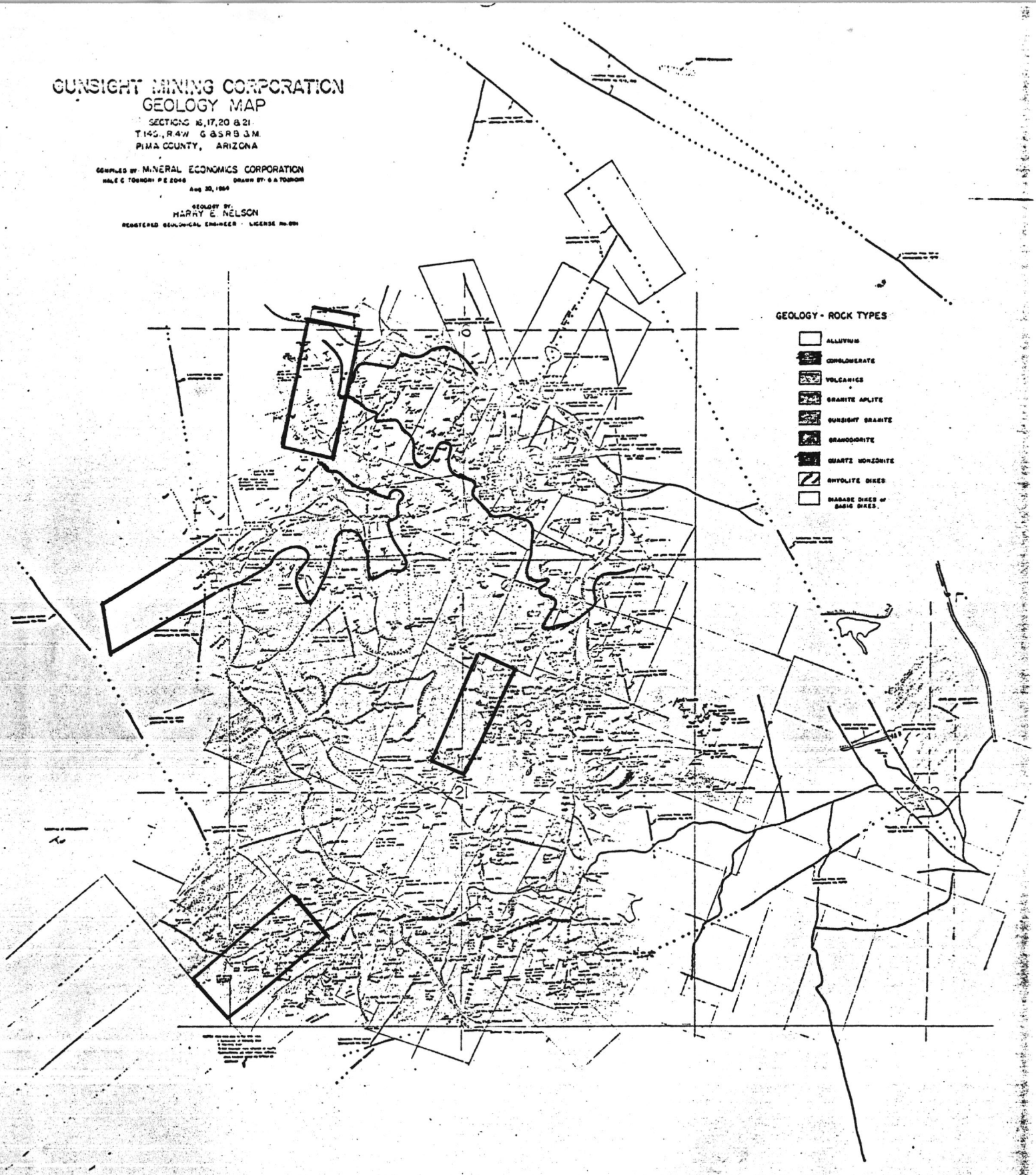
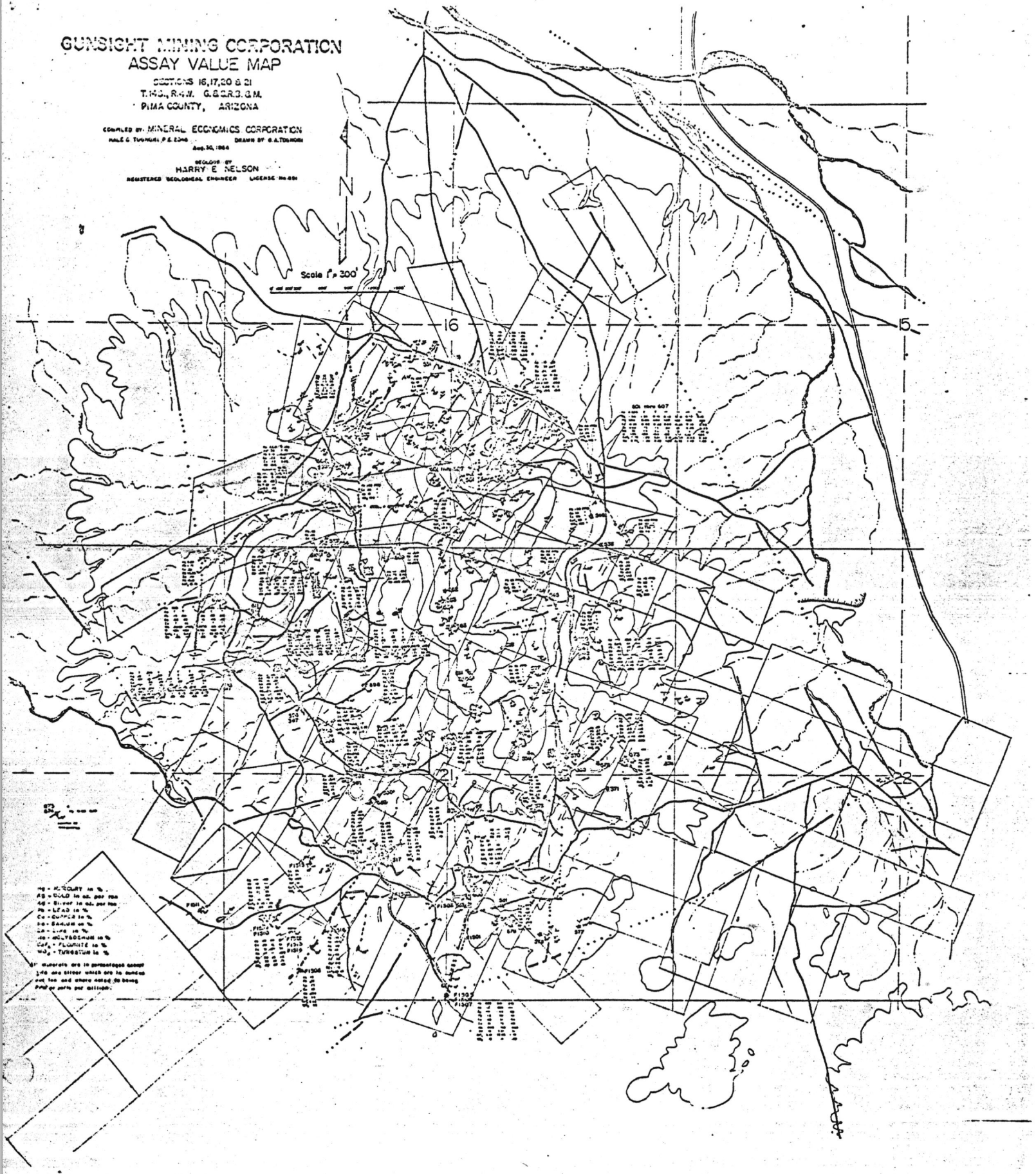
GUNSIGHT MINING CORPORATION
GEOLOGY MAP

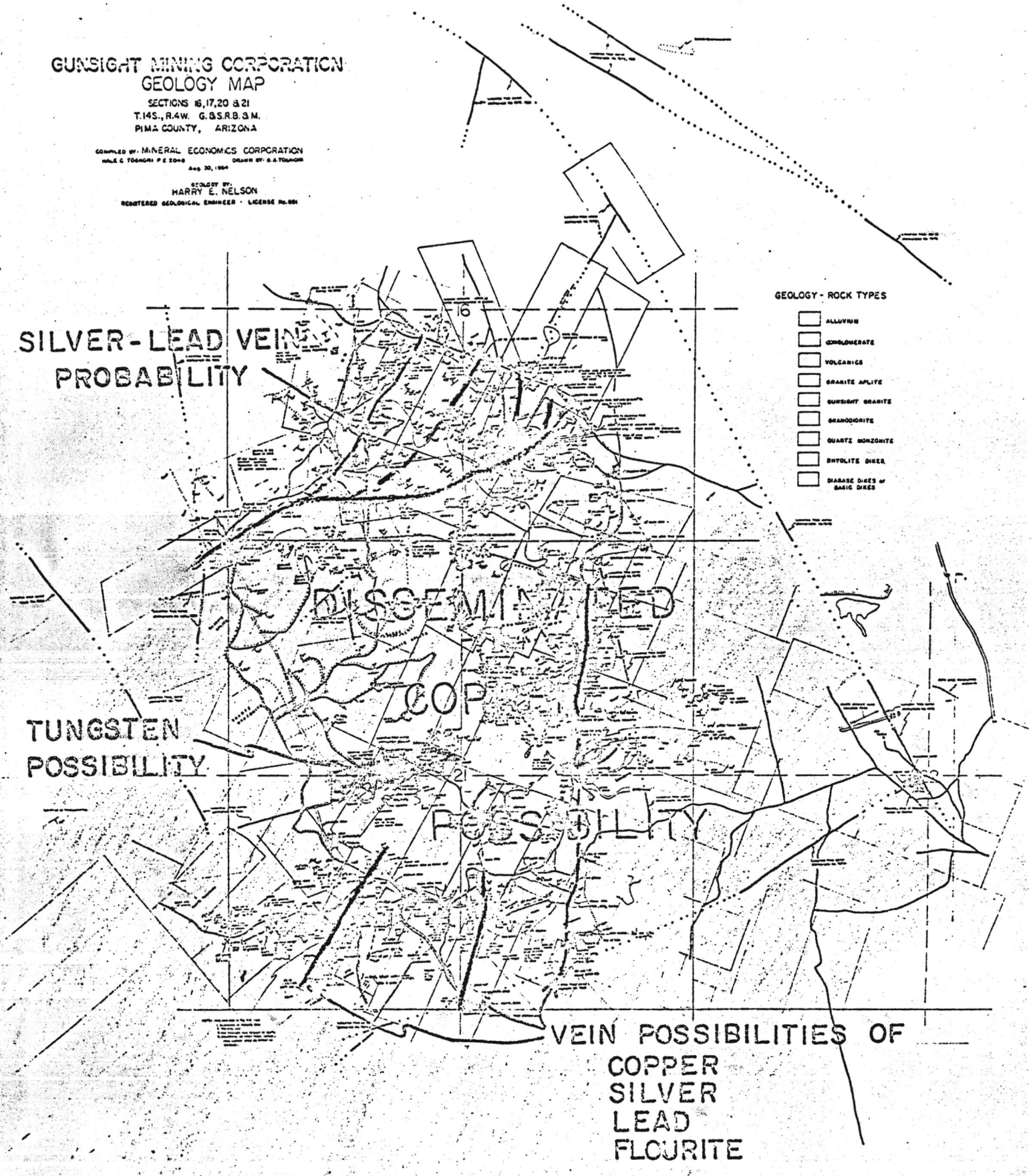
SECTIONS 16, 17, 20 & 21
T 14S., R 4W G&SRB&M.
PIMA COUNTY, ARIZONA

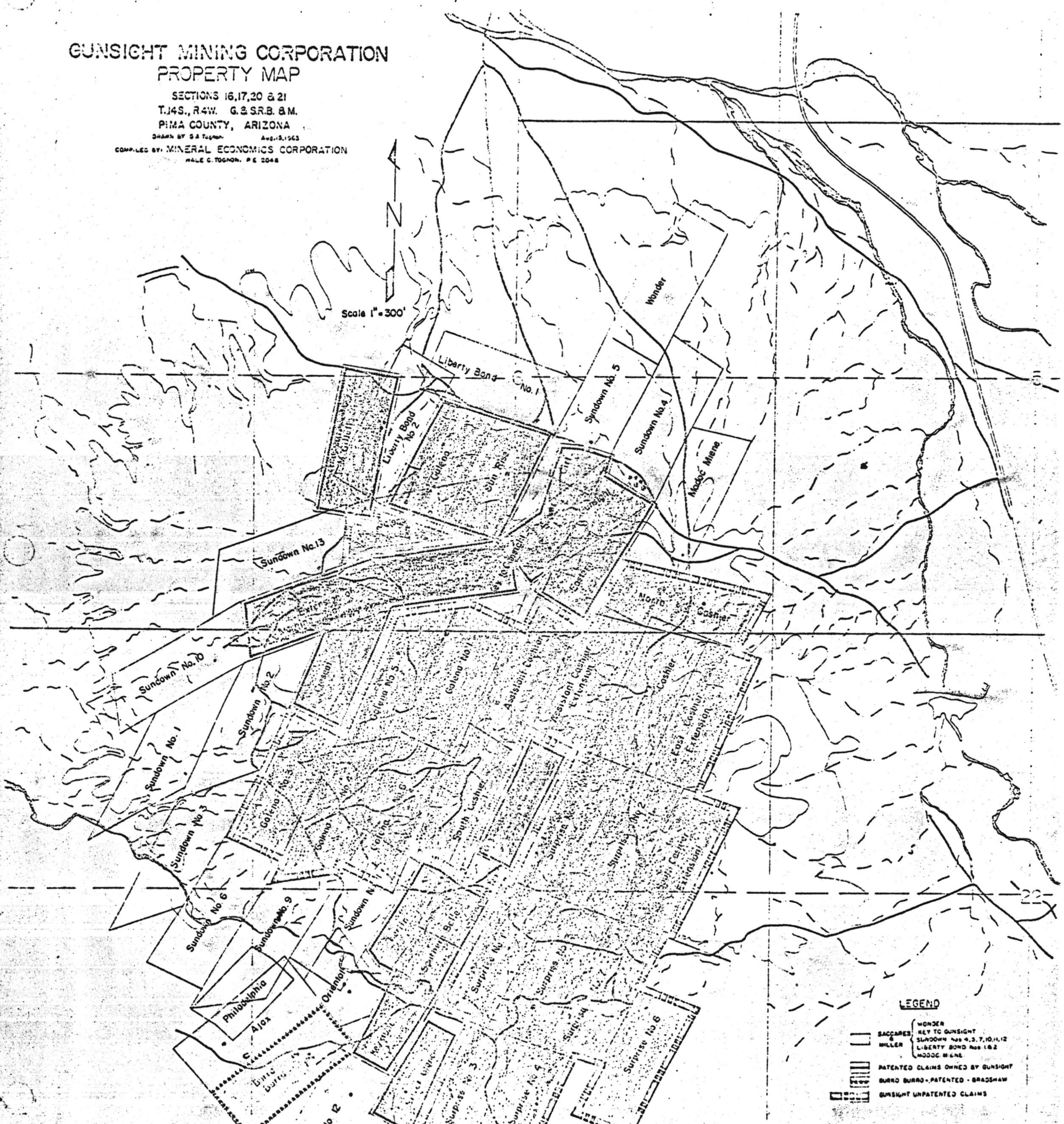
COMPILED BY MINERAL ECONOMICS CORPORATION
HALE C TOURIN P E 2048 DRAWN BY: G A TOURIN
Aug 30, 1954

GEOLOGY BY:
HARRY E. NELSON
REGISTERED GEOLOGICAL ENGINEER - LICENSE No. 691




GUNSIGHT MINING CORPORATION
ASSAY VALUE MAP
SECTIONS 16,17,20 & 21
T.14S., R.4W. G.&S.R.B. & M.
PIMA COUNTY, ARIZONA
COMPILED BY: MINERAL ECONOMICS CORPORATION
DRAWN BY: G.A.TOLMAN
GEOLOGY BY
HARRY E. NELSON
REGISTERED GEOLOGICAL ENGINEER
Scale 1" = 300'
N
16
15
21


GUNSIGHT MINING CORPORATION
GEOLOGY MAP
SECTIONS 16,17,20 & 21
T.14S., R.4W. G.&S.R.B.&M.
PIMA COUNTY, ARIZONA
COMPILED BY: MINERAL ECONOMICS CORPORATION
HALE C. TOGNONI P.E. 2048
DRAWN BY: G.A. TOGNONI
Aug. 30, 1964
GEOLOGY BY:
HARRY E. NELSON
REGISTERED GEOLOGICAL ENGINEER - LICENSE No. 881
GEOLOGY - ROCK TYPES
ALLUVIUM
CONGLOMERATE
VOLCANICS
GRANITE APLITE
GUNSIGHT GRANITE
GRANODIORITE
QUARTZ MONZONITE
RHYOLITE DIKES
DIABASE DIKES or BASIC DIKES
SILVER-LEAD VEIN PROBABILITY
DISSEMINATED
COP
TUNGSTEN POSSIBILITY
POSSIBILITY
16
21
VEIN POSSIBILITIES OF
COPPER
SILVER
LEAD
FLOURITE


GUNSIGHT MINING CORPORATION
PROPERTY MAP
SECTIONS 16,17,20 & 21
T.14S., R.4W. G.& S.R.B. & M.
PIMA COUNTY, ARIZONA
COMPILED BY: MINERAL ECONOMICS CORPORATION
N
Scale 1" = 300'
Wonder
Liberty Bond No. 1
Liberty Bond No. 2
Sundown No. 5
Sundown No. 4
Modoc Miene
Galena
Sun Rise
Sundown No. 13
Morro
Cashier
Sundown No. 10
Sundown No. 2
Sundown No. 1
Sundown No. 3
Sundown No. 6
Sundown No. 9
Sundown No 12
Galena No. 5
Galena No. 1
Assistant Cashier
Assistant Cashier Extension
East Cashier Extension
Galena No. 3
Galena No. 6
South Cashier
Surprise No. 2
South Cashier Extension
Surprise No. 1
Surprise No. 5
Surprise No. 3
Surprise No. 4
Surprise No. 6
Philadelphia
Ajax
Oriental
22
LEGEND
SACCARES & MILLER
WONDER
KEY TO GUNSIGHT
SUNDOWN Nos 4,5,7,10,11,12
LIBERTY BOND Nos 1 & 2
MODOC MIENE
PATENTED CLAIMS OWNED BY GUNSIGHT
BURRO BURRO - PATENTED - BRADSHAW
GUNSIGHT UNPATENTED CLAIMS

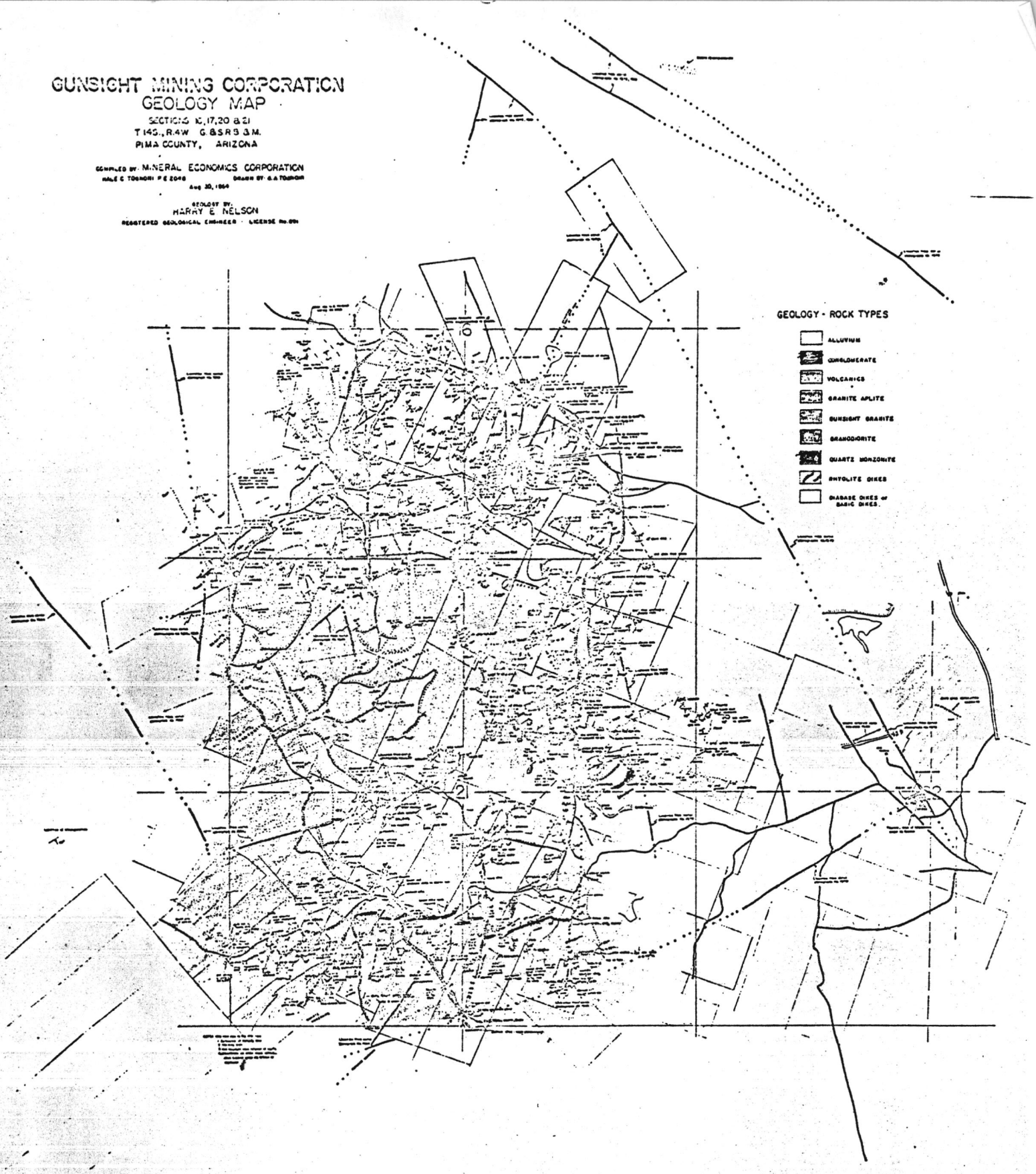
GUNSIGHT MINING CORPORATION

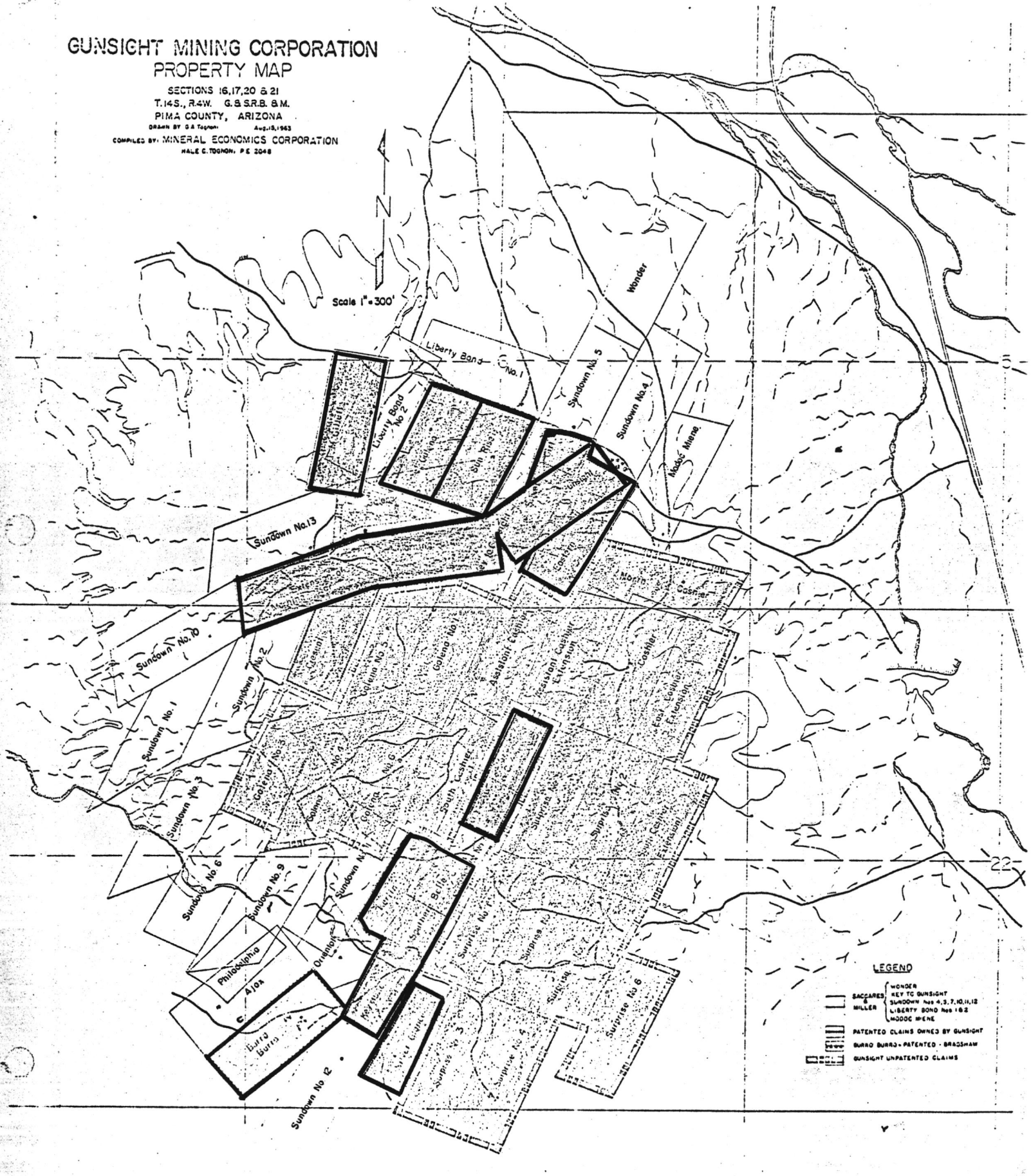
GEOLOGY MAP

SECTIONS 16, 17, 20 & 21
T 14S., R.4W G.&S.R.B.&M.
PIMA COUNTY, ARIZONA

COMPILED BY: MINERAL ECONOMICS CORPORATION
DRAWN BY: G.A. TOURNOUR
Aug 30, 1954

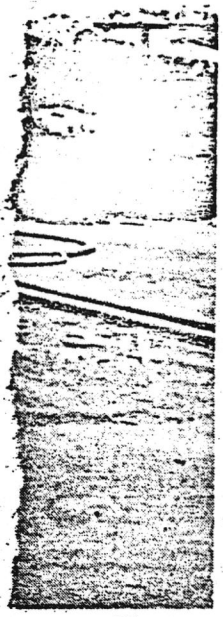
GEOLOGY BY:
HARRY E. NELSON
REGISTERED GEOLOGICAL ENGINEER - LICENSE No. 894




GUNSIGHT MINING CORPORATION
PROPERTY MAP
SECTIONS 16,17,20 & 21
T.14S., R.4W. G.& S.R.B. & M.
PIMA COUNTY, ARIZONA
DRAWN BY G.A Tognoni Aug.15,1963
COMPILED BY: MINERAL ECONOMICS CORPORATION
HALE C. TOGNONI, P.E. 2048
N
Scale 1"=300'
Wonder
Liberty Bond No 1
Liberty Bond No 2
Sundown No. 5
Sundown No.4
Modoc Mine
Sundown No.13
Sundown No.10
Sundown No.2
Sundown No.1
Sundown No.3
Sundown No.6
Sundown No.9
Sundown No.11
Sundown No 12
Philadelphia
A/Qa
Burro Burro
Galena No.1
Galena No.3
Galena No.5
Galena No.4
Galena No.6
Assistant Cashier
Assistant Cashier Extension
Cashier
East Cashier Extension
South Cashier
South Cashier Extension
Surprise No.1
Surprise No.2
Surprise No.3
Surprise No.4
Surprise No.5
Surprise No.6
22
LEGEND
SACCARES & MILLER
WONDER
KEY TO GUNSIGHT
SUNDOWN Nos 4,5,7,10,11,12
LIBERTY BOND Nos 1&2
MODOC MINE
PATENTED CLAIMS OWNED BY GUNSIGHT
BURRO BURRO - PATENTED - BRASSHAW
GUNSIGHT UNPATENTED CLAIMS

TUCSON DAILY CITIZEN
JUL 29, 1975

Fifth company seeks copper in monument



Citizen Photo

Mineral exploration in Organ Pipe Cactus National Monument has intensified, with a fifth company taking the first step toward drilling for copper in the monument south of Ajo.

Pangea Resources Corp. has applied for a special use permit from the National Park Service to drill in the monument, which could be closed to mineral exploration in eight years should a proposal now before Congress be adopted.

Unlike most national parks and monuments, Organ Pipe was opened to mineral exploration and development in 1941. However, a bill that would designate the area as part of the National Wilderness Preservation System is pending in the House Committee on Interior and Insular Affairs and should come up for a vote later this year.

The Wilderness Act calls for withdrawal of wilderness areas from mineral exploration after 1983, but existing claims would remain valid after that time.

Monument Superintendent Edward C. Rodriguez Jr., said Pantea's permit may have to be cleared through the National Park Service western regional office in San Francisco and will probably be issued within two weeks.

Pangea's drilling would be done in collaboation with Knox-Arizona Corp. on that company's claims as soon as the drilling permit is issued.

Thomas W. Mitcham, vice president of Pangea, said the drilling will go on for about a year, with the possibility of renewing the permit at that time.

Several other mining companies have found copper in the area, but Mitcham said he hopes to find ore of "the quality and quantity to make mining economically feasible."

Besides Knox-Arizona and Pangea, there are three other active permits for mining exploration at Organ Pipe, Rodriguez said.

The Pangea drilling will be done in the Ajo Mountain foothills, east of highway 85, just north of Alamo Canyon in the Copper Mountain area.

Mitcham said his company's drilling operations will not require construction of new roads at this time.

If a mine becomes economically feasible, operations will have to be conducted underground because the ore bodies are too deep to make strip mining practical, he said.

Wilderness designation for Organ Pipe has been strongly supported by the Sierra Club, Wilderness Society and other groups, while being opposed by mining companies, U.S. Commerce Department officials and others.

See editorial, page 20

55-gallon
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Most of
s paper

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. He has lists for
group — blacks,
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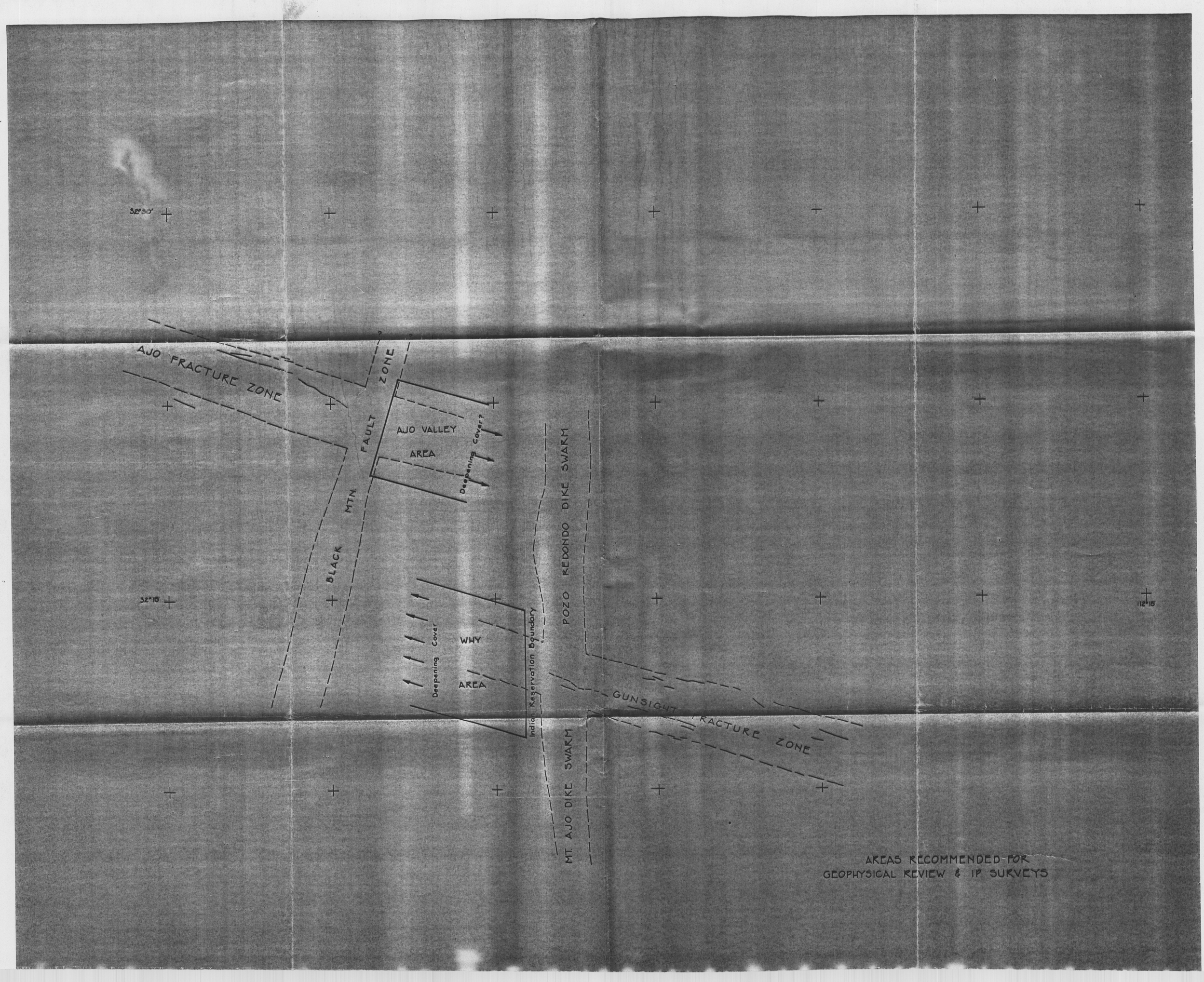
show the available
schools, receiving
d those not eligible
er of each ethnic


32°30'
AJO FRACTURE ZONE
FAULT ZONE
AJO VALLEY
AREA
Deepening Cover?
MTN.
BLACK
32°15'
Deepening Cover
WHY
AREA
Indian Reservation Boundary
POZO REDONDO DIKE SWARM
GUNSIGHT
RACTURE ZONE
MT. AJO DIKE SWARM
112°15'
AREAS RECOMMENDED FOR
GEOPHYSICAL REVIEW & IP SURVEYS

CORPORATION
Nevada Consolidated Copper Comp
ARIZONA DIVISION—RAY MINES
Ray, Arizona

February 26th, 1935.

Mr. R. W. Thomas,
General Manager,
Nevada Cons. Copper Corp.,
Ray, Arizona.

Dear Sir:-

In line with your instructions, Mr. Whitehead and I met Mr. E. W. Grove in Gila Bend on the evening of January 30th and with him on the following day visited the mining claims in which he is interested. The claims are situated about 21 miles south and east of the town of Ajo, and within a few miles of the village which is shown on maps of Arizona as Wall's Well. From the attached sketch map it will be seen that the claims are divided into two groups, the group known as the Lily Claims being held by Messrs. Bradley and Hromadka, associates of Mr. Grove, while the adjoining group, known as the Cyclopic Claims, has been located by Mr. Grove himself. The Cyclopic Group is crossed by the boundary fence of the Papago Indian Reservation approximately as shown on the sketch map, and there are two other claims, known as Dolores Nos. 1 and 2, located by Messrs. Bradley and Hromadka, which are to the north of the Lily Group and entirely within the boundaries of the Reservation.

The general topography of the country embraced by and surrounding these mining claims is quite flat, its monotony being relieved only by low ridges separated by a network of shallow valleys. The country rock, which is exposed at numer-

ous places on the property and is nowhere more than a few feet below the surface, is a biotite granite, and at many points, particularly where it outcrops in a series of narrow ribs which run transverse with the strike of the quartz veins to be described later, is distinctly gneissoid in structure. There is little if any iron staining of surface material to be observed anywhere but there are noticeable bands of varying width running across the surface which are darker in color than the general color of the ground. These dark bands or streaks are approximately parallel with each other and run in a direction very close to magnetic north and south. Most of the test pits have been sunk along two of these bands which are about 300 feet apart, but there are several bands between these two on which no work has been done. For the purpose of discussion we shall consider each of the groups of workings as being a single vein, although the more westerly of the two groups suggests the possibility of a system of a few parallel stringers located fairly close together. It is difficult to prove or disprove this possibility since no single opening shows more than one quartz vein. Numerous observations to determine the dip of the vein system were taken, and it was found to be toward the east at a very flat angle, the average lying somewhere between 24° and 32°.

In all of the openings where veins have been uncovered on the Lily and Cyclopic Claims, the width of the veins varies from 10 inches to a maximum of 18 inches. The very few cuts over 18 inches in length were made in order to include gouge material, which in the majority of cases was entirely absent.

With the exception of the dark bands or streaks just described there is no indication of surface alteration, and even this indication is hardly noticeable a few inches below the surface. This absence of alteration also holds true for the quartz vein material itself as there is nowhere the iron-stained color nor the honeycomb structure which are generally accepted as typical of gold-bearing quartz. On the contrary, the vein filling is a hard glassy quartz, sharply defined between a granite foot wall and hanging wall with, except as noted above, no gouge material in evidence. In every way it merits the term "tight".

All the characteristics of the "tight" veins on the Lily and Cyclopic Claims apply with equal force to the vein opened by the Dolores Shafts Nos. 1 and 2. The only difference is that the Dolores vein has a strike of N47°W (magnetic) and has a much steeper dip than the other veins.

The area taken in by our examination was, of course, quite extensive and, given more time, we could have taken many more samples than we did. However, each of the samples which we did take came from a location which appeared to us as being most likely to carry values, with the idea that such procedure is the fairest to adopt in any preliminary examination. The assays from these samples are given on the attached sheet, the samples being numbered to identify them with the similarly numbered locations shown on the sketch map. These assay returns should speak for themselves.

While we can agree with Mr. Grove that the flat-

dipping veins on the Lily and Cyclopic Claims could be explored at depth by a few properly located diamond drill holes, we are not very enthusiastic over the surface indications as we found them, nor over the assay returns from our samples.

Respectfully submitted,

Moses Brown

Asst. Supt. of Mines.

P. J. Whitehead

Geologist.

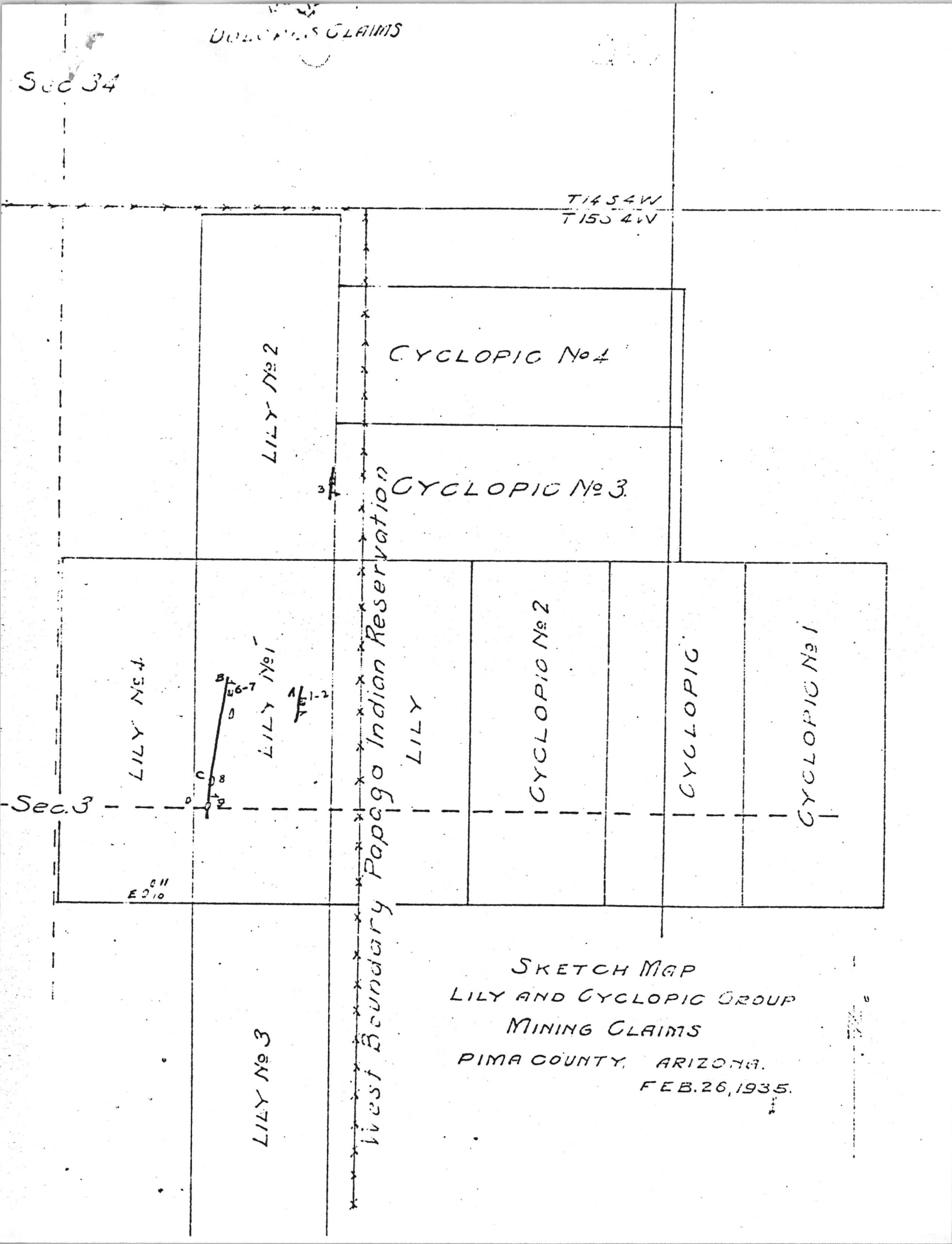
Nevada Consolidated Copper Corporation

ARIZONA DIVISION—RAY MINES

Ray, Arizona

ASSAY RETURNS

Sample No.	Width	Ozs. Ag.	Ozs. Au.	Location	Remarks
1	24"	Nil	.035	A Shaft	South side shaft 40' down
2	32"	"	.185	"	" " " 28' "
3	48"	"	.050	Inc. Shaft	By Lily #1 Stake N side shaft
4	-	-	-	-	-
5	18"	"	.170		Picked sample by Grove (From Dolores Claim)
6	38"	"	.010	B Shaft	South side 25' down
7	16"	Tr.	.255	"	" " 12' "
8	48"	Nil	.040	Open Cut	Sta. C
9	14"	"	.115	" "	Sta. D
10	10"	"	Tr.	" "	Sta. E
11	16"	"	"	" "	60' N of Sta. E
12	30"	"	"	" "	Dolores #2 Claim
13	24"	"	"	" "	" " "


Sec 34
T14S 4W
T15S 4W
LILY No 2
CYCLOPIC No 4
CYCLOPIC No 3
West Boundary Papago Indian Reservation
LILY No 4
LILY No 1
LILY
CYCLOPIC No 2
CYCLOPIC
CYCLOPIC No 1
Sec. 3
LILY No 3
SKETCH MAP
LILY AND CYCLOPIC GROUP
MINING CLAIMS
PIMA COUNTY, ARIZONA.
FEB. 26, 1935.

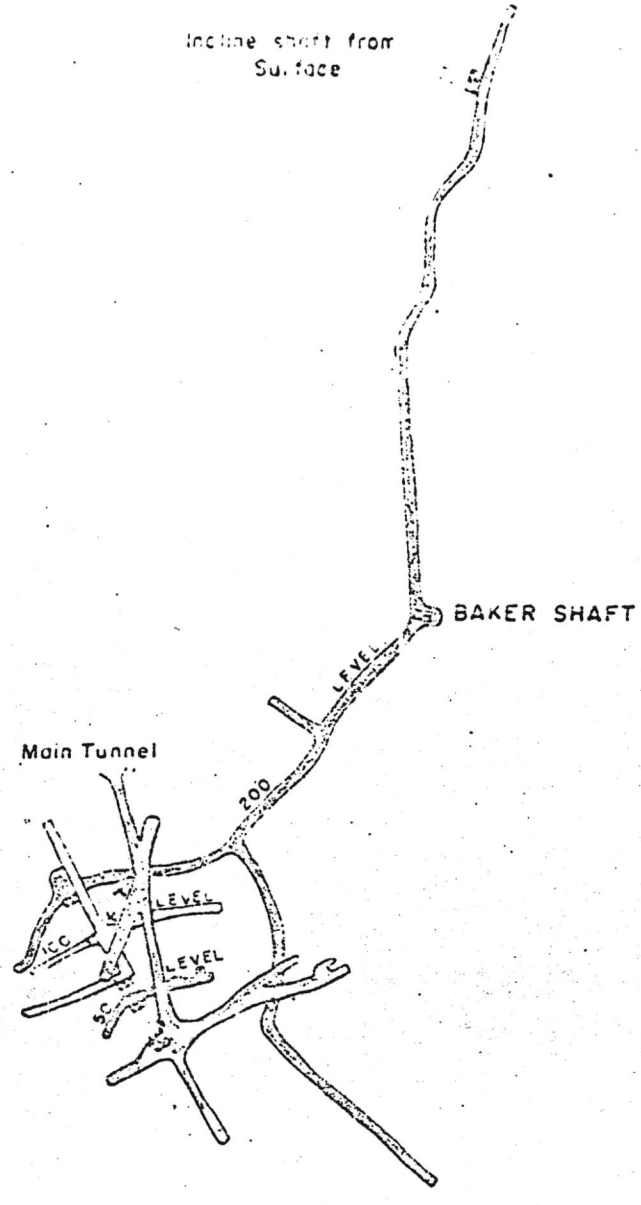


Figure 1

COMPOSITE LEVEL MAP

GUNSITE MINE

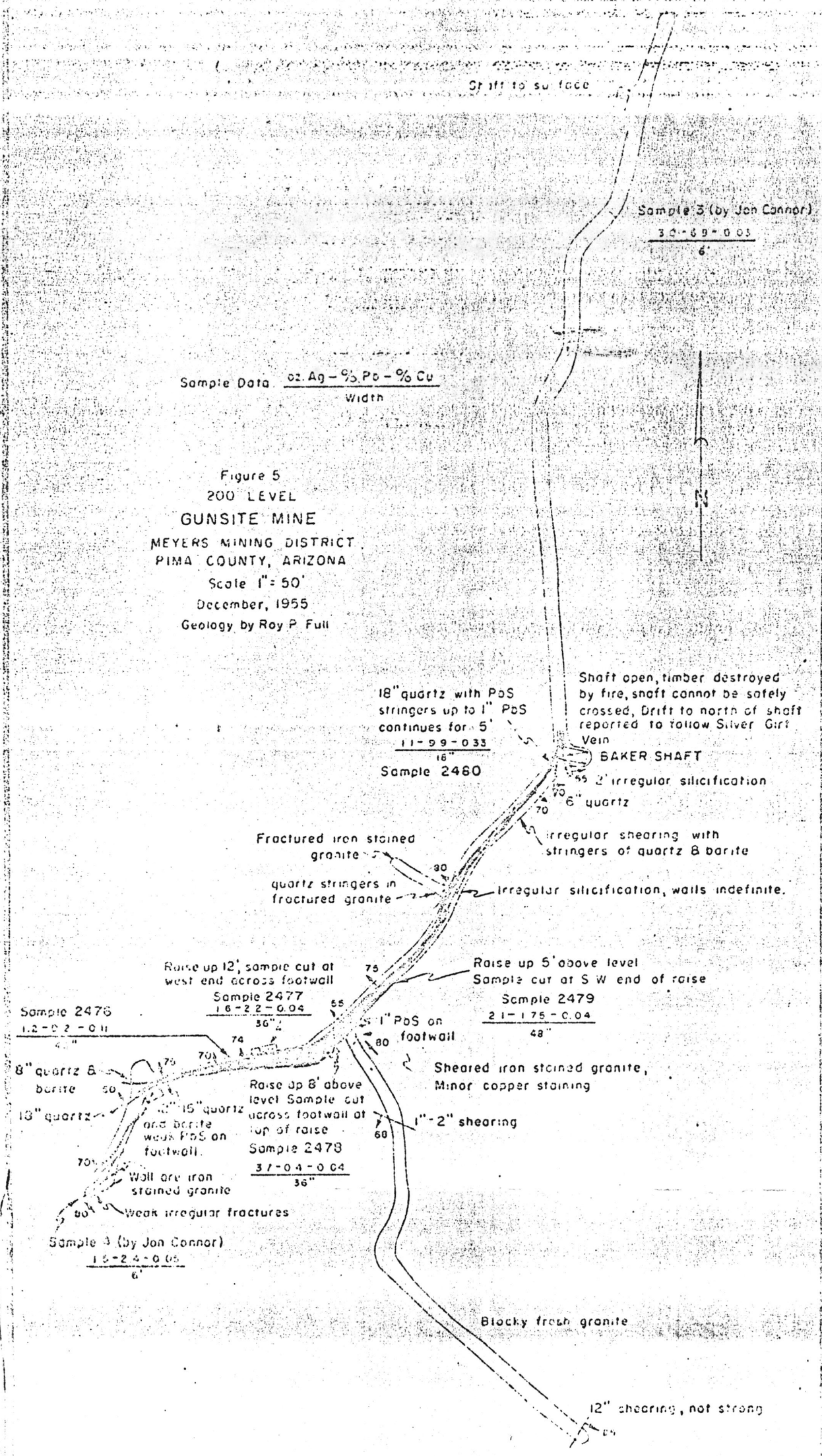
MEYERS MINING DISTRICT

PIMA COUNTY, ARIZONA

Scale 1" = 100'

December, 1955

Note. Modified After Map by
Jon Connor & R L Albright
August, 1955


Stuff to surface
Sample 3 (by Jon Connor)
30-69-0.03
6'
Sample Data oz. Ag – % Pb – % Cu / Width
N
Figure 5
200 LEVEL
GUNSITE MINE
MEYERS MINING DISTRICT
PIMA COUNTY, ARIZONA
Scale 1" = 50'
December, 1955
Geology by Roy P. Full
18" quartz with PbS stringers up to 1" PbS continues for 5'
11-99-033
16"
Sample 2480
Shaft open, timber destroyed by fire, shaft cannot be safely crossed, Drift to north of shaft reported to follow Silver Girl Vein
BAKER SHAFT
2' irregular silicification
6" quartz
Fractured iron stained granite
quartz stringers in fractured granite
irregular shearing with stringers of quartz & barite
Irregular silicification, walls indefinite.
Raise up 12', sample cut at west end across footwall
Sample 2477
16-2.2-0.04
36"
Raise up 5' above level
Sample cut at S.W. end of raise
Sample 2479
21-1.75-0.04
48"
Sample 2476
1.2-0.2-0.11
1" PbS on footwall
Sheared iron stained granite, Minor copper staining
8" quartz & barite
18" quartz
15" quartz and barite weak PbS on footwall.
Raise up 8' above level Sample cut across footwall at top of raise
Sample 2478
37-0.4-0.04
36"
1"-2" shearing
Wall are iron stained granite
Weak irregular fractures
Sample 4 (by Jon Connor)
16-2.4-0.05
6'
Blocky fresh granite
12" shearing, not strong

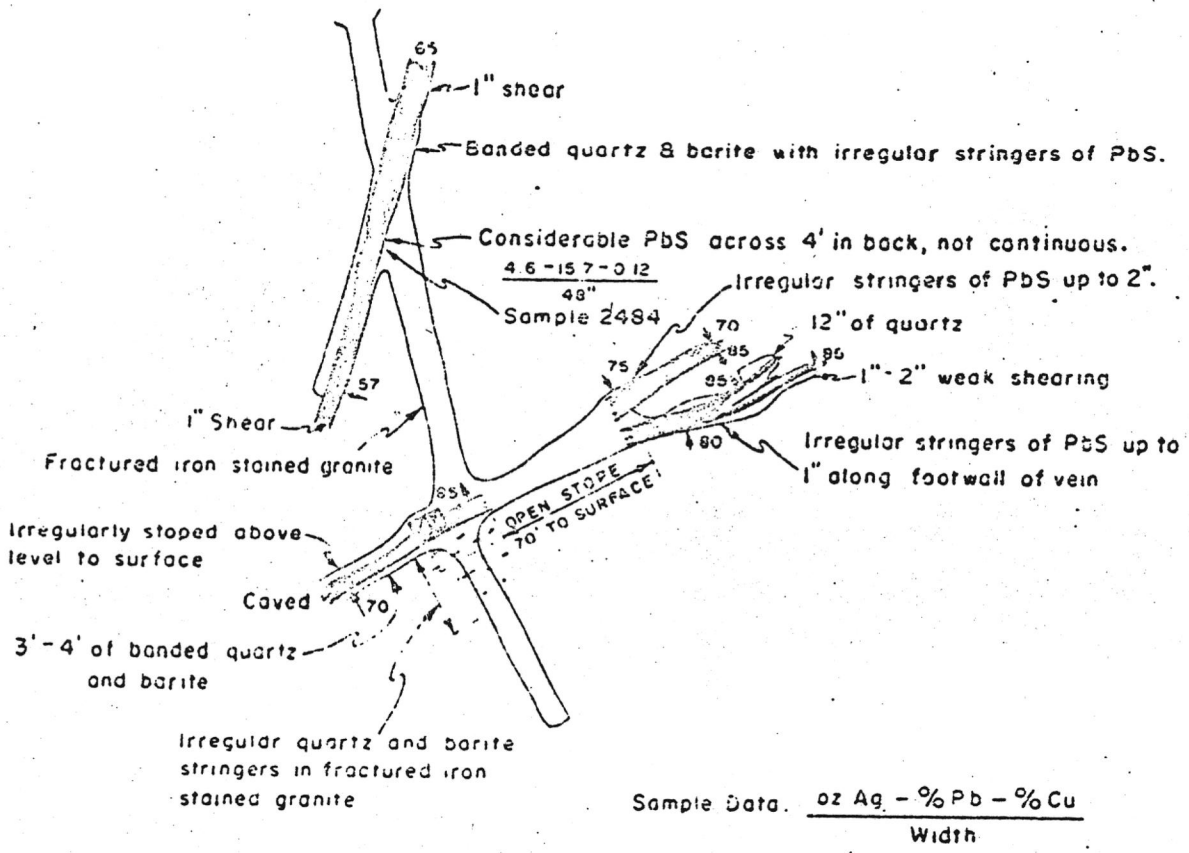


Figure 2

MAIN TUNNEL

GUNSITE MINE

MEYERS MINING DISTRICT

PIMA COUNTY, ARIZONA

Scale 1" = 50'

December, 1955

Geology by Roy P Full

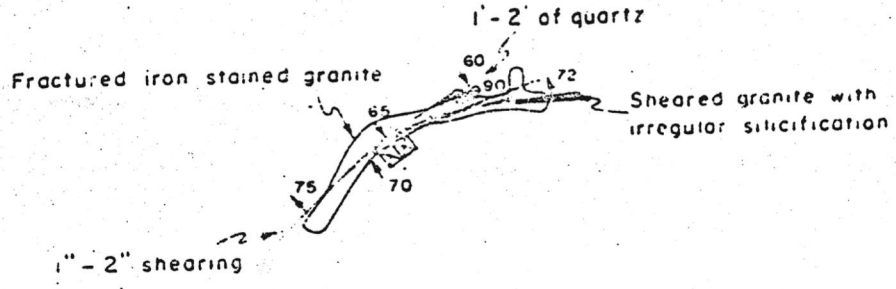


Figure 3
50 LEVEL
GUNSITE MINE
MEYERS MINING DISTRICT
PIMA COUNTY, ARIZONA
Scale 1" = 50'
December, 1955
Geology by Roy P Full

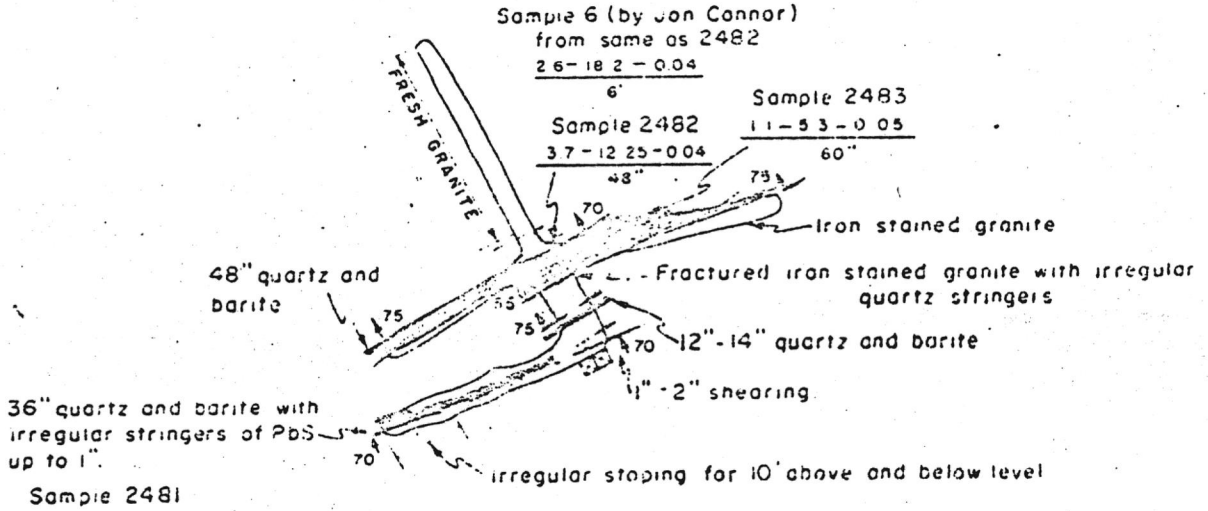


Figure 4

100 LEVEL

GUNSITE MINE

MEYERS MINING DISTRICT
PIMA COUNTY, ARIZONA

Scale: 1" = 50'

December, 1955

Geology by Roy P Full

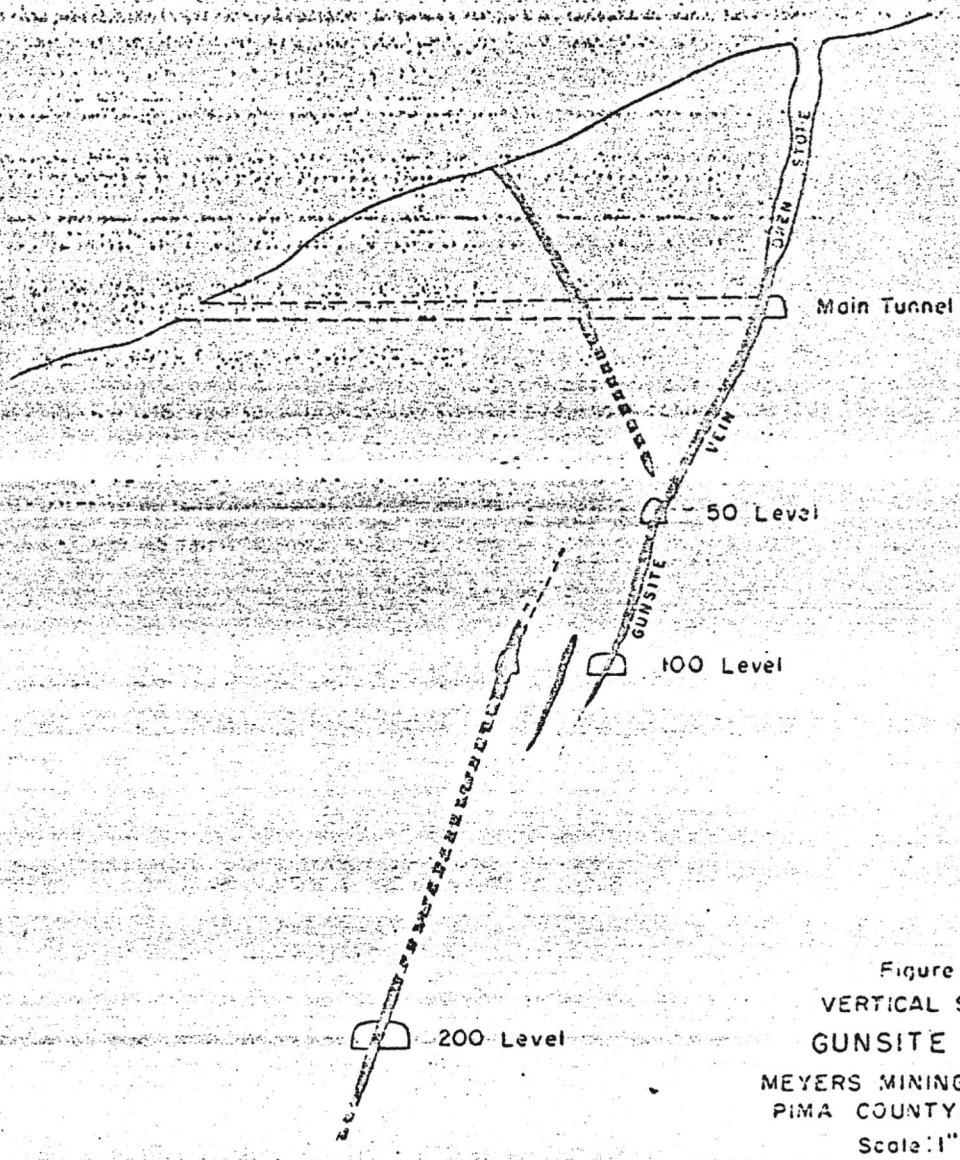


Figure 6

VERTICAL SECTION

GUNSITE MINE

MEYERS MINING DISTRICT
PIMA COUNTY, ARIZONA
Scale: 1" = 50'
December, 1955
Geology by Roy P Full

NOTE. Section approximately through winze, looking N 30° E.

MINERAL ECONOMICS CORPORATION

CONSULTING MINING ENGINEERS AND GEOLOGISTS

HALE C. TOGNONI, P.E. 2084
MINING AND GEOLOGICAL ENGINEER
GEORGE-ANN TOGNONI, CARTOGRAPHER

1525 WEST NORTHERN AVENUE
PHOENIX, ARIZONA - 85021
WI 4-2124

GEOLOGICAL REPORT
GUNSIGHT MINING CORPORATION PROPERTIES

PROPERTY DESCRIPTIONS

In sections 16, 17, 20 and 21, Township 14 South, Range 4 West, G & SRB & M, Meyers Mining District, Pima County, Arizona, the Gunsight Mining Corporation owns the fourteen patented mining claims called the Gunsight, Silver Girt, Eastern, Morning Star, Extension of Morning Star, Crescent, C & C, Sunrise, Galena, F. H. Gillett, Nevlin, Keystone, Silver Glance and Southern Belle and the twenty-one unpatented mining claims which are recorded in Pima County Recorders Office as set forth below:

Name of Claim	Name of Claim	Name of Claim
Cashier	Galena No. 1	Surprise No. 1
Assistant Cashier	Galena No. 2	Surprise No. 2
Assistant Cashier	Galena No. 3	Surprise No. 3
Extension	Galena No. 4	Surprise No. 4
East Cashier Extension	Galena No. 5	Surprise No. 5
North Cashier	Galena No. 6	Surprise No. 6
South Cashier	Surprise	Surprise No. 7
South Cashier Extension		

In section 10, Township 15 South, Range 4 West, at Wahl's Well, approximately 6 miles south of the above property, the corporation owns the patented 5-acre Gunsight millsite and the unpatented Richlieu Placer claim.

In addition to the above, the Corporation acquired rights, from all of its organizers, by quit claim to 57 unpatented mining claims which are located adjacent to and around the south end of the above listed unpatented claims. Legal action quieting title to these 57 claims in the Gunsight Mining Corporation was completed on May 1, 1964. The names of these claims are as follows:

Name of Claim	Name of Claim	Name of Claim
Ajax	Black Bess Extension	New Gunsight

American Boss	Black Boss Extension #1	New Gunsight #2
American Boss #1	Black Boss Extension #2	New Gunsight #3
American Boss #2	Black Boss Extension (Fraction)	Yellow Aster
American Boss #3	Wonder	Yellow Aster #1
Sundown	Wonder #1	Yellow Aster #2
Sundown #1	Wonder #2	Yellow Aster #3
Sundown #2	Wonder #3	Yellow Aster #4
Sundown #3	Wonder #4	Yellow Aster #5
Sundown #4	Wonder #5	Yellow Aster #6
Sundown #5	Wonder #6	Yellow Aster #7
Sundown #6	Wonder #7	Yellow Aster #8
Sundown #7	Ashol	Oriental
Sundown #9	Ashol #1	Philadelphia
Sundown #10	Ashol #2	Regal
Sundown #11	Ashol #3	Regal Fraction
Sundown #12	War Eagle	Revenue
Sundown #13	Key to the Gunsight	Revenue #1
Liberty Bond No. 1		Modoc
Liberty Bond No. 2		

GENERAL GEOLOGY

The Gunsight mining property (approximately 1½ miles wide and 2 miles in length) is located in the Gunsight Hills 14.7 miles south via Arizona Highways 85 and 86 of Ajo, Arizona; thence approximately one mile by dirt road through the Indian settlement of Schuchuli (Many Chickens) to the northern most mine workings. This area is in the Papago Indian Reservation, in southern Pima County, in southwestern Arizona, about 20 miles north of the Mexican boundary.

Ajo is the largest town in the area, and is connected by the Tucson, Cornelia, and Gila Bend Railroad, owned by the Phelps Dodge Corporation, with the main line of the Southern Pacific Railroad at Gila Bend.

Physical Features:

The Gunsight Hills are on the northeast flank of the Ajo Range of Mountains in the Sonoran Desert section of the Basin and Range province at from 1500 to 2000 feet in elevation.

The area is characterized by small though somewhat steep, granitic hills protruding through the Alluvial fill, about 1000 feet above the surrounding valleys.

Climate and Vegetation:

Climatic records at Ajo indicate the temperatures ranges from 25° F. to 115° F., with the daily maximum above 100° F. being very common. Annual precipitation at Ajo is about 10 inches.

Palo Verde, saguaro, palo fierro, mesquite, ocotillo, hedgehog cactus, barrel cactus, prickly pear, cholla, creosote bush, greasewood, and various grasses cover the surface.

HISTORY AND PRODUCTION

Patents were issued on the patented mining claims of Gunsight Mining Corporation at the following times: 1882, Gunsight, Silver Gilt and the Eastern; 1883, Morning Star, Extension of the Morning Star and the Crescent; 1884, C & C, Keystone, Silver Clamps and Southern Belle; 1885, Merlin; 1925, F. M. Gillett; 1926, Celena and Sunrise.

The Gunsight Mine's recorded production is $100,000.00 in silver from 1878 to 1896. (University of Arizona Bulletin No. 140).

Harry E. Nelson (May, 1963) estimates that the Gunsight claim probably produced $250,000.00 in silver and lead.

In 1882, 1883 and 1884 the Report of the Director of the Mint upon Statistics of the Production of Precious Metals in the "United States" stated the following:

> "1882, the Gunsight Mine is mentioned as being the best developed, the best equipped, and the leading mine in the district; with a 200-foot incline, a drift 200 feet on the vein at the 100 foot level, and a crosscut at the 200 foot level, and with plans to sink a vertical shaft immediately. About 4,000 tons of ore were mined during the prospecting work, that averaged between $30 to $40 per ton in value. The mine has two types of ore, free milling and smelting, with the free milling predominating. The milling ore consists of black sulphurets (Raymond - an old synonym for sulfide) and chlorides, and the smelting ore of lead and iron carrying silver."
>
> "1883, the Baker shaft is mentioned as being 340 feet deep, and that crosscuts had been driven connecting to the old workings on the Gunsight Vein, 300 feet below the surface. It was thought that the mill could be furnished

with 50 tons of ore per day from the deepest workings."

"1924, (apparently by R. C. Pearson), the Silver Cliff shaft (probably the Baker shaft mentioned in the Report for 1918) is mentioned as being down 300 feet, with the first level at 200 feet (Shaer's sketch dated Nov., 1942, shows the main shaft cutting the Silver Cliff vein at the 200 level, and the drift north as being driven on the Silver Cliff vein) consisting of a north drift of 147 feet, all in ore; and a south drift 240 feet in length that was being stoped for 160 feet - the ore averaging $23 per ton. The old Gunsight shaft (probably the winze from the Lower Adit Level) is mentioned as being 240 feet (deep?), with 31 feet of ore exposed, averaging $60 per ton without sorting, and still in ore; the first level is at 100 feet, with 130 feet of stoping ground, the vein being seven feet wide and averaging $75; the second level having 180 feet of stoping ground that averaged $60."

From the appearance of the workings on the Galena, G & C and Keystone patented claims and the unpatented Surprise claims some silver and lead was produced but there is no record of such production.

I. M. Sheehan relocated the unpatented, Surprises, Galenas and Cashiers from 1922 through 1926 and is the widow of Mr. C. B. Sheehan who was a mining engineer working at the Gunsight mine.

From the evidence on the ground, it would appear that these unpatented claims were first located at the same time as the patented claims to the north and the south, or sometime before 1900. The surface is dotted by old workings, many of the deeper workings could become accessible by a small amount of cleaning and repairing of the timber.

Due to the isolated location and depressed metal prices in the late 1900's this property has virtually lain idle since then.

Subsequent stock company promotions, claim locations and diversified property acquisitions cluttered the title into an almost impossible tangle.

C. B. Sheehan began his work on the property in 1918. He built a mill, rehabilitated the Gunsight and Surprise mine workings and had acquired many of the existing property rights when his ventures was terminated by his untimely death in 1926.

The New Cornelia Mine, an open pit of Phelps Dodge Corporation, located at Ajo, Arizona produced approximately 350,000 lbs. of copper per/day to 1917. The production from 1917 to 1961, both inclusive, was about 763,000,000 lbs. Since 1961 the production has not been published. Although copper is overwhelmingly the most valuable product, gold and silver recovered with it in the sulphide ores have added about 5/6 cents per pound of copper. The developed reserves of the deposit are adequate for a life of thirty or forty years at a rate of production in excess of 30,000,000 pounds a year. (University of Arizona Bulletin No. 141.)

GENERAL GEOLOGY

From Harry E. Nelson (Los Notes 1963)

The rocks of this area are identified on 1960 geology map prepared by the Arizona Bureau of Mines as being Laramide granite. The hills to the west, north and east are identified as Tertiary andesite.

Geologists think, that during the Perao-Triassic, a geosyncline was developed in southwestern Arizona, the Altar District, Sonora, Mexico, and southern California. The long axis of this trough, northwest to east-west, cradled a seaway through to the Pacific in the vicinity of Los Angeles.

During Triassic time the sediments in the trough were folded into a mountain chain, the thrust being to the northeast against the positive pre-Tertiary Plateau.

Then erosion stripped this Triassic mountain range to base-level during the Tertiary revolution. The line of weakness of the old geosyncline still existed when the Tertiary mountain-building forces produced the present fault-block mountain ranges that trend to the northwest in southwestern Arizona.

The surface features of the area are the result of desert erosion. The older rocks are carved into mountains with sharp ridges and needle peaks. Mesas were formed by the more recent basaltic and andesitic flows. The Sierra type mountains are surrounded by alluvial fans and rock-floored sloping plains.

Sedimentary Rocks:

A conglomerate (Tertiary Daniels?) with a smooth polished surface, outcrops in the wash 300 feet south of the old Camsight

cementary. This conglomerate carries boulders up to two feet in diameter, but most of the partially rounded pebbles are less than ½ inch in diameter. The cementing agent appears to be mostly silica with very little effervescence to dilute hydrochloric acid.

The matrix of the conglomerate is light gray in color, while the component rocks are darker gray andesites, brown and reddish chert, gray granitic rock, and boulders of a basic rock with white phenocrysts ¼ inch long.

Metamorphic Rocks:

No metamorphic rocks (gneisses or crystalline schists) were recognized as such in the field.

Metamorphism thought to be a contact aureole of the late intrusive rocks is partially developed in the southeastern and southern area mapped.

Igneous Rocks:

The igneous rocks of the area were identified by Dr. Eyren J. Sharp from thin sections made by Robert E. Jones of specimens gathered by Harry E. Nelson.

Quartz monzonite and granite are the major igneous rocks of the area and are cut by rhyolitic and basic dikes.

The Gunsight Hills of this area are made up of leucogranite and leucoquartz monzonite herein called granite and quartz monzonite intruded by granite aplite, all of which are cut by rhyolitic and andesite dikes.

The Quartz Monzonite-Tkll:

This rock occupies the southeastern and the southern section and forms brownish-gray rolling hills, and is the least resistant to erosion of the rocks outcropping in the area.

The quartz monzonite has several facies variations and contains quartz, white feldspar, biotite and chlorite. This rock is medium grained and gray to greenish gray in color. Numerous small discontinuous east trending dark basic dikes and tan aplitic dikes cut the gray quartz monzonite with increasing frequency from east to west.

Dull white to gray pegmatitic quartz veins are found in the quartz monzonite with increasing frequency from east to west.

The Granite (Leucogranite-545 and Leucocratic Monzonite-551):

Outcrops in the northern and northeastern section of the area are mapped.

The north limit of the granite is an abrupt change formed earlier than present drainage from a gentle north-dipping weathered outcrop, to perhaps 30 feet of partially cemented alluvial fill.

The granite forms the wall rock of the Gunsight Mine, and the mountain ridges to the south and southeast of the mine. On the crest of the ridge south of the mine, granite aplite is found intruding the granite.

The granite is coarse grained; the chief constituents are quartz and pink and white feldspar. The rock has a reddish color, but this is thought to be from iron oxide. Specular hematite is an accessory mineral.

Granite Aplite (Leucogranite aplite-544, Leucogranite-547, Leucomonzonite-553):

This type of rock outcrops in the central part of the area mapped. Mineral Monument No. 1, on the highest peak, is on an outcrop of the granite aplite. It weathers to sharp ridges and needle peaks, and it forms rock-floored sloping plains bordering the ridges and peaks. It has a pronounced joint system.

The granite aplite intrudes the granite, and while no cropping was seen of it intruding the quartz monzonite - it is thought to do so.

The rock is fresh-looking and appears to be unaltered. It is tan in color, and is very fine grained with an aplitic texture. The chief constituents are quartz, pink feldspar, and a little biotite. Very thin seams of specularite are found in the joints of this type of rock.

An outcrop of this type of rock on the ridge west of the Surprise Incline has many thin (less than 1/16 inch) stringers of quartz, that strike east, cutting the rock.

Rhyolite Dikes (Quartz Latite Porphyry-Fl, Leucocratic Porphyry-[illegible] Quartz Latite Porphyry-F3, Rhyolite Porphyry-F4):

Rhyolite dikes cut the quartz monzonite, the granite, and the granite aplite.

The rock is light gray or tan in color, and weathers gray with small black spots. The rhyolite has very small phenocrysts of quartz and what is thought to be sanidine, as well as larger phenocrysts of partially altered pink feldspar and an unknown dark mineral, all set in a gray or tan aphanitic groundmass.

From the chemical analyses that have been done to date it seems that in all probability that there are two different ages of rhyolite dikes.

A rhyolite dike which varies from about 20 to 30 feet in width, cuts the quartz monzonite in the southern area was traced on the surface for about 2,000 feet. It trends in a westerly direction, and is cut and offset by many faults, in one area it was cut by a black basic dike, with no apparent offset; apparently this is a push-a-part and does indicate the age relation, with the dark basic dike being younger than the rhyolite dike.

Another rhyolite dike cuts the granite in the eastern area mapped was found in a wash. Its lateral extent is not known; where seen it is five feet wide.

A small outcrop of iron stained rhyolite was seen in the northeast corner of the Eastern Claim, apparently cutting the granite.

Another rhyolite dike that outcrops in the southwest corner of the Galena No. 4 Claim was traced for about 300 feet in a westerly direction. It is faulted off on the western end. The dike is about ten feet wide.

Additional specimens of rock resembling rhyolites submitted for petrographic examination are the following: No. 561 (Granophyre) C & C Claim, No. 562 (Leucorhyolite) C & C Claim, No. 565 (Leucogranite) Galena No. 5 Claim, No. 571 (Altered dike 65% altered feldspar probably porphyry) Surprise No. 7 Claim, and No. 581 (Quartz latite porphyry) Surprise No. 4 Claim.

Basic Dikes:

The black (Basic Dikes) cut the quartz monzonite, the granite,

the granite aplite; and one was found cutting a rhyolite dike.

The black basic dikes are most numerous in the southwestern part of the district; only two were mapped cutting the granite, and four were mapped cutting the granite aplite.

An analysis of specimens taken for petrographic examination resulted in the following:

No. 546 - Galena No. 5 Claim, - Andesite Dike
No. 548 - East side of District, 220 feet north of North Endline of Surprise No. 5 Claim, - Andesite Dike
No. 554 - Crescent Claim, - Andesite Dike
No. 555 - Surprise Claim, - Andesite Dike
No. 557 - Surprise Claim, - Quartz Latite
No. 558 - Surprise Claim, - Andesite

SUMMARY OF HARRY E. NELSON'S REPORT (May 25, 1963)

1. Strong persistent veins outcrop on the Sunsight Mining Property; one has been mapped on the surface for over 4,000 feet.

2. The veins follow fault zones and appear as lineation in aerial photographs.

3. The vein systems can be separated into three groups:

a. Veins that strike to the northwest and dip to the southwest.
b. Veins that strike to the north and northeast, and dip to the east and southeast.
c. Veins that strike to the east and northeast, and dip to the north and northwest.

4. The veins that strike to the east and northeast, and dip to the north and northwest have produced the major amount of ore from the district; the values have been in silver and lead, with total production thought to be in excess of $250,000.00 and produced prior to 1900.

5. Large mineralized areas are found at the intersections of veins and other structures.

6. Minerals identifiable in this area are: quartz, calcite, siderite (?), specularite, fluorite, barite, scheelite, galena,

chalcopyrite, chrysocolla, malachite, azurite and cinnabar.

7. Igneous rocks were mapped in this district that contain significant amounts of fluorine, tungsten and zirconium.

8. Gold, silver and lead mineralization appear to be independent of the tungsten mineralization.

9. Fluorite is probably the most common vein mineral after quartz and the dark brown carbonate (siderite?) and is probably present in economic quantities.

10. Studies of the crystal habit of fluorite suggest that the light-colored octahedral crystals are typical of relatively high temperature of formation.

11. The penetration of fluorine into the wall rocks adjacent to the veins is of unique significance. Since the wall rocks are an igneous granitic type Nelson advances the theory that the back pressure has been substantial and that this is probably a deep zone of mineral formation.

12. Tungsten is one of the most persistent elements and although scheelite was the only tungsten mineral identified other tungsten minerals are probably present. One structure shows a calculated average of 64.0 inches of width assaying .675% WO_3. Tungsten is probably present in economic amounts on the property.

13. The copper mineral chalcopyrite has been found on the surface in the southeastern section of the Gunsight Property. It could be that the silver-lead metallization of the northern part of the district is a manifestation of zoning from the copper area of the southeast to the silver-lead of the north. As stated before this is elephant country in regard to mineral wealth. One elephant has been found, the big copper deposit of the New Cornelia Mine, at Ajo. If there be any credence to the zoning hypothesis, then the southeastern section of this district should be prospected for copper.

CONCLUSIONS BY HALE C. TENNEY

This mining property has the criteria that makes it one that merits mineral exploration. The criteria is:

1. Surface mineralization, i.e. barium, copper, fluorite,

gold, lead, mercury, molybdenum, silver, tungsten and zinc appearing in significant quantities.

2. Favorable host rocks. (Similar to the rock types of Ajo.)

3. Structural conditions that can create "space" for economic mineral deposition.

4. Past economic production of silver and lead from a small segment of one of the main vein systems.

IMMEDIATE POTENTIALS

The Gunsight Property possesses the following four potentials which merit immediate attention:

1. Probability of additional silver-lead ore bodies along the 4,000 foot extension of the Gunsight vein.

2. Possibility of an economic tungsten deposit.

3. Possibility of the separation of fluorite and barite to make one economic composite.

4. Possibility of a disseminated copper deposit.

IMMEDIATE PROCEDURAL RECOMMENDATIONS

In order to move toward the development of the above four potentials, it is recommended that the following procedure be followed:

1. Additional surface excavations be made to develop better exposures of the veins and surface mineralization.

2. The above new surface excavations be sampled for additional assay information.

3. Further geophysical surveys be made in the areas recommended by Harry E. Nelson.

4. Companies with sufficient capital to finance exploration on a large scale be contacted.

Respectfully submitted,
MINERAL ECONOMICS CORPORATION
Hilo C. Togneri
Hilo C. Togneri, P.E. #2048
September 6, 1963

MINERAL ECONOMICS CORPORATION

CONSULTING MINING ENGINEERS AND GEOLOGISTS

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MINING AND GEOLOGICAL ENGINEER
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WORK PERFORMED IN SPRING OF 1964

Mr. Henry E. Nelson returned to the Gunsight on January 5, 1964 to complete 34 additional days of surface and underground geologic mapping and sampling finishing on February 7, 1964.

During this period and immediately thereafter the following work was completed:

1. A reconnaissance geophysical survey by Heinrichs Geoexploration Company consisting of a combined induced polarization, magnetic and geochemical survey.

2. The lower Adit Level was cleaned out, collars placed on it and the winze going from that level through to the 200' level. The ladders down the winze were repaired making the 200' and all levels above it accessible.

3. All of the then-accessible workings of the Gunsight mine were mapped and sampled by Mr. Nelson. The Baker Shaft is filled with debris to the 340' level making the underground workings below the 200' level inaccessible. The drifting on the 200' level north of the Baker Shaft was inaccessible due to the ragged condition at the shaft, but since has been made accessible by a bridge being constructed across the Baker Shaft.

4. Approximately thirty miles of roads, bulldozer cuts and trenches on out-crops were completed by El Paso Natural Gas Company men, air drills, bulldozer and other equipment.

5. The timber and ladders in the Surprise Incline Shaft were repaired making that shaft accessible.

6. Geologist from El Paso Natural Gas made reconnaissance geochemical survey with its field geochemical unit to test its applicability to the Gunsight properties.

As a result of the Spring of 1964 work, Mr. Nelson submitted the following:

1. Assay returns from _____ samples.

2. Composite map of surface and various levels of Gunsight Mine.

3. Geologic cross-section A-A through mine showing relationship between Silver Girt and Gunsight veins.

4. Long sections of both Silver Girt and Gunsight veins.

5. Sample map of all underground workings.

6. Surface geology and sample locations posted on surface geology map.

7. Ore reserves of Gunsight Mine posted on long-sections.

8. Notes on Shoshone Mines Area, Gunsight Mining Corporation dated April 11, 1964 which includes report on the ore deposits in Gunsight Mine, a section on economics of fluorspar and a section on the economics of barite.

9. Notes on Shoshone Mines Area, Gunsight Mining Corporation dated June 5, 1964 which includes the ore reserve estimates for the parts of the Silver Girt and Gunsight vein mapped by Mr. Nelson.

As a result of its work, Heinrichs Geoexploration Company submitted a report dated January 1964.

As a result of its work, El Paso Natural Gas Company submitted a report on its geochemical findings.

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WORK ON THE SURPRISE MINING AREA
GUNSIGHT MINING CORPORATION
LUCKY MINING DISTRICT, PIMA COUNTY, ARIZONA

Harry E. Nelson
Registered Geological Engineer
Nevada License No. 891
April 11, 1964

RECOMMENDATIONS:

1. The Gunsight Mine mapping and sampling should be finished. Specimens should be taken for mineralogical and petrographic examination so that the mineralogy (silver and zinc minerals identified) can be worked out, and the paragenesis can be worked out for this section of the district.
   (a) The Baker Shaft, below 350', should be cleaned out so that the 400' Level can be mapped and sampled.
   (b) When all assay returns have been received the ore reserves should be calculated.

2. The Surprise Incline should be mapped and sampled.

3. The cut south of the Korlin Incline should be mucked out and then mapped and sampled.
   (c) Specimens should be taken for mineralogical and petrographic examination from near the bottom of the Korlin Incline (this is the area of highest tungsten assays in the district).

4. The surface south of the Korlin Incline to the wash should be mapped and sampled.

5. The area in the southeastern part of the district where the copper mineral chalcopyrite was found, and that now has been trenched by bulldozing, should be mapped and sampled.

6. Some thought should be given to acquiring the patented Dumo Dumo claim, so that the deep open shaft located on that claim could be utilized in the possible mining of the Keystone Vein.

7. Some thought should be given to redimbering some of the old shafts and inclines in the district, so that the underground workings could be mapped and sampled.

8. Some thought should be given for more geophysical work by the Hallmich Consolidation Company.

(a) It is thought more detailed information is needed on the faulted area where water is thought to be present 1,000-feet north of the Baker Shaft.

(b) It is thought more detailed information is needed on the highly leached area near the center of Section 22.

(c) It is thought detailed information is needed on the granodiorite-chalcopyrite zone on the Surprise No. 6 claim north to the Surprise Incline.

(d) It is thought detailed information is needed along and parallel to the Cumsight Vein System, extending 1,000 feet east of the Baker Shaft.

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NOTES ON THE SILVER GIRT AREA
GUNSIGHT MINING CORPORATION
LOWER MINING DISTRICT, PIMA COUNTY, ARIZONA

Henry E. Nelson
Registered Geological Engineer
Nevada License No. 891
June 5, 1964

CONCLUSIONS:

1. The copper content of the Gunsight Vein is increasing with depth.

2. The zinc content of the Gunsight Vein is increasing with depth.

3. The tungsten content of the Gunsight Vein is increasing with depth.

4. The barite content of the Gunsight Vein increases to the northeast.

5. The fluorite content of the Gunsight Vein appears to increase to the southwest.

6. The silver and lead content of the Gunsight Vein appears to increase towards the Silver Girt Fault.

7. The highest mine grade in lead and fluorite (ore shoot) is found on the Silver Girt Vein.

RECOMMENDATIONS:

1. It is recommended that a bulk sample be taken of the vein material from the Silver Girt on the Lower Adit Level for mill testing.

MINERAL ECONOMICS CORPORATION
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SUMMARY ORE RESERVES GUNSIGHT MINE
(Above 400' Level and North of the Baker Shaft)
March 1, 1964
Harry E. Nelson

Vein	Tons	Oz.Ag.	%Pb	%Cu	%Zn	$\%CaF_2$	%Mn
			Developed				
Silver Girt	898	2.24	2.84	0.108	0.91	14.88	3.89
Gunsight	19,677	1.81	1.78	0.079	0.65	12.63	8.03
			Probable				
Silver Girt	355	0.54	0.79	0.113	1.28	9.75	2.80
Gunsight	662	1.48	2.17	0.075	0.75	11.79	8.18
			Total Developed & Probable				
Silver Girt	1,253	1.76	2.25	0.109	1.02	13.42	3.58
Gunsight	20,339	1.80	1.79	0.078	0.66	12.59	8.04
			Possible				
Silver Girt	762	3.24	4.56	0.104	0.71	18.99	4.53
Gunsight	6,793	2.16	1.34	0.082	0.465	13.56	9.51
			Total Developed, Probable and Possible				
Silver Girt	2,015	2.32	3.13	0.107	0.90	15.53	3.94
Gunsight	27,132	1.89	1.68	0.079	0.61	12.84	8.41
			Total in Both Veins Developed, Probable and Possible				
	29,147	1.93	1.98	0.08	0.62	13.	8.

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INDUCED POLARIZATION, GEOCHEMICAL & MAGNETIC SURVEY
by
MIMMICOS EXPLORATION COMPANY

January 1964

Conclusions

1. No zones of sulfide mineralization of more than about 1 percent total sulfide by volume were encountered in the vicinity of the induced polarization lines that lay within about 1,500 feet of the surface and had dimensions of around 1,000 feet. In other words, no porphyry-copper type deposits were noted within 1,500 feet of the surface along or near the I. P. traverses.

2. Several zones of slightly higher than background frequency effects were found: one on Line 2 between 1 and 2N, the other between 1 and 2E on Line 3. In fact, the whole of Line 3 is stronger in effects than the other two lines, making it of more interest. These zones appear to be slightly higher in sulfide content, probably still less than 1 percent total sulfide by volume unless the zones are small (several hundred feet or so across) -- in which case they could be considerably higher in sulfide content. To test this possibility, smaller dipole-spaced induced polarization surveys over these areas would be useful.

3. Resistivities indicate a contact (probably fault) between 0N/S and 0.5S probably dipping steeply to the north. This is a very strong feature electrically, with granitic rocks to the south and conglomerates and volcanics to the north. There appears to be at least 1,000 feet of thickness of conglomerate and volcanics north of the contact in the vicinity of the I. P. line. It appears that this feature was crossed fairly perpendicularly.

4. A gradational resistivity contact appears on the east half of Line 3. From about 2.5E to 4.5E, a material intermediate in resistivity between the granitics and volcanics (perhaps an altered granitic rock) appears. Between 4.5E and 5.5E, the

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contact with the volcanics appears. Strike and dip of these [illegible] could not be determined.

5. Magnetics show a major contact or structural break of some kind centered around 1.0N on Line 1. This feature appears to be around 400 to 600 feet below the surface and corresponds to the aerial photograph lineament intersection in this area. Another similar feature appears at 1E on Line 3 at about the same depth, also near a lineament intersection.

6. Geochemical residual soil sampling shows copper and molybdenum to be present in very low concentrations -- both lower than the average background for the Southwest. Zinc concentrations are about normal background with several stations above background -- one at 4.5S on Line 1 and the other at 3.0N on Line 2, both near mineralized veins.

7. Induced polarization detailing along with self potential surveys may prove useful in delineating sulfide concentrations in the polymetallic veins of this area.

8. Further magnetic work will likely help map the various rock types and structures and enable a better determination of what significance the magnetic features noticed on this survey may have.

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GROSS VALUE PER TON OF SUNSIGHT MINE ORE RESERVES

Estimated by Hale C. Tognoni

September 4, 1964

Assay values taken as weighted average of Silver Girt and Sunsight ore reserves. Mineral prices used were those estimates by Harry E. Nelson for barite and fluorite and the current N.Y. market price for the others as set forth below--

Ag--1.93 oz. @ $1.29 =	2.49
Pb--1.96% = 39.6#Pb @ 14¢ =	5.54
Cu--0.08% = 1.6#Cu @ 34¢ =	.54
Zn--0.62% = 12.4#Zn @ 12¢ =	1.48
CaF_2--13% = $45.00 per ton	5.85
Ba--8% = $23.00 per ton	1.84
	17.74

NOTES ON

THE SHEEHAN MINES AREA

MEYERS MINING DISTRICT

PIMA COUNTY, ARIZONA

HARRY E. NELSON

REGISTERED GEOLOGICAL ENGINEER

NEVADA LICENSE NO 891

MAY 25, 1963

NOTES ON THE SHEEHAN MINE AREA, MEYERS MINING DISTRICT, PIMA COUNTY, ARIZONA

Table of Contents

Harry E. Nelson
1018 East Norman Avenue
Las Vegas, Nevada

May 25, 1933

NOTES ON THE SHEEHAN MINES AREA, MEYERS MINING DISTRICT, PIMA COUNTY, ARIZONA

INTRODUCTION:

The Sheehan Mine Area is located 14.7 miles south via Arizona Highways 85 and 86 of Ajo, Arizona; thence approximately one mile by dirt road through the Papago Indian settlement of Schuchuli (Many Chickens) to the northern most mine workings. This area is in the Papago Indian Reservation, in southern Pima County, in southwestern Arizona, about 20 miles north of the Mexican boundary.

Ajo is the largest town in the area, and is connected by the Tucson, Cornelia, and Gila Bend Railroad, owned by the Phelps Dodge Corporation, with the main line of the Southern Pacific Railroad at Gila Bend.

The New Cornelia Mine, an open pit producing since about 1917, is located at Ajo, Arizona. As of 1956, the New Cornelia Mine ranked seventh in total copper production when compared with the "Great Porphyry Copper Mines" of the world; its production is under that of Utah, Chuquicamata, Braden, Morenci, Chino, and Andes. Thus this is elephant country in regard to mineral wealth.

The Sheehan Mine Area is about a mile and a half in length and about a mile wide and trends in a northerly direction.

Physical Features:

This area lies in the Sonoran Desert section of the Basin and Range province. It is a part of the Gunsight Hills on the northeast flank of the Ajo Range of Mountains. It lies in Sections 16, 17, 20, and 21, T. 14 S., R. 4 W., Gila and Salt River Base and Meridian.

It is an area whose center is made up of sharp ridges and peaks that

rise about 1,000 feet above the surrounding alluvial valleys. Altitude ranges from about 1,500 to 2,600 feet.

There are no permanent streams in the area.

Climate and Vegetation:

Climatic records at Ajo indicate the temperature ranges from 25° F. to 113° F., with the daily maxima above 100° F. being very common. Annual precipitation at Ajo is about 10 inches.

Even though the climate is that of the Sonoran Desert, vegetation is abundant and the area appears unusually green. Found in the area are the following: palo verde, saguaro, palo fierro, mesquite, ocotillo, hedgehog cactus, barrel cactus, prickly pear, cholla, cresote bush, greasewood, and various grasses.

No farming is done in this area. The Papago Indians run a few cattle in the vicinity of Schuchuli.

Water is obtained from shallow wells.

Rock exposures are excellent.

Purpose and Scope:

Field geologic mappling and sampling started March 12, 1963 and terminated April 11, 1963 for a total of 20 field days. Surface geology was platted on a scale of one inch to 300 feet.

The topographic base map showing the mining claims was prepared by Mr. Hale C. Tognoni, Mining Consultant for the Sheehan Mining Corporation, from an enlargement of an aerial photograph. The surface geology and the location of the samples were drawn directly on the base map.

Aerial photographs of this area were taken by Maddock Associates Aerial Survey, Inc., 4900 East Indian School Road, Phoenix, Arizona. The 9" x 9" steroscopic pairs of the aerial photographs were studied. One enlargement,

at a scale of one inch to 300 feet, of the center of the area was studied. It is thought the aerial photographs were taken at the wrong time of day, for shadows hide much of the features on the north side of the sierra type hills in the center of the area.

During this program 118 samples were taken for assay and for petrographic study. The samples for assay were taken by the writer to Hawley and Hawley, 1800 West Grant Road, Tucson, Arizona. The samples of rock specimens were sent by the writer to Dr. Byron J. Sharp, 4181 Olympic Way, Salt Lake City 17, for petrographic study. Mr. Robert E. Jones, 1615 Sampson Street, Butte, Montana made 43 thin sections of the rock specimens for the petrographic analysis. The field geologic maps were turned over to Mr. Tognoni for final drafting.

Mr. Lawrence J. Sheehan, President of the Sheehan Mining Corporation, worked with the writer during the greater portion of the field work. Mr. Don Dixon, Resident Geologist for the Phelps Dodge Corporation at Ajo, conducted the writer, Mr. Tognoni, Dr. Dobbin, Mr. Hatton, Mr. Bleish, and Mr. Malmstone through the New Cornelia open pit on March 18, 1963. On March 22, 1963, Mr. Dixon discussed the Sheehan Mine Area with the writer, looked at the collected rocks and ore specimens, studied the steroscopic pairs of aerial photographs of the area; and made helpful suggestions, in regard to the textural differences of the rocks as seen in the steroscopic pairs.

The purpose of this investigation was to determine by geologic mapping and by sampling the areas of major economic interest and to make recommendations for exploration to Mr. Tognoni.

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10. 1937, Gilluly, James, Geology and Ore Deposits of the Ajo Quadrangle, Arizona: Arizona Bureau of Mines, Geological Series No. 9, Bulletin No. 141, 83 p., maps.

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13. October 1962, Unpublished Report, Bacon, Vance N., Preliminary Examination of Gunsight Mine Area, 9 p., 4 maps.

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Geologic Map:

1. Geologic Map of Pima and Santa Cruz Counties, Arizona: Prepared by the Arizona Bureau of Mines, University of Arizona, Tucson, Arizona; by Eldred D. Wilson, Richard T. Moore, and Robert T. O'Haire, scale 1/375,000, 1960.

History:

The conspicuous croppings of the veins, some showing galena; the nearness to the watering and trading post at Wall's Well, five miles to the south; the nearness to the copper croppings of the Ajo region, 15 miles to the northwest, all lead one to believe that the Indians, Spanish, and Mexicans, as well as early day Americans undoubtedly mined in this area.

This area is about 90 miles from the Bahia de S. Jorge on the northeast coast of the Gulf of California.

In 1687, the Jesuit missionaries, Fathers Kino and Salvatiera, established the first mission within the region now known as Arizona. Thirty years later there were nine missions. The converts were mostly from the Pimas, who took the name of "Papago" (baptised). The missions were subject to constant raids from the Apaches, who no doubt interfered with the mining, and in the year 1757 there was an uprising of the Pimas, with the destruction of several of the missions and murders of the priests. This disaster was followed in 1765 by a royal decree of expulsion of the Jesuit Fathers and the substitution of eight Franciscan friars in 1768.

New Mexico was ceded to the United States in 1848. At that time, southern Arizona, south of the Gila River, was Mexican territority. The Gadsden Purchase of 1853 brought the Sheehan Mine Area as well as the Ajo Area into the United States.

The old Arizona Copper Mining and Trading Company (Ajo) was one of the first, if not the first, mining incorporations upon Arizona property. The Ajo

mine was located in November 1854, by a party of Americans from California. Major Robert Allen, U. S. A., Deputy Quartermaster-general of the Department of the Pacific, was president, and J. Downer Wilson, of San Francisco, was secretary and treasurer of the corporation. As soon as work commenced on the Ajo mines, they were claimed by several wealthy residents of Sonora as being within Mexican territory. In the month of March, 1855, a Mexican company of cavalry was sent from the district of Altar and from Ures, the capital of Sonora at that time, to dispossess the Americans, to capture them, and to take them to Ures as prisoners. The miners refused to go and defended their position. With only nine men against 110 dragoons and vaqueros, the mine was successfully held and the Mexicans dispersed. For six months after this nothing was done beyond prospecting, but in the fall of the year 1855 the boundary line had been run, and it was found that the Ajo mining camp was at least 40 miles inside the boundary on the United States side. Shortly thereafter ten tons of highgrade copper ore (red oxide) was shipped to Swansea, Wales for smelting. However it wasn't until 1911 that the Calumet and Arizona Company with Ira Joralemon as the geologist and John C. Greenway as the manager that successful drilling was started that finally proved an enormous tonnage of 2% oxidized copper ore; and it wasn't until 1917 that a big plant at Ajo, with a capacity of 5,000 tons per day was completed.

The Gunsight Mine, a part of the holdings of the Sheehan Mining Corporation in the Moyers Mining District, is mentioned in the "Report of the Director of the Mint upon the Statistics of the Production of Precious Metals in the United States" for the years 1882, 1883, and 1884. It is interesting to note that these are the only published reports, known by the writer, to exist on any of the mines in this district.

In the Report for 1882 - the Gunsight Mine is mentioned as being the best developed, the best equipped, and the leading mine in the district; with a 200-

foot incline, a drift 200 feet on the vein at the 100 foot level, and a cross-cut at the 200 foot level, and with plans to sink a vertical shaft immediately. About 4,000 tons of ore were mined during the prospecting work, that averaged between $ 30 to $ 40 per ton in value. The mine has two types of ore, free milling and smelting, with the free milling predominating. The milling ore consists of black sulpherrets (Raymond - an old synonym for sulfide) and chlorides, and the smelting ore of lead and iron carrying silver.

In the Report for 1883 - the Baker shaft (probably the main vertical shaft) is mentioned as being 340 feet deep, and that crosscuts had been driven connecting to the old workings on the Gunsight Vein, 300 feet below the surface. It was thought that the mill could be furnished with 50 tons of ore per day from the deepest workings.

In the Report for 1884 - report apparently by R. C. Pearson - the Silver Girt shaft (probably the main vertical shaft - the Baker shaft mentioned in the Report for 1883) is mentioned as being down 380 feet, with the first level at 200 feet (Rasor's sketch dated Nov. 1942, shows the Main Shaft cutting the Silver Girt Vein at the 200 level, and the drift north as being driven on the Silver Girt Vein) consisting of a north drift of 147 feet, all in ore; and a south drift 240 feet in length that was being stoped for 180 feet - the ore averaging $ 23 per ton. The old Gunsight shaft (probably the winze from the Lower Adit Level) is mentioned as being 240 feet (deep ?), with 31 feet of ore exposed, averaging $ 60 per ton without sorting, and still in ore; the first level is at 100 feet, with 130 feet of stoping ground, the vein being seven feet wide and averaging $ 75; the second level having 180 feet of stoping ground that averaged $ 60.

The Sheehan Mining Property of 19 unpatented mining claims were located and recorded in 1922 and 1925 by I. M. Sheehan, wife of Cornelius Benjamin Sheehan. Cornelius "Con" Sheehan, born in Dublin, Ireland in 1881, moved with

the family to Butte, Montana in 1884. He started working in the mines in Butte when he was eleven and worked his way up to be a shiftboss. He attended the Montana School of Mines while still working underground. He was married in Butte, in 1917 he and Mrs. Sheehan moved to the Ajo area, where Lawrence J. Sheehan was born at Wall's Well. Cornelius Sheehan worked for John C. Greenway in the open pit at Ajo, and later at Jerome, Bisbee, and other mining camps in Arizona as an engineer. In 1921 he acquired the Gunsight Mine and formed an Arizona corporation with Walter Wheeler, a lawyer from Detroit, Michigan, and Marvin Hall, a business man, to develop the area. He rebuilt the Gunsight Mill, installed a water line from Wall's Well, five miles to the south, re-timbered the Gunsight Winze and the Surprise Incline, and started mining in both the Gunsight Mine and the Surprise Mine. Cornelius Sheehan died in 1922, at the age of 41, leaving Mrs. Sheehan with a house in Phoenix and six small children. Following his death the corporation folded, and later John J. Butler, the watchman at the property, sued for wages and was awarded three patented claims. Mr. Butler sold the mill and pipeline, and left in his will the three patented claims to his daughter Margaret Griffin.

In 1942, lessees by the names of Graham and Thomas applied for an RFC loan to reopen the Gunsight Mine. The examining engineer was C. A. Rasor. The loan apparently was refused. The report of C. A. Rasor has not been seen by the writer, but copies of C. A. Rasor's underground maps and assays, dated November 1942, are included in the report by Vance N. Bacon.

According to Lawrence J. Sheehan, "Brick" Squires, a mining engineer working for the Arizona State Mineral Department, examined the underground workings of the Gunsight Mine in 1955, and later wrote a report on the property. This report has not been seen by the writer.

GENERAL GEOLOGY:

The rocks of this area are indicated on the Geologic Map of Pima and Santa Cruz Counties, prepared by the Arizona Bureau of Mines, University of Arizona Tucson, Arizona, 1960, as being Laramide granite. The hills to the west, north, and east are indicated as Tertiary andesite.

It is thought that a deep Permo-Triassic geosyncline was developed in so. western Arizona; in the Altar District, Sonora, Mexico; and in southern California. It is also thought that the long axis of this trough was northwest to east-west, and that the seaway was through to the Pacific in the vicinity of Los Angeles. It is also assumed that during Triassic time the sediments in the trough were folded into a mountain chain, the thrust being to the northeast against the positive pre-Tertiary Plateau element. Erosion then proceeded and continued to the initiation of the Tertiary revolution when the old Triassic mountain range had been base-leveled and the sediments stripped from it. The line of weakness of the old geosyncline still existed, and the Tertiary mountain-building forces tended to make the present fault-block mountain ranges that trend to the northwest in southwestern Arizona.

The surface features of the area are the result of desert erosion. The older rocks are carved into mountains with sharp ridges and needle peaks. The more recent basaltic and andesitic flows form mesas. Rock-floored sloping plains are found bordering the mountains of the sierra type, a good example of this is the Sheehan Mine Area.

Sedimentary Rocks:

A conglomerate is poorly exposed in the wash 300 feet south of the old Gunsight Cemetery; and continues east some 600 feet, to within about 200 feet of the dirt highway that connects Arizona Highway 86 to Wall's Well and Gu Vo.

As exposed in the wash, a smooth polished surface forms the outcrop.

The conglomerate carries boulders up to two feet in diameter, but most of the pebbles are less than 1/4 inch in diameter and are partially rounded. The cementing agent appears to be mostly silica, for very little effervescence was seen when dilute hydrochloric acid was applied.

The matrix of the conglomerate is light gray in color, while the component rocks are darker gray andesites, brown and reddish chert, gray granitic rock, and boulders of a basic rock with white phenocrysts 1/4 inch long.

This conglomerate is tentatively correlated with the Tertiary Daniels Conglomerate as described by Gilluly in the Geology and Ore Deposits of the Ajo Quadrangle, Arizona, page 46.

Metamorphic Rocks:

No metamorphic rocks (gneisses or crystalline schists) were recognized as such in the field.

Metamorphism thought to be a contact aureole of the late intrusive rocks is partially developed in the southeastern and southern area mapped.

Igneous Rocks:

As of this time the petrographic analysis of the 43 specimens, whose thin-sections were made by Mr. Robert E. Jones, and whose petrographic analysis were made by Dr. Byron J. Sharp, have not been received by the writer.

The following rock unit descriptions have been made by the writer in the field based on megascopic examination of the rocks.

The Gunsight Hills of this area are made up of granite and quartz monzonite intruded by granite aplite, all of which are cut by rhyolitic and basic dikes.

(Quartz Monzonite)

This mass of rock occupies the southeastern and the southern section mapped.

It forms brownish-gray rolling hills, and is the least resistant to erosion of the rocks outcropping in the area.

This unit consists of rocks of several varieties. In the main it is gray in color; some areas have a distinct greenish cast, probably caused by epidote. Numerous small discontinuous dark basic dikes cut the gray quartz monzonite with increasing frequency from east to west; they are most numerous from the Burro Burro Claim westward, and they trend in an easterly direction. Numerous small discontinuous tan aplitic dikes cut the gray quartz monzonite in the vicinity of the Southern Belle Claim; they trend in an easterly direction.

Dull white to gray pegmatitic quartz zones are found in the quartz monzonite, with increasing frequency from east to west.

The rock is medium grained. The minerals seen in the hand specimen (No. F-1511, submitted for petrographic analysis) were quartz, white feldspar, biotite, and chlorite (?). Some calcite is thought to be present, for there was some effervescence when dilute HCl was applied.

Qualitative spectrographic analysis of a portion of sample No. F-1511, the elements found and the percentage range are as follows:

Major - Si

1.0 to 10.0% - Al, Na, K, and Fe.

0.10 to 1.0% - Ca, and Mg.

0.01 to 0.10% - Mn, Ti, Ba, Sr, V, and Zr.

less than 0.01% - B, Pb, Zn, Cu, Cr, Ni, and Co.

(Granite)

This type of rock outcrops in the northern and northeastern section of the area mapped.

The north limit of this type of rock is an abrupt change from a gentle north-dipping weathered outcrop, to perhaps 30 feet of partially cemented alluvial fan.

This abrupt change is not a part of the present drainage system, but appears to have been formed earlier.

The granite forms the wall rock of the Gunsight Mine, and the mountain ridges to the south and southeast of the mine. On the crest of the ridge south of the mine, granite aplite is found intruding the granite.

The granite is coarse grained; the chief constituents are quartz and pink and white feldspar. The rock has a reddish color, but this is thought to be from iron oxide. Specular hematite is an accessory mineral. Specimens No. 545 and No. 551 were submitted for petrographic examination.

Chemical analyses of this rock showed the following:

Sample No. 538 - East Side - Trace Au, Trace Ag, 0.20% Pb, None Cu, 0.08% Ba, 0.40% Zn, 0.001% Mo, 1.43% CaF_2, and 0.006% W.

Sample No. 545 - East Side - None Au, Trace Ag, 50 PPM Pb, 20 PPM Cu, None PPM Zn, 10 PPM Mo, 250 PPM W, and None PPM Sn.

Sample No. 551 - North Side, altered zone - Trace Au, Trace Ag, 250 PPM Pb, 40 PPM Cu, 100 PPM Zn, 10 PPM Mo, 100 PPM W, and None PPM Sn.

An important item in these analyses is the 1.43% CaF_2 found in what was thought to be an unaltered specimen of the granite. The fluorite content plus the large grain size leads one to the supposition that the granite crystallized at depth and that the fluorine couldn't escape. The source of the fluorine for the fluorite in the veins in this district is in all probability the same magma that produced this granite.

The tungsten content is important too, for it will be shown that other later rocks in this district also carry tungsten and are probably related to the same magma that produced this granite.

The age of this granite is not known, but it is thought to be probably of Laramide Time, and younger than the quartz monzonite previously described.

(Granite Aplite)

This type of rock outcrops in the central part of the area mapped. Mineral Monument No. 1, on the highest peak, is on an outcrop of the granite aplite. It weathers to sharp ridges and needle peaks, and it forms rock-floored sloping plains bordering the ridges and peaks. It has a pronounced joint system.

The granite aplite intrudes the granite, and while no cropping was seen of it intruding the quartz monzonite - it is thought to do so.

The rock is fresh-looking and appears to be unaltered. It is tan in color, and is very fine grained with an aplitic texture. The chief constituents are quartz, pink feldspar, and a little biotite. Very thin seams of specularite are found in the joints of this type of rock.

An outcrop of this type of rock on the ridge west of the Surprise Incline has many thin (less than 1/16 inch) stringers of quartz , that strike East, cutting the rock.

Specimens No. 544, No. 547, and No. 553 were submitted for petrographic examination.

Chemical analyses of the granite aplite showed the following:

Sample No. 544 - East Side - None Au, Trace Ag, 50 PPM Pb, 10 PPM Cu, None PPM Zn, 20 PPM Mo, 500 PPM W, and None PPM Sn.

Sample No. 547 - East Side, largest grain size of this type of rock found - None Au, 0.10-oz. Ag, 50 PPM Pb, 15 PPM Cu, None PPM Zn, 10 PPM Mo, 500 PPM W, and None PPM Sn.

Sample No. 553 - West Side - Trace Au, 0.10-oz. Ag, None PPM Pb, 20 PPM Cu, None PPM Zn, 10 PPM Mo, 500 PPM W, and None PPM Sn.

It is interesting to note that this type of rock carries up to 0.10-oz. Ag, 500 PPM W, and that it is lacking in Zn.

The small grain size indicates rapid cooling, thus it is thought that this

igneous rock intruded the area under very little cover; and that it is a later and more acidic phase of the same magma that produced the previously described granite.

(Rhyolite Dikes)

Rhyolite dikes cut the quartz monzonite, the granite, and the granite aplite.

The rhyolite dike that cuts the quartz monzonite in the southern area was traced on the surface for about 2,000 feet. It trends in a westerly direction, and is cut and offset by many faults. In one area it was cut by a black basic dike, with no apparent offset; apparently this is a push-a-part and does indicate the age relation, with the dark basic dike being younger than the rhyolite dike.

The rhyolite dike varies from about 20 to 30 feet in width. The rock is light tan in color. Phenocrysts of quartz, what is thought to be sanidine, and an unknown dark mineral are set in a tan aphantic groundmass. Specimen No. 581 was submitted for petrographic examination.

The rhyolite dike that cuts the granite in the eastern area mapped was found in a wash. Its lateral extent is not known; where seen it is five feet wide.

The rock is tan in color. The rhyolite has phenocrysts of quartz and what is thought to be sanidine, all set in a tan aphantic groundmass. Specimen No. 549 was submitted for petrographic examination. Chemical analysis of the rhyolite is as follows:

Sample No. 549 - East Side - None Au, Trace Ag, 150 PPM Pb, 20 PPm Cu, 25 PPM Zn, 20 PPM Mo, 100 PPM W, and None PPM Sn.

A small outcrop of iron stained rhyolite was seen in the NE corner of the

Eastern Claim, apparently cutting the granite. Specimen No. 550 was sent for petrographic examination. Chemical analysis of the rhyolite is as follows:

Sample No. 550 - NE Corner of Eastern Claim - Trace Au, Trace Ag, 50 PPM Pb, 20 PPM Cu, 25 PPM Zn, 10 PPM Mo, 100 PPM W, and None PPM Sn.

The rhyolite dike that outcrops in the SW Corner of the Galena No. 4 Claim was traced for about 300 feet in a westerly direction. It is faulted off on the western end. The dike is about ten feet wide.

The rock is light gray in color, and weathers gray with small black spots. The rhyolite has very small phenocrysts of quartz and what is thought to be sanidine, as well as larger phenocrysts of partially altered pink feldspar; all set in a gray aphantic groundmass. Specimen No. 552 was submitted for petrographic examination. Chemical analysis of the rhyolite is as follows:

Sample No. 552 - SW Corner of Galena No. 4 Claim - Trace Au, Trace Ag, 100 PPM Pb, 20 PPM Cu, None PPM Zn, 10 PPM W, and None PPM Sn.

From the chemical analyses that have been done to date it seems that in all probability that there are two different ages of rhyolite dikes; note Sample No. 552 is the only one not carrying any Zinc. It is suggested that all specimens be assayed by the PPM method.

Additional specimens of rock thought to be rhyolites submitted for petrographic examination are the following: No. 561 C & C Claim, No. 562 C & C Claim, No. 565 Galena No. 5 Claim, No. 571 Surprise No. 7 Claim, and No. 581 Surprise No. 4 Claim.

(Basic Dikes)

The black basic dikes cut the quartz monzonite, the granite, the granite aplite; and, one was found cutting a rhyolite dike.

The black basic dikes are most numerous in the southwestern part of the district; only two were mapped cutting the granite, and four were mapped cutting the granite aplite.

The following specimens were taken for petrographic examination:

No. 546 - Galena No. 5 Claim

No. 548 - East side of District, 220 feet north of North Endline of Surprise No. 5 Claim

No. 554 - Crescent Claim

No. 555 - Surprise Claim

No. 557 - Surprise Claim

No. 558 - Surprise Claim

No. 568 - Surprise No. 7 Claim

No. 571 - Surprise No. 7 Claim

No. 582 - Surprise No. 3 Claim

No. F-1503 - Silver Glance Claim

Chemical analyses of the basic dikes are as follows:

Sample No. 546 - None Au, Trace Ag, 50 PPM Pb, 20 PPM Cu, 50 PPM Zn, 10 PPM Mo, 375 PPM W, None PPM Sn.

Sample No. 548 - None Au, Trace Ag, 150 PPM Pb, 20 PPM Cu, 150 PPM Zn, 10 PPM Mo, None PPM W, None PPM Sn.

Sample No. 554 - None Au, Trace Ag, 50 PPM Pb, 30 PPM Cu, 10 PPM Zn, 10 PPM Mo, 50 PPM W, and None PPM Sn.

Sample No. 555 - Trace Au, Trace Ag, 50 PPM Pb, 10 PPM Cu, 10 PPM Zn, 10 PPM Mo, 50 PPM W, and None PPM Sn.

These assays indicate that there are in all probability two different ages of black basic dikes; note that Sample No. 548 is the only one not carrying any tungsten. It is suggested that all the specimens be assayed by the PPM method.

Summary

As mentioned before it is thought that this area probably has lines of weakness that trend to the northwest along the axis of an old geosyncline. Some of these old lines of weakness are thought to have been recognized, through the study of aerial photographs.

(Aerial Photographs)

Study of the structure of this area was greatly aided by the 9" x 9" steroscopic pairs, at a scale of approximately one inch to 745 feet; and, the enlargement of the central area to a scale of one inch to 300 feet. Shadows on the northern slopes are a problem.

The aerial photographs show a pronounced lineation or linear structure present in the area. Some of these zones are as follows:

1. Photographs 7872 and 7861 - indicate a probable fault zone that strikes N. 50° to 60° W. This zone passes through the southern part of the Indian Village of Schuchuli, north of the area mapped. It is interesting to note that the Little Ajo Mountain Fault as mapped and described by Gilluly in the Geology and Ore Deposits of the Ajo Quadrangle, Arizona is pointed in this direction, and with very little deviation in its strike it could be present. It is to be noted too, that the rocks north of the Little Ajo Mountain Fault in the Ajo Quadrangle are described mainly as Tertiary volcanics with a little Tertiary Daniels conglomerate and Tertiary fanglomerate.

This condition appears to the writer to be somewhat similar just north of the area mapped; for here again is an area of Tertiary volcanics, and here again is a small patch of conglomerate tentatively correlated with the Daniels Conglomerate, north of the postulated fault.

Geophysical prospecting across this area would certainly prove or disprove the geological concept of large faults in this area, and could indicate also