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ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES AZMILS DATA

PRIMARY NAME: COPPEROSITY

ALTERNATE NAMES:
HOUSTON-AZ COPPER CO. PROP.
RIESNER PROPERTY

PINAL COUNTY MILS NUMBER: 690B

LOCATION: TOWNSHIP 10 S RANGE 2 E SECTION 14 QUARTER E2
LATITUDE: N 32DEG 33MIN 31SEC LONGITUDE: W 112DEG 07MIN 45SEC
TOPO MAP NAME: VEKOL MOUNTAINS - 15 MIN

CURRENT STATUS: PAST PRODUCER

COMMODITY:
COPPER SULFIDE
COPPER OXIDE
ZINC
LEAD
MOLYBDENUM
GOLD
SILVER

BIBLIOGRAPHY:
TENNEY, JAMES HISTORY OF MINING IN AZ 1927-29
P. 337
TENNEY, J.B., ECONOMIC GEOLOGICAL RECONN. OF
CASA GRANDE MINING DISTRICT AZBM 1934,
P. 13-14
ADMMR COPPEROSITY FILE
ADMMR U FILE PINAL CU 40

COPPEROSITY

PINAL COUNTY
Pinal Grande District
T10S R2E Sec. 14

USBM "U" file

See: Casa Grande (Mines File) Casa Grande History Report

MAP - Upstairs in the ABM rolled file boxes - 1 map showing geological sketch of the ore bearing poriton of the thin bedded limestone

BLM District Sheet #543

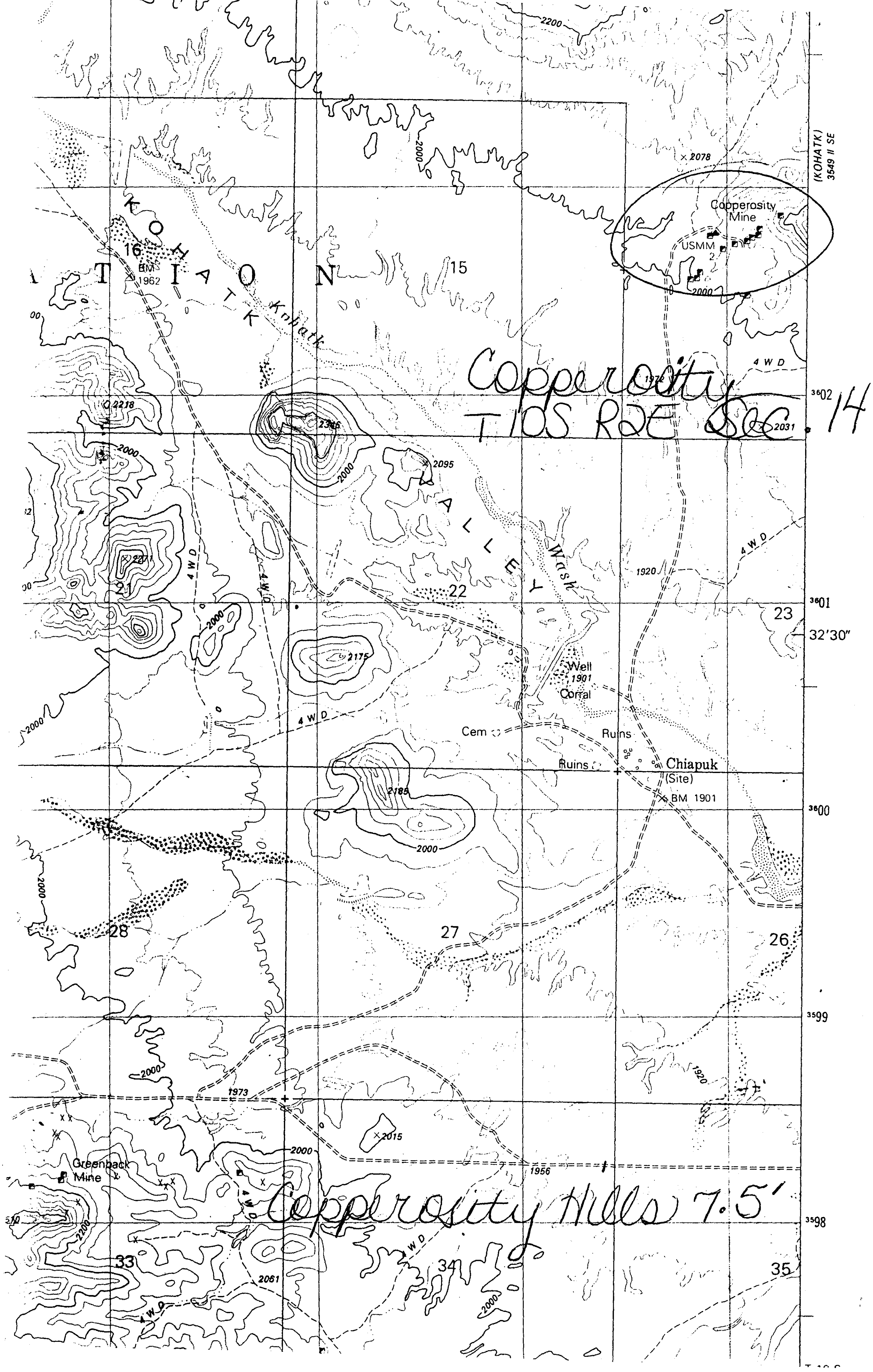
Tenney, James, "History of Mining in Arizona 1927-1929" p. 337 (Geology file)

Tenney, James, "Economic Geological Reconnaissance of Casa Grande Mining District", 1934 p. 13-14 (Geology file)

MILS Pinal County Index #690B

AKA: Houston-Arizona Copper Co. Property, Riesner Property

Copperosity Hill 7.5' Topo (included in file)



(KOHATK) 3549 II SE
Copperosity Mine
USMM 2
K O H A T K
V A L L E Y
Kohatk Wash
Well 1901
Corral
Cem
Ruins
Chiapuk (Site)
BM 1901
Greenback Mine
4 W D
32'30"
Copperosity T10S R2E Sec. 14
Copperosity Hills 7.5'

COPPEROSITY PINAL COUNTY

According to Mr. Osborne, chief field engineer for Newmont, Newmont, et al, had optioned the ten Copperosity patented claims. He did not know who owned them as this information had not "filtered down" from headquarters, but he had heard that 3 sisters of Houston, Texas, were the owners and were represented by a Mr. Powers, a Houston attorney. LAS Memo 5-18-66

Conference with Osborne, field engineer at Vekol

According to Osborne, work continues on schedule and there are no especially new developments. At the Copperosity the drill has cut a considerable thickness of quartzsite and has not shown much mineralization to date. No drilling has yet been done on the Reward. The 5 drills are still working in the SE ¼ of the area. LAS Memo 6-7-66

The drill that was on the Copperosity is now returned to the main site after rather unsatisfactory results. Several holes were completed since the last visit. LAS Memo 9-21-66

References: USBM "U" file

*

* GENERAL REFERENCES

REFERENCE 1 F1 <ABGMT CLI. FILES>

REFERENCE 2 F2 <ABGMT - USBM FILE DATA>

REFERENCE 3 F3 <ADMR FILE DATA>

REFERENCE 4 F4 <BLM DISTRICT SHEET 543>

L110< CLAIMS INCLUDE COPPEROSITY, COPPEROSITY NO 1 THROUGH 5, COPPEROSITY EXTENSION, COPPEROSITY ANNEX AND COPPEROSITY EXTENSION NO 5 AND 6 (MS. 3556)>

F5 <TENNEY, JAMES, HISTORY OF MINING IN AZ 1927-29, P 337>

F6 <TENNEY, J.B., ECONOMIC GEOLOGICAL RECONNAISSANCE OF CASA GRANDE MINING DISTRICT, AZ BUREAU OF MINES 1934 P13-14>

#690B

U.S. CRIB-SITE FORM

RECORD IDENTIFICATION

*RECORD NUMBER B10 <>
*RECORD TYPE B20 <X,1,M>
DEPOSIT NUMBER B40 <>
*REPORT DATE G1 <8,2,V,0,4> (YR. MO.)
*INFORMATION SOURCE B30 <1,2>
*FILE LINK IDENT. B50 <USBM-004 021 0267>

*REPORTER(SUPERVISOR) G2 <ROTH, FRANCES A. (last, first, middle initial)> <(GEST, DON (last, first, middle initial)>
*REPORTER AFFILIATION G5 <ABGMT>
*SITE NAME A10 <COPPEROSITY MINE>
*SYNONYMS A11 <>

LOCATION

*MINING DISTRICT/AREA A30 <PINAL GRANDE DISTRICT>
*COUNTY A60 <PINAL>
*STATE A50 <AZ>
*COUNTRY A40 <U.S.>
*PHYSIOGRAPHIC PROV A63 <1,2,V,>
*DRAINAGE AREA A62 <1,5,0,5,0,3,0,6,V,>
*LAND STATUS A64 <0,0,V,,V,(,,,,,)>
*QUADRANGLE NAME A90 <VEKOL MOUNTAINS COPPEROSITY HILLS, 9,6,3,1>
*QUADRANGLE SCALE A100 <6,2,5,0,0,>
SECOND QUAD NAME A92 <(,,,,,,)>
SECOND QUAD SCALE A91 <,,,,,,,,>
*ELEVATION A107 <2,0,4,0,V,FT>

UTM
NORTHING A120 <3,6,0,2,7,3,0>
EASTING A130 <3,9,4,0,5,0>
ZONE NUMBER A110 <+,1,2>

*ACCURACY
ACCURATE ACC (circle)
ESTIMATED EST <>

GEODETIC
*LATITUDE A70 <,,-,,-,,N>
*LONGITUDE A80 <,,-,,-,,W>

CADASTRAL
*TOWNSHIP(S) A77 <0,1,0,S,:,V,,,,:,V,,,,:,V,,,,>
*RANGE(S) A78 <0,0,2,E,:,V,,,,:,V,,,,:,V,,,,>
*SECTION(S) A79 <14,:,V,,,:,V,,,:,V,,,>
*SECTION FRACTION(S) A76 <E2>
*MERIDIAN(S) A81 <GILA AND SALT RIVER>

*POSITION FROM NEAREST PROMINENT LOCALITY A82 <ABOUT 3 MILES EAST NORTH EAST OF CATHEDRAL ROCK>
*LOCATION COMMENTS A83 <UTM LOCATION MEASURED TO CENTRAL SHAFT INDICATED ON MAP; LOCATED ON THE SOUTHWEST FLANK OF THE VEKOL MOUNTAINS.>

ESSENTIAL INFORMATION
ESSENTIAL SOMETIMES OR HIGHLY RECOMMENDED

COMMODITY INFORMATION

*COMMODITIES PRESENT C10: CU, AG,
*ORE MINERALS C30: CHRYSOCOLLA, MALACHITE, AZURITE, COPPER PITCH, NATIVE COPPER
COMMODITY SUBTYPES C41:
*GEN. ANALYTICAL DATA C43:
COM. INFO. COMMENTS C50:

* SIGNIFICANCE

		PRODUCER	NON-PRODUCER
MAJOR PRODUCTS	MAJOR	CU,	MAIN COMMODITIES PRESENT C11:
MINOR PRODUCTS	MINOR	AG,	MINOR COMMODITIES PRESENT C12:
POTENTIAL PRODUCTS	POTEN		
OCCURRENCES	OCCUR		OCCURRENCES OCCUR:

*PRODUCTION

PRODUCER	NON-PRODUCER
PRODUCTION YES (circle) PRODUCTION SIZE SMALL MED LGE (circle one)	PRODUCTION UNDI NO (circle one)

EXPLORATION OR DEVELOPMENT

*STATUS

PRODUCER	NON-PRODUCER
STATUS AND ACTIVITY A20: 4	STATUS AND ACTIVITY A20:

*DISCOVERER L20:
*YEAR OF DISCOVERY L10: 1890'S *NATURE OF DISCOVERY L30: *YEAR OF FIRST PRODUCTION L40: 1890 *YEAR OF LAST PRODUCTION L45: 1917
*PRESENT/LAST OWNER A12: HEIRS OF B.A. RIESNER (1957)
*PRESENT/LAST OPERATOR A13: NEWMONT EXPLORATION LIMITED (1966)
EXPL./DEV.COMMENTS L110: PREVIOUS OWNERS AND OPERATORS INCLUDE E.S. BONSALL (1890-1906), COPPEROSITY MINING CO. (1907, 1916-17), J.P. WAGNON, HOUGTON-ARIZONA COPPER CO. (1922), CHAMBERLAIN CO. (1980'S),

DESCRIPTION OF DEPOSIT

*DEPOSIT TYPE(S) C40: REPLACEMENT / SHEAR ZONES
DEPOSIT FORM/SHAPE M10: LENSES
*DEPTH TO TOP M20: *UNITS M21: *MAXIMUM LENGTH M40: *UNITS M41:
*DEPTH TO BOTTOM M30: *UNITS M31: *MAXIMUM WIDTH M50: 200 *UNITS M51: FT
*DEPOSIT SIZE M15: (SMALL) M15: (MEDIUM) M15: (LARGE) (circle one) *MAXIMUM THICKNESS M60: *UNITS M61:
*STRIKE M70: N60W, AND N55E *DIP M80: 45S, AND 60-80 NW
*DIRECTION OF PLUNGE M100: *PLUNGE M90:
*DEP. DESC. COMMENTS M110: REPLACEMENT IN LIMESTONE ALONG FAULT ZONES

DESCRIPTION OF WORKINGS

*Workings are: SURFACE M120 UNDERGROUND M130 BOTH M140 (circle one)
*DEPTH BELOW SURFACE M160: 385 *UNITS M161: FT *OVERALL LENGTH M190: 600 *UNITS M191: FT
*LENGTH OF WORKINGS M170: 1000 *UNITS M171: FT *OVERALL WIDTH M200: 500 *UNITS M201: FT
*OVERALL AREA M210: *UNITS M211:
DESC. OF WORK. COM. M220: TWO COMPARTMENT SHAFT (NO.1) (385 FT DEEP) WITH LEVELS AT 200 AND 300 FT, NO. 2 SHAFT, H SHAFT, B SHAFT AND VARIOUS SMALL PROSPECTING SHAFTS

GEOLOGY

*AGE OF HOST ROCK(S) K1: CAMB,
*HOST ROCK TYPE(S) K1A: LIMESTONE
*AGE OF IGNEOUS ROCK(S) K2: LCRET-TERT,
*IGNEOUS ROCK TYPE(S) K2A: GRANITE
*AGE OF MINERALIZATION K3: LCRET-TERT,
PERT. MINERALS (NOT ORE) K4: LIMONITE, GYPSUM, CALCITE
ORE CONTROL/LOCUS K5: NE AND NW TRENDING FAULTS
MAJ. REG. TRENDS/STRUCT. N5: NE AND NW TRENDING FAULTS, LIMESTONE BEDS DIPPING 30-50 NW, QUARTZ MONZONITE DIKES
TECTONIC SETTING N15:
SIGNIFICANT LOCAL STRUCT. N70:
SIGNIFICANT ALTERATION N75: STRONG OXIDATION
PROCESS OF CONC./ENRICH. N80: OXIDATION FROM CHALCOPYRITE AND/OR [redacted] PYRRHOTITE PROBABLE
FORMATION AGE N30: CAMB,
FORMATION NAME N30A: ABRIGO FORMATION
SECOND FM AGE N35:
SECOND FM NAME N35A:
GNEOUS UNIT AGE N50:
GNEOUS UNIT NAME N50A:
SECOND IG. UNIT AGE N55:
SECOND IG. UNIT NAME N55A:
GEOLOGY COMMENTS N85: CRET TO TERT GRANITE, 1/2 MILE WEST OF MINE IN KOHATK VALLEY, GRANITIC DIKES REPORTED IN ADMR FILE

GENERAL COMMENTS

GENERAL COMMENTS GEN:

Houston, Texas, March 5, 1958

Mr. Frank P. Knight, Director,
Department of Mineral Resources,
Mineral Building, Fairgrounds,
Phoenix, Arizona.

Dear Mr. Knight:

Thanks for your letter of February 26th, concerning the Copperosity Mine in Pinal County, Arizona.

Perhaps I did not make myself quite clear. Neither of the Riesner Heirs (present owners of the mining properties) has any desire to spend any money in core tests or other operations. What I did mean, in saying they would like to negotiate with responsible parties to do this work, was that such other parties would advance all necessary funds for such work, after having obtained a written lease contract from the Riesner Heirs, giving such parties authority to do this work and, after such work, if these parties desired to open and re-work the mine they would have the right to do so and would be sole owner and operator thereof; all of this, however, would be subject only to a royalty on all minerals produced and saved to be paid to the Riesner Heirs; the amount of such roualty, to be paid, time to begin operations and other such matters, all to be clearly set out and defined in a contract, executed by all necessary parties, such contract to be placed in escrow in some Bank, to be agreed upon, along with certified check to guarantee that the core tests will be drilled, or the amount forfeited to the Riesner Heirs, in lieu of the drilling of such tests. All of this drilling and operations, if any, would be under the sole direction of the parties in favor of whom the Riesner Heirs would have executed such a lease or contract.

I hope I have now made myself clear, but if not, let me know and I will make another effort to do so.

Thanks very much for your prompt letter.

Very truly yours,

C. S. Powers.
Executor, B.A.Riesner Estate
2220 Stanmore Drive.
Houston 19 Texas

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

March 12, 1958

Mr. C. S. Powers
2220 Stanmore Drive
Houston, 19, Texas

COPY

Dear Mr. Powers:

We are pleased to receive your letter of March 5th which gives us a clear picture of your wishes regarding the Copperosity mine.

Your information will be abailable to prospective buyers who contact us.

Sincerely yours,

FRANK P. KNIGHT,
Director.

FK:lp

DEPARTMENT OF MINERAL RESOURCES
State of Arizona
MINE OWNER'S REPORT

Date Feb. 18, 1958

1. Mine: ✓ Copperosity

2. Location: Sec. 14 SE of NW¼ Twp. 10-S Range 2-E Nearest Town Casa Grande Distance 42 miles
   Direction SW Nearest R.R. Southern Pacific Distance 42 miles
   Road Conditions Part good-paved- part unimproved- being desert track

3. Mining District and County: Pinal County

4. Former Name of Mine: ✓ Copperosity

5. Owner: Present Owners: Heirs of B. A. Riesner, Jr.,
   Address: ✓C/o C. S. Powers, 2220 Stanmore Drive- Houston, 19, Texas

6. Operator: Mine not being operated- abandoned
   Address:

7. Principal Minerals: Ore

8. Number of Claims: Lode ..... Patented ..... Unpatented .....
   Placer ..... Patented ..... Unpatented .....

9. Type of Surrounding Terrain:
   See attached report of Dr. Harrison A. Schmitt of Silver City, New Mexico
   Report dated July 9, 1957

10. Geology and Mineralization: See above referred to report.

11. Dimension and Value of Ore Body: --

* Please give as complete information as possible and attach copies of engineer's reports, shipment returns, maps, etc. if you wish to have them available in this Department's files for inspection by prospective leasors or buyers.

(over)

12. Ore "Blocked Out" or "In Sight": - - - -

Ore Probable: See report of Dr. Schmitt, hereto attached

13. Mine Workings—Amount and Condition:

	No.	Feet	Condition
Shafts			
Raises			
Tunnels			
Crosscuts			
Stopes			

14. Water Supply: ----Available at Copperosity Indian Village.

15. Brief History: See attachedcopy of report of Dr. Schmitt

16. Remarks: Present owners are five heirs of B.A.Riesner, Jr. all of whom are age and able to enter into any legal contract.

17. If Property for Sale, List Approximate Price and Terms: Property not listed for sale; Owners however, would like to negotiate with responsible parties or corporation, under agreeable contract, to dig some core tests to determine whether or not sufficient body of ore is present to warrant re-entering and re-opening mine.

18. Signature: C. A. Power

2220 Stanmar Drive

Houston (19) Texas

Excerpt from Economic Geological Reconnaissance
of Casa Grande Mining District
By J. B. Tenney

COPPEROSITY MINE

History and Production

The Copperosity copper deposit was first discovered and located in the early eighties about the same time as the Reward and Vekol. Very little work was done, however, until 1890 when it was developed under the superintendency of E. J. Bonsall. The outcropping ore was followed down in several inclined shafts but few shipments were made. Development of the mine continued under Bonsall until 1906 when the mine was sold to the Copperosity Mining Company, financed in Texas. Ore was stoped and shipped during the high market of 1907, but the mine was closed at the end of the year.

No further work was done until the World War years of 1915, 1916 and 1917 when the company was reorganized and refinanced. A two compartment vertical shaft was sunk to a depth of 300 feet, connections with the earlier developed ore body were made on the 200-foot level and considerable high grade ore was stoped, hauled to Casa Grande and shipped. The mine was again closed at the end of 1917 and has not been worked since. The company was reorganized in 1922 as the Houston-Arizona Copper Company which is the present owner.

The total recorded production of the mine has been about 360,000 pounds of copper with a gross value of about $80,000. In the Copper Handbook, Vol. X, page 679, the mine was reported by the owners to have had a production previous to 1906 of $200,000, but no records exist, and it is doubtful if it was made unless by the Spaniards prior to the Gadsen Purchase.

Location and Mining Property

The Copperosity Mine is situated at the western end of the east-west trending ridge at the south end of the mountains. The mine is reached from Casa Grande by the 29 mile partly graded county road to the Jack Rabbit followed by about ten miles of fair desert road, passable except in wet weather.

The property is composed of ten patented claims three claims long and three wide together with a claim covering the camp site. At the camp, south of the workings, there are several substantial adobe and frame buildings including a store and general office all in good repair. The shaft and compressor house at the mine is in bad repair.

Mine Development

The principal work at the mine is a vertical two-compartment shaft sunk to a depth of 300 feet (water level) with levels at 200 and 300 feet below the collar. Several hundred feet of lateral work were driven, and connections were made on the 200-foot level with the irregular workings sunk in ore from the outcrop northeast of the shaft. Off the inclined workings considerable drifting and stoping have been done, aggregating about 1000 feet. In addition to this, several shallow pits and open cuts were made on ore and gossan outcrops north of the main shaft.

Geology and Ore Occurrence

The claims of the Copperosity mine cover Paleozoic limestones, pre-Cambrian schist, a small area of post-Paleozoic shales and conglomerate, and small outcrops of quartz, porphyry. The ore consists of replacement deposits in limestone of carbonates, silicates and oxides of copper in a gangue of limonite, gypsum and calcite. The principal work has been done in Devonian and Cambrian limestones. The property covers a part of an extensive section of sediments and basement schist already described under the general geology of the Vekol Mountains. The dip of the sediments at the mine varies from 30 to 50 degrees North 20 to 30 degrees West. The main vertical shaft starts and was sunk in a pink limestone bed near the top of the Devonian limestone. The dips at the shaft are steep averaging about 50 degrees. A few feet west of the shaft the Devonian limestone is covered by several hundred feet of reddish thin-bedded shales in which there is a thick bed of coarse little indurated conglomerate made up of partly rounded boulders of quartzite and Paleozoic limestone. About 300 feet west of the shaft a large fault occurs which brings up pre-Cambrian schist to the west. The greater part of the camp site is located on schist.

The ore so far discovered occurs as a single body of oxidized ore replacing Devonian limestone on either side of a series of closely-spaced parallel faults striking North 60 degrees West dipping 45 degrees to the southwest. Mineralization extends about 50 feet on each side of the faults and extends down the dip of individual beds for a distance of 25 feet and over. The ore outcropped and was followed down to a depth of over 200 feet on the incline following the dip of the fault zone. Connections were made with the inclined workings eight feet above the 200-foot level of the main shaft, 100 feet west of the shaft. The inclined workings are irregular and consist of drifts, inclined raises and winzes almost all in ore. The thickness of ore varies from a few inches up to five feet with an average width of about three feet. Considerable gypsum and calcite is associated with the limonite but sparse silica. Considerable ore has been removed by stoping.

Between the ore outcrop and the vertical shaft there is an irregular outcrop of quartz porphyry showing no alteration but with a little garnet developed on the contact.

The mineralized fault to the northwest of the ore outcrops strongly for a thousand feet or more as veins of manganese oxide and limonite a few inches to a foot in thickness associated with calcite and chrysocolla stain.

Future Possibilities

The oxidized ore is not high grade as a whole and requires careful sorting to allow for shipment at a profit. Little lateral work has been done out of ore. Due to the dip of the sediments to the west, and to the fact that the ore occurs close to the base of the limestone section, prospecting of the

fault zone to the east would penetrate unfavorable quartzites. Prospecting to the west on the other hand is promising as higher horizons of limestones favorable for replacement would be prospected, and the fault zone outcrop is strongly mineralized.

Profitable operations except under an abnormally high copper market are difficult with medium grade oxidized ore amenable only to direct smelting. Oxidation is probably deep as at the Reward. For this reason also, prospecting of the northwest fault zone to the northwest is desirable, as if ore is found, deep prospecting for limestone replaced by sulphide ore would be possible. Deep level prospecting of the zone under the developed ore body would lead shortly into unfavorable quartzite beds. Sulphide ore, if found would be amenable to selective flotation whereby high grade concentrates could be shipped profitably.

HARRISON SCHMITT
MINING GEOLOGIST
COTTAGE SANATORIUM ROAD
SILVER CITY, NEW MEXICO

July 9, 1957

Estate of B. A. Riesner
c/o C. Stewart Powers
2501 Gulf Building
Houston 2, Texas

Subject: Copperosity mine, SE of the NW quarter of Sect. 14, T10S, R2E, Pinal County, Arizona

The Copperosity mine is said to be comprised of a contiguous group of ten patented claims (Survey No. 3556). A map of these claims is included in the papers sent to me. This group of claims is within the area of the Papago Indian Reservation and is on the southwest flank of the Vekol Mountains.

The mine is accessible from Casa Grande, Arizona, a station on the Southern Pacific railroad, by 42 miles of road. The approximately first ten miles of this is paved, the next 15 miles or so is graded and ready for paving and the last 15 miles is unimproved desert track. The direction is southwest from Casa Grande.

The underground workings are not now accessible except through the use of timber, ropes, etc., and may be blocked by caved rock from the shaft collars. This report is based on a surface reconnaissance only.

The average elevation is around 2050 ft. The climate is characterized by dry hot summers and cool agreeable winters. The vegetation is sparce, of southern Arizona desert type, and there is no timber suitable for mine supports. Water is said to stand in the No. 1 shaft at a depth of 300 ft. Whether this is potable is unknown to me. Its rate of inflow is not noted in the reports. Potable water is available at the nearby Copperosity Indian village.

Data to follow are partly derived from the following reports submitted to me.

Malcolmson, James W.	April 16, 1907
Tolman, Cyrus Fisher, Jr.	Sept. 7-15, 1908
Merriman, L. P.	May 23, 1928
Butler, G. Montague	July 23, 1928
Byers, John M.	Sept. 20, 1942

Tolman's map No. 2 was especially useful and is used for positional references in this report.

The history of production from the claims is summarized by Byers as follows:

> "As near as I can determine from these early reports probably 1000 tons of high grade ore (8-10% Cu) have been shipped from the surface, later, probably 3000 tons of 5% (Cu) ore or better have been shipped from parts above the Dance Hall Level, or the 120 ft. level. All of the ores shipped have been oxidized ores, such as red and black oxide, malachite, chrysocolla and some native Cu."

The development and exploitation was done from five principal shafts. These in order from northeast to southwest are the H shaft and another near it, the No. 2 sahft which serves the Dance Hall level, the B shaft or incline which also connects with the Dance Hall level and the Main or No. 1 shaft which is a two compartment shaft said to be 385 ft. deep with levels at 100, 200 and 300 ft. The Dance Hall level is comprised of about 800 ft. of workings. Merriman states that in the No. 1 shaft the vein was cut at 230 ft. and that the No. 1 and No. 2 shafts are connected on the 200 ft. level. He states that the vein was cut on the 200 ft. level 40 ft. south (SE) from the shaft and that on the 300 ft. level the vein was cut north (NW) of the shaft. The relationship of this "vein" to the surface outcrop and the large fault (or ore channel) referred to later is not clear. It may be a bed or contact which has been replaced by mineralization not related to the surface outcrops now visible. There are a number of other prospecting shafts of various depths. Most of the ore appears to have been extracted from the "B" incline and the No. 2 "incline". The latter

appears to have been converted to, or resunk as, a vertical shaft. Some minor ore was extracted from other scattered surface workings.

The general geology has been outlined by Tolman and the distribution of the different rocks is shown on his map No. 2. Sedimentary rocks of possible Permian (?) age dip steeply to the northwest. This series includes various types of limestone, red shale, limestone conglomerate and quartzite. It is cut by dike and sill (?) rocks called "porphyry" and diabase by Tolman.

His map shows several cross faults. In addition to these it is apparent that the strong showing of silica-iron mineralization that outcrops along a southwest trending zone is associated with, if not localized by, a strong northeast bearing high angle fault. This fault is exposed in a weakly mineralized state in shaft "G" at the extreme southwest extension of the zone mentioned above. At this point it strikes N55E, dips ±90° NW and contains more than four feet of breccia. The second shaft near "I" on the extreme northeast extension of the mineralized zone has exposed a fault, presumably the same one, which bears N55E and dips 60° N.. Merriman states that at the west end of the big stope (the limestone ore body) a cross-fault was encountered. This also may be the fault described above.

The fault is probably the main localizing channel for the fluids that brought in the copper. The Dike ore body was localized by the intersection of a dike with the fault and a favorable limestone bed (the thin-bedded platy limestone). The Limestone ore body probably is in the same limestone bed where cut by a cross-fault but may connect in depth with the main fault described above.

Small pockets of ore were mined along the outcrop of the silica-iron main fault zone. One of these was called the Cave ore body by Tolman. This appears to have been worked from shaft No. 4.

The ore is oxidized. No sulphides have been reported. The ore minerals reported by others and/or observed by me include chrysocolla, malachite, azurite, copper pitch and native copper. Gangue minerals include jasper, hematite, brown limonite (geothite ?) and yellow limonite (jarosite ?).

The silica-iron (jasper-hematite) fault zone outcrops that occur along the persistent trend to the southwest start about 175 ft. west of the No. 2 incline. The width of the mineralized part of this zone may be as high as twenty feet diminishing to almost nothing at shaft G where the fault, however, is prominently exposed. An outcrop of jasper-hematite occurs around 100 ft. northeast of shaft No. 2. This presumably is also along the mineralized fault zone. The part of this mineralized zone that does not outcrop but is exposed by prospect holes and shafts is softer material including a small amount of gossan. Along most or all of the zone fairly pure limestone occurs on the foot-wall side. The hanging wall side usually is shale or shaly limestone.

The general characteristics of this outcrop are pre-mineralization brecciation with minor copper stains at places, prospect holes where small pockets of ore that were removed in the past, prominent jasper-hematite outcrops and minor soft, irony or limonitic gossan. Red colors are prominent, brown and yellow are subordinate.

These data suggest that the original mineralization included chalcopyrite and probably pyrite, even massive pyrite. The origin of the massive, hard hematite is obscure. This mineral may actually be martite (hematite) after magnetite or it may be hematite formed by the oxidation of sulphides and the local precipitation of iron oxide. The latter interpretation is favored. In other words, I think this outcrop is the surface expression of the oxidation of massive pyrite or pyrrhotite with minor associated chalcopyrite.

If magnetite had been present in the primary ore there normally should be "contact" type silicates in the limestone. If much chalcopyrite had been present in the primary vein material, say having a copper content of over several per cent, there should be a much greater prominence of oxidized copper minerals in the outcrop especially in the limestone. This rock neutralizes the copper bearing acid water resulting from the oxidation of sulphides at a rate great enough to prevent much migration of copper to depth or to the general ground water circulation. Limestone under such circumstances often contains pockets of oxidized copper ore.

Thus, the possibility for a large amount of commercial primary ore or for an enriched chalcocite zone in depth does not seem good. There may be small pockets of enriched sulphide copper ore, however, and possibly small pockets of primary ore in depth presumably below the permanent ground water level, which is said to be at about El. 1725 ft.

The possibility appears good for a number of small oxidized high-grade ore bodies such as were mined in the past. These should occur in the limestones in contact with the main localizing fault or channel above described. Possibly over a distance of 300 ft. up to 10,000 tons of better than 5% Cu ore could be disclosed by a drift along the fault. This estimate is based on the distribution of ore bodies found along the development drift already made on the Dance Hall level with an allowance for better luck under the strong jasper-iron outcrop. The level selected on which to do the new work would depend on an engineering and geological survey of the topography, geology, etc. It possibly would be feasible on the Dance Hall level.

There seems to be little chance for a large mine because of the character of the mineralization disclosed on the surface.

There is a fair to poor possibility of a medium sized primary sulphide mine, say, up to 100,000 tons of 3% Cu ore. This possibility could be

tested by about three diamond drill holes drilled from the hanging or northwest wall and pointed so as to cut the vein at about 450 ft. below the outcrop. About 1000 ft. of AX hole would be required and it would cost about $6.00 a foot. The total cost including geology, moving the drill in, overhead, etc. would be about $15,000.

Conclusions

The Copperosity mine and group of claims appear of interest chiefly for the possibility of the occurrence of other ore bodies similar to those mined in the past, i.e., ore bodies of a several thousand tons or so of relatively high-grade oxidized copper ore. These are likely to occur along the northeast bearing zone of mineralization and faulting above described and discussed. Up to 800 ft. of drifting on the Dance Hall level could be needed and the No. 2 incline shaft would probably be the easiest shaft to work from. It would need to be rehabilitated. Diamond drilling would not be effective for this work as the ore bodies are too small and core recovery would be poor in the oxidized zone. The job would be ideal for a lessee who could afford to take some risks. The risk includes unknowns such as size of ore bodies, grade, copper market, etc.

There appears to be little chance for a large mine, say, one with tonnages exceeding several hundred thousand.

The chance for a medium sized mine in sulphides below the oxidized zone is fair to poor. This possibility could be tested cheaply, however, with about three ±500 ft. diamond drill holes. These with a few days of preliminary engineering and geological work and including moving in and out and overhead would cost in the neighborhood of $15,000.

Harrison A. Schmitt

HAS:ehs
CC:2 extra

Excerpt from Economic Geological Reconnaissance
of Casa Grande Mining District
By J. B. Tenney

COPPEROSITY MINE

History and Production

The Copperosity copper deposit was first discovered and located in the early eighties about the same time as the Reward and Vekol. Very little work was done, however, until 1890 when it was developed under the superintendency of E. J. Bonsall. The outcropping ore was followed down in several inclined shafts but few shipments were made. Development of the mine continued under Bonsall until 1906 when the mine was sold to the Copperosity Mining Company, financed in Texas. Ore was stoped and shipped during the high market of 1907, but the mine was closed at the end of the year.

No further work was done until the World War years of 1915, 1916 and 1917 when the company was reorganized and refinanced. A two compartment vertical shaft was sunk to a depth of 300 feet, connections with the earlier developed ore body were made on the 200-foot level and considerable high grade ore was stoped, hauled to Casa Grande and shipped. The mine was again closed at the end of 1917 and has not been worked since. The company was reorganized in 1922 as the Houston-Arizona Copper Company which is the present owner.

The total recorded production of the mine has been about 360,000 pounds of copper with a gross value of about $80,000. In the Copper Handbook, Vol. X, page 679, the mine was reported by the owners to have had a production previous to 1906 of $200,000, but no records exist, and it is doubtful if it was made unless by the Spaniards prior to the Gadsen Purchase.

Location and Mining Property

The Copperosity Mine is situated at the western end of the east-west trending ridge at the south end of the mountains. The mine is reached from Casa Grande by the 29 mile partly graded county road to the Jack Rabbit followed by about ten miles of fair desert road, passable except in wet weather.

The property is composed of ten patented claims three claims long and three wide together with a claim covering the camp site. At the camp, south of the workings, there are several substantial adobe and frame buildings including a store and general office all in good repair. The shaft and compressor house at the mine is in bad repair.

Mine Development

The principal work at the mine is a vertical two-compartment shaft sunk to a depth of 300 feet (water level) with levels at 200 and 300 feet below the collar. Several hundred feet of lateral work were driven, and connections were made on the 200-foot level with the irregular workings sunk in ore from the outcrop northeast of the shaft. Off the inclined workings considerable drifting and stoping have been done, aggregating about 1000 feet. In addition to this, several shallow pits and open cuts were made on ore and gossan outcrops north of the main shaft.

Geology and Ore Occurrence

The claims of the Copperosity mine cover Paleozoic limestones, pre-Cambrian schist, a small area of post-Paleozoic shales and conglomerate, and small outcrops of quartz, porphyry. The ore consists of replacement deposits in limestone of carbonates, silicates and oxides of copper in a gangue of limonite, gypsum and calcite. The principal work has been done in Devonian and Cambrian limestones. The property covers a part of an extensive section of sediments and basement schist already described under the general geology of the Vekol Mountains. The dip of the sediments at the mine varies from 30 to 50 degrees North 20 to 30 degrees West. The main vertical shaft starts and was sunk in a pink limestone bed near the top of the Devonian limestone. The dips at the shaft are steep averaging about 50 degrees. A few feet west of the shaft the Devonian limestone is covered by several hundred feet of reddish thin-bedded shales in which there is a thick bed of coarse little indurated conglomerate made up of partly rounded boulders of quartzite and Paleozoic limestone. About 300 feet west of the shaft a large fault occurs which brings up pre-Cambrian schist to the west. The greater part of the camp site is located on schist.

The ore so far discovered occurs as a single body of oxidized ore replacing Devonian limestone on either side of a series of closely-spaced parallel faults striking North 60 degrees West dipping 45 degrees to the southwest. Mineralization extends about 50 feet on each side of the faults and extends down the dip of individual beds for a distance of 25 feet and over. The ore outcropped and was followed down to a depth of over 200 feet on the incline following the dip of the fault zone. Connections were made with the inclined workings eight feet above the 200-foot level of the main shaft, 100 feet west of the shaft. The inclined workings are irregular and consist of drifts, inclined raises and winzes almost all in ore. The thickness of ore varies from a few inches up to five feet with an average width of about three feet. Considerable gypsum and calcite is associated with the limonite but sparse silica. Considerable ore has been removed by stoping.

Between the ore outcrop and the vertical shaft there is an irregular outcrop of quartz porphyry showing no alteration but with a little garnet developed on the contact.

The mineralized fault to the northwest of the ore outcrops strongly for a thousand feet or more as veins of manganese oxide and limonite a few inches to a foot in thickness associated with calcite and chrysocolla stain.

Future Possibilities

The oxidized ore is not high grade as a whole and requires careful sorting to allow for shipment at a profit. Little lateral work has been done out of ore. Due to the dip of the sediments to the west, and to the fact that the ore occurs close to the base of the limestone section, prospecting of the

fault zone to the east would penetrate unfavorable quartzites. Prospecting to the west on the other hand is promising as higher horizons of limestones favorable for replacement would be prospected, and the fault zone outcrop is strongly mineralized.

Profitable operations except under an abnormally high copper market are difficult with medium grade oxidized ore amenable only to direct smelting. Oxidation is probably deep as at the Reward. For this reason also, prospecting of the northwest fault zone to the northwest is desirable, as if ore is found, deep prospecting for limestone replaced by sulphide ore would be possible. Deep level prospecting of the zone under the developed ore body would lead shortly into unfavorable quartzite beds. Sulphide ore, if found would be amenable to selective flotation whereby high grade concentrates could be shipped profitably.

P.O.Box 532
Casa Grande, Arizona...

Mr. George A. Ballam;
P.O.Box 495
Tucson, Arizona.

Dear Sir:

Relative to our conversation concerning the Copperosity Mine:

The Copperosity property consists of 206.6I acres of patented ground covered by the following lode claims:
Copperosity.
Copperosity No.I, 2, 3, 4, 5, & E
Copperosity Extension Nos. 5&6
Copperosity Annex.

IO claims in all and almost full claims at that.

The last Company to own the Property was the HOUSTON ARIZONA COPPER COMPANY but I understand that the property now stands in the name of

B. A. RIESNER, Jr.
2715 GULF BUILDING,
HOUSTON, TEXAS.

It is understood that Mr. Riesner was a former secretary of the Houston Arizona Copper Company.

Contrary to the general belief that the Vekol is the oldest mine in the District; a miner who spent his boyhood days at the Vekol tells me that at that time there was a Mexican watchman at the Copperosity, the miner in question is now close to 80 years of age, a smelter also operated on the property, long ago.

Drop a line.

Very truly yours,

John W. Robinson....

November 19, 1943

Mr. Ira Wagnon
c/o National Mining & Milling Co.
Sunflower, Arizona

Dear Ira:

I have had an inquiry from A. M. Riedesel, Mining Exchange Building, Denver, Colorado, who states, "Do you know of a good big surface copper property in the southwest which can be had at right price and terms on which engineer's report can be furnished."

Mr. Riedesel is a mining broker and states he has responsible parties looking for such a property.

I would suggest that you get in touch with him direct and have in mind you might want to submit data on the Copperosity. I have little or nothing regarding the property in my files so would suggest that if you do submit this property to Riedesel, you send me a copy so that I may have the information available.

Yours very truly,

J. S. Coupal, Director

JSC:LP

WAGNON, Ira
c/o Natl. Mining & Milling Co.
Sunflower, Ariz. 11/19/43

See COPPEROSITY - Re information on property.

Opportunity Mine
S. J Casa Grande

Application for loan
being submitted by
Ira Wagoner +
J. D. McClintock.