exact figures of which are not available, is reported to mount well into thousands of dollars in silver and gold, and much good ore is said to be available in the mines.

WINDY POINT MINE.

The Windy Point mine is in the northeastern part of the district, about a mile northeast of Mineral Park, on open sloping or hilly ground, at an elevation of about 4,800 feet. It is owned by the Arizona Gold Mining and Metallurgical Company, with headquarters at Kingman. It is developed mainly by a 105-foot shaft and a small amount of drift. The shaft starts in gneiss, but soon enters the granite. The mine is newly equipped with a gasoline hoist and electric drills.

The country rock is the pre-Cambrian gneissoid biotite granite and black amphibolite schist. The granite is less dark and micaceous than at the Rural and Buckeye mines. The structure or sheeting strikes N. 85° W. and dips about 75° S. Both the granite and the schist are more or less sericitized and impregnated with pyrite and arsenopyrite near the vein. About 50 feet from the vein, on its

RURAL - BUCKEYE

INTER-COMPANY COMMUNICATION

PERKIN-ELMER

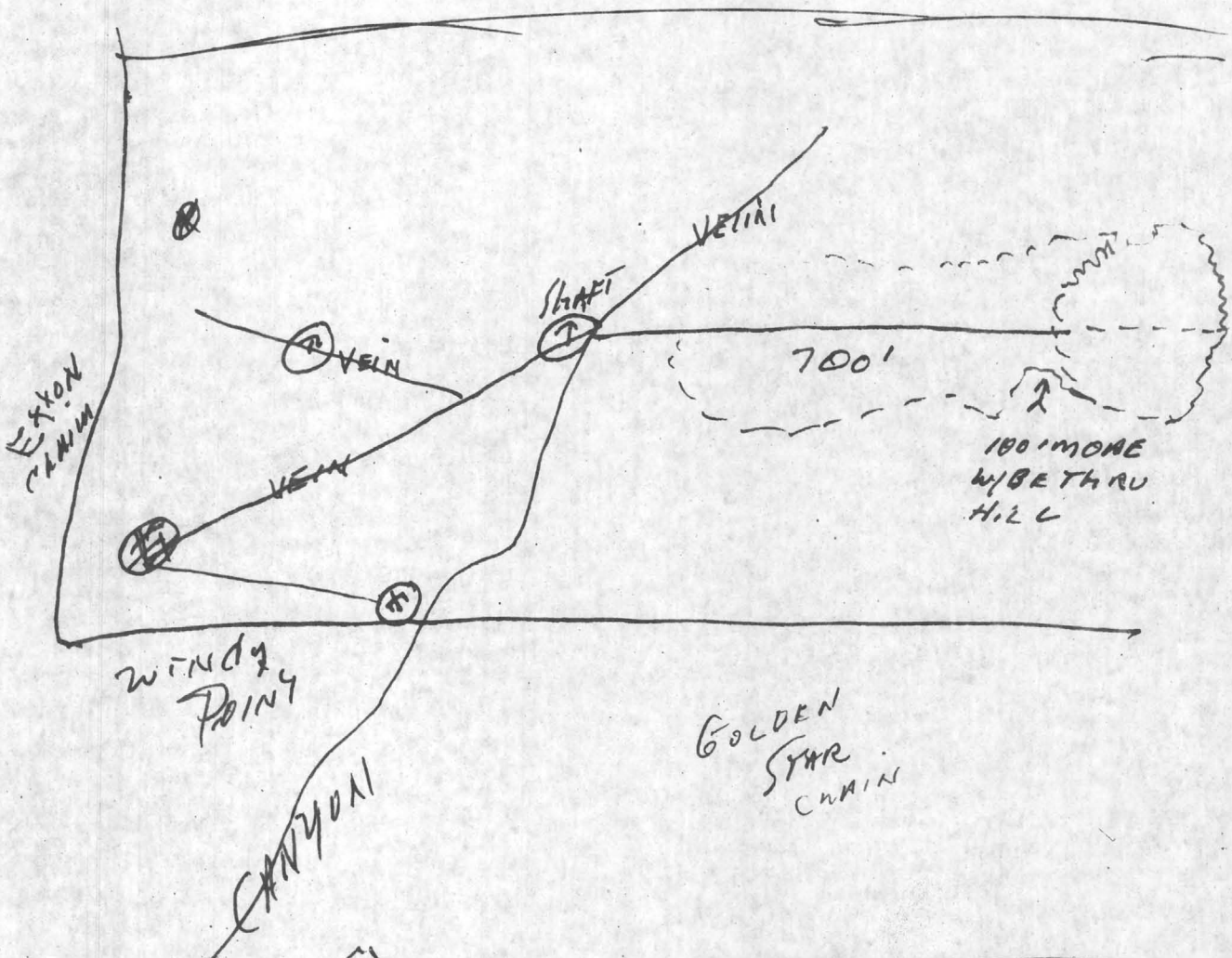
1½ MILES FROM PINKHAM

Date:

To:

From:

Subj:



Arizona - Mountains
TRIAL SITE

Water from Tennessee

ON 88 TON SHIPMENT TO P-D FROM VEIN MATERIAL

TOOK 20 FT WIDE - APPROX 8' COUNTRY ROCK SHIPPED

RIPPED - HANDED SHIPPED

PINKHAM DUMP

Less .20 Cu (By CHEMICAL TEST)

Pb - 2%

Zinc - 0

Enough WATER for SMALL OPERATION ON PROPERTY!

532-02

areas of tennantite carry only scattered small inclusions of sphalerite, whereas bordering areas of proustite are crowded with relatively large sphalerite inclusions.

5. The presence of inclusions of sphalerite and chalcopyrite in both tennantite and proustite is itself suggestive of a primary origin for the proustite, because sphalerite, chalcopyrite, and tennantite are exceedingly rare as products of secondary (supergene) enrichment.

6. Galena, fairly abundant in these ores, is a mineral that is usually particularly susceptible to replacement by silver minerals in the processes of downward enrichment. Where galena and proustite are found together in these ores they commonly occur side by side without evidence of replacement. Figure 4 shows an association of sphalerite and proustite in contact with galena. The smooth galena contacts extending from proustite to sphalerite indicate either simultaneous replacement of galena by proustite and sphalerite, or an absence of replacement, the three minerals all being essentially of the same age and primary. Simultaneous replacement of galena by an intergrowth of proustite and sphalerite is highly improbable and if it occurred would almost certainly be a part of the process of primary (hypogene) mineralization, for the deposition of sphalerite in the downward enrichment of ore deposits is exceedingly rare. In Figure 7 are shown small areas of proustite inclosed by galena. If these were formed by replacement of the galena, they should be related to the galena cleavages, but they show no such relation and are interpreted as inclusions of primary proustite in galena. A single possible exception to the general rule that proustite has not replaced galena is illustrated in Figure 8. This figure was drawn from a specimen which in most places shows the relations illustrated in Figures 4 and 7. The veinlets are interpreted as fillings of a fracture in galena by primary proustite, possibly combined with very slight primary replacement of the galena by the proustite. Such relations are very exceptional. Additional evidence that proustite has not replaced galena is found in the common presence of many small inclusions of sphalerite and chalcopyrite in proustite and the absence of such inclusions from adjacent galena. It can not be assumed that the proustite has replaced galena unless sphalerite and chalcopyrite have replaced it simultaneously.

7. In some ores proustite and pearceite intergrown with tennantite possess regular crystal outlines, as shown in Figure 9. The narrow white areas in this figure are pearceite showing its own characteristic tabular crystal forms (lath-shaped in cross section); the larger white areas are mostly pearceite. Sulphides occasionally develop their own crystal form in replacing other sulphides, but the relation seems to be rare. In ores from the Mowry mine, in the Patagonia district, Ariz.

the writer has observed radiating groups of tabular crystals of covellite replacing galena. The development of the covellite was, however, clearly controlled by cleavage planes of the galena or by contacts of galena with other minerals. In the association of pearceite and tennantite under description there is no such relation of the pearceite to tennantite contacts or partings, but the pearceite appears to be fairly evenly distributed through the tennantite. The two are interpreted as in primary intergrowth. There is no evidence that the proustite of this specimen is the result of a replacement of pearceite; it appears rather to be contemporaneous. On theoretical grounds the supergene replacement of pearceite ($9Ag_2S.As_2S_3$), a rich silver mineral, by proustite ($3Ag_2S.As_2S_3$), a mineral poorer in silver, is unlikely, for it would involve a reversal of the progression to richer silver minerals characteristic of the process of downward silver enrichment.

Although some of the relations outlined above taken singly would not form conclusive evidence that the proustite was primary, taken collectively their significance is unescapable.

The possibility of profitable operation of any particular deposit in this area is dependent upon many considerations, among which may be mentioned the price of silver, costs of transportation and labor, milling and smelting facilities, the width and horizontal extent of the ore body, the primary distribution of silver minerals within the vein, and the nature and extent of downward enrichment in silver.

Some of the richest silver ores of the area, carrying cerargyrite and native silver, were unquestionably products of oxidation and downward enrichment, and the playing out of these ores in depth was certainly an important factor in the closing down of many of the mines. The decline in the price of silver from 1872 to 1916 was unquestionably an added discouraging factor.

The conclusion that the rich ruby silver ores of the region are in the main primary offers encouragement to further exploration of the ore bodies, although this work should be undertaken only with due regard to the many other and perhaps unfavorable factors involved. A general decrease in the primary silver content of veins of this type with increase in depth is probable, but such primary changes are likely to be much less abrupt than those due to downward enrichment and to be recognizable only through vertical intervals measured in many hundreds rather than a few hundreds of feet. The depth of most of the mines is too small to afford any valid test of this factor, even had the workings been accessible for study. Underground studies, had they been possible, would have aided in determining whether the rich primary proustite ores were of spotty or patchy distribution, or of fairly regular distribution within the veins, a question of fundamental practical importance.

:er, in 1870. Its sur-
:s in gold as well as in
:st important producer,
: was later worked by
:o was locally milled in
: James Uncapher, of
:resent owner, the Key-
The production of the

:0 feet deep and 500 feet
:bove which the greater
: surface equipments are

:unite porphyry. There
: located strikes N. 60°
quartz in which the ore
:lar streaks about a foot
:e, and zinc blende, with
:argentite, in part. The
: silver to the ton, 2½ per
:nd 12 per cent of iron.
:larly and closely banded.
:ere it may be distributed-
:t it is good concentrating
:on, and by reason of its
. Some of the ore, how-
:aging $20 or more a ton
None lower than $20 ore
: is about 20 tons a month.
:hich the mine is situated
:d or smaller vein, which
:e nearly all of shipping

:astern part of the district,
: the summit of the range,
:ion of about 5,300 feet, or
:good wagon road extends
:n is made by a good trail
: by Stephen A. Tyler, the
: 1905, but only necessary

The mine is developed mainly by two crosscut tunnels and drifts, mostly situated within a vertical range of 100 feet, principally on the Gold Eagle claim.

The country rock is pre-Cambrian medium-grained gneissoid biotite granite. The vein strikes N. 37° W. and dips about 75° SW., into the mountains. It has a width of about 40 feet and seems to consist mainly of an altered and partly replaced crushed and recemented aplitic dike. The entire width is claimed to be low-grade ore, but the values occur chiefly in the first 6 or 7 feet of the hanging-wall side of the dike and are best near its contact with the granite. The hanging wall also carries 6 inches to 2 feet of slickensided gouge, between which and the country rock occurs quartz breccia containing some ore.

The mine produces gold-silver-lead ore. The principal ore minerals consist of galena and cerusite. The last carload shipped at the time of the writer's visit averaged gold 3.16 ounces to the ton, silver 8 ounces to the ton, and lead 17.5 per cent. At last accounts the mine is reported to be sold to a Los Angeles company.

LADY BUG MINE.

The Lady Bug, an old mine, is about half a mile southeast of the Tyler mine, close to the Tyler camp, at an elevation of about 5,000 feet. It was located in 1886 by Isaac Conkey, the owner, now residing at Mineral Park. It is developed principally by a 63-foot shaft, 100 or more feet of drifts, and a number of surface openings on the vein.

The country rock is pre-Cambrian biotite granite, the same as at the Tyler mine, and it is to a considerable extent intruded by the granite porphyry of Mineral Park. The vein is reported to be 7 to 8 feet thick. It lies nearly parallel with the Tyler vein, but differs from it in being composed of a gangue which is mainly quartz. The ore contains principally silver chloride and gold with a little galena. A considerable portion of the ore mined is reported to have averaged $300 to $500 a ton. The production is reported to be $6,000.

RURAL AND BUCKEYE MINES.

The Rural and Buckeye mines are in the northeastern part of the district, 1½ miles northeast of Mineral Park, near the south base of Cherum Peak, at an elevation of about 5,000 feet. They are reached by wagon road. They are situated but a few hundred feet apart on the same vein, the Rural being on the west and the Buckeye on the east side of the same gulch. The Rural is owned by E. F. Thompson, of Kingman, and the Buckeye by C. E. Lovett and others, of Denver, Colo.

1435 SOUTH 10th AVENUE
P.O. BOX 1889

Jacobs Assay Office

Registered Assayers

85702 Tucson, Arizona,

June 21 1976

Sample Submitted by Mr. Rothco Mines % Mr. Fred Rothwell

Sample Marked	GOLD Ozs. per ton ore	GOLD Value per ton ore * $	SILVER Ozs. per ton ore	COPPER Per cent Wet Assay	LEAD Per cent Wet Assay	Per cent Wet Assay		
"Rural Hill Formation"	0.04	4.00	11 6/10					

Very respectfully, Ben P. Jacobs

* Gold Figured $ 100.00 per oz. Troy

Charges $ 5.00 pb

Rural-Buckeye Assays

1435 SOUTH 10th AVENUE
P.O. BOX 1889

Jacobs Assay Office

Registered Assayers

June 1 1976

85702 Tucson, Arizona

Sample Submitted by Mr. Rothco Mines c/o Mr. Fred Rothwell

Sample Marked	GOLD Ozs. per ton ore	GOLD Value per ton ore * $	SILVER Ozs. per ton ore	COPPER Per Cent Wet Assay	LEAD Per Cent Wet Assay	Per Cent Wet Assay	Per Cent	Per Cent
"Rural Hill Formation"	0.04	4.00	11 6/10					

Very respectfully, Ben P. Jacobs

* Gold Figured $ 100.00 per oz. Troy

Charges $ 5.00 pd

Rural-Buckeye Assays

IRON KING ASSAY OFFICE

ASSAY CERTIFICATE

BOX 14 -- PHONE 632-7410

HUMBOLDT, ARIZONA 86329

ASSAY MADE FOR

ROTHCO MINES
Fred Rothermel
3016 W. Mercer Ln.
Phoenix, Ariz. 85029

Nov. 25, 1975

Ref no.	DESCRIPTION	oz/ton Au	oz/ton Ag		% Fe	% Pb	% Zn	% Cu
11-24-9	Rural Hill Vein	.038	25.16					

CHARGES $4.25 paid

ASSAYER

IRON KING ASSAY OFFICE

ASSAY CERTIFICATE

BOX 14 -- PHONE 632-7410

HUMBOLDT, ARIZONA 86329

ASSAY MADE FOR

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11-24-9	Rural Hill Vein	.038	25.16					

CHARGES $4.25 paid

ASSAYER

1435 SOUTH 10th AVENUE
P.O. BOX 1889

Jacobs Assay Office

Registered Assayers

PHONE 622-0313

85702 Tucson, Arizona, Dec 6th, 1974

Sample Submitted by Mr. John B Rosenniel

Sample Marked	GOLD Ozs. per ton ore	GOLD Value per ton ore $	SILVER Ozs. per ton ore	COPPER Per cent Wet Assay	LEAD Per cent Wet Assay	Per Cent Wet Assay	Per Cent Wet Assay	Per Cent Wet Assay
Rural								
X	1.70	125.00	13 91/12	0 03/100				
74								
		216.00	58.00	.65	0			

* Gold Figured $ 100.00 per oz. Troy

Charges $ 5.00 Paid

Very respectfully,

Jim P. Jacobs

1435 SOUTH 10th AVENUE
P.O. BOX 1889

Jacobs Assay Office

Registered Assayers

PHONE 622-0813

85702 Tucson, Arizona, Dec 6th, 1974

Sample Submitted by Mr. John B. Rosenniel

Sample Marked	GOLD Ozs. per ton ore	GOLD Value per ton ore $	SILVER Ozs. per ton ore	COPPER Per cent Wet Assay	LEAD Per cent Wet Assay	Per Cent Wet Assay	Per Cent Wet Assay	Per Cent Wet Assay
Rural								
X	1.20	120.00	13 91/12	0 03/100				
74								
		216.00	58.00	.65	0			

* Gold Figured $ 100.00 per oz. Troy

Charges $ 5.00 Paid

Very respectfully,

Don P. Jacobs

1435 SOUTH 10th AVENUE
P.O. BOX 1889

Jacobs Assay Office

Registered Assayers

PHONE 622-0813

85702 Tucson, Arizona, June 22, 19[illegible]

Sample Submitted by ~~Mr.~~ Rothco Mines % Mr. Fred Rothchild

Sample Marked	GOLD Ozs. per ton ore	GOLD Value per ton ore * $	SILVER Ozs. per ton ore	COPPER ~~Per cent~~ Wet Assay	LEAD ~~Per cent~~ Wet Assay	~~Per Cent~~ Wet Assay	~~Per Cent~~ Wet Assay	~~Per Cent~~ Wet Assay
Rural Hill Vein-5' Crosscut 1	0.02	2.00	183 8/10	(Note: sample contained some copper)				

* Gold Figured $ 100.00 per oz. Troy

Charges $ 5.00 per

Very respectfully,

Ben P. Jacob

1435 SOUTH 10th AVENUE
P.O. BOX 1889

Jacobs Assay Office

Registered Assayers

PHONE 622-0813

85702 Tucson, Arizona, June 22, 1976

Sample Submitted by Mr. Rothco Mines c/o Mr. Fred Rothchild

Sample Marked	GOLD Ozs. per ton ore	GOLD Value per ton ore * $	SILVER Ozs. per ton ore	COPPER Per cent Wet Assay	LEAD Per cent Wet Assay	Per Cent Wet Assay	Per Cent Wet Assay	Per Cent Wet Assay
Rural Hill Vein - 5' Crosscut 1	0.02	2.00	183 8/10					

(Note: Sample contained some copper)

COS 76

* Gold Figured $ 100.00 per oz. Troy

Charges $ 5.00 per

Very respectfully,

L. Ben P. Jacobs

VALLEY ASSAY OFFICE

AND ORE TESTING LABORATORY

MEMORANDUM OF ASSAY

Made for John Rothermel

Tempe, Arizona Feb 10 75

SAMPLE NO.	PER TON OF 2000 POUNDS AVOIRDUPOIS								COPPER, OR			LEAD, OR			ZINC, OR			TOT
	GOLD, PLATINUM				SILVER													
	AT	PER OUNCE			AT	PER OUNCE			AT	PER LB.		AT	PER LB.		AT	PER LB.		
	OZS.	100's	$	Cts	OZS.	100's	$	Cts.	%	$	Cts.	%	$	Cts.	%	$	Cts.	$
Rural-1	0.	52																
REMARKS:																		

NO.

CHARGE $ 5.00 Pd.

BY L. Lee Boyer

Registered Assay

PASSED ASSAYER
CERTIFICATE EXPIRES
L LEE
SOYER
DEC. 31, 1975
ARIZONA, U.S.A.

VALLEY ASSAY OFFICE

AND ORE TESTING LABORATORY

MEMORANDUM OF ASSAY

Made for John Rothermel

Tempe, Arizona Feb 10 75

SAMPLE NO.	PER TON OF 2000 POUNDS AVOIRDUPOIS								COPPER, OR			LEAD, OR			ZINC, OR			TOT
	GOLD, PLATINUM				SILVER													
	AT	PER OUNCE			AT	PER OUNCE			AT	PER LB.		AT	PER LB.		AT	PER LB.		
	OZS.	100's	$	Cts	OZS.	100's	$	Cts.	%	$	Cts.	%	$	Cts.	%	$	Cts.	$
Rural-1	0.	52																
REMARKS:																		

NO.

CHARGE $ 5.00 Pd.

BY L. Lee Boyer

Registered Assay

BFEC SAMPLE NO.	MGA 851	MGA 852	MGA 853
LAB SAMPLE NO.			
U_3O_8 R (ppm)	80.4	7.2	1.3
U_3O_8 W (ppb)			
U_3O_8 S,SS (ppm)			
LOI S,SS (%)			
MEA (ppm)			
Ag	< 0.5	700.0	30.0
Al	60000	10000	30000
As	< 200	10000	3000
B	10	20	50
Ba	20	100	50
Be	10	5	15
Ca	150000	1000	1000
Co	5	10	10
Cr	200	50	500
Cu	< 10	2000	100
Fe	50000	150000	50000
La	700	50	< 20
Li	< 100	< 100	< 100
Mn	200	70	>5000
Mo	< 10	< 10	< 10
Na	2000	2000	5000
Nb	70	20	10
Ni	< 10	< 10	20
Pb	70	1000	1000
Sb	< 100	< 100	< 100
Sc	15	< 10	15
Sn	< 10	< 10	< 10
Sr	1000	< 100	< 100
Ti	7000	< 20	1500
V	30	10	30
W	< 100	< 100	< 100
Y	>200	< 10	10
Zn	< 200	1000	1500
Zr	>1000	< 10	20

Rural
20 ounces
Silver

BFEC SAMPLE NO.	MGA 851	MGA 852	MGA 853
LAB SAMPLE NO.			
U_3O_8 R (ppm)	80.4	7.2	1.3
U_3O_8 W (ppb)			
U_3O_8 S,SS (ppm)			
LOI S,SS (%)			
MEA (ppm)			
Ag	< 0.5	700.0	30.0
Al	60000	10000	30000
As	< 200	10000	3000
B	10	20	50
Ba	20	100	50
Be	10	5	15
Ca	150000	1000	1000
Co	5	10	10
Cr	200	50	500
Cu	< 10	2000	100
Fe	50000	150000	50000
La	700	50	< 20
Li	< 100	< 100	< 100
Mn	200	70	>5000
Mo	< 10	< 10	< 10
Na	2000	2000	5000
Nb	70	20	10
Ni	< 10	< 10	20
Pb	70	1000	1000
Sb	< 100	< 100	< 100
Sc	15	< 10	15
Sn	< 10	< 10	< 10
Sr	1000	< 100	< 100
Ti	7000	< 20	1500
V	30	10	30
W	< 100	< 100	< 100
Y	>200	< 10	10
Zn	< 200	1000	1500
Zr	>1000	< 10	20

Rural
20 ounces
Silver

Wallapai Mining District
Mohave County, Arizona

Bendix

Field Engineering Corporation

Albuquerque District Office

2201 San Pedro Dr. N.E.
Building 3, Suite 220
Albuquerque, NM 87110

A Subsidiary of
The Bendix Corporation

August 10, 1979

Mr. Dick Genova
2608 N. Potrero
Phoenix, Az. 85006

Dear Dick,

Here are your long - awaited results of the analyses we promised you.

Sample # MGA-851 is from the road cut area near the Chico Mine where the scintillometer showed 2400 cps. Sample #MGA-852 is of the gossan above the Rural Mine. Sample #MGA-853 is the one we took from the vein exposed in the short, partially caved, adit at the Sky-scraper Mine.

The enclosed analyses are all expressed in parts per million. I have also included a copy of a conversion table that will enable you to convert the ppm values into per cent and, for the silver values, into troy ounces per short ton.

Regards to John, and good luck.

Sincerely,

Wade

Wade Corder
Geologic Technician

Encl. (2)

Re: Rural Township Lines
Wallapai Mining District
Mohave County, Arizona

Bendix

Field Engineering Corporation

Albuquerque District Office

2201 San Pedro Dr. N.E.
Building 3, Suite 220
Albuquerque, NM 87110

A Subsidiary of
The Bendix Corporation

August 10, 1979

Mr. Dick Genova
2608 N. Potrero
Phoenix, Az. 85006

Dear Dick,

Here are your long - awaited results of the analyses we promised you.

Sample # MGA-851 is from the road cut area near the Chico Mine where the scintillometer showed 2400 cps. Sample #MGA-852 is of the gossan above the Rural Mine. Sample #MGA-853 is the one we took from the vein exposed in the short, partially caved, adit at the Sky-scraper Mine.

The enclosed analyses are all expressed in parts per million. I have also included a copy of a conversion table that will enable you to convert the ppm values into per cent and, for the silver values, into troy ounces per short ton.

Regards to John, and good luck.

Sincerely,

Wade

Wade Corder
Geologic Technician

Encl. (2)

AMENDED

Notice of Mining Location

LODE CLAIM

TO ALL WHOM IT MAY CONCERN:

This Mining Claim, the name of which is the Rural Extension Mining Claim, situate on lands belonging to the United States of America, and in which there are valuable mineral deposits, was entered upon and located for the purpose of exploration and purchase by John B. Rothermel, Jr., a citizen of the United States, Frederic M. Rothermel, a citizen of the United States, John B. Rothermel, a citizen of the United States

(Locator must insert after "a citizen of the United States" or "who has declared his intention of becoming a citizen of the United States.")

the undersigned, on the 20th day of March, 19 74.

The length of this claim is 300 feet, and its claim 130 feet, in a westerly direction and 170 feet in a easterly direction from the center of the discovery shaft, at which this notice is posted, lengthwise of the claim, together with 300 feet in width of the surface grounds, on each side of the center of said claim. The general course of the lode deposit and premises is from the east to the west.

The claim is situated and located in the Kellond Mining District, in Mohave County, in the State of Arizona, about 1½ miles in a northeast direction from Mineral Park. This claim adjoins the Rural No. 2 Patented Claim.

The surface boundaries of the claim are marked upon the ground as follows: Beginning at a 4" x 4" x 4' post set in a mound of stones at a point in a easterly direction 170 feet from the discovery shaft (at which this notice is posted), being in the center of the east end center end line of said claim; thence 300 feet to a 4"x4"x4' post, being the southeast corner of said claim; thence 300 feet to a 4"x4"x4' post, being at the southeast corner of said claim; thence 300 feet to a 4" x 4" x 4' post at the west end center end of said claim; thence 300 feet to a 4" x 4" x 4' post, being at the northwest corner of said claim; thence 300 feet to a 4" x 4" x 4' post at the northeast corner of said claim; thence 300 feet to the place of beginning.

All done under the provisions of the laws of the United States, and the State of Arizona.

This is an amended Location Notice of the original Rural Extension Mining Claim, located by John B. Rothermel, Jr., John F. Rothermel, Frederic M. Rothermel on the 14th day of March, 19 74, and recorded in Book of Record of Mines, at page, in the office of the County Recorder of the aforesaid County of to which reference is hereby made, and this amended Location Notice is made and posted to correct errors in the description in the said original Location Notice Rural Extension

Dated and posted on the grounds this 20th day of March, A.D., 19 74.

John F. Rothermel

John B. Rothermel

John B. Rothermel, Jr.

Frederic M. Rothermel

BOOK 318 PAGE 763

No. 87—AMENDED NOTICE OF MINING LOCATION
A. P.
MESSENGER GRAPHICS Line Legal Blanks — Phoenix, Arizona

AMENDED

Notice of Mining Location

LODE CLAIM

TO ALL WHOM IT MAY CONCERN:

This Mining Claim, the name of which is the BUCKEYE (M.S. No. 3637) Mining Claim, situate on lands belonging to the United States of America, and in which there are valuable mineral deposits, was entered upon and located for the purpose of exploration and purchase by JOHN B. ROTHERMEL, J

A CITIZEN OF THE UNITED STATES OF AMERICA

(Locator must insert either a citizen of the United States, or one who has declared his intention of becoming a citizen of the United States.)

the undersigned, on the 12TH day of MARCH, 1979

The length of this claim is 1,498.02 feet, and I claim 1,398.02 feet, in a SOUTH EASTERLY (S.68°02'40"E.) direction and 100 feet in a NORTH WESTERLY (N 68° 02' 40"W) direction from the center of the discovery shaft, at which this notice is posted, lengthwise of the claim, together with 300 feet in width of the surface grounds, on each side of the center of said claim. The general course of the lode deposit and premises is from the NORTH WEST to the SOUTH EAST

The claim is situated and located in the WALLAPAI Mining District, in MOHAVE County, in the State of Arizona, about 1½ MILES in a NORTH EASTERLY direction from MINERAL TOWN AND ITS NORTH EAST CORNER IS 2,073.08' N.82° 27' 48"W. OF SECTION 7, 18 & 24 CORNER MARKERS. T25N, R17W IN SECTION 18.

This Survey conforms to MS SURVEY No. 3637, Surveyed July 20-25, 1920

The surface boundaries of the claim are marked upon the ground as follows: Beginning at A 4"x4"x40" WOOD POST SET IN ROCK MONUMENT

[redacted],

at a point in a N.68°W NORTHWESTERLY direction 100 feet from the discovery shaft (at which this notice is posted), being in the center of the NORTH end line of said claim; thence N.24°E 300 feet to a MONUMENT, being the NORTH EAST corner of said claim; thence 1,498.02 S 68°02'40E feet to a MONUMENT, being at the SOUTHEAST corner of said claim, thence S 24°W 300 feet to a MONUMENT at the center of the SOUTH end of said claim; thence S 24°W 300 feet to a MONUMENT, being at the SOUTH WEST corner of said claim; thence 1,498.02 N68°02'40W feet to a MONUMENT at the NORTHWEST corner of said claim; thence N. 24°E 300 feet to the place of beginning.

All done under the provisions of the laws of the United States, and the State of Arizona.

This is an amended Location Notice of the BUCKEYE M.S. No. 1166 Mining Claim, located by JOHN B. ROTHERMEL, JR. on the 24TH day of NOVEMBER, 1977, and recorded in Book 431 of Record of Mines, at page 659, in the office of the County Recorder of the aforesaid County of MOHAVE to which reference is hereby made, and this amended Location Notice is made and posted to correct errors in the description in the said original Location Notice.

Dated and posted on the grounds this 12TH day of MARCH, 1979.

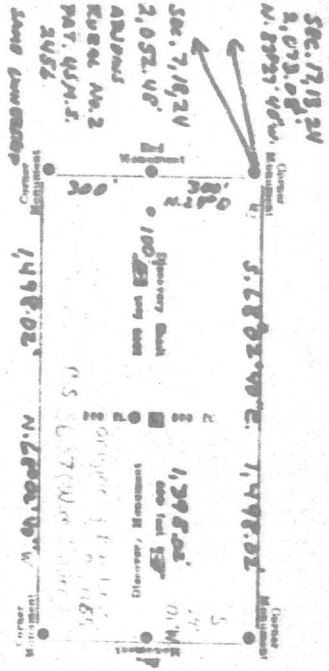
PRIOR POSTING TO ABOVE WAS NOV. 11, 1974 BOOK 250 PAGE 330. MOHAVE COUNTY RECORDER

John B. Rothermel, Jr.

State of Arizona
County of Mohave
The foregoing instrument was acknowledged before me this 12th day of March, 1979
by John B. Rothermel, Jr.
Notary Public [illegible]

BOOK 528 PAGE 628

Forms by [illegible] Form 87 My Commission Expires May 26 1981



This diagram is to give locator a general idea of plan of location under the new law. The Discovery Shaft can be in the center of claim or any distance from either end desired. In the diagram it is placed 500 feet from one end, and 1000 feet from the other. Commence description of claim at a center end monument, giving its distance and direction from center of Discovery Shaft; thence bound the claim in either direction. In description be careful to state locality of claim with reference to some natural object, or permanent monument, as will identify the claim.

AMENDED

Notice of Location

LODE CLAIM

BUCKEYE

M.S. 5637

T 23 N, R17W, SECT. 18

ORIG. FILED NOV. 11, 1974

Dated MARCH 12, 1979

STATE OF ARIZONA
County of MOHAVE } ss.

I hereby certify that the within instrument was filed and recorded at request of JOHN B. ROTHERMEL, JR.

Book

In Docket

on page

Witness my hand and official seal the day and year aforesaid.

County Recorder

By Deputy Recorder

STATE OF ARIZONA
County of } ss.

I, County Recorder in and for the County and state aforesaid, do hereby certify that the within instrument was filed for record at o'clock M., on the day of 19 and duly recorded in Book No. of Records of County Arizona at pages

WITNESS my hand and official seal the day and year first above written.

County Recorder

BOOK 528 PAGE 629

SURVEY No. 5637
ARIZONA & GRAND DISTRICT
MOHAVE COUNTY, ARIZONA
SURVEYED JULY 20-25 1928
RURAL No. 2456
SUR. No. 2456
SILVER BELL
USHSUR
WILD SILVER
BUCKEYE
SUSSUR
SHELDON
No. 1
USHSUR

Notice of Mining Location

LODE CLAIM

TO ALL WHOM IT MAY CONCERN:

This Mining Claim, the name of which is the Rural Annex I Mining Claim, situate on land belonging to the United States of America, and in which there are valuable mineral deposits, was entered upon and located for the purpose of exploration and purchase by John B. Rothermel Jr. A citizen of the United States
Frederic M. Rothermel A citizen of the United States
(Locator must insert either "A Citizen of the United States," or "Who has declared his intention to become a Citizen of the United States.")
the undersigned, on the 14 day of March, 1976

The length of this claim is 1500 feet and WE claim 1400 feet in a westerly direction and 100 feet in a easterly direction from the center of the discovery shaft, at which this notice is posted, lengthwise of the claim together with 300 feet in width of the surface grounds, on each side of the center of said claim. The general course of the lode deposit and premises is from the East to the West

The claim is situated and located in the Wallapai Mining District, in Mohave county, in the State of Arizona, about 1½ miles in a northeast direction from Mineral Park. This claim sidelines the Rural No. 2 Patented claim

The surface boundaries of the claim are marked upon the ground as follows:

Beginning at A 4"x4"x4' Post in a mound of stones at a point in a easterly direction 100' feet from the discovery shaft (at which this notice is posted), being in the center of the East end line end line of said claim; thence N24°19'E 300 feet to a 4"x4"x4' Post, being the northeast corner corner of said claim; thence westerly 1500' feet to a 4"x4"x4' Post being at the northwest corner of said claim; thence S24°19'W 300 feet to a 4"x4"x4' Post at the center of the west end line end of this claim; thence S24°19'W 300 feet to a 4"x4"x4' being at the southwest corner of said claim; thence easterly 1500' feet to a 4"x4"x4' Post at the southeast corner of said claim; thence 300' feet to the place of beginning.

Dated and posted on the ground this 14 day of March, 1976

John B. Rothermel Jr. — Witness
Frederic Mohr Rothermel — Witness
John B. Rothermel — Witness

John B. Rothermel Jr.
Frederic Mohr Rothermel
John B. Rothermel — Locator(s)

STATE OF ARIZONA
COUNTY OF MOHAVE ss.

I hereby certify that the within instrument was filed and recorded at request of John B Rothermel

BOOK 318 OF OFFICIAL RECORDS
MAR 19 1976 - 8 00 AM at
M

FILED 76-7443
Indexed Mines

Witness my hand and official seal the day and year aforesaid.

Joan McCall
County Recorder.

By
Deputy Recorder.

Indexed	Photostat Compared	Blotted

BOOK 318 PAGE 239

AMENDED

Notice of Mining Location

LODE CLAIM

TO ALL WHOM IT MAY CONCERN:

This Mining Claim, the name of which is the Rural Lines Mining Claim, situate on lands belonging to the United States of America, and in which there are valuable mineral deposits, was entered upon and located for the purpose of exploration and purchase by John B. Rothermel, Jr., citizen of the United States, Frederic M. Rothermel, citizen of the United States, John B. Rothermel, citizen of the United States

(Locator must aver either "a citizen of the United States" or "who has declared his intention of becoming a citizen of the United States.")

the undersigned, on the 20th day of March, 19 76.

The length of this claim is 1500 feet, and we claim 1400 feet, in a westerly direction and 100 feet in a westerly direction from the center of the discovery shaft, at which this notice is posted, lengthwise of the claim, together with 400 feet in width of the surface grounds, [illegible] of said claim. The general course of the lode deposit and premises is from the east to the west.

The claim is situated and located in the Wallapai Mining District, in Mohave County, in the State of Arizona, about 12 miles in a northwest direction from Mineral Park. This claim adjoins the Jur. No. 2 Patented claim and overlaps onto it.

The surface boundaries of the claim are marked upon the ground as follows: Beginning at 4" x 4" x 4' post set in a mound of stones at a point in a westerly direction 100 feet from the discovery shaft (at which this notice is posted), being in the center of the [illegible] number one line of said claim; thence 1400 feet to a [illegible] post, being the northeast corner of said claim; thence 1500 feet to a 4" x 4" x 4' post, being at the northwest corner of said claim; thence 300 feet to a 4"x4"x4' post at the center of the westend center end of said claim; thence 100 feet to a 4"x4"x4' post, being at the northwest corner of said claim; thence 1500 feet to a 4" x 4" x 4' post at the northeast corner of said claim; thence 300 feet to the place of beginning.

All done under the provisions of the laws of the United States, and the State of Arizona.

This is an amended Location Notice of the original Rural Lines Mining Claim, located by John B. Rothermel, Jr., John B. Rothermel, Frederic M. Rothermel on the 14th day of March, 19 76, and recorded in Book of Record of Mines, at page, in the office of the County Recorder of the aforesaid County of , to which reference is hereby made, and this amended Location Notice is made and posted to correct errors in the description in the said original Location Notice Rural Lines

Dated and posted on the grounds this 20th day of March, 19 76.

John B. Rothermel, C.E.

Book 318 page 761

AMENDED NOTICE OF MINING LOCATION

1435 SOUTH 10th AVENUE
P.O. BOX 1889

Jacobs Assay Office

Registered Assayers

PHONE 622-0813

85702 Tucson, Arizona, Dec 6th 1924

Sample Submitted by Mr. John B Rothermel

Sample Marked	GOLD Ozs. per ton ore	GOLD Value per ton ore * $	SILVER Ozs. per ton ore	COPPER Per cent Wet Assay	LEAD Per cent Wet Assay	Per Cent Wet Assay	Per Cent Wet Assay	Per Cent Wet Assay
Rural	1.70	120.00	13 1/12	0 .03/100				
74								
		216.00	58.00	.65	0			

* Gold Figured $ 100.00 per oz. Troy

Charges $ 5.00 Paid

Very respectfully,

Jas. B. Jacobs

IRON KING ASSAY OFFICE

ASSAY CERTIFICATE

BOX 14 — PHONE 632-7410

HUMBOLDT, ARIZONA 86329

REGISTERED ASSAYER
CERTIFICATE NO.
2978
WALTER G.
STATLER
Date Signed
ARIZONA, U.S.A.

ASSAY MADE FOR
ROTHCO MINES
3016 W. Mercer Lane
Phoenix, Ariz. 85029

10-22-75

Ref no.	DESCRIPTION	oz/ton Au	oz/ton Ag		% Fe	% Pb	% Zn	% Cu
10-14-1	Rural Mine	.010	91.39					

CHARGES $4.25 paid

ASSAYER

1435 SOUTH 10th AVENUE
P.O. BOX 1889

Jacobs Assay Office

Registered Assayers

PHONE 622-0813

85702 Tucson, Arizona, June 22, 19[illegible]

Sample Submitted by ~~Mr.~~ Rothco Mines % Mr. Fred Rothchild

Sample Marked	GOLD Ozs. per ton ore	GOLD Value per ton ore * $	SILVER Ozs. per ton ore	COPPER Per cent Wet Assay	LEAD Per cent Wet Assay	~~Per Cent Wet Assay~~	~~Per Cent Wet Assay~~	~~Per Cent Wet Assay~~
(Rubel Hill Vein-5' Crosscut)	0.02	2.00	183 8/10	(Note: sample contained some copper)				

* Gold Figured $ 100.00 per oz. Troy

Charges $ 5.00 per oz.

Very respectfully,

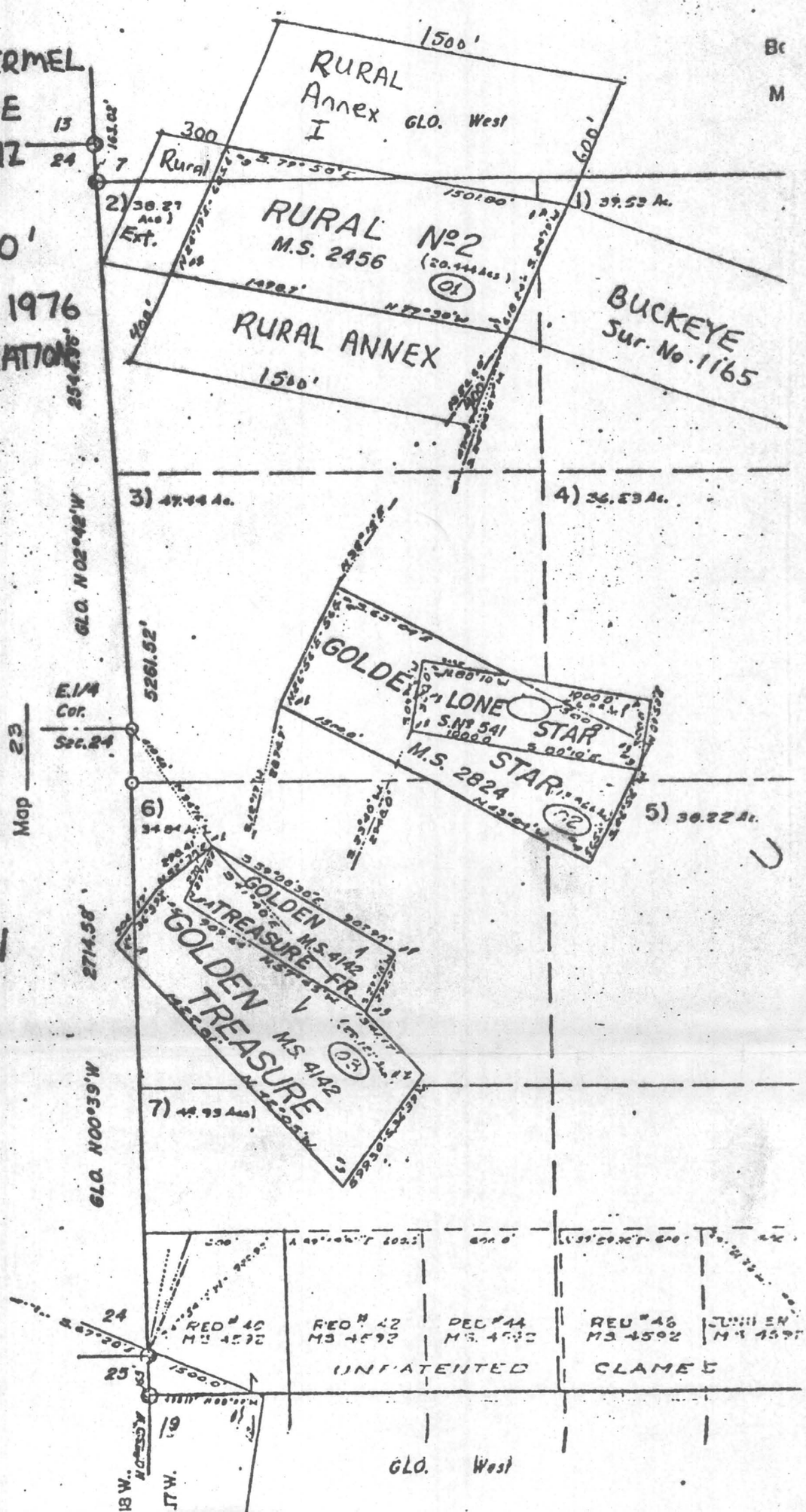
Ben P. Jacob

BLM COPY
RURAL GROUP

DRAWN BY
JOHN B. ROTHERMEL
6012 N. 47 DRIVE
GLENDALE, ARIZ
85301

SCALE 1" = 600'

DATE MARCH, 1976
AMENDED LOCATIONS

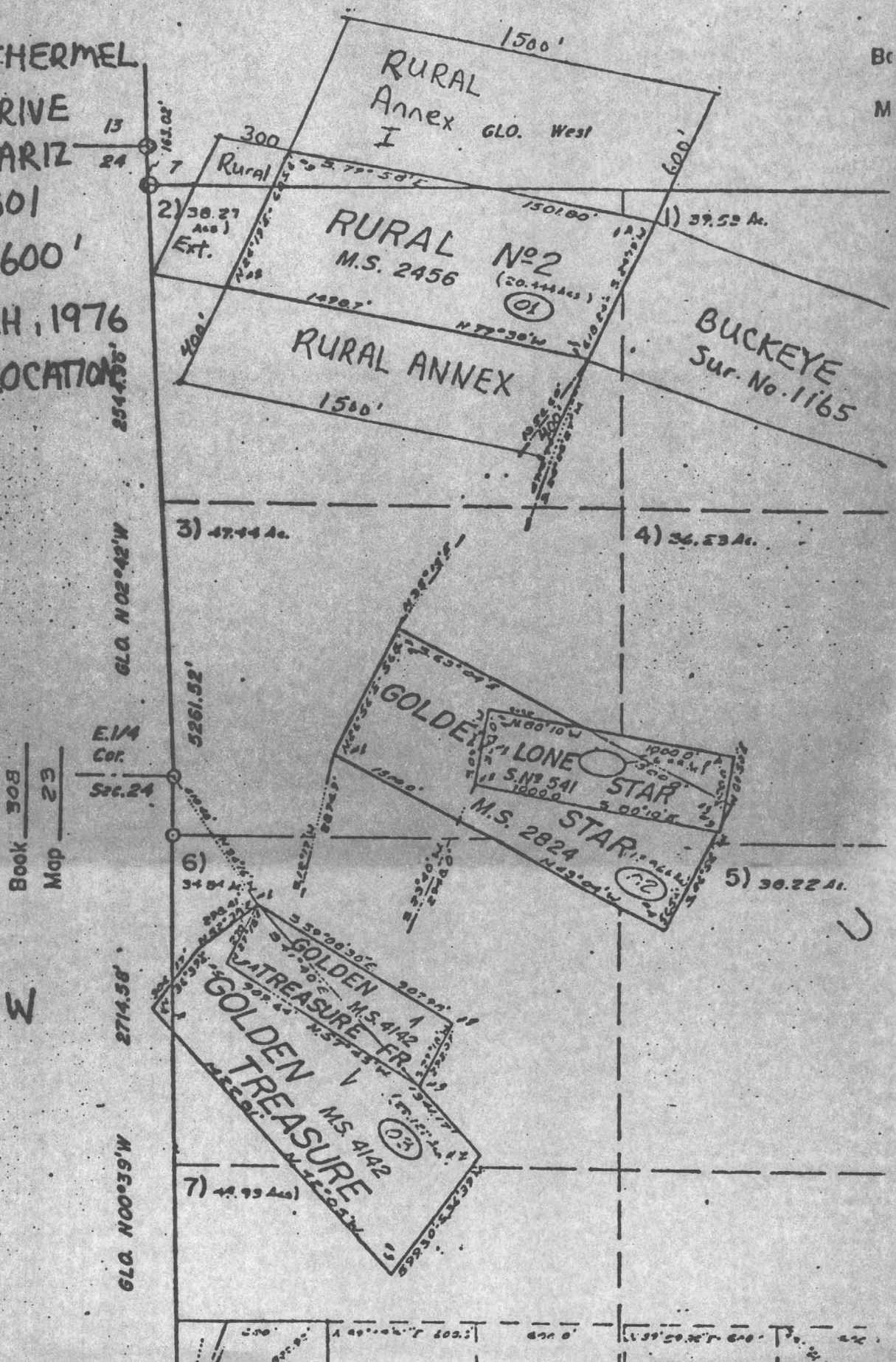


BLM COPY
RURAL GROUP

DRAWN BY
JOHN B. ROTHERMEL
6012 N. 47 DRIVE
GLENDALE, ARIZ
85301

SCALE 1" = 600'

DATE MARCH, 1976
AMENDED LOCATION



~~AMENDED~~

Notice of Mining Location

LODE CLAIM

TO ALL WHOM IT MAY CONCERN:

This Mining Claim, the name of which is the Rural Annex, Mining Claim, situate on lands belonging to the United States of America, and in which there are valuable mineral deposits, was entered upon and located for the purpose of exploration and purchase by John B. Rothermel Jr. A citizen of the United States
Frederic M. Rothermel A citizen of the United States

(Locator must insert either "a citizen of the United States" or "who has declared his intention of becoming a citizen of the United States.")

the undersigned, on the 14 day of March, 1976.

The length of this claim is 1500 feet, and we claim 1400 feet, in a westerly direction and 100 feet in a easterly direction from the center of the discovery shaft, at which this notice is posted, lengthwise of the claim, together with 300 feet in width of the surface grounds, on each side of the center of said claim. The general course of the lode deposit and premises is from the east to the west.

The claim is situated and located in the Wallapai Mining District, in Mohave County, in the State of Arizona, about 1½ miles in a northeast direction from Mineral Park. This claim sidlines the Rural No 2 Patented Claim

The surface boundaries of the claim are marked upon the ground as follows: Beginning at A 4" x 4" x 4' Post in A Mound of Stones

at a point in a easterly direction 100' feet from the discovery shaft (at which this notice is posted), being in the center of the east end line end line of said claim; thence N 24°19'E 300 feet to a 4"x4"x4' post, being the northeast corner corner of said claim; thence westerly 1500' feet to a 4"x4"x4' Post, being at the northwest corner of said claim; thence S 24°19'W 300 feet to a 4"x4"x4' Post at the center of the west end line end of said claim; thence S 24°19'W 300 feet to a 4"x4"x4' Post being at the southwest corner of said claim; thence easterly 1500' feet to a 4"x4"x4' Post at the southeast corner of said claim; thence 300' feet to the place of beginning.

All done under the provisions of the laws of the United States, and the State of Arizona.

~~This is an amended Location Notice of the Mining Claim, located by on the day of of Record of Mines, at 19, and recorded in Book page, in the office of the County Recorder of the aforesaid County of to which reference is hereby made, and this amended Location Notice is made and posted to correct errors in the description in the said original Location Notice~~

Dated and posted on the grounds this 14 day of March, 1976.

John B. Rothermel Jr.
Frederic M. Rothermel

John B. Rothermel Jr.
Frederic M. Rothermel

PLEASE RECORD

8 pt. type or larger

NOTICE OF LOCATION

MILL SITE CLAIM

(See Sections 2301 - 2324, Inclusive, Public Resources Code)

TO WHOM IT MAY CONCERN: Please take notice that:

The name of this claim is Rural Mill Site

The name~~s~~ of the locator~~s~~ of said claim are (is - are):

John B Rothermel Jr — A citizen of the United States
Frederic M. Rothermel — A citizen of the United States
John B. Rothermel — A citizen of the United States

The said locator~~s~~ do~~ ~~ hereby declare and publish as a legal notice that they (he - they) are (is - are) the proprietor of a vein or lode claim, or mine, or the owner~~ ~~ of a quartz mill or reduction works, and have a valid right to the occupation, possession and enjoyment of all and singular that tract or parcel of nonmineral land not exceeding five acres, situate, lying and being in Section 18 Township 12 N Range 17W Salt River And G&R Meridian, in the County of Mohave, State of Arizona, bounded and described as follows:

The Rural Mill Site,

COMMENCING at Corner No. 1 which is the southeast corner of the Rural Patented Mine thence 330' easterly to a 4"x4"x4' Post which is corner no. 2 thence in a southerly direction 660 feet to a 4"x4"x4' Post which is corner no. 3 thence 330 feet in a westerly direction to corner no. 4 thence 660 feet in a northerly direction to the beginning where this notice is posted.

together with all and singular the hereditaments and appurtenances thereunto belonging or in anywise appertaining.

The aforesaid Mill Site consists of 5 acres or _____ feet claimed and was located this 14 day of March, 19 76

The date of the discovery and posting of this Notice is the 14 day of March, 19 76.

IN WITNESS WHEREOF, the said parties have hereunto set their hands and seals, this 14 day of March, 19 76

WITNESSES:[1]

John B. Rothermel Jr
Frederic Mahr Rothermel
John B. Rothermel

LOCATORS:[2]

John B. Rothermel Jr.
Frederic Mahr Rothermel
John B. Rothermel

BOOK 318 PAGE 235

[redacted]

AMENDED

Notice of Mining Location

LODE CLAIM

TO ALL WHOM IT MAY CONCERN:

This Mining Claim, the name of which is the BUCKEYE M.S. No. 1165 Mining Claim, situate on lands belonging to the United States of America, and in which there are valuable mineral deposits, was entered upon and located for the purpose of exploration and purchase by FREDERIC MANE ROTHERMEL AND JOHN B. ROTHERMEL JR., BOTH CITIZENS OF THE UNITED STATES OF AMERICA

(Locator must insert either "a citizen of the United States", or "who has declared his intention of becoming a citizen of the United States.")

the undersigned, on the 11TH day of NOVEMBER, 1974.

The length of this claim is 1,498.02' feet, and WE claim 1,398.02' feet, in a SOUTH EASTERLY (S.48°02'-40"E) direction and 100 feet in a NORTH WESTERLY (N.48°02'-40"W.) direction from the center of the discovery shaft, at which this notice is posted, lengthwise of the claim, together with 400' TOTAL (200' EACH SIDE) feet in width of the surface grounds, on each side of the center of said claim. The general course of the lode deposit and premises is from the NORTH WEST to the SOUTH EAST

The claim is situated and located in the WALLAPAI Mining District, in MOHAVE County, in the State of Arizona, about 1½ MILES in a NORTH EASTERLY direction from MINERAL PARK & ITS NORTH WEST CORNER IS 2,077.08' N.82°37'-40"W. OF SECTION 7 B.29E.T. ALSO IS 2,852.48' N.26°56'50"W. OF SECTION 7 B.29 CORNER MARKERS, T.23N., R.17W. IN SECTION 18.

The surface boundaries of the claim are marked upon the ground as follows: Beginning at A 4"x4"x48" WOOD POST & ROCK MONUMENT

at a point in a 100' NORTH EASTERLY direction 100 feet from the discovery shaft (at which this notice is posted), being in the center of the NORTH WEST end line of said claim; thence 200 feet to a 4"x4"x48" WOOD POST being the NORTH WEST corner of said claim; thence 1,498.02 feet to a 4"x4"x48" WOOD POST being at the NORTH EAST corner of said claim; thence 200 feet to a 4"x4"x48" WOOD POST at the center of the SOUTH EAST END of said claim; thence 100 feet to a 4"x4"x48" WOOD POST being at the SOUTHERN corner of said claim; thence 1,498.02 feet to a 4"x4"x48" WOOD POST at the SOUTH WEST corner of said claim; thence 200 feet to the place of beginning.

All done under the provisions of the laws of the United States, and the State of Arizona.

This is an amended Location Notice of the BUCKEYE M.S. NO. 1165 Mining Claim, located by FREDERIC MANE ROTHERMEL AND JOHN B. ROTHERMEL, JR. on the 11TH day of NOVEMBER 1974, and recorded in Book 250 of Record of Mines, at page 330 in the office of the County Recorder of the aforesaid County of MOHAVE. [illegible] number made, and this amended Location Notice is made and posted to correct errors in the description in the said original Location Notice. SEE BOOK 330, JAN 20, 1920.

(Copy) Dated and posted on the grounds this 24TH day of NOVEMBER, 1977.

[illegible]

STATE OF ARIZONA,

County of MOHAVE ss.

I, _____

the County and state aforesaid, do hereby certify that the

record at ____ o'clock _____ M., on this _____ day of

recorded in Book No. _____ of _____ Records of _____

Arizona at pages _____

WITNESS my hand and official seal the day and year [redacted] written.

_____

County Recorder.

AMENDED

Notice of Location

LODE CLAIM

BUCKEYE

Located M.S. No. 1165

T.23 N., R.17 W., Sec. 18

G&S. Salt R. B. & M. Nov. 11, 1924

Dated Nov. 25, 1977

STATE OF ARIZONA, } ss.

County of MOHAVE

I hereby certify that the within instrument was filed and recorded at request of JOHN B. ROTHERMEL

Book _____

In Docket _____

on page _____

Witness my hand and official seal the day and year aforesaid.

_____ County Recorder.

By _____ Deputy Recorder.

Indent Mines

Filed at ___ 77-33242

Recorded at the request of

John B. Rothermel

on ___ 2:37 o'clock 00 AM

in Book ___ of Official Records

Page ___

Records of Mohave County, Arizona.

_____ Deputy Recorder

Mohave County, Arizona

By _____

94

57 - 650

Rural - Buckeye

INTER-COMPANY COMMUNICATION

PERKIN-ELMER

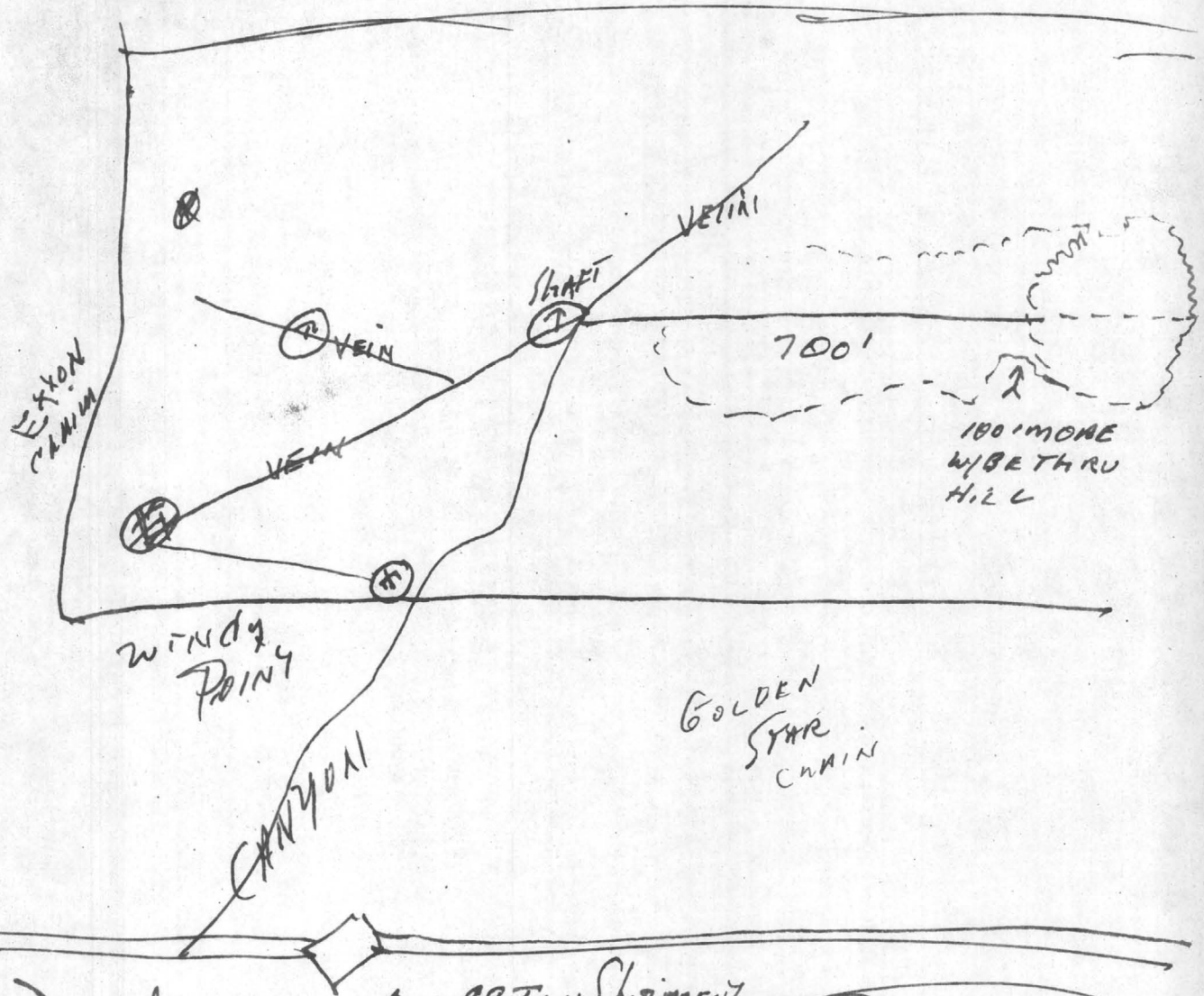
1½ miles from Pinkham

Date:

To:

From:

Subj:



Arizona - Mountains
Mill site

Water from Tennessee

On 88 ton shipment to P-D from vein material

Took 20 ft wide - approx 8' country rock shipped

Ripped - hand shipped

Pinkham Dump

Less .20 Cu (By chemical test)

Pb - 2%

Zinc - 0

Enough water for small operation on property!

0-0532-02

VALLEY ASSAY OFFICE

AND ORE TESTING LABORATORY

MEMORANDUM OF ASSAY

Made for John Rothermel

Tempe, Arizona Feb 10 75

SAMPLE NO.	PER TON OF 2000 POUNDS AVOIRDUPOIS								COPPER, OR			LEAD, OR			ZINC, OR			TOT
	GOLD, PLATINUM				SILVER													
	AT	PER OUNCE			AT	PER OUNCE			AT	PER LB.		AT	PER LB.		AT	PER LB.		
	OZS.	100's	$	Cts	OZS.	100's	$	Cts.	%	$	Cts.	%	$	Cts.	%	$	Cts.	$
Rural-1	0.	52																

REMARKS:

NO.

CHARGE $ 5.00 Pd.

BY L. Lee Boyer

Registered Assay

L. LEE BOYER
CERTIFIED ASSAYER
ARIZONA, U.S.A.

1435 SOUTH 10th AVENUE
NO. BOX

PHONE 622-0813

Jacobs Assay Office

Registered Assayers

85702 Tucson, Arizona, Dec 6, 1974

RURAL No. 2

Sample Submitted by Mr. John B Rothermel

Sample Marked	GOLD Ozs. per ton ore	GOLD Value per ton ore * $	SILVER Ozs. per ton ore	COPPER Per cent Wet Assay	LEAD Per cent Wet Assay	Per Cent Wet Assay	Per Cent Wet Assay	Per Cent Wet Assay
	1.20	120.00	15.01	0.03				
X								
74								
		270.00	58.00	.64	0			

* Gold Figured $ 100.00 per oz. Troy

Charges $ 5.00 Paid

Very respectfully,

Dan P. Jacobs

Wallapai Mining District
Mohave County, Arizona

Bendix

Field Engineering Corporation

Albuquerque District Office

2201 San Pedro Dr. N.E.
Building 3, Suite 220
Albuquerque, NM 87110

A Subsidiary of
The Bendix Corporation

August 10, 1979

Mr. Dick Genova
2608 N. Potrero
Phoenix, Az. 85006

Dear Dick,

Here are your long - awaited results of the analyses we promised you.

Sample # MGA-851 is from the road cut area near the Chico Mine where the scintillometer showed 2400 cps. Sample #MGA-852 is of the gossan above the Rural Mine. Sample #MGA-853 is the one we took from the vein exposed in the short, partially caved, adit at the Sky-scraper Mine.

The enclosed analyses are all expressed in parts per million. I have also included a copy of a conversion table that will enable you to convert the ppm values into per cent and, for the silver values, into troy ounces per short ton.

Regards to John, and good luck.

Sincerely,

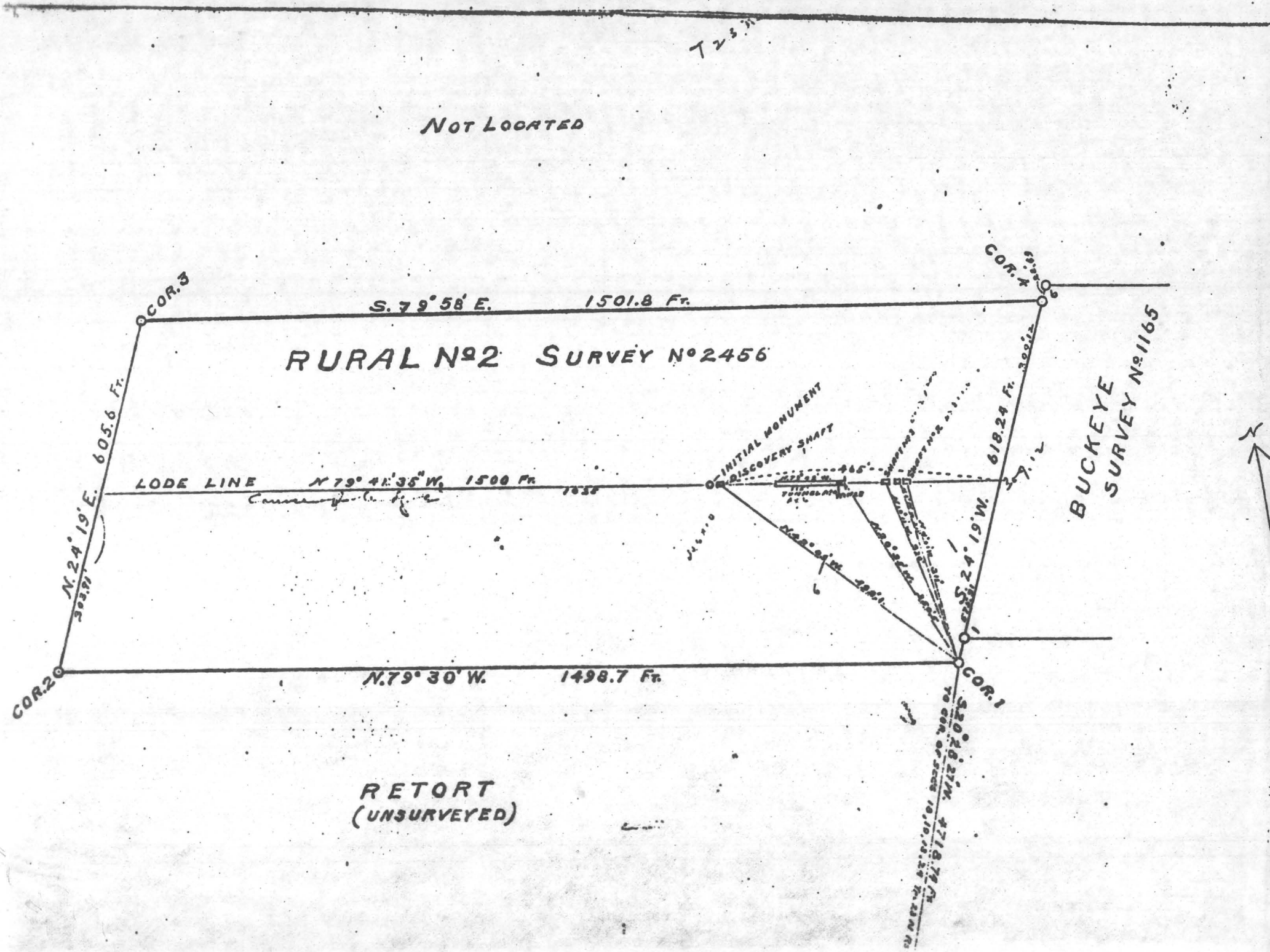
Wade

Wade Corder
Geologic Technician

Encl. (2)

BFEC SAMPLE NO.	MGA 851	MGA 852	MGA 853
LAB SAMPLE NO.			
U_3O_8 R (ppm)	80.4	7.2	1.3
U_3O_8 W (ppb)			
U_3O_8 S,SS (ppm)			
LOI S,SS (%)			
MEA (ppm)			
Ag	< 0.5	700.0	30.0
Al	60000	10000	30000
As	< 200	10000	3000
B	10	20	50
Ba	20	100	50
Be	10	5	15
Ca	150000	1000	1000
Co	5	10	10
Cr	200	50	500
Cu	< 10	2000	100
Fe	50000	150000	50000
La	700	50	< 20
Li	< 100	< 100	< 100
Mn	200	70	>5000
Mo	< 10	< 10	< 10
Na	2000	2000	5000
Nb	70	20	10
Ni	< 10	< 10	20
Pb	70	1000	1000
Sb	< 100	< 100	< 100
Sc	15	< 10	15
Sn	< 10	< 10	< 10
Sr	1000	< 100	< 100
Ti	7000	< 20	1500
V	30	10	30
W	< 100	< 100	< 100
Y	>200	< 10	10
Zn	< 200	1000	1500
Zr	>1000	< 10	20

Rural
20 ounces
Silver


T 2 S R
NOT LOCATED
COR. 3
S. 79° 58' E.
1501.8 Ft.
COR. 4
RURAL Nº2 SURVEY Nº2456
N. 24° 19' E.
605.6 Ft.
LODE LINE
N 79° 41' 35" W.
1500 Ft.
INITIAL MONUMENT
DISCOVERY SHAFT
618.24 Ft.
S. 24° 19' W.
BUCKEYE SURVEY Nº1165
COR. 2
N. 79° 30' W.
1498.7 Ft.
COR. 1
RETORT
(UNSURVEYED)

1435 SOUTH 10th AVENUE
P.O. BOX 1889

Jacobs Assay Office

Registered Assayers

85702 Tucson, Arizona, June 11 1976

Sample Submitted by Mr. Rothco Mines % Mr. Ofel Rothwell

Sample Marked	GOLD Ozs. per ton ore	GOLD Value per ton ore * $	SILVER Ozs. per ton ore	COPPER ~~Per Cent~~ Wet Assay	LEAD ~~Per Cent~~ Wet Assay	~~Per Cent~~ Wet Assay		
"Rural Hill Fabrication"	0.04	4.00	11 6/10					

Very respectfully, Ben C. Jacobs

* Gold Figured $ 100.00 per oz. Troy

Charges $ 5.00 pd

Rural- Buckeye Assays

IRON KING ASSAY OFFICE

ASSAY CERTIFICATE

BOX 14 -- PHONE 632-7410

HUMBOLDT, ARIZONA 86329

ASSAY MADE FOR

ROTHCO MINES
Fred Rothermel
3016 W. Mercer Ln.
Phoenix, Ariz. 85029

Nov. 25, 1975

Ref no.	DESCRIPTION	oz/ton Au	oz/ton Ag		% Fe	% [illegible]	[illegible]	[illegible]
11-24-9	Rural Hill Vein	.038	25.16					

CHARGES $4.25 paid

ASSAYER

PRELIMINARY CONSIDERATIONS

TO CONVERT PARTS PER MILLION TO OUNCES PER SHORT TON:

PPM x 0.2916 = OPT (ounces per ton)

PERCENT	= PARTS PER MILLION	= TROY OUNCES (per 2000 lb short ton)
100.000 %	1,000,000 PPM	29,166.667 OZ
10.000	100,000	2,916.667
1.000	10,000	291.667
0.100	1,000	29.167
0.010	100	2.917
0.001	10	0.292
0.0001	1	0.029
0.00001	0.1	0.003

TO CONVERT TROY OUNCES IN A SHORT TON (2000 LBS) TO PARTS PER MILLION:

$$\frac{1{,}000{,}000 \text{ PPM (Short Ton)}}{29{,}166.667 \text{ Troy Ounces}} = 34.285 \text{ PPM}$$

PPM	TROY OZ PER TON
34.285	1.000
3.4285	0.100
0.3428	0.010
0.0343	0.001

REFERENCES:

PREPARED BY H. Richard DATE Feb 1966
APPROVED BY _____ DATE _____
_____ BY _____ DATE _____

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

FIELD ENGINEERS REPORT

THE ARIZONA DEPARTMENT OF MINERAL RESOURCES MAKES NO REPRESENTATION AS TO THE ACCURACY OF THE CONTENTS OF THESE DOCUMENTS.

Mine: Rural

Date: April 8, 1976

District: Mineral Park, Mohave County

Engineer: Ken A. Phillips

Subject: Present status

Owner: John Rothermel, 3016 W. Mercer Lane, Phoenix, 942-4470.

Claims: Rural (patented), Rural Anex, Rural Anex #1, Rural Extension (3 unpatented)

Location: One and one-half miles northeast of Mineral Park near the south base of Cherum Peak (Schrader, 1909, p. 83) NE¼NW¼ S. 18 T23N R17W (USGS Chloride Quad)

Commodity: Silver (gold, copper, zinc and lead)

Minerals: Dominant vein minerals; pyrite, arsenopyrite and quartz with subordinate chalcopyrite, sphalerite and galena. Silver was reported to occur primarily as native silver along with argentite and cerargyrite (Schrader, 1909, p. 83; Bastin, 1923, p. 24)

Geology: Country rock is medium-grained gneissic biotite granite and associated schist. It is intruded by dikes of granite porphyry. The mineralization occurs in a fissure vein 2-8 feet in width. The vein strikes west of north and dips 80° south. The mineralization is believed associated with a dike of the granite porphyry, most of which occur nearly to the north. The deposit has contained ore shoots ranging from 4 to 20 feet in width, which consist mostly of pyrite and chalcopyrite with parallel streaks of arsenopyrite, black oxide on manganese, gray chert and quartz. (Schrader, 1909, p. 84).

Past production: The only reported production was 152.282 short tons of silver-gold ore averaging ~~[illegible] oz. Ag/ton~~ and 6.41 oz Au per ton in 1886-87 (Bastin, 1924, p. 24)

Present activity: John Rothermel reported that he has sampled the surface of the vein by small pits in 50 foot intervals over approximately 300 feet of exposure. Six samples ranged from 60-90 oz Ag/ton and 0.01 Au/ton. The vein is reported to pinch and swell from 2 to 8 feet in width.

References: Schrader, F.C.; 1909, Mineral Deposits of the Cerbat Range, Black Mts. and Grand Wash Cliffs, Mohave County, Arizona; U.S. Geol. Survey Bull. 397, 226 p.

Bastin, Edson S., 1923; Origin of Certain Rich Silver Ores Near Chloride and Kingman, Arizona, in Contribtuions to Economic Geology; U.S. Geol. Survey Bull. 750, p. 17-39

MS 2456

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

THE ARIZONA DEPARTMENT OF MINERAL RESOURCES MAKES NO REPRESENTATIONS AS TO THE ACCURACY OF THE CONTENTS OF THESE DOCUMENTS.

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Date: April 1976

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Bastin, Edson S., 1923; Origin of Certain Rich Silver Ores Near Chloride and Kingman, Arizona, in Contributions to Economic Geology; U.S. Geol. Survey Bull. 750, p. 17-39

NO TAILINGS

[illegible] and chalcopyrite. The vein at [illegible] point stands about vertical or dips very steeply northeast instead of southwest, its normal direction.

Later a fine body of high-grade copper sulphide ore, 18 to 24 inches in width, was opened in extending the drift northwestward on the fourth or 140-foot level. This ore averaged about 9 per cent of copper and 60 ounces of silver to the ton.

On the fifth or 230-foot level, which is practically the bottom of the mine, the vein dips about 70° SW. and is from 4 to 6 feet in width. The face of the drift, 100 feet northwest of the shaft, shows a width of 8 feet with the foot wall not yet in sight. Here the vein consists of coarsely streaked or irregularly banded ore, crushed quartz, and altered country rock, all pretty soft and containing 4 to 6 inch gouge seams.

South of the shaft the vein is mineralized for a width of 20 feet or more, and at the end of a 40-foot crosscut into the hanging wall there is a good looking small vein 1½ feet wide, which dips steeply to the northeast.

MIDNIGHT MINE.

The claim of the Midnight mine practically joins that of the Pinkham mine on the northwest, as shown in Plate III, and, like the Pinkham, is situated on open, gently sloping ground. (See Pl. VI, *B*.) The mine was discovered prior to 1866. The original owner was a pioneer named Carpenter, who in early times hauled some of the ore to the Mineral Park mill. Later the mine was owned by Heinrods, McDuffee & Gilleland, and still later by the partners Darius Brown, Robert Gibson, James Boyd, and John St. Charles. Finally, about 1898, John St. Charles and his brother Keene became the sole owners. They alone have done most of the development, and have shipped ore from the deeper levels.

The mine is developed principally by inclined shafts, drifts, and crosscuts, and is equipped with a gasoline hoist. The main shaft is 200 feet deep, and the drifts, crosscuts, and stopes aggregate several hundred feet of workings.

The same country rocks prevail as in the Pinkham vein, being principally pressed and crushed microcline-biotite granite, and this is also intruded by the same classes of diabase and granitic dikes in or near the mine, the diabase apparently being the later of the intrusives (fig. 11). The vein or lode is less well defined than the vein in the Pinkham mine. As shown in figure 10, it strikes in general about N. 65° W. and on the southeast seems to join the Pinkham vein. It has a width of 50 to 75 feet and contains much low-grade ore. As seen in the mine, it contains two main veins or ore bodies, of which the principal or south one strikes about northwest and dips irregularly southwest at angles of [illegible] [illegible] N. 80° W. and dips steeply to the north.

A large amount of good ore is shown in the mine, but it contains much zinc, and considerable disturbance, including lateral faulting, has taken place, by reason of which further development is needed before the structure can be worked out. The ore contains silver, copper, gold, zinc, and iron. The silver occurs mostly in chalcopyrite, the rule being the more chalcopyrite the more silver. Some galena, the rule being the more chalcopyrite the more silver. Some bornite is present. The gold is found principally in the pyrite. The zinc blende, though more or less mixed with the ore, occurs also in a relatively pure 3-inch shoot on the hanging wall in the northeastern part of the mine.

For some years past the mine has been shipping copper ore in a small way. This ore was rich and averaged about $1,500 a ton, but some of it contained 5 or 6 per cent more of zinc than the 10 per cent allowed by the smelters and was accordingly penalized. It seems probable that by the use of a suitable magnetic separator the zinc could be extracted and profitably marketed as zinc ore. In certain parts of the mine the ore contains 30 to 40 per cent of zinc, and is so low in other values that it will be shipped as zinc ore. A recent carload shipment of the ore averaged 66 ounces in silver and $2.50 in gold to the ton and 4.5 per cent of copper. Under the present management the mine has produced about 300 tons of ore, with a total value of about $7,000. The ore is reported to mill about 5 to 1.

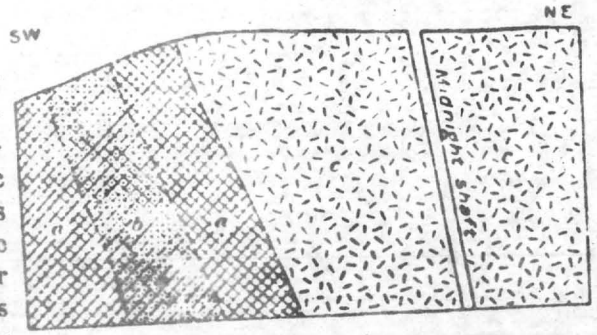

FIGURE 11.—Diagram showing intrusions near Midnight shaft. *a*, Aplite; *b*, diabase, intrusive into aplite; *c*, granite.

SILVER HILL VEIN.

The Silver Hill vein is located on Silver Hill, a prominent elongated ridge just southwest of Chloride and rising about 150 feet above it. It extends southward nearly to the railroad station. The ridge trends about north and south, is about three-fourths of a mile long and one-eighth of a mile broad, and is composed almost wholly of dark amphibolite schist. A coarse granititic rock appears to be intruded in its western base, and it is locally traversed by dikes and stringers of the garnet-bearing aplitic granite and also by a coarse granititic granite. The schist dips about 60° E. and is cut by a well-marked sheeting that dips about 35° W.

Study Of Kingman Silver Ores

-1924, PART I.

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ORIGIN OF CERTAIN RICH SILVER ORES NEAR CHLORIDE AND KINGMAN, ARIZONA.

By Edson S. Bastin.

INTRODUCTION.

The mineral deposits of the Cerbat Mountains between Kingman and Chloride, in northwestern Arizona, were described by Schrader[1] in 1909. The writer visited some of the silver mines and prospects of the Cerbat Mountains in 1913, in the course of a study of silver enrichment undertaken by the United States Geological Survey in many mining camps of the western United States. The work of preparing the results for publication has been delayed by the war and other causes.

The practical application of the results lies in the determination of the extent to which the several silver minerals of the ore are secondary or primary and hence to what extent they are likely to play out at moderate depths or to persist below the reach of surface processes of alteration. The results are summarized at the end of the report.

The mines described were reached from Kingman, on the main line of the Atchison, Topeka & Santa Fe Railway, and from Chloride, the terminus of a short railroad line from Kingman.

GENERAL FEATURES OF THE AREA.

The area here considered is arid, with hot summers and mild winters. The annual precipitation is about 5 inches, almost never in the form of snow. The area is for the most part treeless, and its vegetation is of desert types.

The Cerbat Mountains constitute one of the numerous desert ranges of nearly north-south trend that form a characteristic feature of the Great Basin topography. In the parts of the range under discussion the altitude ranges between 4,000 and 6,000 feet.

The Cerbat Mountains consist in the main of pre-Cambrian igneous and metamorphic rocks, and these form the wall rocks at all the mines

[1] Schrader, F. C., Mineral deposits of the Cerbat Range, Black Mountains, and Wash Cliffs, Mohave County, Ariz.: U. S. Geol. Survey Bull. 397, 1909.

Good Source

Depth Of RURAL-BUCKEYE WORKINGS

Rural Shaft 200'

Buckeye 170' Shaft

Winze 180' deep

125' from mouth of Tunnel

origin. In degree the replacement of proustite by silver is compatible with that of chalcopyrite by covellite in the same specimen, and both are attributed to descending oxidizing solutions.

The silver content in the specimens examined is therefore in part primary, in proustite and polybasite, and in part secondary, as native silver. The primary silver content is high—sufficient in itself to produce a rich silver ore. Such abundance of primary sulphosalts of silver in ores from depths of only 50 to 80 feet is unusual but is due to the dense, highly quartzose, fine-grained nature of the ore, which narrowly limits oxidation and enrichment to the immediate vicinity of fractures.

RURAL AND BUCKEYE MINES.

The Rural and Buckeye mines are about 1½ miles northeast of Mineral Park and are a few hundred feet apart on the same vein. The wall rocks are granite gneiss and schist of pre-Cambrian age, intruded by dikes of much younger granite porphyry. The vein is nearly vertical and from 2 to 8 feet wide. All workings were inaccessible in 1913, the mines having been idle for many years. Ground water stood at a depth of about 50 feet below the collar in the Rural shaft.

Ores seen on the dumps showed pyrite, arsenopyrite, and quartz as the dominant minerals, with chalcopyrite, sphalerite, and galena subordinate. No silver minerals were seen on the dump, but native silver is abundant in specimens from this mine seen at Kingman. One specimen in the collection of E. F. Thompson shows a mass of nearly solid native silver 1½ inches across.

The following records show the tenor of the richer ores:

Tenor of smelting ores shipped from Rural and Buckeye mines in 1886–87.

Net weight (pounds).	Silver (ounces per ton).	Gold (ounces per ton).	Net weight (pounds).	Silver (ounces per ton).	Gold (ounces per ton).
9,033	722	6.13	29,862	266	5.85
8,024	410	2.66	21,166	249	4.00
13,600	280	2.35	72,650	480	8.25
28,376	479	9.16	10,212	442	8.16
23,575	119	4.90	27,142	172	4.70
30,999	196	6.03	87	4,467	4.80
9,808	109	5.12	167	4,024	5.35
20,314	73	7.20			

QUEEN BEE MINE.

The Queen Bee mine is in the northwestern part of the Mineral Park district, close to the cut-off trail to Chloride. The mine is owned by James B. Uncopher, of Mineral Park, to whom the writer is indebted for valuable information and specimens. The

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[6] Op. cit., p

their deposition. They bear evidence of having been formed rather close to the surface by hot waters which ascended through the lavas at the close of igneous activity.

MINERALOGY.

The region is not characterized by a great variety of minerals. The Black Mountains are especially poor in this respect.

The gangue minerals in the Cerbat Range consist of quartz, with some calcite, dolomitic carbonates, and siderite. Those of the Black Mountains are quartz, calcite, adularia, and pale-green fluorite. Limonite and hematite are common in both ranges as products of oxidation. The absence or scarcity of barite is remarkable.

The ore minerals of the Cerbat Range include silver, gold, pyrite, chalcopyrite, arsenopyrite, stibnite, galena, zinc blende, molybdenite, argentite, bornite, chalcocite, and ruby silver. Vanadinite and wolframite are known from the Gold Basin district. Among the oxidized minerals horn silver, cerusite, azurite, and malachite are the more important. The ore minerals of the Black Mountains are confined to native gold, pyrite, malachite, and a little argentite. Tellurides have lately been reported from several mines in the Gold Road, Vivian, and Union Pass districts, but none were found during the field work for the present report. Copper stains are present in places, indicating chalcopyrite or tetrahedrite. Vanadinite and galena are reported from the Gold Bug district.

CERBAT RANGE.

INTRODUCTION.

The principal districts in the Cerbat Range, named in order from north to south, are the Gold Basin, White Hills, Chloride, Mineral Park, Cerbat, Stockton Hill, McConnico, and Maynard. Of these the four most important are the Chloride, Mineral Park, Cerbat, and Stockton Hill districts, and these are often spoken of collectively as the Hualpai or Wallapai district. They are located in the middle part of the Cerbat Mountains, extending from a point just south of Stockton Hill and Cerbat to a point north of Chloride, a distance of about 12 miles, and they have certain features in common.

The rocks of this portion of the mountains are essentially of the pre-Cambrian complex, and consist of gray granite, gneissoid granite, and dark schists, including hornblende, mica, and garnet schists. They are flanked on the west in the Cerbat district by local areas of rhyolite and other Tertiary volcanic rocks. To the north, through Mineral Park and toward Chloride, they are intruded by distinctly younger masses of granite porphyry. Furthermore, they are locally

Chloride District - Pinkham
Mineral Park - Rum I, Buckeye
Stockton Hill - Little Chief

cut by dikes of pegmatite, aplitic granite, diabase, vogesite, minette and rhyolite.

The deposits are well-defined fissure veins, of which there are two main sets, one striking about N. 10° to 30° W. and the other N. 45° to 70° W., usually with steep dips. According to Comstock[a] there is also a not generally recognized but important older latitudinal or east-west auriferous vein system, whose veins, usually not prominent or not apparent at the surface, have been encountered mainly in some of the deeper mines and have contributed handsomely toward the enrichment of the ores of these mines. The Elkhart and Tennessee mines at Chloride are given as examples. Veins of the same strike usually occur in two "conjugated systems"—that is, dipping in opposite directions, indicating that a compressive stress has originated the fissures. The dips are usually steep. The veins are more or less clearly associated with younger intrusions of granite porphyry, and some of them follow dikes of vogesite, minette, or aplite. The croppings, which are generally prominent, consist of dark reddish-brown quartz and altered country rock stained by the oxides of iron and manganese. The veins are straight and some are long. The walls are usually good and marked by soft gouge, although many veins are "frozen" to the walls. The gangue is quartz, in many places shattered and recemented by a later generation of calcite. Among the primary ores the most important are pyrite, chalcopyrite, arsenopyrite, galena, and zinc blende, more rarely molybdenite and stibnite. Silver and lead predominate in the Chloride, Mineral Park, and Stockton Hill districts; gold and silver in the Cerbat district. The primary ore is leaner in gold and silver than the oxidized ore, and many mines, notably in the Chloride and Mineral Park districts, which near the surface were silver mines, with increase in depth carried more lead, and at still greater depths seemed to become cupriferous. The so-called "copper belt" of the area extends from Mineral Park northwestward toward Chloride for a distance of several miles.

The water level is found at a maximum depth of 400 feet, but in some places lies considerably nearer the surface. In general the ores above the water level are oxidized, but the line between the two classes is not always sharply marked. In many places (e. g., in the Tennessee vein) galena, and locally, also, pyrite, appears near the surface in association with oxidized ores. In the Towne mine and a few others oxidized ores are found below water level, but not to any great depth, so far as known. The secondary or oxidized ores consist chiefly of native silver, probably also some native gold, horn silver, and cerusite. Ruby silver and argentite are also present with oxidized ore, but do not seem to occupy any well-defined zone between the oxidized and primary ores.

[a] Comstock, Theodore B., Geology and vein phenomena of Arizona: Trans. Am. Inst. Min. Eng., vol. 30, 1900, pp. 1044-1054.

Many of the ore shoots coincide with intersections or forking of veins. Good examples are mentioned in the description of the Pinkham, Elkhart, Rainbow, Pay Roll, and Tennessee mines.

CHLORIDE DISTRICT.

LOCATION.

The Chloride district, the most important in the Cerbat Range, is situated about 20 miles north-northwest from Kingman, in the northern part of the Hualpai district, near the western slope of the Cerbat Mountains. It is comprised in an irregular area about 6 miles in diameter. As shown on the accompanying map, the principal mining locations are disposed roughly in two broad, irregular belts, intersecting each other near their middle points, one, about a mile in width, extending from the Samoa mines, at the crest of the range on the east, for about 6 miles to the west, terminating in the foothills or adjacent part of the Sacramento Valley plain about 2 miles west of Chloride. Its western half parallels the base of the mountains, which here depart from their normal nearly north-south course and extend several miles to the west, and its eastern half lies between the crest and the base of the mountain range on its western slope. The other belt parallels the north-south base of the range and lies mainly in its lower slope and the adjacent part of the Sacramento Valley. It diminishes in width from about 2 miles on the south to less than a mile on the north.

Chloride, the shipping and distributing point of the district, is situated a trifle northwest of its center, at the northern terminus of a branch of the Atchison, Topeka and Santa Fe Railway, connecting with the main line at Kingman. It is favorably located at an altitude of 4,000 feet on an open gentle slope near the base of the mountains. It is also the distributing point for the Weaver, Minnesota, and White Hills districts and for Eldorado Canyon, Nevada.

HISTORY AND CONDITIONS.

Chloride, so named from the character of its rich silver ore, was the first settlement laid out in this part of the area. As a camp it dates from the early sixties, when the first mineral discoveries were made, and as a town from the early seventies. The decline in the price of silver affected the district unfavorably, of course, but it has continued fairly active up to the present time. In 1900 it is said to have had a population of 2,000. For the last four or five years the district has been quiet. Several of the more important mines, however, are in active operation and considerable work on a moderate scale is being done on a score or more properties of well-known merit.

The following are the depths reached by the principal mines:

Depths of mines in Chloride district.

Juno	600	Pinkham	2
Elkhart	500	Midnight	3.
Tennessee	600	Altata	3.
Schuylkill	500	Payroll	4.
Minnesota-Connor	530	Mollie Gibson	3.
Lucky Boy	400	Distaff	18
Samoan	300		

The early prospectors were several times driven out by the Indians, and seven of them are said to have been killed. Owing to the prominent vein croppings, all the principal mines were located at about the same time.

Among the first locations made were the mines now known as the Silver Hill properties, just southwest of Chloride, and the Golden Fleece, Tintic, Independence, and others. Some of the ores were of too low grade for shipment to San Francisco and to Swansea, England, but later, when a mill was built at Mineral Park, they were reduced there. Others, however, were so rich that when shipped abroad they netted their owners large sums. The district has produced a very large amount of lead and several million dollars' worth of gold and silver. It is not possible to obtain even approximate figures of the production. The lack of water has been one of the chief drawbacks of the camp, but with deep sinking plenty will be obtained.

Plate III is a map of the mining claims in this district, and Plate IV gives views showing the topography.

GEOLOGY.

The eastern part of the district is in part rugged, the topography being of the type produced by erosion and weathering of granite. In a distance of about 2 miles the surface descends from the altitude of 6,000 feet at the crest of the range to about 4,000 feet at its base where it meets the plain of the Sacramento Valley. This plain is composed of detritus and wash derived from the range and contains deposits of caliche(?). (See p. 219.) The mountain slope is dissected by several main gulches, among which Samoa, Windmill, and Tennessee gulches are the chief. These drain southwestward into the Sacramento Valley. On the northwest the mountains are lower. Southward-sloping foothills, with no sharp line of demarcation, separate them from the adjacent plain of the valley.

The rocks are chiefly those of the pre-Cambrian complex. In the westward extension of the mountains, immediately north of Chloride, is an area of younger granitic rock, which is intruded into the pre-

Cambrian, and at first glance is difficult to distinguish from the older granitic gneisses, especially as it also has a distinct schistosity. It is a medium-grained granitoid rock, much resembling the granite porphyry of the Mineral Park batholith. It breaks down easily and weathers greenish or yellowish brown, and seems to impart the latter color to about all but the upper portion of the front of the range from Chloride northward. It is moderately schistose in a north-south direction, the dip of the schistosity being vertical, and it is sliced by a northwesterly sheeting which dips 70° NE.

GENERAL CHARACTER OF DEPOSITS.

The deposits occur in two systems of well-defined fissure veins. One strikes a little west of north and stands nearly vertical, another

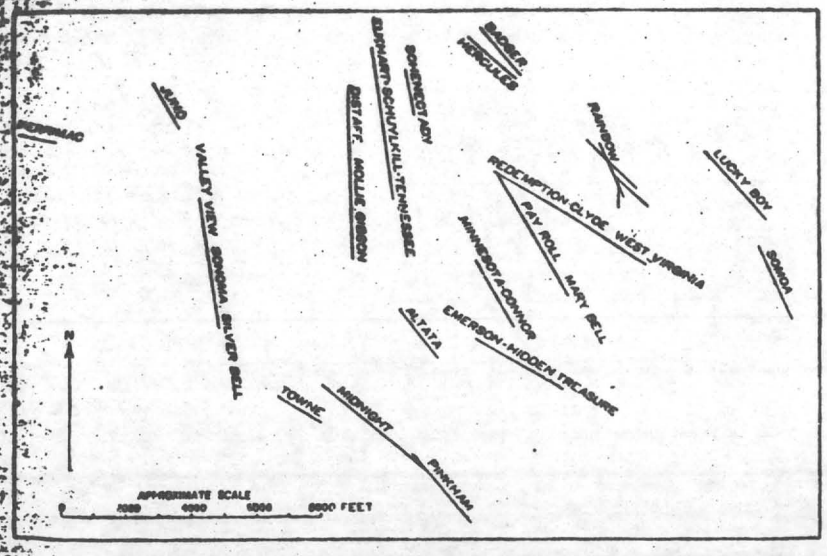

FIGURE 4.—Diagram showing trend and relative position of the principal veins in the Chloride district.

strikes about due northwest and dips steeply either to the northeast or to the southwest. (See fig. 4.) Many of the ore shoots are located at points where spurs or feeders join the vein in an oblique direction. The ores principally contain silver and lead with some gold and copper. The gangue is quartz with some calcite and other carbonates. The primary ore minerals include pyrite, chalcopyrite, arsenopyrite, galena, zinc blende, molybdenite, and probably bornite. The secondary minerals are silver, hornsilver, argentite, ruby silver, and chalcocite, together with various oxidized lead and copper minerals. In a reconnaissance report, like this one, only some of the more important properties can be described to convey an idea of the deposits and developments of the region.

Pinkham Mine with Midnight intersection

wide, and associated with it on the hanging-wall side was a foot or more of soft gangue composed principally of crushed and altered granitic material, which, on being removed by blasting, leaves the intact ore bared in fine condition for loading on the cars. The shoot contains parallel seams of light-colored material, which emphasizes the roughly banded character of the ore.

The ore consists in places of pure galena, but usually it contains also zinc blende, pyrite, and chalcopyrite. The gold in some of it amounts to several ounces a ton. The silver occurs in part as sulphide and native, as masses and wire silver, which locally interlaces adjacent parts of the ore shoot. The amount of zinc increases in the deeper, northern portion of the mine. Toward the northwest end of the surface workings occurs a large amount of reddish quartz ore, which seems to contain chiefly gold values. This probably represents the body of rich gold ore reported to have been found in the surface openings of the mine. A short distance north of this locality galena and zinc-blende ore with comb quartz and chalcopyrite seem to prevail.

CUPEL MINE.

The Cupel mine is situated in the foothills at Stockton Hill camp, on the south side of Cupel Wash. This mine is regarded as probably the oldest on Stockton Hill. It was located about 1863, and was worked intermittently from that date to 1891, being constantly a heavy producer. It is said to have yielded handsome returns to lessees in the seventies, and in the eighties it was opened up by an inclined shaft to the 400-foot level by Spruance, Stanley & Co., of San Francisco. From this shaft nearly half a million dollars in silver and gold ore is reported to have been taken.

The principal equipments are a steam hoist and an excellent 200-ton mill and plant of the Joplin type, recently installed. The mine is owned by the Stockton Hill Mining Company, with headquarters at Topeka, Kans. The mine is developed principally by a shaft 400 feet deep, a three-compartment shaft 150 feet deep, drifts, and stopes to a depth of about 400 feet, the workings being nearly all situated within 300 feet of the main shaft. The mine is said to produce about 25,000 gallons of water a day.

The production of the mine is conservatively reported to exceed $500,000, and is variously estimated at one to one and a half million dollars. From September 3, 1885, to May 1, 1890, according to the smelter sheets, the output was $131,405, and averaged approximately 150 ounces of silver to the ton and 20 per cent of lead, silver at that time being worth about $1 an ounce. It is stated that the mine contains much ore in sight and that the dumps contain about 2,000 tons of ore that is estimated to mill $6 or $7 net per ton.

The Rural is developed principally by a 200-foot shaft, about 100 feet of drift, and a winze. The drift extends westward, its face being about 110 feet distant from the shaft. The shaft contains some water. The Buckeye is developed principally by about 750 feet of drift, extending in an easterly direction. Toward the face of the drift the vein is faulted off to the northeast by a lateral throw of about 75 feet.

The country rock is medium-grained gneissoid biotite granite and associated schist. It is intruded by dikes of granite porphyry. The deposits occur in a fissure vein which is 2 to 4 feet in width in the Rural and attains a maximum of 8 feet in the Buckeye. In the Rural it dips about 80° S. and in the Buckeye about 70° N. In both mines it is associated with a dike of the granite porphyry, masses of which occur to the northeast near by. The gangue is quartz and is generally "frozen" to the walls. It shows ore shoots ranging from 4 to 20 feet in width, which consist mostly of pyrite and chalcopyrite, with parallel streaks of arsenopyrite, black oxide of manganese, gray chert, and quartz, the quartz being more prominent in the Buckeye than in the Rural mine.

The ore contains silver, gold, and copper, with high silver and gold values. The display of ores from these mines, containing masses of solid silver and beautiful specimens of wire silver, is said to have been awarded the silver medal at the Louisiana Purchase Exposition.

The production, exact figures of which are not available, is reported to mount well into thousands of dollars in silver and gold, and much good ore is said to be available in the mines.

WINDY POINT MINE.

The Windy Point mine is in the northeastern part of the district, about a mile northeast of Mineral Park, on open sloping or hilly ground, at an elevation of about 4,800 feet. It is owned by the Arizona Gold Mining and Metallurgical Company, with headquarters at Kingman. It is developed mainly by a 105-foot shaft and a small amount of drift. The shaft starts in gneiss, but soon enters the granite. The mine is newly equipped with a gasoline hoist and electric drills.

The country rock is the pre-Cambrian gneissoid biotite granite and black amphibolite schist. The granite is less dark and micaceous than at the Rural and Buckeye mines. The structure or sheeting strikes N. 85° W. and dips about 75° S. Both the granite and the schist are more or less sericitized and impregnated with pyrite and arsenopyrite near the vein. About 50 feet from the vein, on its

side of the valley, in a steep northeastern slope of the mountain, at an elevation of about 4,500 to 4,700 feet. The country rock is the dark pre-Cambrian granite porphyry, extensively intruded by a light aplitic granite. The vein strikes nearly east and west and dips about 75° N. The mine is developed mainly by two tunnels, aggregating 500 feet in length and 200 feet of drift. The tunnels are situated 100 feet apart vertically; the lower one trends S. 16° E. for a distance of 350 feet to the vein. Here in the face of a 33-foot drift to the east the vein contains 2 feet of quartz with pyrite, intrusive aplitic granite on the hanging wall. The vein looks well, but is said to carry only a little gold, with a trace of copper and silver.

The upper tunnel, situated on the same vein as the lower, lies mostly in the granite porphyry and in the oxidized zone. It contains 160 feet of drift that runs toward the west. Here the vein is 4 to 6 feet wide and consists mainly of iron-stained, streaked, and banded brecciated material. It has yielded considerable good ore, some of which averaged $500 in silver chloride and $4 in gold to the ton.

KATIE MINE.

The Katie mine, owned by C. E. Sherman, of Mineral Park, is reported to have been a producer of rich silver ore since pioneer times.

OTHER PROPERTIES.

Among the other properties in the district are the Annie, Blue Martin, Kenney, Estella, Estella-Bronco, Flora, and Congress. They are all in the prospect stage; all but the last named are east or southeast of Mineral Park and are owned by J. W. Haas.

The Annie prospect is one-eighth mile northeast of Mineral Park. It is developed by a 25-foot shaft and smaller openings. The deposits consist of a "ledge," or mineralized zone, from 10 to 50 feet in width. It trends N. 70° W. and is located on the southwest contact of a rhyolite dike several hundred feet wide, erupted through the pre-Cambrian amphibolite schist and granite. The schist is traversed by numerous veinlets of fresh iron pyrites. The deposit, however is oxidized. It is reported to carry silver, gold, and copper.

The vein of the Blue Martin prospect strikes N. 60° W. and dips about 75° SW. It is about 3 feet thick and is composed mainly of crushed quartz, containing principally dark manganese-stained chalcopyrite ore with some malachite, the ore being reported to run about $30 in copper to the ton. The country rock is a medium-grained gray granite, sparingly impregnated with small crystals of chalcopyrite.

The Kenney prospect vein consists of 2½ feet of crushed or partly brecciated iron-stained quartz and rock, which contains lead values. The country rock is the dark granite.

The Estella prospect has six veins, which are mostly small, some of the larger being about 2 feet thick. They strike mostly about N. 60° to 70° W. and dip steeply southwest. They consist principally of quartz and other oxidized material and are said to have produced good silver chloride ore, and some that contained values of $25 in gold to the ton.

The Estella-Bronco vein, to judge from the croppings, is about 4 feet thick and has an extent of at least 200 feet. It dips northeast at angles of about 80°. Its ore contains iron pyrites and green silver chloride. The vein of the Flora prospect is 20 to 30 inches wide. It dips about 30° NE., and contains two 3 to 5 inch streaks of oxidized galena ore, which is reported to average about $30 in lead to the ton. The deposit is associated with the contact of the aplitic intrusive with the older granitic rocks.

The Congress prospect, also known as the "Great Bronco," is situated in Mineral Park Wash, about three-eighths of a mile west of Mineral Park, mainly on the south side of the wash. It is owned by James Uncapher. It is a mineralized shear zone, or a fault zone, with an observed width of 300 feet and a reported width elsewhere of 600 feet. It trends N. 50° W., is in alignment with Ithaca Peak and Niggerhead, and is reported to be the same "ledge" on which the Queen Bee mine is located. It is probable that the Queen Bee and Pinkham veins and the Congress ledge are all associated in this locality, but their direct connection was not traced. The deposit occurs mainly in the granite porphyry at or near its contact with the pre-Cambrian complex. It consists of more or less silicified and in part altered and iron-stained gray porphyritic granite, with pyrite and chalcopyrite forming the principal part of the ore, disseminated more or less throughout. The deposit, where best exposed and opened in the wash by shallow workings extending more or less across it, is reported to average about $5 a ton in copper, silver, and gold. Here conspicuous patches and areas of malachite and azurite resulting from recent oxidation occur on the surface and basal slopes of the workings, and much of the surface diggings is stained yellowish and greenish. The deposit has received the consideration of some of the largest companies in the Southwest. Whether values will be found in depth seems doubtful.

The McDonald prospect, situated within a few hundred feet of the top of Cherum Peak on the south side, is on a ledge that dips steeply north and is reported to contain tungsten ore.

The Argo prospect, said to be located at an elevation of about 6,000 feet, is reported to have shipped some high-grade ore running from 200 ounces up in silver and containing good lead values.

The Swift claim is said to have produced and shipped some ore containing good values in gold, silver, and lead.

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is reported to contain a
silver to the ton.

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Long Wash from the
and Lane Springs Basi

The country rock is
complex. It is intrude
base, rhyolite, basalt,
with workable veins a
tion. The complex is
Tertiary volcanic rocks

show portions of the deposit to contain as high as $20 in gold to the ton. The gold is mostly free milling. The quartz also contains some iron, principally hematite and limonite, derived from pyrite by oxidation.

STOCKTON HILL DISTRICT.

GENERAL OUTLINE.

LOCATION AND HISTORY.

The Stockton Hill district joins the Cerbat district on the east, and is about parallel and coextensive with it north and south, being situated on the opposite slope of the mountains. It is about 4 miles in width and but little more in length. It ranges in elevation from 3,500 feet at the edge of Hualpai Valley on the east to 5,500 feet at the crest of the range.

The principal and oldest camp is Stockton Hill, situated in the foothills in the eastern part of the district, 10 miles north of Kingman, at an elevation of about 4,800 feet. It dates from early in the sixties, when the principal veins were first discovered and began to produce. In former days much of the ore was shipped to Swansea, Wales, but later it was treated in the Mineral Park and Cerbat mills and shipped to the smelters in San Francisco and to New Mexico. At present the ore is hauled by wagon to Barry or Kingman, whence it is shipped, mostly to Needles. The district is reported to have produced many million dollars' worth of ore.

TOPOGRAPHY AND GEOLOGY.

The topography, shown in part in the sketch map (fig. 16), is generally rough, but the mines are nearly all accessible by wagon roads, mostly of easy grade. The drainage issues eastward into Hualpai Valley, mainly through several short side valleys or transverse washes—the Canyon Station, C. O. D., I. X. L. (known as I. X. L. Basin from the width and open character of its middle part), Cupel, Treasure Hill, and Maywell. In their upper parts most of the washes contract into V-shaped gulches.

The country rock is the pre-Cambrian gneiss and schist complex. It is reddish brown and iron stained and is intruded by dikes of granite porphyry, diabase, and other rocks, mostly of basic character. The schistosity trends about N. 30° E. and dips usually vertically or at steep angles to the northwest. The dominant jointing or sheeting strikes northwest.

ORE DEPOSITS AND MINES.

The deposits occur in pre-Cambrian gneiss or schist, intruded in places by a later aplitic granite or by basic dikes. They are fissure

veins, which in general strike northwesterly and are vertical or dip at steep angles to the northeast. The gangue is quartz and the ores contain chiefly silver, with some gold, lead, and copper. Primary sulphide minerals are galena, zinc blende, chalcopyrite, and pyrite, but the district owes its reputation to the rich silver ores, such as native silver, cerargyrite, argentite, and ruby silver, which were found in large quantities in the upper levels. The water level is about 100 feet below the surface. Galena is often found above it, while rich silver minerals descend to a considerable distance below it. The greatest depth attained is 400 feet.

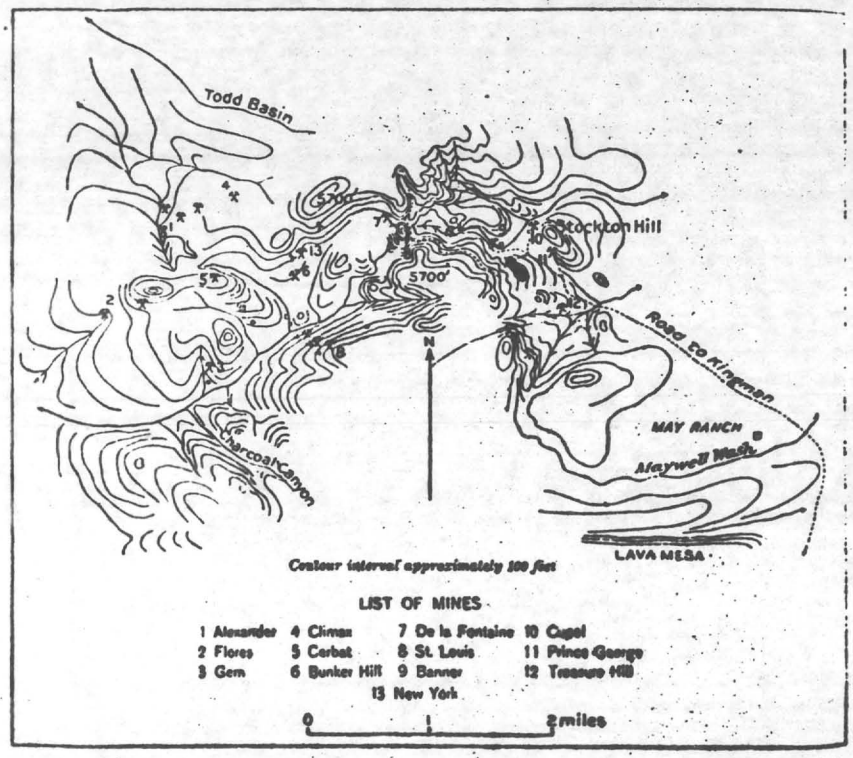

FIGURE 16.—Sketch map of Stockton Hill district and adjoining part of Cerbat district.

The district contains about 10 mines, of which the principal are the Banner Group, Treasure Hill, Little Chief, Cupel, Prince George, De La Fontaine, C. O. D., and Sixty-three. Their general distribution is shown on the accompanying sketch map (fig. 16). The principal locations made in the district are indicated on the claim map (Pl. VIII).

MINES ON STOCKTON HILL WASH.

The principal mines on or near Stockton Hill Wash are the Banner Group, Cupel, and De La Fontaine. Their situation in alignment on a nearly east-west line about 1½ miles in extent has led to the prevalent belief that they are all on the same vein. They are perhaps in a general way in the same mineral zone, but as the strike of the veins at the different mines does not coincide with the trend of the lines and the veins have not been traced and do not seem to connect from mine to mine the single-vein theory remains to be proved.

BANNER GROUP MINE.

Location.—The Banner Group mine (Pl. VII, *B*) is about half a mile west of Stockton Hill, near the center of the district, toward the upper or gulch part of Cupel Wash at a point where it widens into a small basin at about 4,800 feet elevation. The property is said to comprise six adjoining claims, of which the most important are the Infallible (formerly Indian Boy) and the Star Spangled Banner. The principal mine openings are on the former, whence the workings extend northwestward into the latter. The property is owned and operated by the Arizona-Mexican Mining and Smelting Company, of Needles, Cal., where the large smelter owned and operated by this company is located.

Developments.—The mine is developed principally by adit drifts, stopes, winzes, and shafts, aggregating about 2,500 feet of underground work, including the tunnel or adit drift, 1,600 feet in length, on the vein. This drift has a greatest depth of 230 feet below the surface. Several shafts, mostly shallow ones, are located up to 1,050 feet from the mouth of the drift. At 800 feet from the mouth of the drift is a gasoline hoist and a 60-foot winze, reported to be sunk all the way in good ore. The property is equipped with a nearly new 40-ton mill supplied with concentrating tables.

The production is reported to be many thousand dollars in gold, silver, and lead, the zinc thus far being culled and left on the dump. The dumps also contain much second-class ore, which is said to be suitable for concentration. The mine now works about 20 men and produces about 30 tram-car loads of ore a day, of which one-fourth is shipping ore and three-fourths milling ore. The ore is shipped to the Needles smelter.

Neighboring Mine on Same Vein

Geology and ore deposits.—The country rock is light to iron-gray fine-grained gneiss, in which the structure trends about N. 30° E. and dips steeply to the north-northwest. Toward the veins on the foot-wall side the rock is red from oxidized pyrite.

The fissure vein strikes N. 40° W. and dips about 80° NE. The croppings consist principally of leached reddish-brown quartz. The vein averages about 7 or 8 feet in width; the ore varies from about ½-foot to 3 feet in width and usually occurs on the foot-wall side of the vein. In the face of the drift at the time of visit it was 2½ feet

Banner Vein is found on Chief Engineer Group for 3,000'

tion are not at hand. Some of these properties are reported to be developed to the depth of 200 feet or more and contain several hundred feet of drift.

MINERAL PARK DISTRICT.

GENERAL DESCRIPTION.

The Mineral Park district practically joins the Chloride district on the south. Mineral Park, the main camp and post-office, situated near the middle of the district at an elevation of 4,200 feet, is about 4 miles from Chloride. The district trends about north and south, with a length of about 5 miles, which but slightly exceeds its width. It lies mainly in a basin several miles in diameter between the elevations of 4,000 and 5,000 feet. Some of the deposits on the north, however, extend nearly to the top of Cherum Peak, whose elevation is about 7,000 feet. The topography surrounding the basin is mountainous, but for the most part not rugged. The drainage issues westward into Sacramento Valley, mainly through Mineral Park Wash. Open groves of scrub pine and cedar occur in the hills.

The principal supply point is Chloride, but ore and heavy freight are hauled direct to the railroad, 3 miles to the west. The first location made in the district was the Mayflower, in 1870. It was soon followed by the Keystone No. 1 and No. 2, and then by the Lone Star. Considerable ore was soon taken out and shipped to the Selby smelter at San Francisco at a cost for freight of $125 a ton. Some ore was also freighted eastward by oxen over the old government trail to New Mexico.

The Keystone mill, which is still standing, was built at a reported cost of $125,000 and started in 1876. Operations continued more or less actively until the price of silver began to decline in 1882, and during that time the district was one of the heaviest producers and shippers of rich gold and silver ore in the Cerbat Mountains. Since 1882, however, the production has been small, only a few of the mines being worked. One of the reasons seems to be the fact that many of the mines are owned by the original locators or men who have not the means to work them below water level, which in a greater portion of the district is encountered at a comparatively shallow depth. Several springs occur in the district.

The Keystone mill contains a crusher, five 1,000-pound stamps, with pans, a Bruckner revolving reverberatory furnace, and a 25-horsepower engine. In the early days it received most of the ore from the Cerbat Mountain region, including the Chloride, Cerbat, and Stockton Hill camps. The treatment charges are reported to have been very heavy, but, on the other hand, the operators found it difficult to extract the values from the ore.

GEOLOGY.

The country rock is the pre-Cambrian complex, and comprises gneisses and schists as well as gneissoid granite. The structure or schistosity strikes a little west of north, with nearly vertical dip. The complex is extensively intruded or broken through by masses of the later, probably post-Carboniferous coarse granite porphyry, and cut by dikes of rhyolite, diabase, and minette. In the northeastern part of the district, on the slope of the range between Mineral Park and Cherum Peak, the schistosity and sheeting in the pre-Cambrian rocks trend N. 65° E., with vertical dip, and a secondary sheeting trends N. 20° W. and dips about 80° E.

The district on the whole is well mineralized, and its mineralization seems to be largely due to the porphyry. Remote from the intrusive masses this granite porphyry is locally associated with the veins as dikes. It forms the upper part of a prominent foothill or knob on the northwest, known as Niggerhead. It also constitutes a considerable portion of the mountains on the opposite side of the wash, to the south, and extends interruptedly throughout the greater portion of the basin eastward for 1½ miles into the slope of the range. Its structure or jointing, which also penetrates the underlying pre-Cambrian rocks, is well shown across the northern part of Mineral Park district. It dips westward at angles of about 35°.

ORE DEPOSITS.

The deposits contain gold, silver, lead, and copper in fissure veins or lodes, some of which are unusually large. The strike of the veins is N. 37° to 60° W., and the dip is steep to the northeast or the southwest. There are also a few cross veins striking northeast or east and west. The gangue is quartz, with pyrite, chalcopyrite, arsenopyrite, galena, and zinc blende as the principal ore minerals. Especially in the upper levels there are also secondary argentite, native silver, copper, horn silver, and cerusite. The oxidized zone does not extend to a great depth.

The mines, numbering about twenty, are small, few of them exceeding 300 feet in depth or containing more than 1,000 feet of underground work. The principal ones are the Rural, Buckeye, Ark, Queen Bee, Tyler, Keystone, Fairchild, Metallic, Accident, Lady Bug, Standard, and Golden Star. They are nearly all reached by wagon road. The most important producers at present are the Keystone, Tyler, and Queen Bee.

KEYSTONE MINE.

The Keystone mine is situated on open ground about one-fourth of a mile east of Mineral Park and about 200 feet higher. It was located

The mine is developed mainly by two crosscut tunnels and drifts, situated within a vertical range of 100 feet, principally on the Gold Eagle claim.

The country rock is pre-Cambrian medium-grained gneissoid biotite granite. The vein strikes N. 37° W. and dips about 75° SW., into the mountains. It has a width of about 40 feet and seems to consist mainly of an altered and partly replaced crushed and recemented aplitic dike. The entire width is claimed to be low-grade ore, but the values occur chiefly in the first 6 or 7 feet of the hanging-wall side of the dike and are best near its contact with the granite. The hanging wall also carries 6 inches to 2 feet of slickensided gouge, between which and the country rock occurs quartz breccia containing some ore.

The mine produces gold-silver-lead ore. The principal ore minerals consist of galena and cerusite. The last carload shipped at the time of the writer's visit averaged gold 3.16 ounces to the ton, silver [illegible] ounces to the ton, and lead 17.5 per cent. At last accounts the mine was reported to be sold to a Los Angeles company.

LADY BUG MINE.

The Lady Bug, an old mine, is about half a mile southeast of the Tyler mine, close to the Tyler camp, at an elevation of about 5,000 feet. It was located in 1886 by Isaac Conkey, the owner, now residing at Mineral Park. It is developed principally by a 63-foot shaft, [illegible] or more feet of drifts, and a number of surface openings on the vein.

The country rock is pre-Cambrian biotite granite, the same as at the Tyler mine, and it is to a considerable extent intruded by the granite porphyry of Mineral Park. The vein is reported to be 7 to [illegible] feet thick. It lies nearly parallel with the Tyler vein, but differs from it in being composed of a gangue which is mainly quartz. The ore contains principally silver chloride and gold with a little galena. A considerable portion of the ore mined is reported to have averaged $300 to $500 a ton. The production is reported to be $6,000.

RURAL AND BUCKEYE MINES.

The Rural and Buckeye mines are in the northeastern part of the district, 1½ miles northeast of Mineral Park, near the south base of Cherum Peak, at an elevation of about 5,000 feet. They are reached by wagon road. They are situated but a few hundred feet apart on the same vein, the Rural being on the west and the Buckeye on the east side of the same gulch. The Rural is owned by E. F. Thompson, of Kingman, and the Buckeye by C. E. Lovett and others, of Denver, Colo.

visited. Near Kingman and along the western flank of the range occur rhyolite, andesite, and other volcanic rocks of Tertiary age. The familiar desert wash occupies the valleys that flank the mountains.

The ore deposits of the Cerbat Mountains are veins of prevailingly northerly or northwesterly strike and steep dip. All those studied have been worked mainly for their silver content, although minor amounts of gold were present in some. A few veins worked mainly for their base metals were not included in this investigation. The veins are believed by Schrader to have been formed in Tertiary time and to be connected in origin with the granite porphyry of the area.

The bulk of the silver produced in this area in the seventies and eighties came from oxidized ores extending from the surface to depths varying from 50 to 300 feet. Cerargyrite (horn silver) and native silver were the dominant silver minerals of these ores. In the lower part of the oxidized zone ruby silver (proustite) was commonly present, in places so abundantly as to constitute very rich ore. Most of the silver veins were worked to depths of only a few hundred feet and in 1913 had been idle for many years. Few workings could be entered, and samples of the ores were obtained mainly from the dumps or were generously donated by former operators from their personal collections. Specimens of the rich oxidized ores were not available, and these studies therefore relate almost wholly to the sulphide ores.

The reasons for the suspension of mining on most of the silver veins were probably complex. Foremost, perhaps, was the rapid decline in the price of silver between 1885 and 1895. To this was added the fact that the sulphide ores were in general not as rich as the oxidized ores and were more costly to mine. Resumption of mining during the recent period of high silver prices has perhaps been hindered by a fear that the best of the ruby silver ores also owed their richness to enrichment by waters of surface origin, but as indicated on pages 36–39 this belief appears to have no justification in fact.

CHLORINE IN SURFACE WATERS.

The abundant development of silver chloride in the oxidation of the ores of this desert area suggested the testing of the surface waters for chlorine by neutralization with silver nitrate tablets of known weight in the presence of an indicator. Because most of the streams are intermittent only one good opportunity presented itself for such a test. The water of a stream in Tennessee Wash, a quarter of a mile east of the Elkhorn shaft, was collected at a point where it emerged from a dry wash. This water carried about 80 parts per million of chlorine, a large content as contr[illegible] or example,

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at Tonopah, Nev., and of
of the Comstock lode, Nev
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DETAI

The Distaff mine is abou
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collar is about 250 feet a
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The wall rock is somew
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quartz from the surface i
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is no heavily iron-stained

The Distaff shaft was
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that is, close to the level
mine is situated.

All ore above the 250-
tion. Horn silver (cera
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most abundant somewha
level, but most of it betw
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weight. A specimen in
showed a slablike mass
along a fracture in sulph
in this ore.

[3] Jackson, D. D., The normal
and New England: U. S. Geol.
[4] Hastin, E. S., and Laney, F
Survey Prof. Paper 104, p. 29,
[5] Hastin, E. S., Bonanza ores
vey Bull. 735, p. 60, 1922.
[6] Op. cit., p. 60.

the first mineral deposited, and some fracturing of it occurred prior to the deposition of the other ore minerals. As in most of the ores of Mineral Park the proustite is clearly associated with tennantite, a relation which suggests that it may replace tennantite. Close examination, however, shows that the tennantite nearly everywhere has sharp crystal faces next to proustite, as shown in Figure 10 and on a larger scale in Figure 11. The proustite can not have replaced tennantite and is interpreted as primary (hypogene). The galena when tarnished brown with hydrogen peroxide, a reagent that does not tarnish silver minerals, shows no evidence of replacement by other minerals to more than the most incipient degree. The proustite is never found along galena contacts or cleavages.

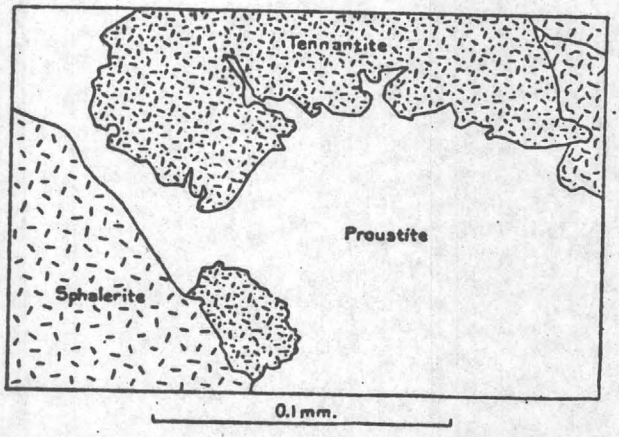

FIGURE 11.—Primary association of proustite and tennantite, Mineral Park, Ariz.

MINES NEAR STOCKTON HILL.

The mining camp of Stockton Hill is about 9 miles north-northwest of Kingman, near the south end of the Cerbat Range and on its east slope. It lies within the area of pre-Cambrian gneiss and schist. In 1913 all the mines had been idle for many years, but some old mine dumps were examined. According to Schrader[7] the district was noted for its rich minerals—cerargyrite, native silver, argentite, and proustite—found in the upper portions of its mines. The water level stood commonly at a depth of about 100 feet.

At the Cupel mine the dump is very old, and the workings are caved, operations having ceased in 1891. The output of the mine is variously estimated at $500,000 to $1,500,000, chiefly in silver. According to Schrader[8] some of the ruby silver ore averaged 3,000

[7] Op. cit., p. 108.

[8] Op. cit., p. 111.

ounces of silver to the ton. Cerargyrite and argentite were found in some of the ore.

Specimens collected by the writer from the old dumps and one especially rich specimen of unoxidized ore presented by Mr. H. H. Watkins, of Kingman, showed the following minerals:

Primary (hypogene): Quartz (usually gray and fine grained), pyrite, arsenopyrite, galena, sphalerite, siderite, chalcopyrite, tennantite, proustite, pearceite.
Secondary (supergene): Proustite and argentite, both very rare.

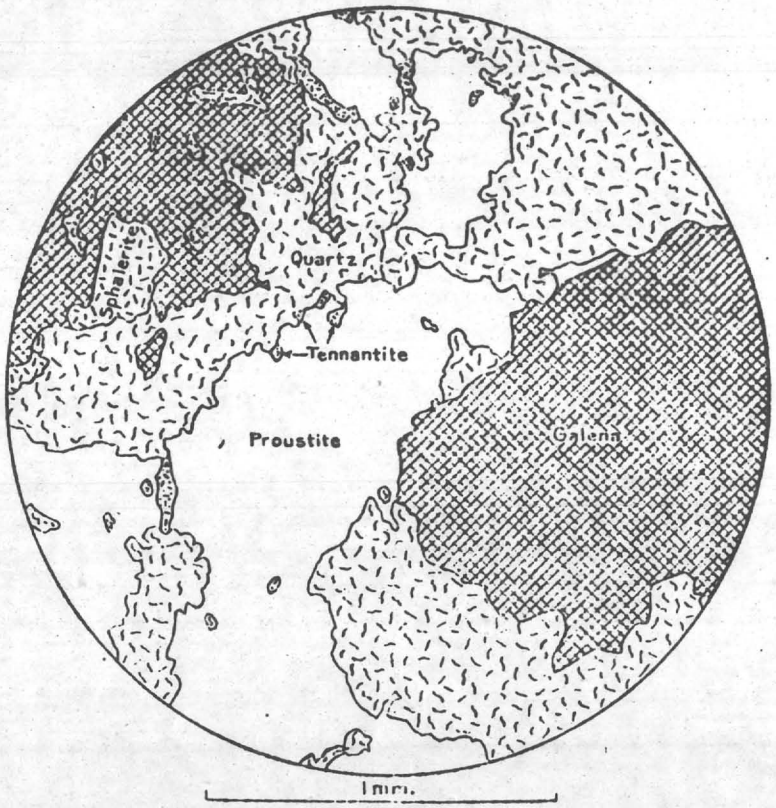

FIGURE 12.—Primary proustite in association with galena, tennantite, and quartz, Cupel mine, Stockton Hill, Ariz.

In the specimen presented by Mr. Watkins proustite constitutes fully half of the volume of the ore throughout an ill-defined band 1½ inches wide. Microscopic study of this specimen fails to disclose any evidence that the proustite either fills fractures in older minerals or has replaced them. The mineral commonly most susceptible to replacement by silver minerals in downward enrichment is galena. In this ore, however, there is no indication that galena has been replaced by proustite. On the contrary, the two minerals occur side by side in areas of comparable size, as shown in Figure 12.

Tennantite is present in small amounts and here, as in the ores of Mineral Park and Chloride, is particularly intimately associated with proustite, usually forming small patches within the proustite. These patches of tennantite are not, however, replacement remnants, because they are as likely to occur at the border of proustite areas as in their interior and because they commonly show crystal outlines characteristic of tennantite. If tennantite had been replaced by proustite the original crystal outlines would have been destroyed. Added evidence that proustite has not replaced tennantite is found in the localization of some tennantite crystals along the contact between two crystals of proustite; such a relation is not explainable on the assumption that proustite has replaced tennantite but is readily understood if the two minerals crystallized at about the same time. In places proustite carries abundant inclusions of quartz and of chalcopyrite, both of which show crystal outlines.

Though nearly all the proustite in the ores of the Cupel mine is interpreted as primary (hypogene), one specimen of partly oxidized ore from the dump showed very thin films of argentite and of proustite, with dendritic outlines, along a small fracture. These minerals are very probably secondary (supergene), but they are quantitatively of almost negligible importance. This mode of occurrence of proustite is in marked contrast to that of the proustite which is intercrystallized with the primary ore minerals.

SUMMARY AND CONCLUSIONS.

The minerals noted in the silver ores of the Cerbat Mountains, between Kingman and Chloride, Ariz., are listed below. Those marked with an asterisk (*) are rare under the conditions indicated.

Oxidation products: Cerargyrite (horn silver), native silver, *copper pitch ore, *malachite, *native copper.

Products of downward sulphide enrichment: Argentite, *proustite (very rare), *covellite, *chalcocite.

Primary (hypogene) minerals: Quartz (usually gray and finely crystalline), manganiferous siderite, *calcite (white), pyrite, arsenopyrite, sphalerite, galena, chalcopyrite, tennantite, *argentite, proustite, pearceite, *polybasite.

It is noteworthy that the ores are prevailingly arsenical, with four arsenic minerals, arsenopyrite, tennantite, proustite, and pearceite. Only in one specimen were small amounts of an antimony mineral (polybasite) noted.

The unoxidized ores are in general fine grained and compact. Vugs are few and small. Because of this compactness oxidation above the ground-water level is very commonly incomplete, being confined to the vicinity of fractures that traverse the ore. Ore specimens several inches across essentially unoxidized may in places be found within a few feet of the outcrop. Heavily limonite-stained gossans or "iron caps" are not characteristic.

The ground-water level stood at depths of 25 to 250 feet in the mines studied. A test of stream water near Chloride showed the high chlorine content (80 parts per million) usual in desert regions.

According to Schrader the dominant silver mineral in the ores found close to the surface was usually cerargyrite. No specimens of these ores were obtainable for study. In this area, as elsewhere, cerargyrite is confined to the oxidized zone.

Native silver appears to have been most abundant at slightly greater depths than those at which cerargyrite was dominant—that is, close to the surface native silver is dissolved and partly reprecipitated as cerargyrite by chloride-bearing waters. Native silver appears to have been confined mainly to the oxidized zone in the vicinity of vugs and fractures. A little may have been deposited a short distance below the ground-water level. Some of the silver has replaced proustite, as shown in Figure 3. It was also noted replacing polybasite, pearceite, and argentite. In places the silver forms tapering and curling "teeth" attached to these minerals and obviously formed by their alteration. Some such silver "teeth" are in contact with older crystals of calcite that are unetched, indicating that the silver was not deposited from acid solutions. The manganiferous siderite and calcite present in most of the veins would insure the prompt neutralization of acidity developed in solutions descending through the oxidized zone. Schrader[9] mentions the occurrence in the Distaff mine of slabs of native silver many pounds in weight.

Chalcocite is not abundant, but it was noted along fractures in granite near the King vein, in Mineral Park. It contained remnants of pyrite and was evidently formed by the replacement of pyrite. In places a little native copper is associated with this chalcocite and probably represents a residuum after the oxidation of the sulphur of the chalcocite.

Argentite, though not abundant, occurs in two contrasting ways—in scattered, thin fungus-like scales or patches along fractures in unoxidized or only slightly oxidized ore and in small but well-formed octahedral crystals occurring side by side with crystals of proustite and pearceite in small vugs in unoxidized ore. Some of this argentite is intercrystallized with small amounts of chalcopyrite and sphalerite, and on some of the argentite small crystals of later quartz are implanted. It is probable that the argentite occurring in octahedral crystals is primary (hypogene); that occurring in scales or patches is very probably supergene, a product of downward enrichment.

Downward (supergene) sulphide enrichment, or the deposition of sulphides below the ground-water level by solutions descending from

[9] Op. cit., p. 60.

the oxidized zone, appears to have been of nearly negligible importance in these ores. The supposedly supergene argentite mentioned above is present in only small amounts. In one specimen of ore from the Cupel mine, at Stockton Hill, very thin films of argentite and of proustite, dendritic in form, occurring along small fractures cutting primary ore, are believed to be secondary (supergene). Quantitatively such occurrences are negligible, and most of the proustite, for reasons enumerated below, is believed to be primary (hypogene). Very slight downward enrichment in copper was shown in some specimens by peripheral replacement of pyrite by chalcocite and of chalcopyrite and sphalerite by covellite.

Proustite, or light ruby silver, is the only abundant silver mineral of the unoxidized ore, although pearceite, polybasite, and argentite also occur. In some specimens studied masses 1 or 2 inches across are mainly proustite, and masses of pure proustite as large as the end of a man's thumb were noted. Such proustite is believed to be primary (hypogene), and the evidence for this opinion will next be summarized.

1. Masses of proustite as large as the end of a thumb and with well-developed crystal faces were noted intercrystallized with the undoubtedly primary minerals quartz, sphalerite, pyrite, and ferruginous calcite—all having apparently been deposited at about the same time.

2. In one specimen studied small areas of proustite are wholly inclosed by calcite that forms the lining of vugs. Elsewhere well-formed crystals of proustite are coated with calcite. There is no evidence that this calcite has been deposited by descending (supergene) solutions.

3. Relatively large unmixed areas of proustite in a granular aggregate of ore minerals must either be primary (hypogene) or the product of complete replacement of older minerals. In places, however, such proustite areas are adjacent to chalcopyrite and sphalerite that show only incipient peripheral replacement by covellite. Such incipient replacement by covellite would hardly be expected to occur side by side with complete replacement of relatively large masses of some hypothetical mineral by proustite. It is more probable that the proustite was formed not by replacement but by primary crystallization.

4. In all the ores studied proustite is more intimately associated with tennantite than with any other mineral. Proustite is the sulpharsenide of silver; tennantite is the sulpharsenide of copper. The proustite has not, however, replaced tennantite, for the tennantite nearly everywhere has its own characteristic crystal outlines, as shown in Figures 2, 5, 9, and 10. Added evidence that proustite has not replaced tennantite is furnished by the fact t certain