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JDS

ASARCO

Southwestern Exploration Division

June 13, 1991

FILE NOTE

Willie Rose Mine
Section 26, T15S, R30E
Cochise Head Quad.
Cochise County, AZ

Mr. Woodlief F. Brown
933 So. Pioneer
Abilene, Texas 79605

Dropped off this package on 6/10/91. He has 200 acres of patented (in 1974) mining claims making an "[" shaped group with the Willie Rose Mine near the bend in the group.

State land surrounds him in three sides, and he has taken a lease on 400 of the acres.

Although he has records of shipping 4.1945 tons of chalcocite ore which averaged 24.84% Cu and 3.09 opt silver, this hand picked and sorted ore, he says, just about depleted his pod of mineralization. His labor of love grossed him $187.35 between 1941 and 1953.

The poddy mineralization in faults cutting Permian Colina limestone appear to be quite limited and geophysical results are not encouraging for large tonnage features.

I told "Woody" that Asarco was not pursuing narrow fault or vein underground mines at this time.

James D. Sell

James D. Sell

JDS:mek
Atts.

cc: W.L. Kurtz

W. E. HAWLEY — F. L. HAWLEY

Douglas, Arizona, 7/21/41

Mr Woodlief Brown, Willie Rose,
San Simon, Arizona

IN ACCOUNT WITH
HAWLEY & HAWLEY
W. E. HAWLEY MANAGER
DOUGLAS, ARIZONA
537 12TH ST. BOX 151
SHIPPERS' REPRESENTATIVES AND ORE BUYERS
ASSAYERS & CHEMISTS

HAYDEN ARIZ. BOX 749 — EL PASO TEX. BOX 4

CORRECTION

14 sacks ore	2224 lbs gross		R'c'd 7/19/41
sacks	10 "		Silver 70.62¢
	2214 " net wet		Copper 11.77¢
Moisture 1.4%	31 "		
	2183 " net dry		
	1.0915 dry tons		
	PAYMENTS PER TON		
Gold....trace	No pay		
Silver..3.1 ozs - 0.5	2.6@70.62¢		1.84
Copper..25.04%	90%@11.77¢-2.5¢		41.78
			43.62
	DEDUCTIONS PER TON		
Treatment, $3.50 plus 10% of excess of smelter payments over $15 per ton			6.36
	Smelter value per ton		37.26
1.0915 dry tons @ 37.26			40.67
Drayage to smelter 1.10 wet tons @ 1.00			1.10
			39.57
Less: Sampling & assaying		2.50	
10% Commission		3.95	6.45
			33.12
	Less first payment		15.29
	Balance due		$17.83

W. E. HAWLEY F. L. HAWLEY

Douglas, Arizona, 10/29/46 194

Mr W. F. Brown, Willie Rose Mine,

Box 15, San Simon, Arizona

IN ACCOUNT WITH

HAWLEY & HAWLEY

W. E. HAWLEY, MANAGER

SHIPPERS' REPRESENTATIVES AND ORE BUYERS

ASSAYERS & CHEMISTS

DOUGLAS, ARIZ., BOX 1060 927 TWELFTH STREET EL PASO, TEX., BOX 4

Lead ore	1892 lbs gross		R'c'd 10/26/46
tare	98 "		Silver 90-1/8¢
	1794 " net wet		Copper 14.15¢
Moisture 1.0%	18 "		
	1776 " net dry		
	.888 dry tons		

Payments per ton

Gold....trace		
Silver..4.4 ozs - 0.5 ozs 3.9 @ 90-1/8¢		3.51
Copper..40.06% 90% @ 14.15¢-2.5¢		84.01
		87.52

Deductions per ton

Treatment, Maximum		6.50
Smelter value ton		81.02
.888 dry tons @ $81.02		71.95
Drayage to smelter .897 wet tons @ 1.50		1.35
		70.60
Less: Sampling & assaying	3.25	
10% Commission	7.06	10.31
Balance due		$60.29

Douglas, Arizona 8/5/49

Mr. W. F. Brown, & Sam Magee,
San Simon, Arizona.

Willie Rose Mine,
San Simon Mng. Dct.,
Arizona.

IN ACCOUNT WITH

HAWLEY & HAWLEY

W. E. HAWLEY, MANAGER

SHIPPERS' REPRESENTATIVES AND ORE BUYERS

ASSAYERS & CHEMISTS

DOUGLAS, ARIZ., BOX 1060 837 TWELFTH STREET EL PASO, TEX., BOX 4

Copper Ore

Trailer & Load	1980 lbs gross		R'c'd 8/2/49	
traler	500 "		Silver	90¢
	1480 " net wet		Copper	17.325¢
Moisture 1.0%	15 "			
	1465 " net dry			
	.7325 dry tons			
	PAYMENTS PER TON			
Gold....0.005 ozs	No pay			
Silver..2.1 ozs - 1.0 oz	1.1@90¢			0.99
Copper..14.64%	90% @ 17.325¢-2.5¢			39.07
				40.06
	DEDUCTIONS PER TON			
Treatment	3.50% plus 10% of excess smelter payments over $20.00 ton			5.51
		Value per ton		34.55
.7325 dry tons @ 34.55				25.31
Drayage to depot & switching to smelter .74 wet tons @ 1.85				1.37
				23.94
Less: Sampling & assaying			2.50	
10% Commission			2.39	4.89
				$19.05
Weighing trailer				0.50
		Balance due		$18.55

Douglas, Arizona 8/5/49

Mr. W. F. Brown, & Sam Magee,
San Simon, Arizona.

Willie Rose Mine,
San Simon Mng. Dct.,
Arizona.

IN ACCOUNT WITH

HAWLEY & HAWLEY

W. E. HAWLEY, MANAGER

SHIPPERS' REPRESENTATIVES AND ORE BUYERS

ASSAYERS & CHEMISTS

DOUGLAS, ARIZ., BOX 1060 — 237 TWELFTH STREET — EL PASO, TEX., BOX 4

Copper Ore

Trailer & Load	1980 lbs gross		R'c'd 8/2/49	
trailer	500 "		Silver	90¢
	1480 " net wet		Copper	17.325¢
Moisture 1.0%	15 "			
	1465 " net dry			
	.7325 dry tons			
PAYMENTS PER TON				
Gold....0.005 ozs No pay				
Silver..2.1 ozs - 1.0 oz 1.1@90¢				0.99
Copper..14.64% 90% @ 17.325¢-2.5¢				39.07
				40.06
DEDUCTIONS PER TON				
Treatment 3.50% plus 10% of excess smelter payments over $29.00 ton				5.51
	Value per ton			34.55
.7325 dry tons @ 34.55				25.31
Drayage to depot & switching to smelter .74 wet tons @ 1.8$				1.37
				23.94
Less: Sampling & assaying		2.50		
10% Commission		2.39		4.89
				$19.05
Weighing trailer				0.50
Balance due				$18.55

Douglas, Arizona, 8/13/53

Woodlief F. Brown, owner Willie Rose, California
San Simon, Ariz. Mining District, Cochise Co., Ariz

IN ACCOUNT WITH

HAWLEY & HAWLEY

W. E. HAWLEY, MANAGER

SHIPPERS REPRESENTATIVES AND ORE BUYERS

ASSAYERS AND CHEMISTS

DOUGLAS, ARIZONA, BOX 1060 — 237 TWELFTH STREET — EL PASO, TEXAS, BOX 4

COPPER ORE

Truck & load	2065 lbs gross		R'c'd 8/11/53	
Truck	550 "		Silver	90¢
	1515 " net wet		Copper	28.5¢
Moisture 1.0%	15 "			
	1500 " net dry			
	.750 dry tons			
PAYMENTS PER TON				
Gold....trace				
Silver..3.4 ozs - 0.5 oz 2.9 @ 90¢-1.5¢				2.57
Copper..26.19% - 8 lbs 95% @ 28.5¢-3.08¢				124.56
				127.13
DEDUCTIONS PER TON				
Treatment				6.50
	Value per ton			120.63
.750 dry tons @ 120.63				90.47
Drayage to depot & freight to El Paso .7575 wet tons @ 7.78				5.89
				84.58
Less: Sampling & assaying		3.50		
10% Commission		8.45		
Weighing trailer		.50		12.45
	Balance due			$72.13

Geology of the Willie Rose Mine Area

by

Floyd F. Sabins, Jr.

October 13, 1954

Geology Department
Yale University
New Haven, Conn.

see GSA Bulletin

INTRODUCTION

As shown on the enclosed U. S. Geological Survey topographic maps of the Cochise Head and Vanar Quadrangles, the Willie Rose Mine is located on a low, east-west trending ridge in Section 26, T 15 S, R 30 E. This ridge is separated from Dunn Springs Mountain to the north by the flat, gravel filled valley at the mouth of Fox Canyon. On the south side of the ridge is a similar, but wider valley formed by the mouth of Triangle Canyon which separates the ridge from San Simon Head to the south.

The mine area was mapped on a scale of one inch to 300 feet by the pace and compass method. The topographic base was enlarged from the U.S.G.S. maps and slightly modified in the field.

REGIONAL GEOLOGY

The detailed geology of the mine area may best be understood after a brief description of the geology of the northern Chiricahua Mountains. These mountains consist of a Precambrian basement complex of Pinal schist, intruded by very coarse grained Precambrian granite. A thick and varied sequence of Paleozoic and lower Cretaceous sedimentary rocks overlies the basement complex. Thrust faulting of late Cretaceous-early Tertiary age strongly deformed the entire sequence of rocks, causing local omission of great thicknesses of rock and elsewhere repetition of the sequence. Tear faults trending approximately north-south developed concurrently with the thrusting. The thrusting was followed by a period of igneous activity during which a thick cover of extrusive volcanic rocks was spread over the Chiricahuas. Before and after this volcanism, a variety of igneous rocks was intruded into the deformed rocks of the area. The

last structural disturbance of the area was the development of northwest trending normal faults which are presumably parallel to the northeast margin of the range. Movement along these faults uplifted a large block, tilted steeply to the southwest and bordered by down dropped blocks. Later erosion and valley filling modified these into the modern Chiricahua Mountains and the adjacent San Simon and Sulphur Springs valleys.

GEOLOGY OF THE MINE AREA

Sedimentary Rocks

The ridge on which the Willie Rose Mine is located consists of Permian sedimentary rocks striking east-west and dipping from 40 to 70 degrees. From oldest to youngest the formations are the Colina limestone, Scherrer quartzite and Concha limestone. The proper names Colina, etc., refer to the type localities where these particular rock units were first formally described and entered into the geological literature. In addition to the three Permian formations, a small outcrop of lower Cretaceous Glance conglomerate occurs on the south side of the east end of the ridge. The ridge is surrounded by low terrain covered with recent stream gravel deposits, mapped as Qal.

Colina limestone:

This is the oldest formation exposed along the ridge where it forms a thick outcrop belt consisting of a series of small ledges along the north slope of the ridge. The base of the Colina limestone is covered by gravel and its top is overlain by the Scherrer quartzite. The maximum thickness is 428 feet, but on the ridge the lower part of this formation is concealed. The Colina limestone

consists of thin to medium bedded, dark gray to black limestone which weathers to various shades of olive and gray. The limestone is very fine grained and non-porous. It contains a few fossil zones and some scattered very thin lenses of dark chert. No mineralization was noted in this formation.

Scherrer quartzite:

The Scherrer quartzite consists of two members, a lower red siltstone and an upper white quartzite. The very thin bedded, sandy, red siltstone member is about 30 feet thick and rests with a sharp lithologic contact on the Colina limestone. The siltstone weathers to a slope covered by reddish soil. The upper member consists of about 75 feet of very thin bedded, pure, medium grained, white quartzite which weathers reddish brown. The quartzite is massive and resistant so that it forms much of the crest of the ridge. One show of malachite was noted in this member at a prospect pit in the northeast part of the map area. It should be noted that at the Hilltop Mine, seven miles to the south, the Scherrer quartzite is the main host rock for the lead and zinc ore.

Concha limestone:

This is the youngest Paleozoic formation exposed in the Chiricahua Mountains. It forms the steep dip slope on the south side of the mine ridge and at places forms the crest of the ridge. It is resistant to weathering so that the crest and south side of the ridge have many small north-facing cliffs. The formation consists of pure, fine-grained crystalline limestone which is light pink to pale yellowish gray on a fresh surface and weathers to various shades of olive and gray. The lower part of the formation

contains much grayish pink chert in irregular nodules which stand out in relief on weathered surfaces. Numerous silicified fossils are present, frequently standing out in relief on weathered surfaces. The maximum thickness of the Concha limestone is 700 feet, but only the lower half is exposed here.

Most of the mine shafts are located on the Concha limestone outcrops and an examination of the mine dumps indicates that it is the ore-bearing formation.

Glance conglomerate:

The only exposure of this lower Cretaceous formation is in the southwest part of the map area where there is a small outcrop surrounded by gravel deposits. The conglomerate consists of rounded cobbles and boulders derived from the Paleozoic formations. These fragments are tightly cemented in a siltstone matrix. The Glance here is about 40 feet thick, but elsewhere in the Chiricahuas it is more than a thousand feet thick. No mineralization was noted in the conglomerate.

Igneous Rocks

The two distinct types of intrusive igneous rocks present are quartz monzonite porphyry and a basic rock. The location of these intrusions is controlled by the faults, showing that the intrusions are younger than the faults.

Basic igneous rock:

This rock type occurs as dikes along three faults in the eastern half of the mine area. It is a fine to medium grained, dark greenish gray rock which weathers olive green. It consists of approximately 60% white feldspar and 40% dark green ferromagnesian minerals.

o quartz is present. This rock is non-resistant and weathers to orm shallow trenches. In the absence of a microscopic study of he rock it can best be termed a diorite. No mineralization is ssociated with this basic rock.

uartz monzonite porphyry:

This rock type is confined to a single north-south trending ike at the west end of the ridge. It was intruded along a fault hich has a relative displacement of the west side toward the south. he dike cuts across all three Paleozoic formations but very little all rock alteration is present along the contact which is nearly ertical. Some malachite stains are present in prospect pits dug long the contact. The porphyry is strongly jointed and usually eathers to a rubble covered slope, but at the south end of the dike he joints are wider spaced and the porphyry weathers to small ounded knobs.

The white to pink porphyry contains about 40% phenocrysts of eldspar and quartz in a groundmass of very fine grained quartz and eldspar. The quartz phenocrysts are large clear octahedra which racture to an irregular glossy surface. The feldspar phenocrysts re elongate tabular pink crystals which cleave to form shiny surfaces. Less than 5% ferromagnesian minerals are present and are sually decomposed.

Although the relation of the porphyry to the ore deposits could not be determined from a surface study, it is known that quartz monzonite is associated with most of the major copper deposits of southeast Arizona. This association probably holds at the Willie Rose Mine, although the exposed dike may be only a small extension of a deeper seated intrusion. This supposition is based on the occurrence of several similar intrusives near the mine area.

STRUCTURAL GEOLOGY AND ORE DEPOSITS

Structurally, the mine ridge is a generally south dipping block of steeply tilted sedimentary rocks cut by northeast to northwest trending faults which dip nearly vertical. The maximum relative horizontal displacement along the faults is 280 feet. Between these larger faults are numerous parallel tears with only a few feet of displacement. The relative horizontal displacements along all the faults could have been caused by either vertical or horizontal movements or a combination of both. It is believed that the movement was predominantly horizontal and related to the large thrust faults of the region which moved from southwest to northeast. No thrusts occur along the ridge, but several superposed thrusts occur a short distance to the north on Dunn Springs Mountain.

Regardless of the type of movement along the faults, it is apparent that the faults served to localize the ore deposits. Fracturing of the rocks along the faults formed open spaces in which the ore bearing solutions emanating from igneous intrusions deposited the copper minerals. From an examination of the ore dumps at the various shafts, it appears that calcite was first deposited in the open spaces along the faults. Then the calcite was locally replaced by copper minerals. The main primary minerals observed were chalcocite and chalcopyrite. Oxidation of these minerals has produced azurite and malachite.

RECONNAISSANCE, EXAMINATION & SAMPLING

of

WILLIE ROSE MINE AREA, SURFACE AND WORKINGS

Cochise County, Arizona

January 1960

for

Mr. Woodlief F. Brown

by

HEINRICHS GEOEXPLORATION CO.
P. O. Box 5671, Tucson, Ariz.

TABLE OF CONTENTS

INTRODUCTION

During the week of January 25 through January 29, 1960 an examination and sampling program was conducted in the Willie Rose Mine and adjacent seven claim area in cluding the claims: Copper Nugget #1 and Rose #1
" " #2 " " #4
" " #3 " " #5
" " #4

The work was done at the request of Mr. Woodlief F. Brown of Abilene, Texas, in a letter dated 15 December 1959.

LOCATION AND ACCESSIBILITY

The Willie Rose Mine is located in the California Mining District, Section 26, T15S, R30E Cochise County, Arizona. The mine is approximately 11½ miles due south of San Simon, Arizona and is reached by a rough, ungraded though level road along a section line south from San Simon. Only minor work would be required to restore and maintain the present road to provide heavy duty access.

OBJECTIVES

Besides sampling, in order to obtain the most information immediately available regarding factors relating to overall economic potential of the claims, a reconnaissance magnetic geophysical survey was made. As an efficient expedient for such work, a continuous recording, total intensity, mobile unit was used.

In addition to the visible surface evidence obtained geologically and from the sampling, it was hoped that some important unseen and unknown relationships to potential ore might be revealed. Frequently, in Arizona and elsewhere, copper has been associated with so called higher temperature contact metamorphic or pyro-metasomatic effects. Such effects are very often accompanied by a concentration of magnetite mineralization which may

be readily detected with a suitable magnetometer.

Although no direct correlation between magnetite and the copper on the Willie Rose is yet known, the possibility, especially at depth, is evident. The fact that magnetic anomalies were obtained is important and a determination of their exact relationship would be a next logical step.

CONCLUSIONS

1. No relationship was established between mineralization and tertiary intrusive activity.

2. Mineralization is apparently controlled by early tertiary (laramide) fault activity and is primarily localized in associated fractures as replacement of calcite fracture fill.

3. Underground samples #1 through #6 indicate the possibility of the existance of discontinuous primary copper sulfide ore shoots along and adjacent to major faults and associated fractures.

4. The results of surface sampling are somewhat misleading as to potential grade because of some near surface leaching and oxidation. This is particularly true in the more highly fractured areas. For instance samples #7, #10 and #13 are considered to be in a relatively favorable enviornment for mineralization and it is felt that the lower grade assay results may be due to increased solution activity in these fractured areas.

5. Conclusions drawn from the magnetometer work are that there is a contact metamorphic zone along a fault that crosses the Rose #4 and Rose #1 claims. This fault zone has a dip to the west or probably southwest and because of the mineralization in the area it should be investigated or at least further considered in any future appraisal seeking economic mineralization.

6. Finally it is concluded that the area has some potential for a small to medium sized operation and that further cautious investigation is warranted.

RECOMMENDATIONS

1. An economic geologic plane table survey of the area should be made.

2. A preliminary geophysical investigation should be made to determine the possible applicability of several geophysical methods including self-potential, electro magnetics, and possibly resistivity and induced polarization. On the basis of the mobile magnetometer results a limited hand magnetometer survey may be warranted as well. Depending on the success of the preliminary investigation, detailed studies by one or more of the above methods may be indicated.

3. The following five drill holes are tentatively recommended to aid in the geologic evaluation and determination of the attitude and distribution of mineralization:

Hole #	Location	Bearing	Inclination	Total Est. depth
	100' S42°W of main shaft	N40E	- 60°	250' minimum
	235' S69°W " " "	N45°W	- 45°	150' "
	165' S66°E " " "	N58°W	- 45°	210' "
	760' S82°E " " "	N50°E	- 45°	150' "
	1550' S74°E " " "	N52°E	- 45°	275' "

Hole #1 is designed to intersect a major fault and associated structures observed in the main shaft at a depth of approximately 170 ft. below the surface.

Hole #2 is designed to intersect structure observed at sample site #7 about 100 ft. below the surface.

Hole #3 is designed to intersect a northerly trending fault east of the main shaft and continued to cut structure observed in the main shaft.

Hole #4 is designed to intersect a northwesterly trending fault and associated highly fractured ground observed at sample sites 10 and 13 at a depth of 100 ft. below the surface.

Hole #5 is designed to intersect the trend of the magnetic anomaly as observed and projected at a depth of about 150 ft. below the surface.

AREAL GEOLOGY

As reported by F. F. Sabins, Jr., 13 October 1954, the outcropping rocks, from oldest to youngest, consist of Permian Colina limestone, Scherrer Quartzite, and Concha limestone. One small outcrop of Cretaceous Glance conglomerate is reported by Sabins. The major structural pattern consists of northerly trending flat to steeply dipping laramide faults which apparently control the intrusion of Tertiary quartz monzonite porphyry at the western end of the claim group and some basic Tertiary intrusives at the eastern end.

LOCAL GEOLOGY

The mine workings and prospect pits are confined primarily to the Concha limestone. The Concha is more or less massive with bedding planes often obscure. Where observed the strike was a fairly consistent N60°W to N85°W and the dip a consistant 70° to 75° to the south. The contact of the Quartz Monzonite porphyry where observed in pits on the Copper Nugget No. 1 claim had a strike of N20°E with a near vertical dip.

Mineralization appears to be confined primarily to the Concha limestone and occurs as pods of chalcocite replacement and fracture fill, in calcite healed faults and fractures altering to malachite; as disseminated malachite in weathered goudge and bracciated zones, and as malachite stain on small fractures, joints and bedding planes.

Relationship, if any, between the Tertiary intrusive activity and the copper mineralization is obscure. Several pits immediately on the contact of the quartz monzonite porphyry with the Concha limestone were examined and sampled. No apparent relation was noted between the igneous activity and the mineralization observed. Rock on the dump at the deep shaft on Copper Nugget #3, indicates that this shaft cut the basic intrusive at some depth, probably near the bottom, but this shaft was not examined and the

basic rock showed no evidence of being mineralized.

PROCEDURE & METHODS

The main shaft and associated workings were surveyed by Brunton and tape starting from the NW corner of Copper Nugget #3 which is in common with ;the NE corner of Copper Nugget #2 and is on the southeast side line of Copper Nugget #4, 600 ft. N89° 35'E of the SW corner of said #4. A lathe marked "relocation A" was placed at the point where it is recommended this corner be moved which is 9.0 ft. S0° 25'E of the present position. This is so that the main portion of the lower drift lies in Copper Nugget #4, the main portion of the stoped area lies in Copper Nugget #2, and the shaft proper is in Copper Nugget #3. (See inset on Claim Map). The shaft was plumbed by means of a weighted chain. The total depth from collar to sill is 68.0 ft. The apparent sill is reportedly back filled muck resting in an additional 15 to 20 ft. of shaft.

Sampling was accomplished by means of single jack sledge and tungsten-carbide tipped moils. Channels were cut across apparent structure or lineation of mineralization as nearly as could be determined. Every effort was made to keep the sample representative of the area channeled both in volume of mineral to waste and in direction of channeling.

Results of Sampling and Examination

The assay results of the sampling are tabulated as follows:

Sample #	Wt of Sample lbs.	%Cu	oz. Ag	oz Au.	%Mo
1	18.0	11.92	2.4	.005	.004
2	60.0	1.74			
3.	28.0	2.17			
4.	3.5	8.68			
5.	16.0	0.70			
6.	5.5	18.30			
7.	5.0	0.98			
8.	26.0	0.08			
9.	41.0	0.14			
10.	3.0	1.29			
11	46.0	0.43			
12	3.5	0.35			
13	27.0	0.27			
14	12.0	0.15			

Spectroscope analysis by the Arizona Bureau of Mines of an essentially pure piece of chalcocite showed no zinc, gold or rare earths; silver > 25 oz per ton. This grab sample was taken from sample site #1 in the main shaft.

DESCRIPTION OF SAMPLES

In the following text the samples are classified as follows:

Class A: lineation of mineralization and/or structure and their interrelationship well defined allowing for excellent representation of the area sampled.

Class B: lineation of mineralization and/or structure fairly well to poorly defined, random mineral disseminations, questionable representation.

Class C: Relationship of sampled zone to lineation of mineralization structure obscure.

Samples #1, #4, #6 and #14 were made on the Copper Nugget #3 claim. No. 1 was taken from a zone in the back 8.0 ft. S30°E of Pt. #1, 14.5 ft. above the sill of the shaft. The channel was 4.2 ft. long actual length or approximately 2.5 ft. across structure, 18" wide and from 1" to 2" deep. Class B sample.

Sample #4 was 1.5 ft. long by 4 ft. wide across a 2" chalcocite seam located 10.0 ft. S51°W from Pt. #1. Class B. Sample.

Sample #6 was taken from a small exploration hole (drift) in the east wall of the shaft 36.5 ft. below the collar. Channel was 5.0' actual length, across structure was 3.25 ft.; width of sample 4", depth of channel 1" to 2". Class A Sample.

Sample #14 was taken from 10 ft. pit 250 ft. southeast of the main shaft. The channel is horizontal 2½ ft. in length, 6" wide by 2" deep across part of north wall of the pit 6 ft. below the collar. Bedding was obscure as is the direction of mineralization. A major fracture strikes N45°W and dips 45° northeasterly. The sample site was across a small fractured and altered

area at the intersection of a split in the major fracture. Mineralization occurs as secondary malachite replacement of calcite fracture fill. A class B sample.

Samples #2 & #3 were taken from the back of the drift on the Copper Nugget #4. Number 2 was a 4.0' channel, 15" wide across structure located 14.5' N77°W from Pt. #1. Class A sample.

Sample #5 was a channel 7.0' in length by 12" in width and 1" to 2" deep located 40.0 ft. N68°W of Pt. #1. This sample was taken primarily normal to the bedding in the lower face at the west end of the stoped area on Copper Nugget #2. The attitude of the little mineralization visible at this point was obscure and the sample must be regarded as Class C and representative only of the mineral content of the limestone face. Some good mineralization was also observable high in the back of the stope, but sampling was deemed impractical at this time, because of the delay and extra expense required in extensive staging for suitable access.

Sample #7 was taken from the west wall of a 40' shaft on Copper Nugget #2. partially filled with water, 10.5' below the collar. The channel was 20" in length and 8" in width, by 1" deep across a mineralized (malachite) shear zone dipping 50° southerly at its intersection with a fault dipping 20° southerly. Class A. sample.

Sample #8 was taken from the north wall of a 15' shaft located on Copper Nugget #1. This shaft is 32' east of a deep (40'?) shaft in the quartz monzonite porphyry intrusive at the Cochina limestone contact. This sample was a horizontal 4' channel 8" wide by 2" deep across northerly trending fractures 9' below the collar of the shaft. Secondary copper mineralization (primarily malachite) appears as narrow fracture fill. The limestone strikes N60°W and dips 70° southerly. The fractures strike approximately N10W and dip ± 80° westerly. Class A sample.

Sample #12 was taken from the north wall of an 8' shaft located just east of the west sideline of Copper Nugget #1. It was a 20" horizontal channel 6" wide by 1" deep across northerly trending fractures in limestone 2' below the collar and 18" west of the porphyry-limestone contact. The contact here strikes N20°E and is nearly vertical. The main fracture system sampled strikes N10°W and the dip is nearly vertical. Copper mineralization occurs as secondary fracture fill with only minor limestone replacement. A second fracture system which appears to strike N68°E and dips 75° northerly shows mineralization as stain on fractures. The apparent fractures may in fact be bedding planes although the limestone is somewhat massive at this location. Class B sample.

Sample #9 was taken from an 8' pit at the east end of Rose #4 claim. The channel is located 1' from the bottom of the pit on the east wall and is 3.0' in length by 6" in width by 1½" deep. Class B sample.

Sample #10 was taken from a 10.0' pit, 40.0' west of the discovery monument of Rose #5. The channel is 6.0' below the collar on the east wall and is 2.0' in length by 2½" in width and 1" to 2" deep. Class B. Sample.

Sample #13 was taken from a 12.0' pit located near the north end of Rose #5 about 75' northwest of the #10 sample site. The channel is located 7' below the collar at the west end of the pit and is 4.5' long by 4" wide by 2" deep. The indistinct bedding strikes N85°W and dips 73° southerly. The channel is horizontal across bedding and a flat dipping fracture which is from 2" to 8" wide and filled with calcite which has been partially replaced with chalcocite altering to malachite. The highly fractured limestone is highly siliceous approaching possibly a quartzite. The fracture system in this area is very complex and random in direction. The fractures are calcite healed which has been partially replaced by malachite. The main fracture system strikes N50°E and dips 70° northerly.

Sample #11 was taken from the east wall of the west pit 500' west of the east end line on the centerline of Rose #1 about 8' southwest of the location monument. The channel is a 4.0 ft. vertical channel 6" wide by 3½" deep. Mineralization occurs as malachite and possibly some cuprite fracture fill in quartzite.

GEOPHYSICAL WORK

A magnetometer record was made starting on the road north of the property and driving south and west to the mine. Anomalous areas were found to the south opposite each break or saddle in the east-west trending limestone hills with the largest anomaly noted in the western end of the Rose #4 claim. These anomalies and especially the larger one, which has a variation of nearly 400 gammas, show a westerly dip component.

The second record was made as a group of short runs around and across the property and showed no new areas of significant anomalism but did pick up extension of the anomaly found on Record #1. On the north side of the hills the profile showed a rise of some 225 gammas, still with a westerly dip, and somewhat west of a north projection of the anomaly as found on the road. This would be in the west end of the Rose #1 claim and south of Fox Canyon. About 1/8 mile south of the hills and just off the claim group the same anomaly was again picked up somewhat east of a south projection of where it was found on the road. A rough projection across these 3 points would give a strike of about N15W. The geology map of Sabins and the topography indicate a fault here, with a similar strike, and structural offset. A short ground search of the area showed some iron rich, strongly magnetic float rocks.

Two final records were made, one due south from the mine across the valley toward San Simon Head, to about the middle of Section 35, the other north across the valley in Section 26 to about the top of the section. Neither of these showed any significant anomalism.

Respectfully submitted,

E. Grover Heinrichs

E. Grover Heinrichs

Franklin A. Seward, Jr.

Franklin A. Seward, Jr.

John W. Marlatt

John W. Marlatt

HEINRICHS GEOEXPLORATION COMPANY

Approved by: Walter E. Heinrichs, Jr.

Walter E. Heinrichs, Jr.

4 February 1960
P. O. Box 5671
Tucson, Arizona

MAGNETIC SURVEY OF THE WILLIE ROSE MINE AREA COCHISE COUNTY, ARIZONA

For

Mr. Woodlief F. Brown

August - September 1967

By

Heinrichs Geoexploration Company
P. O. Box 5671 Tucson, Arizona 85703
Phone: 623-0578 Area Code: 602

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INTRODUCTION

At the request of Mr. Woodlief F. Brown of Abilene, Texas, Heinrichs Geoexploration Company conducted a detailed magnetic survey over all of the following unpatented mining claims:

The Copper Nugget No. 1, Copper Nugget No. 2, Copper Nugget No. 3, Rose No. 5, Lola No. 1, Mary Louise No. 1, Mary Louise No. 2, and the adjacent state leased land located within Sections 26 and 27, T15S, R30E, G. & S. R. B. & M., and in the vicinity of the Willie Rose Mine, California Mining District, Cochise County, Arizona, during the interim August 30, 1967 to September 7, 1967.

A total of 66,900 feet of traverse was run, all on 100 foot stations using the Brunton and chain method for horizontal ground control. The lines were 300 feet apart and oriented north-south. All north-south lines were tied to each other at the extreme south and north ends with 100 foot stations and 300 foot segments.

The magnetic readings were obtained with a Jalander vertical intensity, fluxgate type, hand held magnetometer having a sensitivity of 25 gammas. The data obtained are presented as magnetic contours overlaying a plan of the claim group.

Geoex personnel involved in the field work were H. Rene Moulinet, geophysical crew chief and Donald Berglind, helper. Report and interpretation were done by Paul A. Head, geophysicist.

CONCLUSIONS AND RECOMMENDATIONS

We base the following recommendations on "Geology of the Willie Rose Mine Area", by Sabins, our report of January 1960, and the present magnetic survey. It is apparent that the copper showings in the area are emplaced by solution along faults and fractures mainly in the limestones. Neither intrusive noted in the geologic reports seem to bear a direct relation to the copper deposits. We therefore must assume that if commercial mineralization is present, it will be in a somewhat different environment or on intrusive contacts not yet prospected.

The basic intrusives have not been shown to correlate with the magnetics and therefore, the magnetic features marked I, II, III, and IV on the contour map are very likely to be caused by magnetite concentrations along limestone-igneous contacts.

The proposed I.P. lines shown on the magnetic contour map are placed to check both the contact deposit possibility and the possibility of low grade deposits under the state leased ground. Two 500 foot dipole-dipole lines are proposed which will serve this dual purpose and the one 250 foot dipole line will check the magnetic feature on Mary Louise No. 1. Estimated cost for the I.P. work would be $1,500.00

INTERPRETATION

In 1960 Heinrichs Geoexploration Company conducted a brief reconnaissance, mobile magnetometer survey over a portion of this same area. The present work has confirmed the three rather minor anomalies found along mobile magnetometer traverse #1. The anomaly in the northwest corner of Lola #1 is located on a string of magnetic highs trending about N20°W. This trend, marked "I" on the contour map, seems to have no positive correlation to the known geology. A second, but much less distinct magnetic trend bearing about N35°E, marked "II", through Copper Nugget No. 3 and intersects the N20°W trend about 400 feet north of the Rose No. 5 centerline.

A magnetic body striking about parallel to trend "II" and about 100 feet deep on the west line of Mary Louise No. 1 marked "III", was detected on three lines.

The quartz monzonite porphyry dike extending through the west half of Copper Nugget No. 1 may correspond to the magnetic lows detected, and by extrapolation, the magnetic lows in the State Leases south of Copper Nugget No. 1, No. 2, and No. 3 may also be due to a quartz monzonite intrusion.

It is very likely that the isolated magnetic highs of trend "I" are more uniformly connected than shown. Notice that a low occurs more or less continuously to the northeast of this trend lending support to trend "I" being caused by a single magnetic body. We believe there is a possibility that trend "I" and trend "II" may be due to magnetite concentrations in limestone along the margins of an intrusive body. That we have not directly correlated the basic dikes to the magnetics also indicates that magnetic surveys may trace contact deposits fairly well in this area.

The isolated magnetic high, marked "IV" has no obvious relation to the rest of the area.

Respectfully submitted,

HEINRICHS GEOEXPLORATION COMPANY

Paul A. Head
Geophysicist

APPROVED:

Walter E. Heinrichs, Sr.
President & General Manager

September 28, 1967
Tucson, Arizona