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PRINTED: 11/21/2002

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES AZMILS DATA

PRIMARY NAME: AZURITE MINE

ALTERNATE NAMES:

BLUE BALL  
RISING SUN  
ENTERPRISE CLAIMS  
INTERNATIONAL PIPE CLAY

GILA COUNTY MILS NUMBER: 99B

LOCATION: TOWNSHIP 1 S RANGE 15 E SECTION 7 QUARTER C  
LATITUDE: N 33DEG 21MIN 34SEC LONGITUDE: W 110DEG 51MIN 11SEC  
TOPO MAP NAME: PINAL PEAK - 7.5 MIN

CURRENT STATUS: PAST PRODUCER

COMMODITY:

COPPER OXIDE  
GEMSTONE AZURITE NODU  
CLAY KAOLIN  
GEMSTONE CARBONATES

BIBLIOGRAPHY:

ADMMR AZURITE MINE FILE  
GRANT, RAY "BLUE BALL MINE" MINERALOGICAL REC.  
P. 447, VOL. 20, #6, 1989

11/29,

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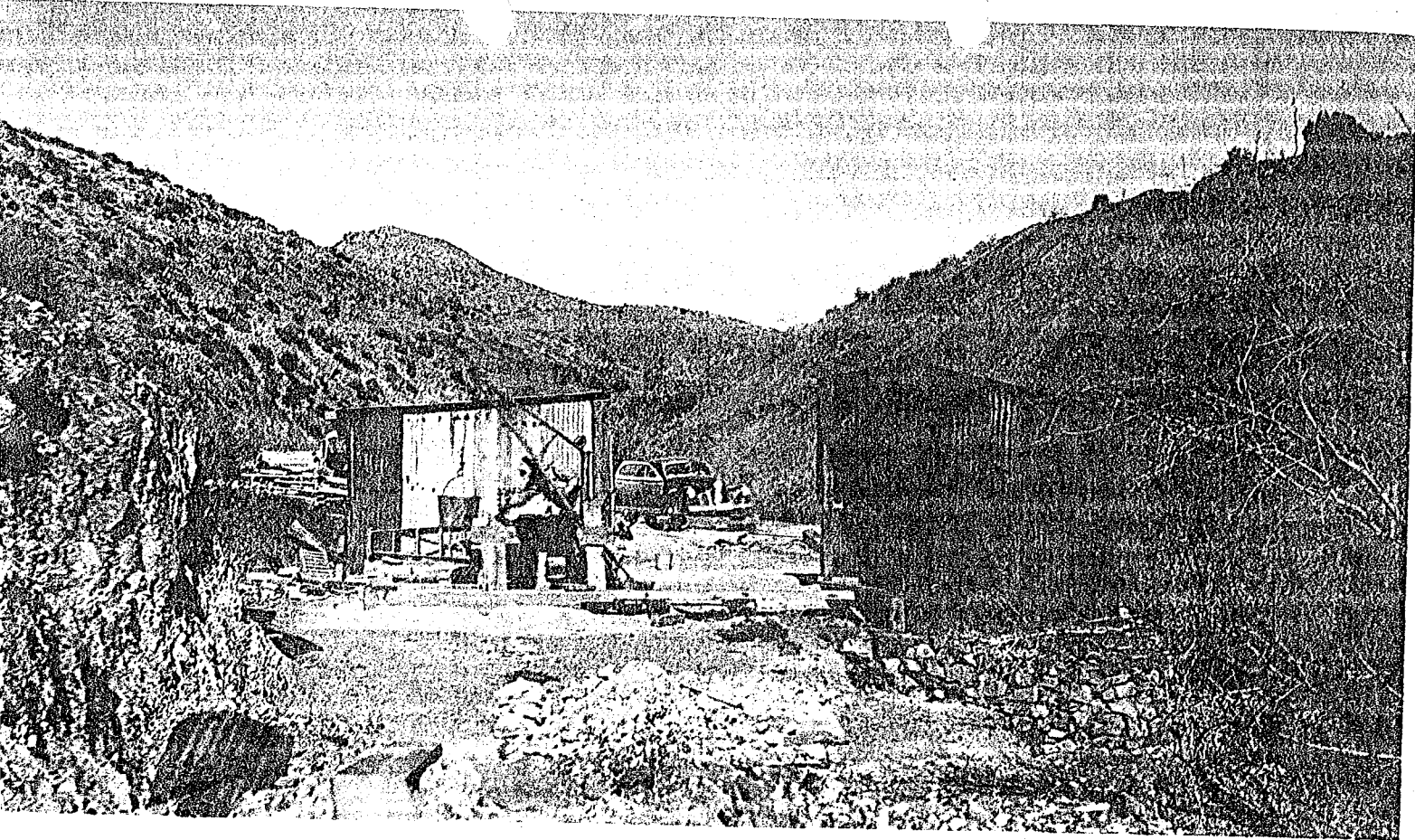
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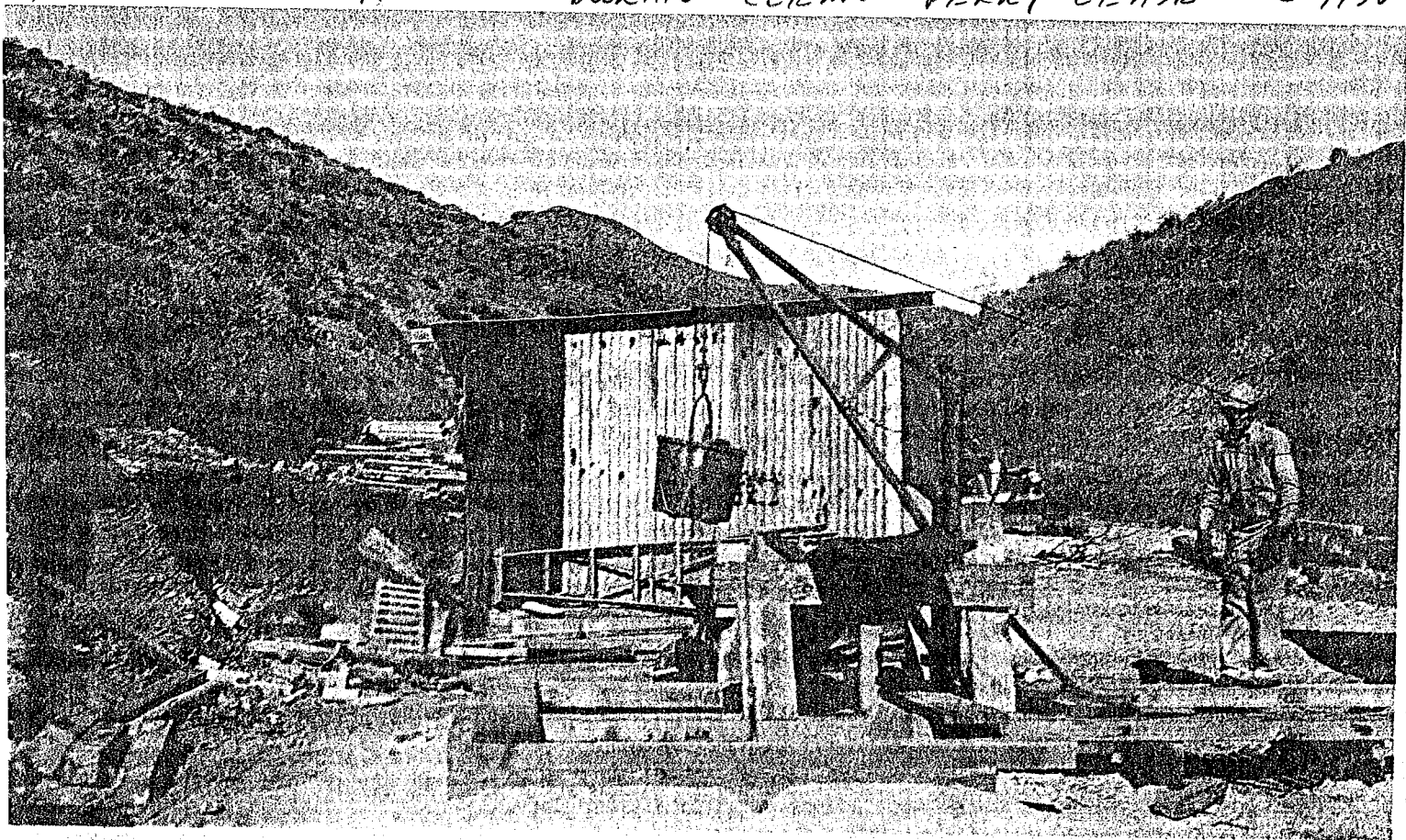
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GEMSTONE AZURITE NODU  
CLAY KAOLIN

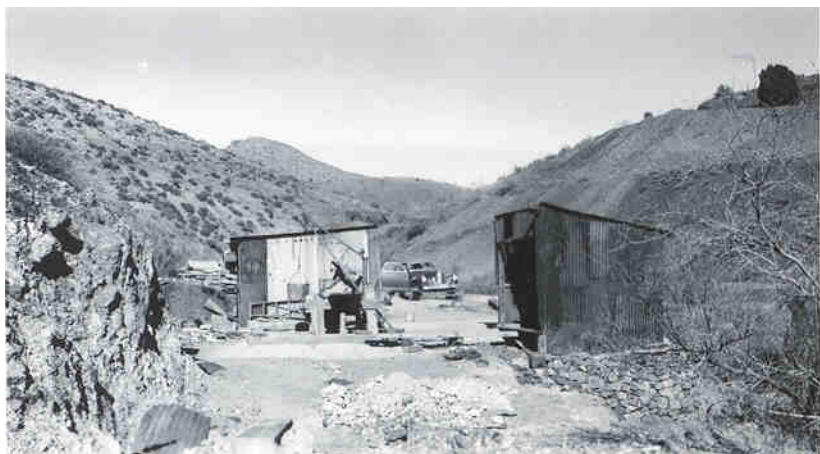
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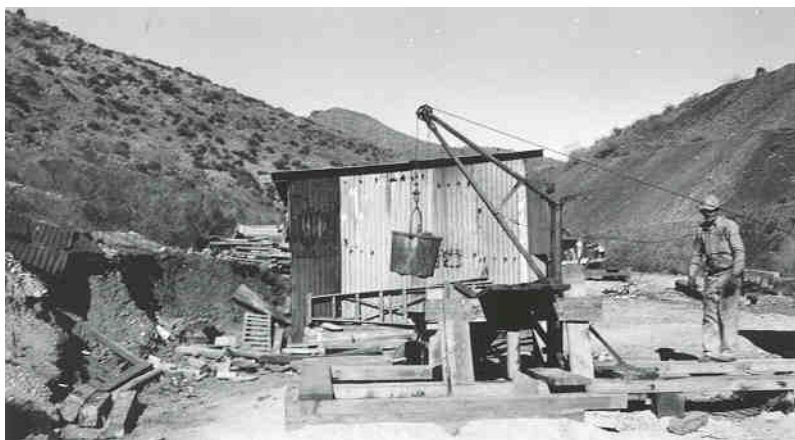
ADMMR AZURITE MINE FILE  
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P. 447, VOL. 20, #6, 1989



RISING SUN COPPER CO. DURING CLEMO - PERRY LEASE C-1950







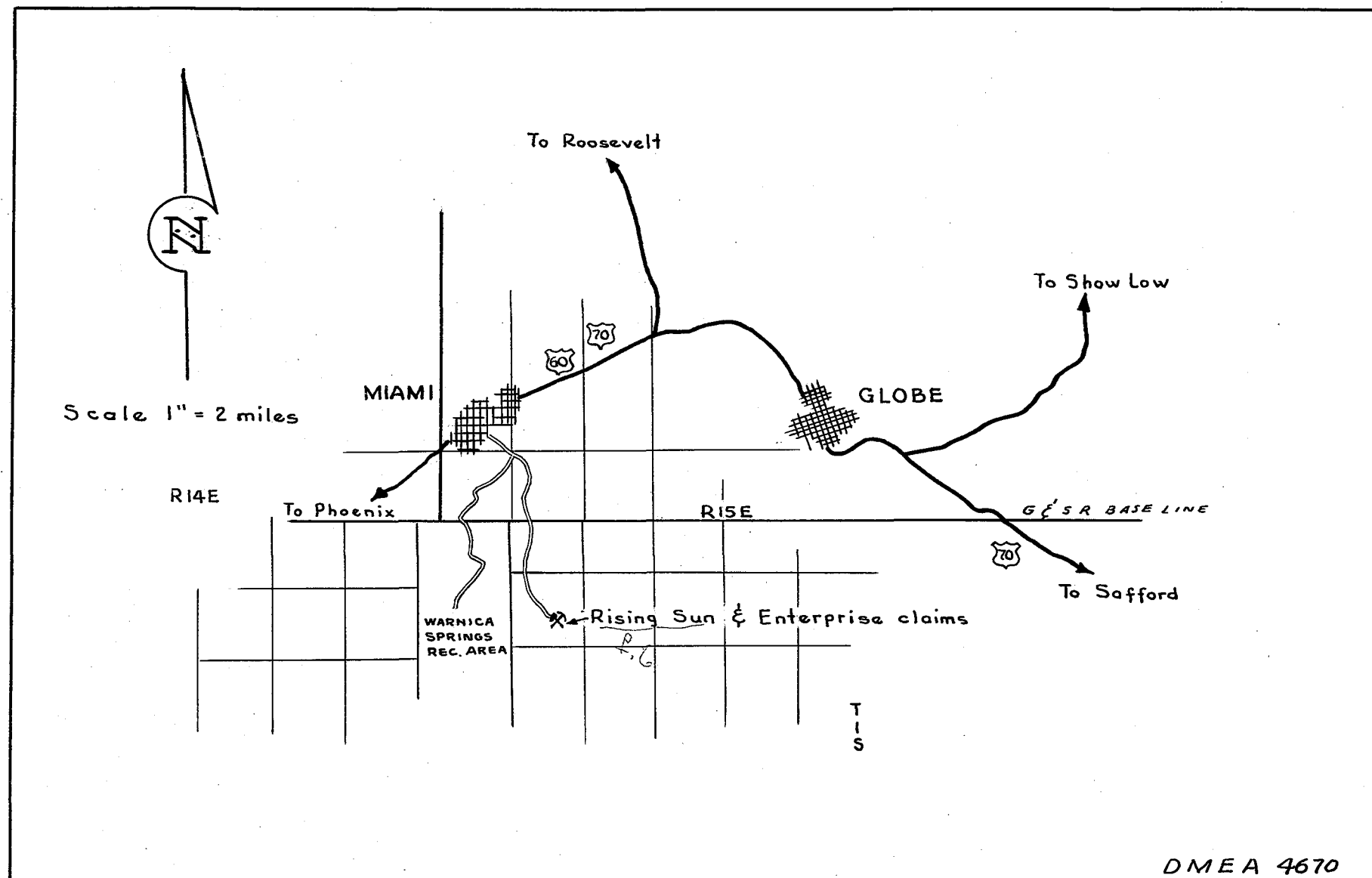


Fig-1-Location map, Long Island Enterprises, Ltd.  
Gila County, Arizona



350 V NW  
SPIRATION

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

110° 52' 30"  
33° 22' 30"

512000m E

R. 14 1/2 E

R. 15 E

514

515

50'

3692000m N

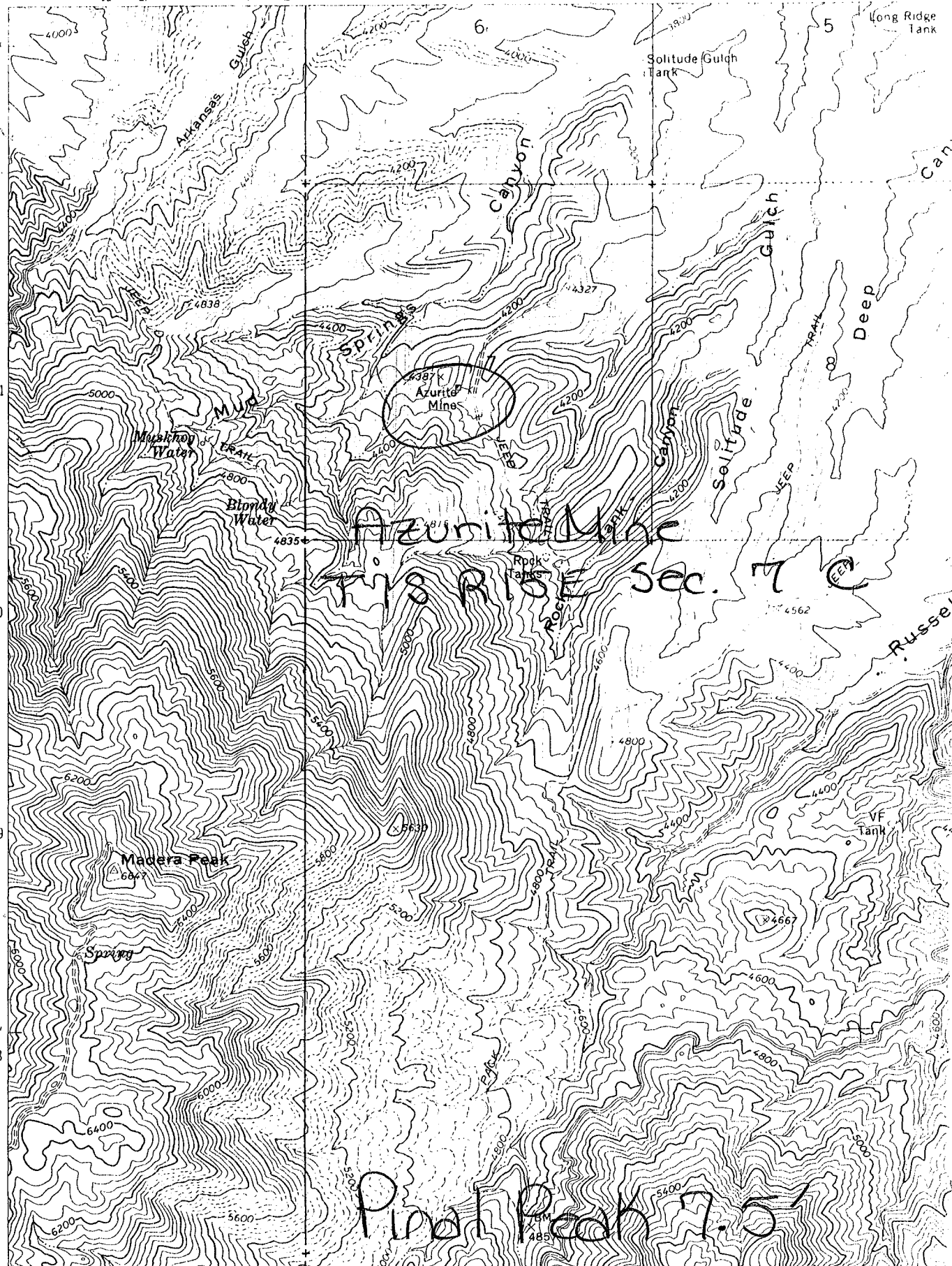
3691

3690

3689

3688

20'





ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

INFORMATION FROM MINE CARDS IN MUSEUM

ARIZONA *Card 1*

GILA COUNTY

BLUE BALL MINE #1

near Miami

MILS #99B

4-AKA's

Azurite mine (file)

MM-6473 AZURITE  
MM-6476 AZURITE  
MM-6474 AZURITE AND MALACHITE  
MM-6475 AZURITE  
MM-6477 AZURITE  
MM-6478 AZURITE and MALACHITE  
MM-6479 AZURITE AND MALACHITE  
MM-6480 AZURITE AND MALACHITE  
MM-6481 MALACHITE AND AZURITE  
MM-6482 AZURITE AND MALACHITE  
MM-6483 AZURITE  
MM-6484 AZURITE  
MM-6485 AZURITE AND MALACHITE  
MM-6486 AZURITE  
MM-6487 AZURITE  
MM-6488 AZURITE AND MALACHITE  
MM-6489 AZURITE AND MALACHITE  
MM-6490 AZURITE  
MM-6491 AZURITE AND MALACHITE  
MM-6492 MALACHITE AND AZURITE  
MM-6493 MALACHITE AND AZURITE

ARIZONA *Card 2*

GILA COUNTY

BLUE BALL MINE #2

near Miami

MM-6495 AZURITE AND MALACHITE  
MM-6496 MALACHITE AND AZURITE  
MM-6497 AZURITE AND MALACHITE  
MM-6498 AZURITE AND MALACHITE  
MM-6499 AZURITE AND MALACHITE  
MM-6500 AZURITE AND MALACHITE  
MM-6501 AZURITE  
MM-6502 AZURITE  
MM-6503 AZURITE  
MM-6504 AZURITE  
MM-6505 AZURITE  
MM-6506 AZURITE  
MM-6507 AZURITE  
MM-6508 AZURITE  
MM-6509 AZURITE AND MALACHITE  
MM-6510 AZURITE AND MALACHITE  
MM-6511 AZURITE AND MALACHITE  
MM-6512 AZURITE AND MALACHITE  
MM-6513 AZURITE AND MALACHITE  
MM-6514 AZURITE  
MM-6515 MALACHITE AND AZURITE  
MM-6516 AZURITE

*Azurite  
malachite*

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

INFORMATION FROM MINE CARDS IN MUSEUM

ARIZONA

*card 3*

GILA COUNTY

BLUE BALL MINE #3

near Miami

MM- 6517 MALACHITE AND AZURITE

MM-6518 AZURITE

MM-6583 Azurite nodule

MM7085 Azurite Concentrate

7924 Azurite Pendant

8003 Azurite, pendant

8004 Malachite, pendant

8005 Malachite, pendant

AZURITE MINE

GILA COUNTY

NJN WR 3/11/88: Graham Sutton (card) of Digmore Mining, reports that he plans to open up the Azurite Mine (file) Gila County from the present depth of 40' to a planned depth of 70' to produce azurite nodules from the clay seam. Chuck Withers actually owns the property, Graham Sutton will be doing the mining and selling the nodules to Jimmy Vacek (card) for export.

---

NJN WR 4/29/88: Jimmy Vacek (card) reported that contractor, Graham Sutton (card), has a D9 Caterpillar on the Azurite Mine (file) Gila County exposing the mineralized zone and producing azurite nodules. He promised additional specimens to the Museum.

---

NJN WR 4/29/88: Jimmy Vacek (card) reported that contractor, Grahma Sutton (card) has a D9 Caterpillar on the Azurite Mine (file) Gila County exposing the mineralized zone and producing azurite nodules. He promised additional specimens to the Museum.

---

AZURITE MINE

GILA COUNTY

KAP WR 7/24/79: Mr. Jim Vacek has leased the mine which produces specimen quality azurite nodules and azurite which is ground for pigment. The nodules are wholesaled to mineral specimen dealers and the pigment material is exported to Japan. The mine is operated by Glenn Wanden, Globe, phone 425-4948. George Site & Jack Tanner are also involved in the property according to Vacek. The nodules are said to occur in clayey gouge zone in granitic rock.

---

Jim Vacek, "49er" reported he has a crew cleaning out the Azurite Mine, also known as Blue Ball, Miami District, Gila County.

---

AWB WR 8/6/80: Jim and Joyce Vacek were in. He said the Blue Bell Mine is not working now but work should start again when it is cooler.

---

KAP WR 12/5/80: Bob Erwin reports that he, along with Jim Vacek, are looking for additional sources of pigment quality azurite.

---

KAP WR 12/24/82: Jim Vacek reported the Azurite Mine in Gila County is again producing azurite nodules.

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KAP WR 3/15/85: Samples of clay from the Azurite Mine (file) Gila County were packaged and shipped to the U.S. Bureau of Mines in Tuscaloosa, Alabama for analysis.

---

KAP WR 6/28/85: Mr. V. Ward dba Anglo-Arizona was in to review the results of a clay test done by the U.S. Bureau of Mines on a test sample from his Azurite Mine (Blue Bell Claims-file), Gila County. The results indicated the clay is potentially usable for structural items such as bricks. Mr. Ward explained he had sent a sample to Interlocking Roof Tile Company, 500-T King Avenue, Fremont, California, phone (415) 793-0344 and that they are interested in the clay as possible raw material in the manufacture of roof tiles.

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RISING SUN 1-45 GROUP

GILA COUNTY

Glenn Warden, Box 601, Miami, Arizona, 85539, plans to produce specimen azurite nodules from his claims in Sec. 7, T1S, R15E. He owns the Rising Sun 1-45 group and the Enterprise 1-8. He plans to recover the nodules by shallow stripping, hand picking of the nodules, and then backfilling. He has deposited \$200 cash with the Forest Service to guarantee he will backfill his cuts. WR KP 2/2/78 3/28/78 sef

if not known <sup>make</sup> city commodity card  
put info on it

INTERNATIONAL PIPE AND CERAMICS CORP.

CLAY PROSPECT

LOCATION: Near to the Enterprise and Rising Sun Claims, where Phelps Dodge drilled 3 holes last year. This is up the ridge from the "Little Acres" tailing dam that lies between Miami and Globe and West of Hwy 60-70. (approx Sec 7 T1S R15E) 3½ miles SE of Miami.

Interview with Woodrow Simmons, Chief Geologist, for Miami Copper Co 9/27/63.

Mr. Simmons said that Gerald Henderson of International Pipe and Ceramics Corp., 1081 S 2nd St. W., Salt Lake City Utah, had located a clay deposit that lies along a fault zone immediately below the Enterprise and Rising Sun Groups. Simmons said that International reportedly is the successor to Gladding-McBean of California. Henderson, so far, has taken a 50 ton sample to be tested. If the clay proves good it will be used for blending with other clays. Mr. Henderson was away from the area so could not be contacted.

MEMO LAS 9/27/63

KAP March 13, 1987: This property has been determined to be the same as the Azurite Mine (file), Gila County and has been added to that file.

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Arizona Department of Mines and Mineral Resources

VERBAL INFORMATION SUMMARY

May be Reproduced

1. Information from: Mr. V. Ward dba Anglo - Arizona Mining  
Address: P.O. Box 2887, Tucson, AZ 85707 Message Phone (602) 887-0960
2. Mine: Azurite 3. ADMMR Mine File Azurite Mine
4. County: Gila 5. District Pinal Mountain
6. Township 1S Range 15E Sec(s) 7
7. Location: \_\_\_\_\_
8. No. of Claims - Patented \_\_\_\_\_ Unpatented Many
9. Owner (if different from above) Occidental Minerals
10. Address: 777 S. Wadsworth Blvd., Lakewood, CO 80226
11. Operating Company: Anglo - Arizona Mining in partnership with Chantell Corp.
12. Pertinent People and/or Firm: V. Ward and George Sites et al
13. Commodities: Copper, Clay, Azurite gem nodules
14. Operational Status: Exploration - evaluation
15. Summary of information received, comments, etc.

Mr. Ward brought in a sample of a gritty redish-brown clay material for submission to the U.S. Bureau of Mines for testing. He explained the clay is from the deposit which had been producing the azurite nodules marketed by 49er Minerals. They have not been able to find anymore nodules. A shallow rotary drilling program consisting of 20+ holes 40-60 feet deep found a few pockets of nodules which were mined out.

Mr. Ward explained the clay deposit from which the sample was obtained is approximately 50 feet wide and has been surveyed to over 600 feet long. It is a gouge clay which strikes northerly and dips 60° to the east.

The claims which cover the old Azurite Mine are parts of Occidental Minerals Rising Sun group and Enterprize group. Six of those claims which cover the area of past azurite nodule production have been survey for patent as M.S. 4805.

The lease from Occidental Minerals was originally to Derral Glenn Warden and the Chantell Corp. Mr. Ward bought out to Mr. Warden's interest and crubstaked the drilling. He (Ward) provided copies of the topo map showing drilling locations and a consulting geologist's report for the Department's files.

Date:

December 13, 1984

Ken A. Phillips  
(Signature)

ADMMR

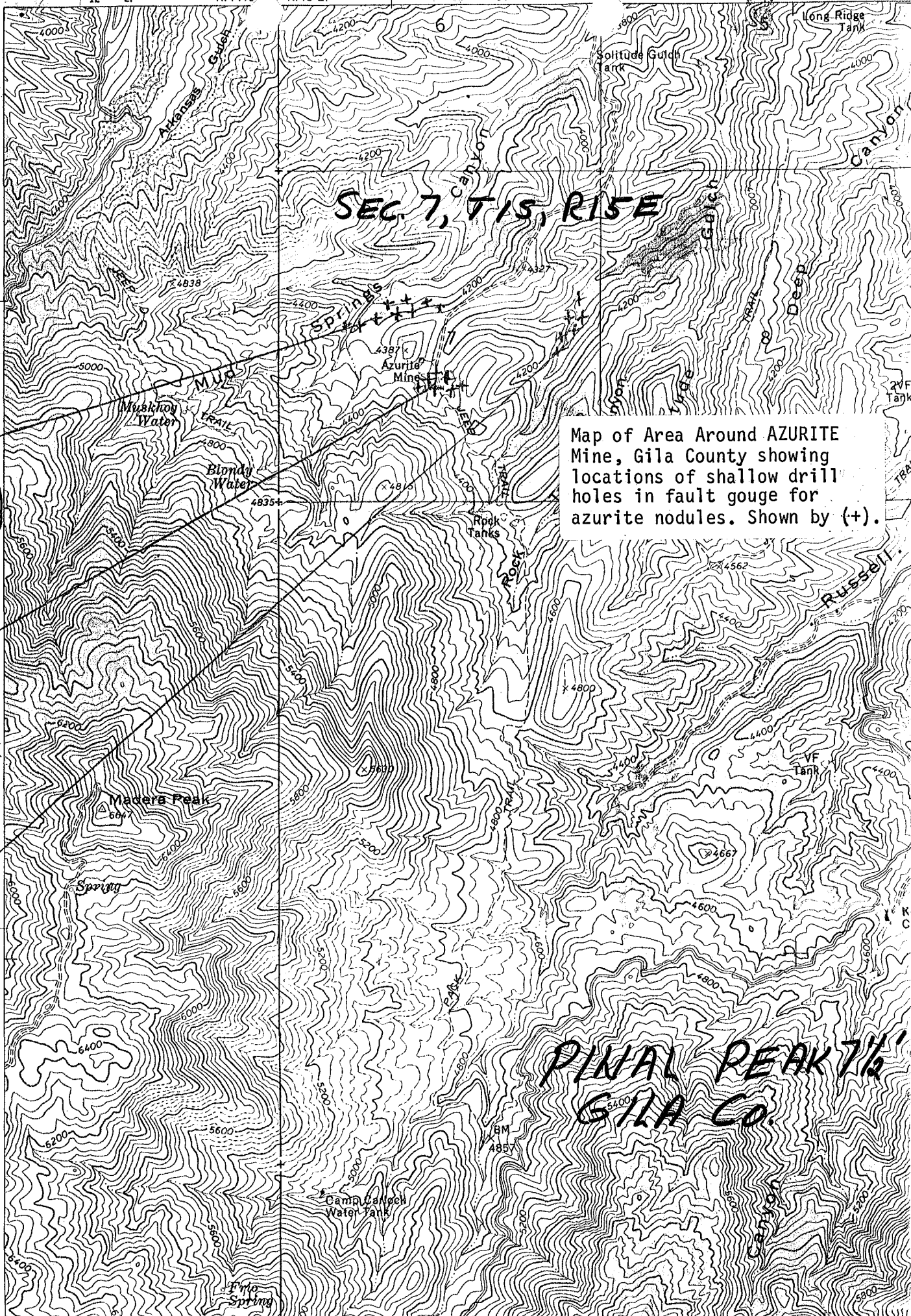


WGS  
NC  
NC  
1' NC  
321' Best  
-56' c  
11-41' c  
15-46' c  
47-48' c  
Flow 40'  
91' VG  
roll deposit  
good  
2 Dep.  
good  
layer  
4' dm

SEC. 7, T. 15, R. 15 E

Map of Area Around AZURITE Mine, Gila County showing locations of shallow drill holes in fault gouge for azurite nodules. Shown by (+).

PINAL PEAK 7 1/2'  
GILA CO.





United States Department of the Interior

BUREAU OF MINES

TUSCALOOSA RESEARCH CENTER

P.O. BOX L

UNIVERSITY, ALABAMA 35486

June 13, 1985

205-758-0491

Mr. Ken A. Phillips, Chief Engineer  
Arizona Department of Mines and  
Mineral Resources  
Mineral Building, Fairgrounds  
Phoenix, AZ 85007

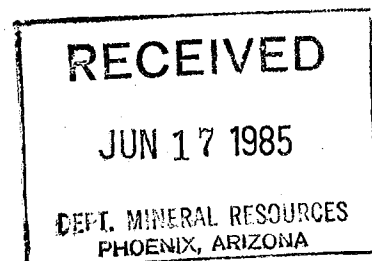
Dear Mr. Phillips:

Enclosed you will find the data sheet on the sample of clay from Azurite Mine, Gila County, submitted with your letter of March 11, 1985. The fired briquettes are being sent by separate package. If you have any questions concerning this evaluation, please call.

Sincerely yours,

Kenneth J. Liles  
Research Chemist

Enclosures



Tuscaloosa Research Center  
Preliminary Ceramic Evaluation

Tuscaloosa Number AZ-8-1

Date received 03-08-85

Date reported 06-12-85

Sender's Name Arizona Department of Mines and Mineral Resources

Sender's Identification Azurite Mine, Gila Co.

Type Material Clay

Raw Properties:

Water of Plasticity, Percent 16.1 Working Properties Plastic

Color Red Drying shrinkage, percent 7.5 Dry Strength Good

Slow firing test:

Temp. ° C	Munsell Color	Moh's Hardness	Percent Linear Shk	Percent Abs.	Percent Appr. Por.	Bulk density gm/cc
1,000	2.5 YR 7/4	4	7.5	9.1	19.0	2.09
1,050	2.5 YR 6/6	4	10.0	6.1	13.3	2.19
1,100	2.5 YR 5/6	4	10.0	3.4	7.7	2.26
1,150	2.5 YR 4/6	5	10.0	3.1	7.0	2.26
1,200	-	-	Melted	-	-	-
1,250	-	-	-	-	-	-

pH 7.9 HCL Effervescence None Other tests --

Preliminary Bloating Test: Negative

Temp. ° C	Percent absorption	Bulk Density gm/cc (lb/ft <sup>3</sup> )	Remarks

Potential Use Structural clay products (e.g., building brick at 1,000°-1,150° C).

Good firing range.

*Modeling Clay*

The data presented in this report are based on laboratory tests that are preliminary in nature and will not suffice for plant or process design. It does not preclude the use of the material in mixes.



STATE OF ARIZONA

DEPARTMENT OF MINES AND MINERAL RESOURCES

Mineral Building, Fairgrounds, Phoenix, Arizona 85007 • (602) 255-3791

June 20, 1985

Mr. V. Ward  
Anglo-Arizona Mining  
P.O. Box 2887  
Tucson, AZ 85707

Dear Mr. Ward:

We have received the results for the clay sample from your Azurite Mine from the U.S. Bureau of Mines. A copy of their report is enclosed.

Although a potential use listed is for structural clay products, no tests of sample bricks or blocks were made as it is beyond the scope of the testing done by the Bureau of Mines.

Please feel free to contact us anytime we might be of further assistance.

Sincerely,

Ken A. Phillips  
Chief Engineer

KAP:sk

Enclosure

REPORT ON  
AZURITE MINE COPPER PROSPECT  
MIAMI GLOVE, ARIZONA, U.S.A.

MARCH, 1975

BY F.R. GATCHALIAN,  
VANCOUVER, BRITISH COLUMBIA, CANADA.

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FIGURE 5 IDEALIZED PLAN OF COPPER ZONE DIP SLIP OFFSET	AFTER FIGURE 4A
FIGURE 6 IDEALIZED PLAN OF COPPER ZONE STRIKE SLIP OFFSET	AFTER FIGURE 5

## APPENDIX

I	LOGS AND ASSAYS OF DDH 1-10, MCCH 1-3, PDH 1-3.
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## INTRODUCTION

During the period 1st to 14th March, 1975, a semi-detailed program of geological mapping over a small part of a large block of claims of Utah-Occidental Mineral Option in the so-called Azurite Mine was completed. The purpose of the mapping was to evaluate the economic potential of the known copper deposit there. Heavy emphasis was placed on mapping the geologic structures to determine if drilling expenditures were warranted. During this period, a number of geological traverses were also completed, on a regional scale, over the areas south, west and northwest of the Azurite Mine. The purpose of this survey was to determine the mineral potential of these areas.

## LOCATION AND ACCESS

The Azurite Mine is located about three (3) miles south of Miami, Arizona in the foothills of the Pinal Mountains. It can be reached by about four (4) miles of dirt road from Miami. The elevation of the Azurite Mine area is between four thousand (4,00) and four thousand two hundred (4,200) feet above sea-level.

## PREVIOUS WORK DONE

It is not exactly known when and how much geological and geophysical work has been done on the Azurite Mine. As far as it can be determined, Inspiration Consolidated Copper Company did surface mapping, geophysical survey (IP) and drilled sixteen (16) shallow diamond holes totalling three thousand six hundred and twenty-four (3,624) feet in 1968. Miami Copper drilled three (3) holes (MC #1 to 3) totalling three thousand three hundred and forty-six (3,346) feet and Phelps Dodge also drilled five thousand three hundred and sixty-nine (5,369) feet in three (3) holes (PD #1 to 3). Ancient workings, (e.g. two (2) caved shafts and trenches) are evident in the Azurite Mine Area.



## REGIONAL GEOLOGY

Figure 1 depicts the regional geology of the Azurite Mine Copper prospect. With the exception of additional mappable contacts, attitudes of faults, fractures, schistosity and minor occurrences of copper and leimonites, the excellent mapping done by D.W. Peterson of the United States Geological Survey was considered valid.

The oldest rock in the region is the Pinal schist (PS) of lower Pre-Cambrian age. The Schistose rocks in the mapped area consist of a variety of rocks from fine-grained quartz-sericite to quartz-muscovite-chlorite-schist. Biotite flakes have been observed in both varieties, but only in sparse amounts. Locally, the schistose rocks are brecciated, as in the Azurite Mine area, and are believed to be a milled portion of the rock. The brecciation of the rock is believed due to intense fracturing and faulting. Foliations of the schistose rocks range from highly foliated to only slightly or non-foliated coarse granular massive rock. The foliation is characterized by thin layers of quartz grains, sericite, muscovite and chlorite. Elsewhere, when observed, the foliations trend in all directions. Irregularities in their attitudes, apparently, are complicated by either intense faulting or granitic intrusions.

The second oldest rock in the mapped area is the Solitude granite (S) dated Cretaceous or Tertiary age (?). This intrusive body occupies a large part of the central mapped area and is largely muscovite bearing granite. Locally, it contains books of biotite. In general, the rock is light colored with white to yellowish tinge shades. Commonly, it is coarse grained to equigranular, but locally contains porphyritic (Quartz eyes) variety. Examples of this are the exposures located in the southern part of the Azurite Mine where quartz phenocrysts are set on quartz, feldspar, sericite matrix. The Solitude cuts the Pinal schist (PS) very sharply. Near their contacts, inclu-



sions of schist fragments are present within the granite. These inclusions are prominent in the northwestern end margin and possibly also in the southern margin where the contacts against the Pinal schist are irregular.

On the northwestern tip of the Solitude granite (S) two small diabase (D) intrusive bodies were observed. There, the diabase cut the Pinal Schist (PS) and also appears to intrude the exposed granitic rock which is similar to the Solitude granite (S). The small diabase body shown within the Schultze granite (SG) was reported cut by the Schultze granite, however, their relationship was not directly observed. Lithologically, the diabase bodies are very similar in composition. They are dark colored rock, dark grey or dark green depending on the abundance of hornblende and augite. Quartz and epidote veins and inclusions believed part of the superjacent Pinal Schists (PS) are present in the two (2) observed diabase bodies.

The Schultze granite (SG) in the mapped area is similar in composition to the Solitude granite (S) and distinguishable from the Solitude granite (S) because of being prominently darker in color (grayish-yellow). A typical hand specimen shows that the Schultze granite is medium to coarse grained and equigranular. White feldspar, quartz, muscovite and flakes of black biotite are readily identifiable in them with the naked eye. In the mapped area, the schultze granite (SG) intrudes all of the older rocks mentioned above, possibly including the diabase. Because only a small portion of the northwestern corner of the Schultze granite has been observed, the exposures farther west of the mapped area are not known.

The northeastern half of figure 1 is completely covered by the so-called Gila conglomerate (GC). Gila deposits are considered Tertiary and/or Quaternary in age. Gila conglomerate is fairly widespread in the district and it extends farther east beyond the mapped area. This deposit has been considered Post-Mineral

cover rock and in this particular area is over two thousand (2,000) feet thick, but may exceed four thousand (4,000) feet thick farther to the east. The conglomerate here consists of unsorted and unconsolidated rubble of angular boulder size blocks to well stratified deposits of firmly cemented sand, silt gravel containing rounded pebbles and cobbles. Compositionally, Gila conglomerate varied from one place to another. Although not much attention was paid to the detailed mapping of the Gila, it was observed that in the area east of Azurite Mine prospect, fragments of gneissic diorite (Madera?), Shcultze and Solitude granites are more common than those of the Pinal Schist (PS) fragments. To the northwest of Azurite Mine, four thousand (4,000) feet east of the northwestern tip of the Solitude granite, the conglomerate is largely composed of Pinal Schist with lesser amounts of gneissic diorites and granitic fragments. In places, the schistose rock fragments in the conglomerate are oxidized ( $J^+ G^- H^+$ ) and locally mineralized with small amounts of copper oxide.

#### REGIONAL STRUCTURE

Faults are the major structural feature observed in the mapped area. One is the so-called Williamson fault which cuts and separates the contact between the Solitude granite (S) and the Pinal Schist (PS). This fault is believed a low angle normal fault ( $25^\circ$  to  $40^\circ$ ) and it runs irregularly to the northwest to southeast. To the northwest corner of the mapped-area, the Williamson fault branches to the north-northeast trend and was called the Miami fault. The Miami fault also is a normal fault dipping at moderate angle to the southeast and continues farther to the northeast beyond the mapped-area. The Williamson and the Miami faults are believed both post-mineral faults in the district and is known to be transecting and offsetting large mineralized bodies of the district. Their movements and amounts of displacement are, therefore, significantly critical in locating position of dislocated mineralized body.

X

The foliation of the schistose rocks of the Pinal Schist, as shown in Figure 1, does not mean much. As mentioned earlier, much if not all of the original foliations were destroyed by faultings and granitic intrusions, their attitudes are at present not considered significant.

Fractures (joints and minor shears) within the granitic rocks trend predominantly north-northwest and appear related to the structural trend of the Williamson fault. These fractures are weak, tight and barren, although in places they are leuconitic.

Quartz veins, as those observed in the schistose rock northwest of the mapped-area, are conformable with the foliation. Some of the veins are discontinuous and form large pods within the folia. Their common strikes are northeast and dip thirty-five (35) to forty (40) degrees northwest. Quartz veins in the granitic rock are not common, but one 2.5 feet thick, smoky quartz veins in the Solitude granite were observed. The veins strike north thirty (30) degrees west and dip vertically. The vein which appears injected on open fractures is mineralized with chalcopyrite, minor pyrite and stained with copper oxides.

#### LOCAL GEOLOGY

Figure 2 depicts the geology of the Azurite Mine Copper Prospect.

#### GENERAL

Hosting the copper mineralization in the Azurite Mine is the Pinal Schist. Pinal schist, based on mapping, is a small (1,000 by 200 foot), severely shattered wedge, with a long axis trending to the northwest. It is flanked on both sides by granite-schists fault contact to the southwest and Williamson (?) fault to the northeast. These faults, particularly the latter, were interpreted as low dipping normal faults, offsetting and dislocating the mineralized Pinal schist. The mineralized schist

# MAPPING + INTERPRETATION

LINE 5 CHAN TAO 46

figure 2

Tonnage 1,748,000 Tons ~ 0.26% Cu.


~~Waverly~~

••• Gila Congl. (Pool Mineral Concr.)

~~12~~ Granite / Granite Porph. (Qtz, plagioclase)

✓ ✓ ✓ A<sup>10</sup> Solid/or Breasted equivalents.

faults & day gauge, projected day strike

⑤  diamond Drill holes

Zone of Copper mineralization mainly  
sulfide & b.f. below surface;  
∴ Cu-Fe ox (surface oxidation);

Average grade of copper zone 0.26% Cu.

showing #1  
35' zone of Azurite  
malachite in propylitic  
fig - see sketch

⑦ 1st brown Caprine  
238-244.

longer red brown. C. apter  
Males? 126-189.

showing it 2

Agurite also w/  
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10 red. brown  
oxidized  
0 274-286

H. dy dive gran  
goug... fault 19  
intrus. no (?).

F.R.D. ON  
AZURITE MINES

AN

$$1'' = 200'$$

PAGE 5 COUPAGE

Derivately schistose rock chips:  
 hi FeO, 1<sup>st</sup> Guss  
 Congl.

0-248' C  
 248-376 gauge 45 ps. 4.08  
 376-436 crushed gr.

0.250' Comp.  
146.30', range 200.  
200.250' broken fr.

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138-140 Crush gr. rough.  
140-239 Crush. etc  
239-296 Crush. gr.

6. 238 Cong!  
228-249 Ad. D. G.  
249-274 Frank  
274-294 C. K. G.

Conj., etc. in, c

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Zond... H-  
O<sup>+</sup>, J<sub>2</sub>, blk c  
no whid., ..  
P.k. frag. lev  
J<sup>+</sup>, C<sup>-</sup>, H<sup>+</sup>,  
frag. orhol.

0.59 Congl.  
49-108 crush. feld. Dio.  
108-163 gr.

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 20-20 20 - pages of box work struct  
 10-20 20 - pages of box work struct  
 150-204 5.

1. In the school

shaded lower.  
gr. w/ 5-10%  
mosses, etc.

Sub. h. - ch. gouge, 100, or, How  
lady brown gr.

0.74' ± .28% Cu, .008 H<sub>2</sub>O ✓

0.28% Cu, .005 Mol ✓  
 0.15% Cu, .002 Mol ✓  
 0.20% Cu, .003 Mol ✓

126. 0.27% Cu, 0.064% Pb.

107 = 0.007% Cu, .0004 MoS<sub>2</sub>  
 108 = 0.18% Cu, .03 MoS<sub>2</sub>

777: 0.20% Cu, .003 Al<sub>2</sub>O<sub>3</sub>

$\mu = 0.60$ ,  $0.06$  Hz; cap. 0.28'

F 30314 1002 HOS ✓

$\eta = 1.06\% \text{ cm}^2, \text{ to Mol}$

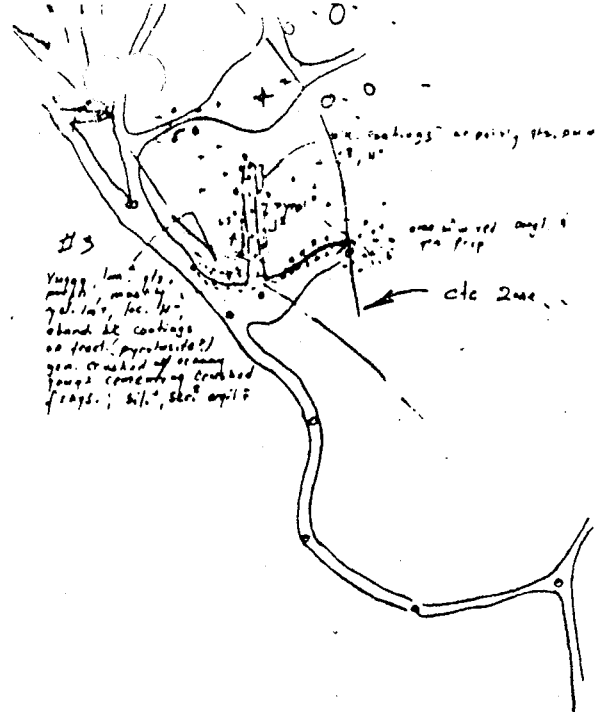

1944

W 10 276. 246: 122/0. 002 M,

286. 376 - 105' 100 ft  
376 - 105' 100 ft 100 ft

• 4.55 = Hk. copper. 500 n. 240% (a)





(2,300) feet was intersected by drilling (PD#3). Furthermore, as indicated by drilling (DDH #8 to MC#1-3 and PDH#1-3), it shows a rapid thickness increase from Williamson Fault to east of about 2.5 feet per horizontal foot. The deposit, as mentioned earlier, consists of unsorted and poorly consolidated rubble, cobbles and boulder size gneissic diorites, granites, and schistose rock fragments. None of the fragments of the conglomerate in the Azurite Mines was found mineralized.

#### MINERALIZATION

The exposed mineralization in the Azurite Mine consists of azurite associated with balls of gypsum and malachite. Hosting the mineralization is the shattered, brecciated, and moderately oxidized quartz-sericite-muscovite-chlorite schist. As mapped and drilled, the zone of mineralization is about six hundred (600) by two hundred (200) feet and appears parallel to and localized at the northwest trending Solitude granite fault-contact zone.

Despite the scattered azurite-malachite mineralization on surface, it was reported that virtually none was found during the drilling. Virtually all mineralization encountered while drilling was in the form of sulfide (e.g. pyrite, chalcopyrite, chalcocite and molybdenite).

There is no significant copper mineralization found in the granitic rock, however.

#### RESERVES

As mapped and drill tested by previous workers (ICC, MCCO and Phelps Dodge), the Azurite Mine indicates a tonnage potential of about 1.7 million tons containing 0.26 per cent copper. This tonnage estimate was based on ten (10) drill holes drilled by Inspiration Consolidated Copper Co. (ICC) and the tonnage calculations were based on the six (6) cross-sections shown in Figure 3.

In the cross-sections, it indicates that the mineralized schistose rock occurs as a small wedge on the footwall of the Williamson fault. Although in plan the mineralization lies between two (2) faults, the Williamson fault and the shallower dip Solitude granite fault-contact, it appears interconnected at depth. In addition, there is very little doubt that the Williamson fault did not cut or offset the mineralized schistose rocks and should offsetting have occurred during faulting, an additional copper reserve somewhere on the hanging wall of the Williamson fault is expected.

#### ECONOMICS AND EXPLORATION TARGETS

Previous workers (e.g. Miami Copper and Phelps Dodge) have drilled (MC#1-3 and PD#1-3) part of the area of the hangingwall of the Williamson fault without success. Because of the fact that the precise movements and direction of the Williamson fault offset is not known, the exploration of the dislocated Azurite Mine (if there is any) will remain critical. Another apparent problem which is most critical is the grade of the deposit. The in place copper reserves of 1.7 million tons grading 0.26 per cent copper is, at present, not workable. This alone indicates that further exploration of the Azurite Mine is not warranted. However, assuming that the grade of the dislocated deposit is workable grade, as well as size (porphyry dimension) two (2) wild hypotheses are given below to the location of the dislocated part of the deposit.

First, as shown in Figure 4 and 4A, an idealized Pre-mineral fault copper reserve (say 100 M.T.) is drawn on the Azurite Mine area. For convenience, the position of the deposit roughly parallels the elongation of the known reserves, northwest trend. Then, faulting occurred, which, I assume to be a dip slip movement to the northeast with horizontal displacement along fault gap between seven thousand (7,000) and eight thousand (8,000) feet (as dictated by drill hole PD#2). Second, as illustrated in Figure 6, fault offsets along strike slip components with horizontal movements either to the southeast and northwest. These projections, how-

# EXPLANATION

● Conglomerate (Aite Conglomerate) pebbles, boulders of schist, granitic rocks, dioritic rocks and qtz.; gneiss fragments, small amounts.

## GRANITIC INTERMEDIATE ROCKS

includes med. gr. muscovite, lt. colored granite (Solitude Granite), med. to coarse gr. slightly altered (qtz. sericite) granite, "qtz. gneiss" porphyry (south of the mapped area, DDH 2 & 3).

▲ Quartz-sericite schist (Pinel Schist): generally fragmented (Bttd.) texture w/ milled qtz. fragments in sil. sericitic matrix. Entire surface exposed exhibits J. G. H. locally malachite and azurite associated w/ white gyps. occurs as balls and nodules w/ hl. rhy. gangue.

Fault w/ associated hi. clay gouge, dashed line when inferred.

● Surface feature oxidation, includes malachite, azurite and FeOx (J, G, H) - mainly in Bttd. sc.

● Zone of predominantly Copper Sulfide (Cry, C) intersected by DDH; may include small amounts of CuOx.

0.14 % Cu intercept by DDH.

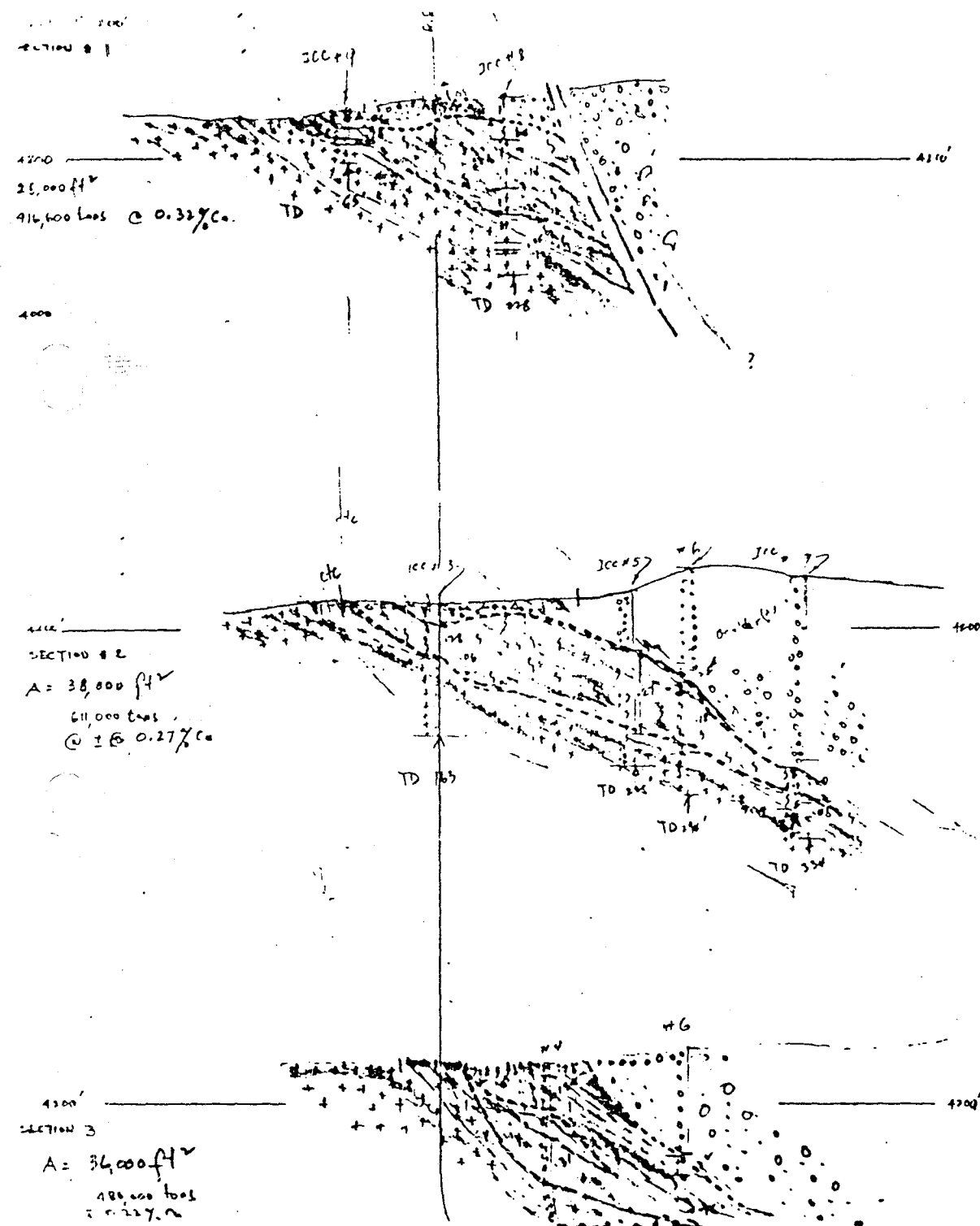
TD 218 Total depth of DDH.

"AZURITE MINES"

DRAWN BY F.R.G.

Figure 3

*Handwritten signature*



SECTION 1  
SCALE 1"=200'

A=13,200 ft<sup>2</sup>

235,000 lbs

@ 0.21% Cu.

4200'

R.P.

10

4200'

5-1/2" (1)

397

SECTION 2  
SCALE 1"=200'

4200'

4200'

163

4200'

4200'

SECTION 3  
SCALE 1"=200'

174

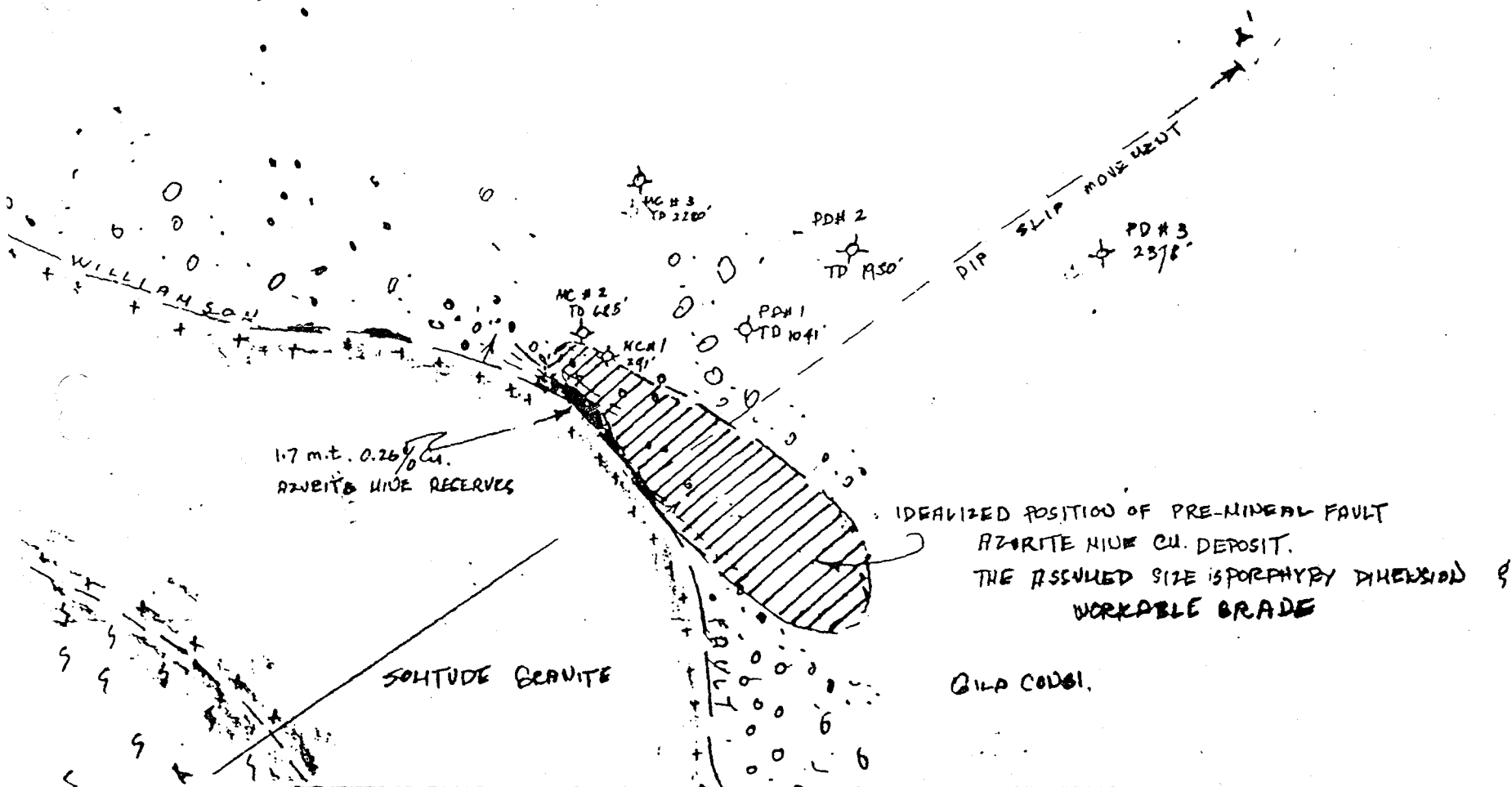
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FIGURE 4

HYPOTHETICAL PRE-MINERAL FAULT  
AZURITE MINE CU DEPOSIT

SCALE 1" = 20'

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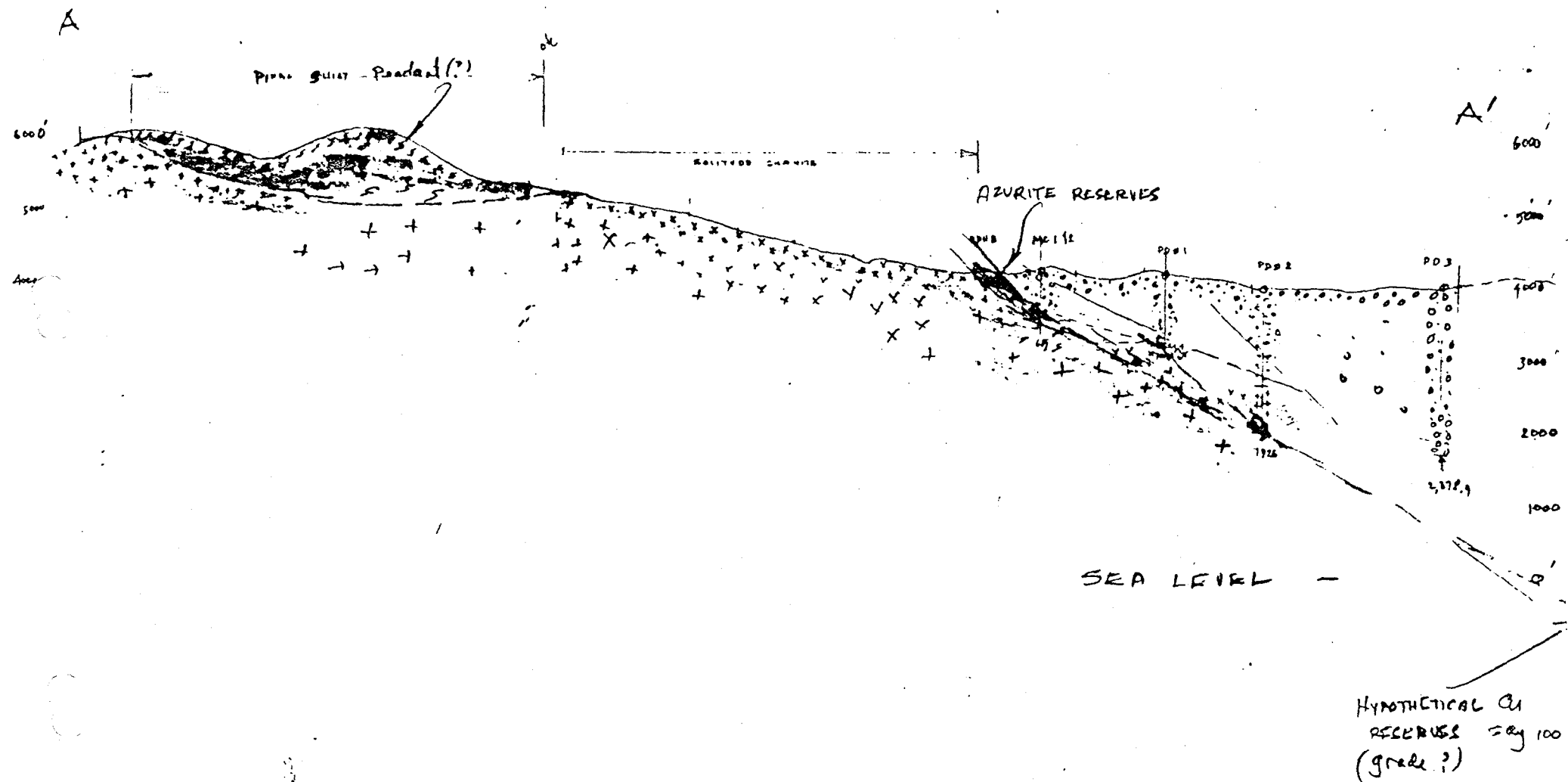




Figure 5

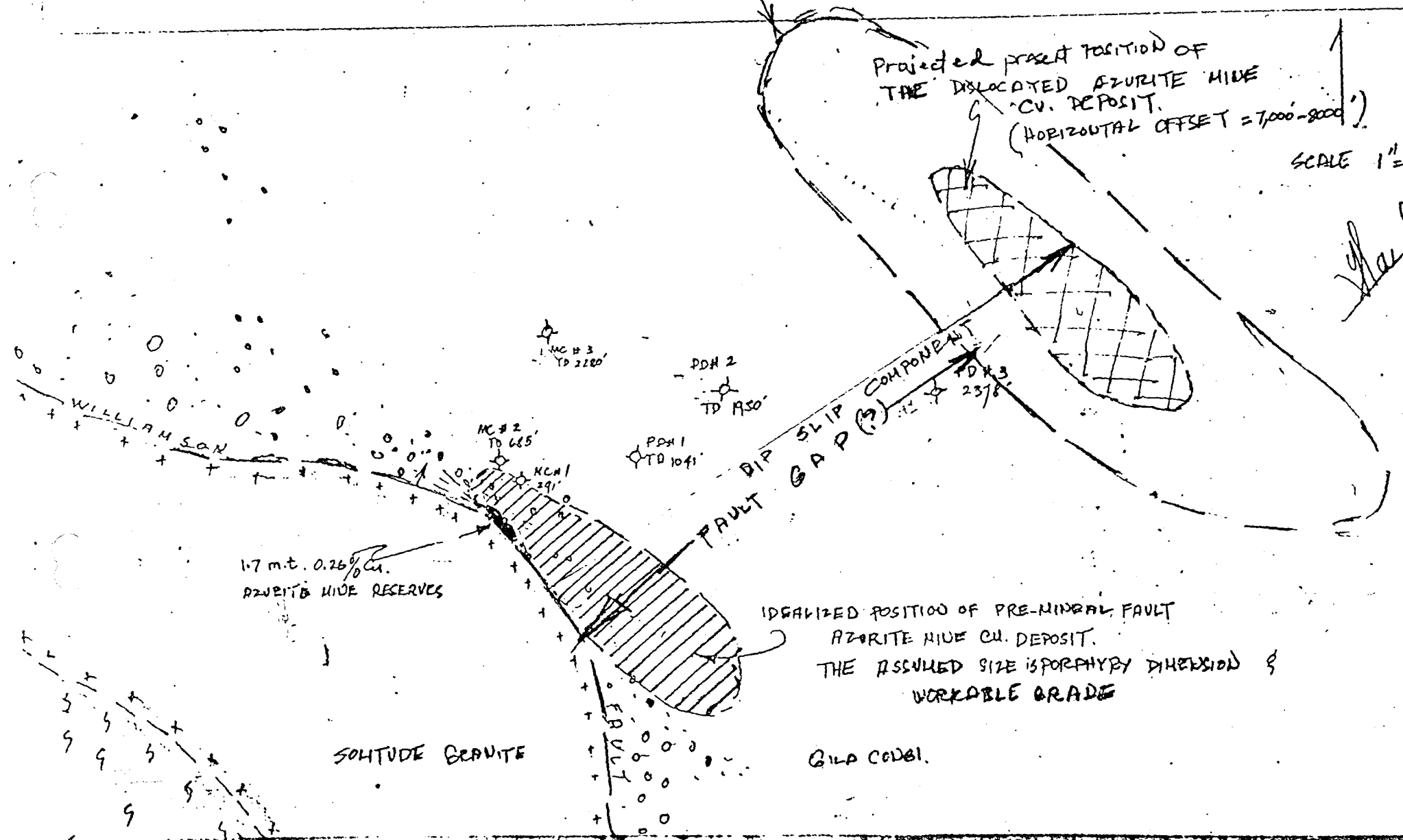
# IDEALIZED FAULT OFFSET DIP SLIP OFFSET

CONFIDENCE LIMIT OF DISLOCATED  
AZ. MINE CU. RESERVES

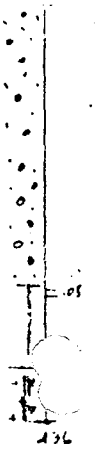
Projected present position of  
the dislocated AZURITE MINE  
CU. DEPOSIT.  
(HORIZONTAL OFFSET = 7,000-8,000')

SCALE 1" =

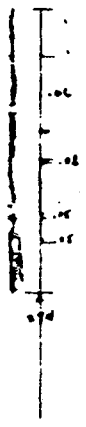
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CDH # 1  
4370'



CDH # 2  
4370'



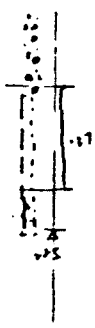
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4355'



#4  
4355'



#5  
4355'



#6  
4380'



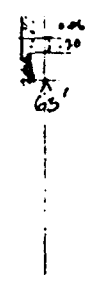
#7  
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#8  
4380'



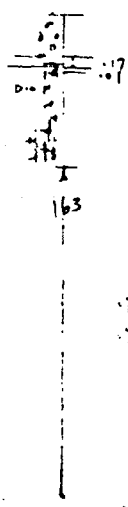
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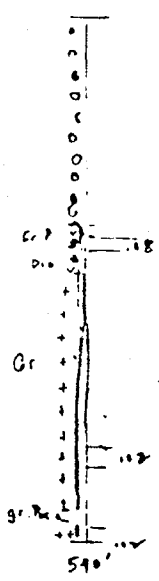
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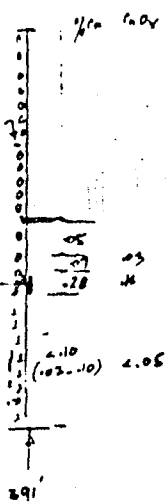
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ASSAY & GEOLOGIC LOGS  
INSPIRATION DPH'S  
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*[Signature]*

186 42

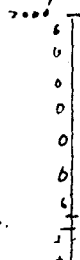


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MC 83



4/5

<sup>2270</sup>  
(2280) reported bit solid @ 2280 T.D., uncertain

4161'

DDH 2

d.

conglomerate abundant. (Sequences of 20-70% grit-grains

Iron stained in frogwells appears due to uricis or uricatile.

$$TSG + \bar{I}$$

T.O. 1041

$$\text{mod. } \overline{c} \cdot 0$$

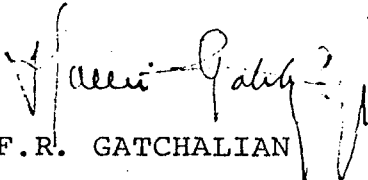
LD. 19x'

TD:  
278.9

ever do not have any direct evidence to substantiate the direction and amounts of fault movements.

#### CONCLUSION AND RECOMMENDATION

Present data on hand concerning further exploration of the Azurite Mine is not attractive. Although projections of the possible locations of the dislocated copper deposit (if there is any) has been made, the deposit is still considered blind. Again, should the grade of the dislocated deposit is similar to the present Azurite Mine reserves which are 0.26 per cent copper, further exploration would not be warranted. Because of these situations, no further work is recommended at the present time. However, in the future, should the 0.26 per cent copper material become workable, a serious thought of locating the dislocated portion of the Azurite Mine copper deposit is to be planned. Since the target is blind and deep (expected to be between 3,500 and 4,00 feet deep below post mineral cover) the exploration risk is therefore high. Induced Polarization surveying, if possible, on the existing deep drill holes (e.g. PD#1-3 and ME#1-3) particularly drill hole PD#3, will be the logical initial start. This would test the closest area of the projected zone of dislocated copper zone.

  
F.R. GATCHALIAN

VANCOUVER, BRITISH COLUMBIA

21ST APRIL, 1975.

FRG/mw  
Attachments.

# BLUEBERRIES! IN ARIZONA?

By James Vacek

The "49'er Wholesale Minerals

1909 North 72nd Place, No. 1, Scottsdale, Arizona 85257

ALL PHOTOGRAPHS BY RON KOEPEL, SCOTTSDALE, ARIZONA, UNLESS OTHERWISE NOTED

Can you imagine any one product from Arizona which has this many uses?

First: A high-grade copper ore. Second: A new jewelry sensation. Third: A new study material. Fourth: An intense pigment source. Fifth: A lapidary's delight. Sixth: A beautiful mineral specimen.

If your response to this question was a prompt "Arizona's turquoise, malachite, or chrysocolla" . . . you're incorrect. A more correct answer is *blueberry azurite nodules* from a long time source of various copper ores . . . Globe, Arizona.

These azurite nodules are fifty percent copper in composition, which makes them a high-grade copper ore. When popped in half they make excellent rings, pendants, and earrings. They are studied as an enigma to many who encounter them. Quantities (with no central crystal cavities) have been sold to manufacture intense blue pigment for discriminating artists, and lapidaries relish the high polish the nodules take.

Worldwide, azurite is an uncommon form of copper carbonate, but in Arizona, it has been found in Jerome, Bisbee, Morenci, Ajo, Miami, Tombstone, Bagdad, Gleeson, the Tucson area and elsewhere throughout the state. It assumes a number of forms but at the Blueball Mine it occurs as minute-to-golf-ball-sized nodules with central hollow cavities lined either with brilliant crystals of azurite, or velvet tufts of malachite, hence the name blueberry. *Nowhere else in the world does it occur exactly like this!* Another Arizona original!

The Blueball Mine is situated on the northern slopes of the manzanita-clad Pinal Mountains, south of Globe, Arizona. It was worked sporadically as a source of copper, but about one year ago, on a lazy Sunday afternoon, Glenn Warden, while riding on his trail bike, rekindled an old ember of interest in the nodules initiating the marketing of this multipurpose substance known as blueberry azurite nodules.

Many area residents were aware of the presence of the Blueball Mine, but few had the foresight and energy to enlist the aid of a team of mining engineers and merchandising wizards to market the mine's product potential. At the suggestion of Chuck Withers (life long Globe resident and all-around good guy), Glenn sought out the assistance of Chantell Incorporated. Chantell is a

drilling and mining firm comprised of an old-time Bisbee miner, Jack Tanner, and a young engineer, Bill Sites. As Glenn was approaching their doorstep, the partners were reviewing their financial status. Bill, the business-oriented member of the team, was expounding upon the need to allocate additional funds to purchase equipment for a drilling job when Glenn's knock interrupted their discussion. Glenn, with a handful of nodules jiggling in his half-clenched fist and a hopeful sparkle in his eye, asked: "Can you guys dig these out for me?"

A host of practical and financial questions blurted from Bill, the younger partner, while the old-timer, Jack, just sat back in his rocking chair and stared at the glistening nodules.

"After we mine them for you, who'll buy 'em?" asked Bill.

"Well," Glenn said, "I know a rock dealer in Scottsdale, The '49er; he can sell anything germane to minerals."

Just then, the old-timer spoke with a deliberate nostalgia, "You know son, I got my first date with Isabelle because I gave her an azurite crystal from Bisbee some forty-odd years ago."

"How many you reckon are up there?"

"Tons, sir, they're lodged in the clay," Glenn retorted.

"Well, it'll take some doin'!" Jack said with a note of anxious anticipation. His response sounded as though he were standing in a huge echo-laden cavern . . . why is it all old miners' voices take on such resonance?

"Son, you sure you got a market for these?" Jack and Bill asked.

"Yes!" Glenn assured them. "I met a rock dealer in Scottsdale who said he'll buy as many nodules as his wife has freckles, and she has at least a million! He said he can sell jewelry grade ones, and he'll sell the mineral specimen ones to museums, and the pigment grade he'll sell for use in paints, etc. He'll buy 'em all."

Work began and, through fearful cold and oppressive heat, these blueberry azurite nodules are now a major seller in rock and gift shops throughout the state. Visitations to the Blueball Mine site are discouraged, but when in Globe there are tours conducted by other much larger mining firms, and nodules are available for those interested in shops throughout the state. Among the more

frequented shops where nodules can be obtained are:

In *Sedona*: Ramsey's Rock Shop.

In *Phoenix*: Mueller's; Carl's Rocks and Gems; Arizona Botanical Gardens; Sky Harbor Airport Gift Shops; Starlite Gems and Minerals.

In *Scottsdale*: Andrew Designer In Gold; Rocks and Gems of the Ages; Hodson's; The Good Earth; Gold Key Gallery.

In *Apache Junction*: Hinegardners'; Swenson's.

In *Payson*: J and J Rock Shop; and many other dealers in the Southwest. A special display of azurite nodules can be viewed at the Arizona State Mineral Museum, where the curator, Art Bloyd, is well versed in their history.

Although the nodules have only been on the market for about a year, they have found homes in many advanced mineral collectors' showcases, and have been used in unique jewelry. They are just another in a long list of Arizona mineral products with a bright future.

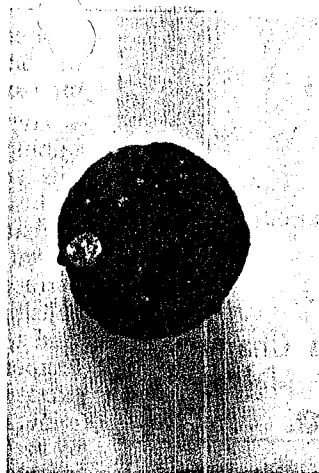
The nodules' past, however, is exciting and nebulous. The azurite nodules are a product of almost incredible forces of nature as you will see from the possible explanation of their origin which follows.

Merely from a casual observation, in a plane above Arizona's fabulous Grand Canyon, or winding through Superior's ancient limestone canyons tilted eighty degrees on end, it's quite evident that Arizona, geologically speaking, has been kicked around a mite. In early Tertiary times (approximately sixty-two million years ago) a period of earth movement and widespread tectonics occurred, called the Laramide revolution. Regions of North and South America were folded, which was instrumental in producing the Rocky, Andean and Antillean Mountain chains. Volcanic activity occurred from Canada to Mexico. The Appalachian Mountains were uplifted at this time and the cycle of erosion was initiated that helped produce the existing land forms. Subterranean molten rock and mineral gases intruded the lost gulch quartz monzonite and granodiorite (granite-like rock) of the Globe-Miami district. Each magmatic surge shattered these host rocks forming several unique clayey fault zones, wherein the beautiful azurite nodules occurred. The clayey environment in the fault was

(Continued on Page 1944)



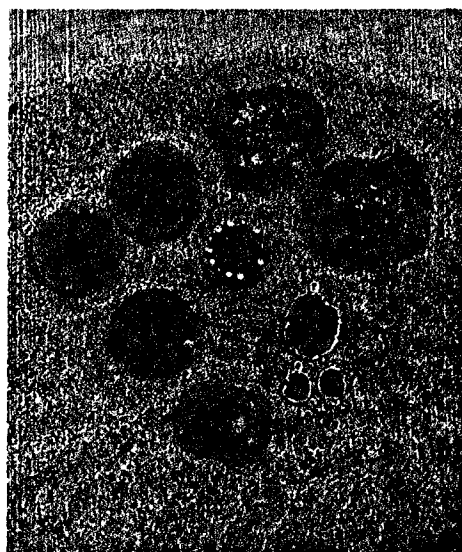
Popped azurite nodule revealing crystals.



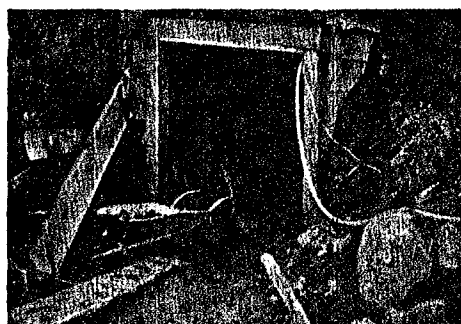
Le Monde nodule named because of its resemblance to the world from afar.



PHOTOGRAPH BY BOB JONES, SCOTTSDALE, ARIZONA  
Author's wife's ring with acicular malachite crystal nodule.



Blueberry azurite nodules, Blueball Mine, Gila Co., Arizona.



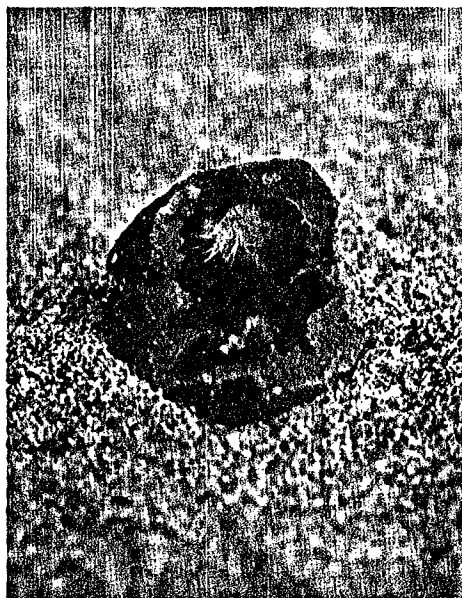
Entrance to current adit of Blueball Mine.



Crystalline copper in its native state, arborescent (fern-like).



Blueball Mine (note size of rounded talus boulders above mine entrance).



Acicular malachite in azurite geode, Blueball Mine, Gila Co., Arizona.



Bill Sites clearing mine area after rain.



Mining azurite nodule bearing clay.

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**82c ea.**

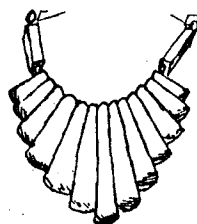


**Abalone Inlayed Charms**  
gold or silver plated  
**14c ea.**



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**82c each**



Mini-Collar 13 Pcs.  
Available in Tigereye,  
Carnelian, Sodalite,  
Crystal, Black Onyx,  
Abalone, Jasper,  
Goldstone, etc.

**\$3.00**  
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**BLACK COCO HISHI**  
straight or tapered  
As Low As

**31c**  
strand

**BLUE CORAL HISHI**  
straight or tapered  
As Low As

**65c**  
strand

**PHILIPPINE  
TURQ HISHI**  
straight or tapered  
As Low As

**75c**  
strand

**BLACK COCO**  
Combination Hishi  
As Low As

**40c**  
strand

**TIGEREYE 4 MM**  
Round Bead 16" str.  
As Low As

**\$6.75**  
strand

**MALACHITE 4 MM**  
Round Bead 16" str.  
As Low As

**\$15.00**  
strand

**BLACK JADE ROUND**  
Beads size 4 to 8mm  
As Low As

**\$1.35**  
strand

**GARNET ROUND**  
Bead Graduated  
As Low As

**\$3.60**  
strand

**A GRADE  
MALACHITE CHIPS**  
16" str.  
As Low As

**\$3.00**  
strand

**TIGEREYE CHIPS**  
16" str.  
As Low As

**\$2.50**  
strand

**M.O.P. RICE BEAD**  
Size 4x6  
As Low As

**\$1.50**  
strand

**M.O.P. CARVED TULIP**  
16" strand  
As Low As

**\$2.60**  
strand

**M.O.P. DYED  
FETISHES**  
A Grade  
As Low As  
**\$4.00**  
per 100

**TIGEREYE CABS**  
8 x 6  
As Low As  
**15c**  
each

**MALACHITE CABS**  
30x40 A grade  
As Low As  
**\$3.25**  
each

**M.O.P. MANY  
COLOR**  
13 pieces  
As Low As  
**\$1.00**  
each

**LIQUID SILVER TWIST**  
As Low As  
**\$1.15**  
per oz.

**SURGICAL STEEL  
EARWIRE**  
As Low As  
**25c**  
or Sterling Silver

**SILVER PLATED  
2 MM BEADS**  
As Low As  
**\$1.55**  
per 1000

**M.O.P. HEARTS**  
20 mm A grade  
As Low As  
**17c**  
each

**M.O.P. TUSK**  
With Cap, A grade  
As Low As  
**16c**  
each

**Gold Filled  
LINK CHAIN**  
16" or 18"  
**\$1.25**  
each  
Packed 36

**Silver Plated  
CURB CHAIN**  
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As Low As  
**8c** each  
Packed gross

**M.O.P. CARVED  
FINGER RINGS**  
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# Yousuf International

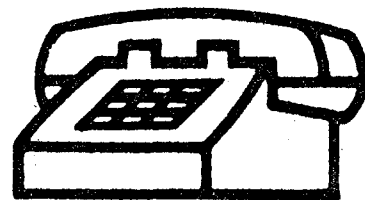
P.O. Box 306, 1602-B Stemmons Frwy., Carrollton, Texas 75006  
Phone: (214) 242-0428

created from the alternation of the orthoclase (feldspar) constituent of the monzonite.

Hypogene (ascending) fluids, containing copper-laden sulfides, invaded this completely different country rock and were exposed to oxygen, perhaps to that of the atmosphere or to that dissolved in percolating surface and near-surface water where they oxidized, thus causing copper sulfates and sulfuric acid to be formed. Lower pressure and temperatures near the surface allowed proper conditions of solution-forming minerals such as azurite and malachite to be formed, since carbonate ions were readily available. Torrential rains, causing leaching action, assured further oxidation of the suspended copper minerals and redeposited them into voids in the various sections of the clayey fault zone. As the supergene (descending) copper-oxide-laden waters filtered through and were enveloped by the plastic and expanding nature of the clay, rounded nodular masses resulted upon crystallization.

Although electrochemical valances were probably responsible for the unique shape of these nodules, a lifetime of study by the best minds in the geological scientific realm would not uncover all the secrets of their exact origin. The hollow nature and half azurite and malachite mixture of these nodules makes this fault zone truly a unique geological phenomenon. Arizona is a mineralogist's dream! ☺

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The Graves Company of 950 S.W. 12 Avenue, Pompano Beach, Florida 33060, is pleased to announce greater telephone coverage.

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The toll free WATS line number is (800) 327-9103. In Florida, dial (305) 782-8000. ☺



# BLUE BALL AZURITE

IT IS AN UNUSUAL AND BEAUTIFUL FORM OF AZURITE,  
FOR JEWELRY OR FOR SPECIMENS

by BOB JONES

One of the more interesting occurrences of azurite can be found in the Pinal Mountains, south of Miami, Arizona. This entire area is noted for its rich copper deposits . . . the old Dominion Mine, Sleeping Beauty Pit, Inspiration, and other Globe-Miami deposits known as rich producers for nearly a century. All the deposits mentioned, and those most often noted in the literature, are located north and west of the towns. The deposit described here, however, is south of Miami, six or seven miles into the foothills of the Pinals, the mountain range which dominates the region. The azurite occurs in small geode-like nodules in a clay zone. They have been collected for decades in a more or less small way, but recent events have brought about a very active production from this mine, and this has had a most interesting impact on the mineral and gem market. With some enterprising marketing by Jim Vacek, these azurites have been adapted to jewelry making, as well as continuing to be an interesting addition to the specimen market. In addition, the conversion of many formerly useless azurite masses into useful artist's paint pigment has made production at the mine more fruitful, leading to greater efforts to recover and save the finer spheres for the jewelry and specimen market.

I guess I've been aware of these small azurite nodules for at least 20 years. They've been mined by collectors who found the deposit, and traded off as "interesting" or "different" azurite specimens. But they lacked size, and were seldom considered significant by azurite collectors. The mine was also worked on an almost one-man basis for a number of years, but became too dangerous and was abandoned. So it has been only in recent years that these quite apparently unique nodules have gained the attention they deserve. Such an accomplishment is not the work of one person. Mine owners George Sites and Bill Tanner deserve much credit. After seeing the mine, it is easy to understand how much work they have invested in the

property. In the marketing of the nodules, two names come immediately to mind. Bud Stanley, one of Phoenix's finer craftsmen, adapted these delightful gems to the making of fine jewelry, and the response has been positive. Jim Vacek, known as "The 49'er" in marketing circles, has been responsible for the greater share of marketing, for it was he who developed the bulk market, making possible the search for the unusual azurite crystal geodes, azurite-malachite nodules, and other rarities which comprise only a small fraction of the production of nodules.

The mine is known on the U.S.G.S. topographic maps as the Azurite mine, or the Azurite prospect. Locally, it has been called the Blue Ball Mine for decades, and for good reason. The azurites occur as more or less spherical masses of powder blue to dark blue azurite, sometimes altered to malachite wholly or in part. Most of the nodules are solid, partially decomposed, or at least softened by alteration. Some are so soft they crumble to the touch. Others are solid enough that they can be carefully broken in two, and with the end faces polished, can be made into fine jewelry gems. Spheres range in size from two or three millimeters to an inch or more. Very rarely, intergrown spheres have been found which exceed three inches, but these are most rare. The majority of the azurite are solid blue throughout. Some show surface crystal terminations of a sub-parallel arrangement, not unlike other azurite spheres from Jerome, Bisbee, Chessy, and elsewhere. But most have a rough surface, rather porous in appearance. Uncommonly, the interior of some solid azurite nodules has altered to bright green malachite. More often than not, this malachite nearly fills the interior. This is normal, as malachite tends to take up less space than its brother azurite, so some shrinkage is inevitable. On rare occasions these azurite-malachite nodules contain very tiny crystals of other minerals, barite being particularly well-formed in a few cases. Sometimes the azurite nodules are geode-like, and are lined with brilliant, deep-blue microscopic crystals of azurite.

deep-blue microscopic crystals of azurite, probably the most popular, and the better-known of the azurite "balls" from this deposit. Some nodules, again rarely, have completely altered to malachite, and a few even have a malachite exterior and an azurite interior. As yet, there has been no complete study of these delightful specimens to explain fully their many varieties of form.

So, I contacted Jim Vacek after he had issued an invitation, and we made the trip one day. Jim's fine wife Joyce, and my son Evan and his friend David Stein, accompanied us to Miami. There we met with George and Bill, who were working on some mine equipment when we arrived. George was kind enough to take a morning off and drive up to the property with us. Unfortunately, if we had visited the place before the Spring of 1980, we would have been able to examine the underground workings both old and new, and examine the working face. But the "dry" desert that Spring had experienced some considerable rainfall, and mud slides had played havoc with the property. Over 39 inches of rain had been recorded, and the mud slides which sealed the main entrance were mute evidence of the disaster. Yet the men were undaunted. They had already dug-out their bulldozer, where it had been buried in nearly four feet of mud. And within a few weeks they expected to be back in production. We were content to collect on the surface, and to crawl part way in the one remaining but very muddy tunnel to see the working face. George explained the underground works and how the nodules are extracted. From that I gained a greater respect for what I had seen on the market in jewelry and as specimens. They represent the barest fraction of what is found, for most nodules are useless as specimen and gem material.

*Continued on page 50*

*Azurite nodules from the Blue Ball Mine may be solid azurite, or may have centers altered to malachite, and many nodules are solid enough to be polished for use in jewelry.*

liantly crystal-lined. Fewer of these may also contain a brilliant crystal-covered sphere, a nodule inside a geode with the facing surfaces each brilliantly crystallized. These are the exceptional pieces, saved for the advanced collector. Solid nodules with a pleasing interior, either solid blue, or zoned blue and green, are polished for jewelry use. Once in a great while a nodule, more properly a geode, is opened which is crystal-lined and also contains a delicate spray of bright green malachite, or clear tabular crystal of barite. These are the most highly-prized. As for size, a one-inch geode or nodule is exceptional. Yet, in the old days, three-inch nodules were reported, and Bill's wife even showed us a couple she had! So, it is expected that when operations proceed again, some larger ones might show up as operations move back toward the earlier workings.

Attractive and valued as the crystallized nodules are, it is the lowest-grade azurite spheres from the deposit that make mining worthwhile. These spheres, usually solid, are not attractive, just blue. They are not suited to jewelry unless stabilized, but they are blue. And therein lies their value. The use of copper azurite as a blue pigment by artists has been in vogue for centuries. Artists in the 15th and 16th centuries used azurite as a pigment without stabilizing it, and oil paintings of that era now have a green (malachite) sky, rather than one of the original azure blue.

The color blue has been cherished by many cultures through the ages, and it still is. Terms in our language such as "sky-blue" and "azure-blue", denote some affection for the color. And so it is not surprising to find the vast bulk of what is mined at the Blue Ball Mine eventually ends up as a pigment base. Formerly, this tonnage was tossed aside and considered worthless. The result was that the small percentage of choice geodes and colorful zoned nodules could not be sold for enough money to make bulk mining pay. The pigment market, however, makes the difference. It makes "worthless" azurite chunks a viable part of the paying operation. The pigment nodules are crushed to a fine texture in Japan, and then introduced into blue eye shadow pigment (often given the designation "ultramarine"), and into artist's oil paint pigment. The deep rich blue color is unequalled by other natural pigments.

As for the gem and specimen grade nodules and geodes, the market can't seem to get enough, as the supply is always limited. The larger geodes with fine crystal pockets of azurite, velvet malachite, barite crystals, and needle-like sprays of malachite, are sold as specimens. They provide a remarkable color contrast when added to any collection. Those nodules containing the alter-

*Continued on page 81*

44-290-20x15      44-290-18x13      44-290-16x12      44-290-14x12

4813-      4583-20x15      3858-20x15      -18x13

4807-      3857-18x13      44-283-18x13      -18x13

4760-      44-122-16x12      3835-16x12      4-16x12

44-28-      44-282-14x10      44-282-11x      5-12x10

4895-14x12      -14x12

44-117-14x12      3856-14x10      3856-12x10      44-112-14x12

44-112-14x12

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**DEPARTMENT OF MINERAL RESOURCES**

**STATE OF ARIZONA**

**FIELD ENGINEERS REPORT**

Mine Enterprise and Rising Sun

Date January 18, 1962

District Miami District, Gila Co.

Engineer Lewis A. Smith

Subject: Interview with Carley Moore.

Carley stated that he had contracted the building of roads and drill sites for Phelps Dodge. He said Boyle Brothers were doing the drilling with a Joy rotary drill and that two holes had been sunk to 2,000 feet. A second rotary is being brought in. The bottom of the Gila Conglomerate was reported to have been reached at 1300 feet in one hole and 1400 feet in the second hole (higher upslope than the first). Pinal schist was reached in each and some pyritic mineralization was encountered between 1800 and 2000 feet. Moore did not know if there was copper present. The third hole was down about 450 feet and is at the lowest collar elevation of the three holes. Woodrow Simmons stated that Miami sunk a deep hole on the adjoining claims, but with a much higher collar elevation. This did not bottom the Gila. This work was all done on the down throw side of the Miami fault. Moore said they now had three people on the drilling, but soon would have a couple more. The holes are about  $5\frac{1}{2}$  inches in diameter and yield a core of about  $2\frac{1}{4}$  to  $2\frac{1}{2}$  inches. Some difficulty was encountered in the Gila Conglomerate.

DEPARTMENT OF MINERAL RESOURCES  
STATE OF ARIZONA  
FIELD ENGINEERS REPORT

Mine Rising Sun & Enterprise

Date March 23, 1961

District Miami District, Gila County

Engineer Lewis A. Smith

Subject: Interview with Woodrow Simmons and Bert Reed. *not covered by L.A.S.*

Location: S 7, T 1 S, R 15 E (3½ miles SE of Miami).

Property: Large blocks of claims are owned by Miami Copper Company and Phelps Dodge has optioned a group which surrounds Miami's block (including the Rising Sun & Enterprise claims not covered by Miami). ?

Work: Miami drilled 3 holes along the Miami Fault and failed to discover much. Some geophysical work is to be done by Phelps Dodge. (Contact with Phelps Dodge has not been made.)

Geology: Here the granite and overlying schist butts against the Gila Conglomerate along a flat fault face. The Gila Conglomerate is over 2000 feet thick next to the fault but two miles north a drill hole, sunk by Inspiration, was ended in conglomerate at 4025 feet. Next to the fault a wedge of mineralized schist outcrops. The drilling was not deep enough to reach the down-dropped schist in the northeast block or so-called Gila Conglomerate Basin. It is believed by some that the schist may be quite deep and, therefore, if mineralized, would present a stiff mining problem. It is believed to be questionable whether geophysical equipment could reach deep enough to be conclusive.

Dec 14 1917

Mr. R. J. C. Manning

I have been over  
and saw Bill Strobel  
to day I told him about  
it and he said it was  
all right for you to go  
head with the Deilling

Yours Truly  
Fred Gleno  
& Bill Strobel

Fred Gleno  
525 So Hill St  
Globe Arizona

Fred C. no  
525 S. Hill St  
Globe Arizona  
Oct 7 1947

Mr Manning

We have been trying  
to get some Horses  
for you we cant get any  
yet, but I will still  
look ~~over~~ around for some  
I will let you know  
if I get some  
Bill Strobel say it is just  
1 mile and  $\frac{1}{2}$  one away  
from the car

Yours Truly  
Fred C. no  
+ Bill Strobel



Fred & Bill  
525 So Hill So  
Glendale Arizona  
Sep 20 1947

Mr Manning

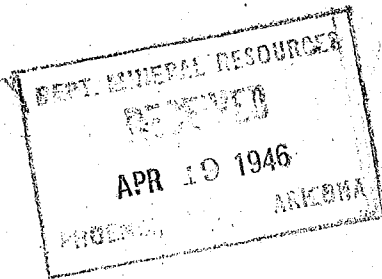
Dear Sir

I received your letter  
to day in regard to in  
the conditon of the Road,  
we cant not get over the  
Road with the car,  
with in two miles that  
distant we have to walk.  
I am hoping in the near  
feather to have the Road  
open all the way but as  
now the Road is not pasable  
all the way.

Yours Truly

Fred blum & Bill Strobel  
will get 50# sample of  
Clay & Cement.

*Man...*  
April 18, 1946



Mr. Fred Clemo  
Box 1225  
Globe, Arizona

Dear Mr. Clemo:

I have your letter of the 16th, asking when the surveyor will be in Globe. I am presuming you mean the Department of Mineral Resources Engineer. He is scheduled to be in Globe for the April meeting of the Globe Council of A.S.M.O.A. on Friday, April 26.

I am transmitting your letter along with a copy of this reply to the Department, so that the engineer will know that you want him to get in touch with you.

Yours very truly,

Charles F. Willis  
State Secretary

CFW:fl

P. S. Mr. Willis left for Albuquerque, N. Mex. before this letter was transcribed. Therefore, it does not have his personal signature.

*Pg 6*

*Missing  
9/18/94*



Globe, Ariz.

April 16th, 46

Mr. Charles F. Willis, State Secretary

Phoenix, Arizona

Dear Sir: Will you kindly let me know when the Surveyor  
will be in Globe. Call up Fred Clemo, 481 R when  
he is coming.

Respectfully Yours

*Fred Clemo*

No.346 De

CHAS. A. DIEHL

Phoenix, Arizona,

Oct.11,1947.

*Rising Mine  
Sun  
Gila Co*

# ARIZONA ASSAY OFFICE

Mail: P. O. Box 1148

815 North First Street

Phone 3-4001

THIS CERTIFIES That samples submitted for assay by **DEPARTMENT OF MINERAL RESOURCES** contain as follows per ton of 2000 lbs. Avair

MARKS	SILVER		VALUE		GOLD		VALUE		TOTAL VALUE Of Gold & Silver	% PERCENTAGE				REMARKS
	Ounces	Tenths	(OZ.)		Ounces	Hndths	(OZ.)			COPPER				
IRON DIKE OUTCROP	Trace					.01		\$.35			.45			
EAST DUMP											.05			
WEST DUMP											.27			

Charges \$ 4.00

Assayer ARIZONA ASSAY OFFICE

*Signature*

No. 244 De

Phoenix, Arizona,

CHAS. A. DIEHL

Oct. 2, 1947

# ARIZONA ASSAY OFFICE

Mail: P. O. Box 1148

815 North First Street

Phone 3-4001

Department of Mineral Resources

THIS CERTIFIES That samples submitted for assay by

contain as follows per ton of 2000 lbs. Avair.

MARKS	SILVER		VALUE		GOLD		VALUE		TOTAL VALUE Of Gold & Silver	% COPPER	PERCENTAGE				REMARKS
	Ounces	Tenths	(OZ.)		Ounces	Hndths	(OZ.)								
Sands-124 grams										3.91					
Slimes-707 grams										.65					

Charges \$2.00

Assayer ARIZONA ASSAY OFFICE



**Phoenix, Arizona,**

Rising Sun Mine

**Phone 3-4001**

**815 North First Street**

contain as follows per ton of 2000 lbs. Avoir.

[illegible]

Assayer 01075

# DEPARTMENT OF MINERAL RESOURCES

## State of Arizona

### MINE OWNER'S REPORT

Date April 26, 1946

1. Mine: Rising Sun Copper Company
2. Location: Sec. 15 Twp. 15 Range 15 E Nearest Town Miami  
Distance 5 1/2 Direction South Road Condition poor last 2 miles impossible
3. Mining District & County: Miami Gila County
4. Former Name of Mine: ?
5. Owner: Fred Cleimo, W. H. Stoble  
Address: Globe, Arizona Box 1225
6. Operator: \_\_\_\_\_  
Address: \_\_\_\_\_
7. Principal Minerals: Copper Gold Silver
8. Number of Claims: 14 Lode ✓ Placer \_\_\_\_\_  
Patented \_\_\_\_\_ Unpatented 14
9. Type of Surrounding Terrain: Steep Hills covered with granite boulders Mesquite & Cedars
10. Geology & Mineralization: Granite cut by dikes mineralization on H.W. of dike E.W. Malachite & Azurite in clay and quartz. E.W. dike cut by N.S. dike near top of hill on E side of property. Good specimens of Azurite in clay.
11. Dimension & Value of Ore Body: Copper 1 1/2 to 2 1/2 spots, Silver 3 ag, Gold trace vein width 2 1/2 to 3 ft.

RISING SUN COPPER CO.			
Cu, Au, Ag			
Gila	4 - 4	T 1 S, R 15 E	
Fred Cleimo, W. H. Stoble, Box 1225, Globe, Ariz.			

file 4-1 Rising Sun Copper Co. Fred Cleimo W. H. Stoble Globe Ariz Cu Ag Au B/A 46

Shaft (road)

Pulse

Shaft (road)

open cut

Wash

Proposed Tunnel

Tunnel Bed

open cut

open cut

Open cut (Re-entry)  
(300 ft)

Open cut

Open cut  
1 ft. 10 in. wide

Map

Scale 1" = 100'  
Date 4-27-46

4200

4100

Hand Dike  
8-10 ft high

Proposed Tunnel

Section

Scale 1" = 100'  
Date 4-27-46

DEPARTMENT OF MINERAL RESOURCES  
STATE OF ARIZONA  
MINE OWNER'S REPORT

Date April 26, 1946

1. Mine Rising Sun Copper Company
2. Location T 1 S, R 15 E, 5½ miles South of Miami, Ariz.
3. Mining District & County Miami Dist., Gila County
4. Former name
5. Owner Fred Clemo, W. H. Stoble,
6. Address (Owner) Box 1225, Globe, Ariz.
7. Operator
8. Address (Operator)
9. President, Owning Co.
- 9A. President, Operating Co.
10. Gen. Mgr.
14. Principal Minerals Copper, Gold, Silver
11. Mine Supt.
15. Production Rate
12. Mill Supt.
16. Mill: Type & Cap.
13. Men Employed
17. Power: Amt. & Type
18. Operations: Present

19. Operations: Planned

20. Number Claims, Title, etc. 14 unpatented.

21. Description: Topography & Geography Steep hills covered with granite boulders - mesquite and cedars.

22. Mine Workings: Amt. & Condition

2 shafts	1 - 90', 1 - 25'	caved
1 raise		partly caved
2 tunnels	20 & 30 feet	good
Stopes		open cut (4)

Ore: Positive & Probable, Ore Dumps, Tailings

A. Dimensions and Value of Ore body      Copper  $4\frac{1}{2}\%$ , Silver 3 oz., Gold trace. Vein width undetermined.

Mine, Mill Equipment & Flow-Sheet

Road Conditions, Route      Fair.

Water Supply      Rain water.  $1\frac{1}{4}$  mile to spring, another  $3\frac{1}{4}$  mile (mud spring)

Brief History      Mine worked about 40 years ago. No available information on history.

Special Problems, Reports Filed

Remarks

If property for sale: Price, terms and address to negotiate.      For sale. Contact owners for price.

32. Signature.....Fred Clemo.....



Ans @ 1 RPM.

24" 34 lbs - 24 hrs.

12.9 - 1154.

6x6 18" - 2HP  
all 240, less turk

8x8 30" - 5HP  
414,

10x10 38 - 10HP  
560.

5x5 -	1.5	(6)	4x4(5)	1.
6x7 -	2.5	(8)		
7x7	4.0	(8)		
8x8	6.0	(10)		

$$\begin{array}{r} 28 \\ 65 \\ \hline 168 \\ \hline 1720 \end{array}$$

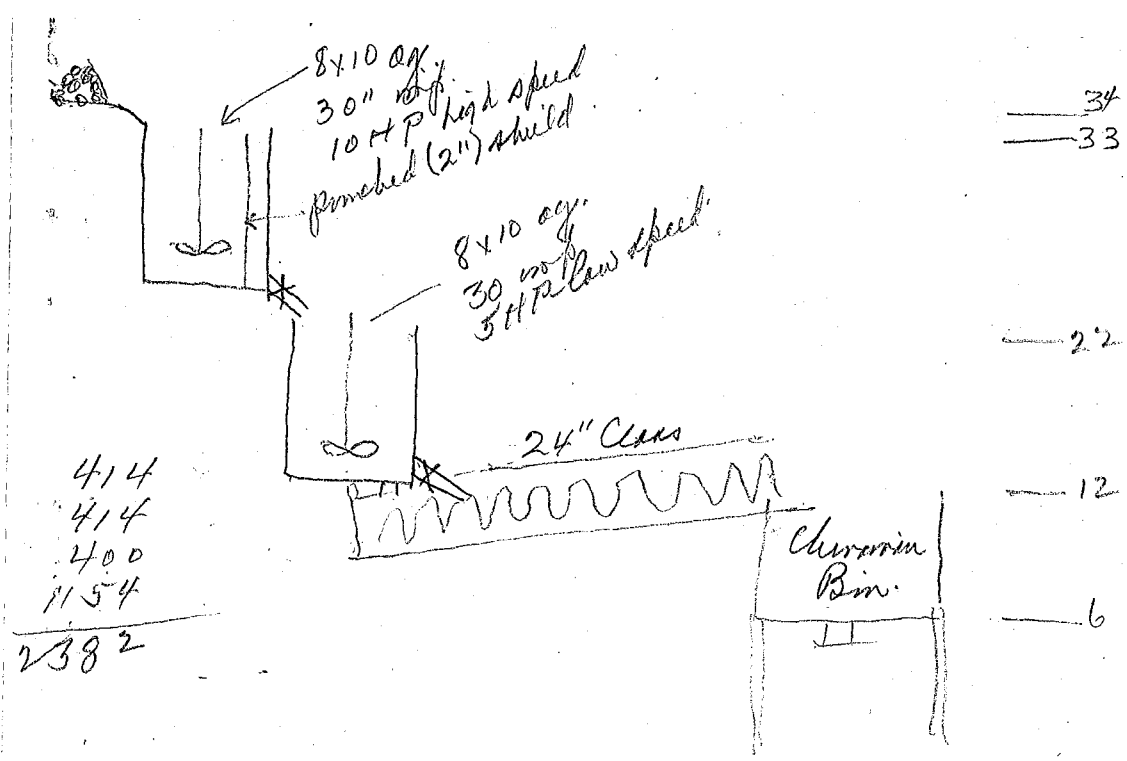
$$\begin{array}{r} 32 \\ 24 \\ 12 \\ \hline 68 \end{array}$$

32046

270

5x5	1.5
6x7(8)	2.5
7x7(8)	4.0
8x8(10)	6.0
12x12	16.
14x14	27

2# ore  
 3# H<sub>2</sub>O  
 start 10:23  
 can raised 1/2"  
 at 10:33 many large chunks left  
 start 10:36  
 stop lowered to 2x3  
 10:55  
 11:00 all down but one  
 increased pitch  
 start 11:02  
 11:05 clean  
 very thick  
 fine mix with 14 lbs  
 looks like 50-60% to  
 separate



File Ray Sam  
(Chico property)

notes by cld  
10/6/17

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400

441J

9-5-51