



CONTACT INFORMATION  
Mining Records Curator  
Arizona Geological Survey  
3550 N. Central Ave, 2nd floor  
Phoenix, AZ, 85012  
602-771-1601  
<http://www.azgs.az.gov>  
[inquiries@azgs.az.gov](mailto:inquiries@azgs.az.gov)

The following file is part of the Walter E. Heinrichs, Jr. Mining Collection

#### **ACCESS STATEMENT**

These digitized collections are accessible for purposes of education and research. We have indicated what we know about copyright and rights of privacy, publicity, or trademark. Due to the nature of archival collections, we are not always able to identify this information. We are eager to hear from any rights owners, so that we may obtain accurate information. Upon request, we will remove material from public view while we address a rights issue.

#### **CONSTRAINTS STATEMENT**

The Arizona Geological Survey does not claim to control all rights for all materials in its collection. These rights include, but are not limited to: copyright, privacy rights, and cultural protection rights. The User hereby assumes all responsibility for obtaining any rights to use the material in excess of "fair use."

The Survey makes no intellectual property claims to the products created by individual authors in the manuscript collections, except when the author deeded those rights to the Survey or when those authors were employed by the State of Arizona and created intellectual products as a function of their official duties. The Survey does maintain property rights to the physical and digital representations of the works.

#### **QUALITY STATEMENT**

The Arizona Geological Survey is not responsible for the accuracy of the records, information, or opinions that may be contained in the files. The Survey collects, catalogs, and archives data on mineral properties regardless of its views of the veracity or accuracy of those data.

F  
NORTH AMERICAN MINES, INC.

QUINCY A. SHAW, PRESIDENT

HEINRICHS  
GEOEX  
GEOCHEMICAL CONSULTANTS  
TUCSON, ARIZONA



60 STATE STREET  
BOSTON, MASS. 02109

TELEPHONE  
AREA CODE 617  
523-8110

REC-7 OCT 30 1969

BOX 5671 TUCSON, ARIZONA 85703

Phone: (AREA 02) 623-0578

October 28, 1969

Mr. Walter E. Heinrichs  
Heinrichs Geoexploration Co.  
806 West Grant Road  
Tucson, Arizona 85703

Dear Walter:

I have sent you under separate cover the data on the Yellow Basin that I received from Bob Breedlove, in three separate packages as follows:

- ✓ 1. A large 4" tube containing the drill logs from diamond drill holes 1 through 14. *Recd: 10/28/69*
- ✓ 2. A smaller tube, about 2½" in diameter, containing three maps *Recd. 10/30/69*  
the geological map, the geochemical map of molybdenum, and the geochemical map on copper. *W.E.H.*
- ✓ 3. A summary of the drill holes showing the position and grade of the sections of the drill holes which Mr. Breedlove classed as open pit or comparable to the Brenda Mine.

When you are through with the above items, please return them to Bob Breedlove, c/o Arkansas Louisiana Gas Company, Shreveport, Louisiana.

I have kept copies of items 2 and 3 here in the office so that I will be able to discuss them more easily with you on the telephone. Give me a ring when you have reached some conclusions.

Regards!

Sincerely,

*Quincy*

QAS:G

HEINRICH'S GEOEXPLORATION COMPANY  
MINERAL ENGINEERING CONSULTANTS AND CONTRACTORS  
GEOPHYSICAL, GEOLOGICAL AND ECONOMIC APPRAISALS  
TUCSON, ARIZONA 85708

AREA CODE 602  
PHONE: 622-4202, 622-4241  
800-808 WEST GRANT ROAD  
MAIL: P. O. BOX 8071

WALTER E. HEINRICH, JR.  
E. GROVER HEINRICH

October 12, 1971

Mr. Q.A. Shaw, President  
North American Mines  
50 Congress Street  
Room 920  
Boston, Massachusetts 02109

Re: GEOEX Job # 624

Dear Mr. Shaw:

Enclosed is a bound set of translucent overlays and one set of blue-line copies showing the generalized interpretation and land status of the Cuprite Project. Also included is one set of magnetic profiles, the dipole-dipole induced polarization sectional data sheets, and one set of gradient array I. P. data plots. Multi-element spectrographic assay results of two samples are included which have been held for this final presentation.

Vic Verity has the assessment work affidavits and geophysical report for the Blackstone Claims. These will be filed and copies sent to you and the Waers.

Since the gradient array work was never final drafted except for the Blackstone Claim Area, I have also enclosed a set of the assessment work maps.

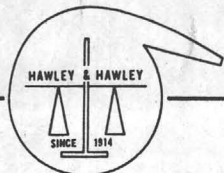
Previous letters and preliminary maps were abstracted for the final land status and interpretation maps and should pretty well complete the project. We understand that no formal report is desired at this time. Should the P.K.K. proposal be acted upon, a formal presentation may be desired by them. This can be prepared rather easily whenever requested.

We plan to initiate some specific ground work in the Aravaipa Area this week, probably consisting of picking optimum positions for reconnaissance dipole-dipole induced polarization lines.

Sincerely yours,  
Heinrichs GEOEXploration Company

*Paul A. Head*  
Paul A. Head, Geophysicist

Encl:  
PAH:dm



Registered Assayers  
OVER 50 YEARS

# HAWLEY & HAWLEY

ASSAYERS AND CHEMISTS, INC.  
BOX 50106 1700 W. GRANT RD.,  
TUCSON, ARIZONA 85703 (602) 622-4836

BRANCHES

Douglas  
Hayden  
Morenci  
Inspiration  
El Paso  
St. Louis

Job 624

IDENTIFICATION	Gold OPT	Silver OPT	Lead %	Copper %	Zinc %	Mo. %			
Report of semiquantitative spectrographic analysis									
Sample No.:	624-1			624-2					
Si-	17. %			15. %					
Fe-	3.6			16.					
Al-	5.4			1.5					
Ca-	15.			9.3					
Mg-	4.4			1.3					
Na-	1.6			nil					
Ti-	0.75			0.034					
Mn-	0.11			1.4					
Be-	ND < 0.0003								
B-	ND < 0.002								
Pb-	TR < 0.01			0.062					
Ga-	0.0026			TR 0.003					
W-	ND < 0.05								
Cu-	0.0082			1.1					
Cr-	0.0075			0.0043					
Ni-	0.0033			TR < 0.0009					
Bi-	ND < 0.001			0.031					
V-	0.018			ND < 0.002					
Cd-	ND < 0.006								
Ag-	ND < 0.001			0.0017					
Zn-	ND < 0.03			0.17					
Zr-	0.0082			ND < 0.003					
Co-	0.0052			ND < 0.001					
K-	TR < 0.20			ND < 0.20					
Sr-	0.013			ND < 0.0003					
For both samples: (cont'd)									
SB-	ND < 0.008			Mo- ND < 0.002					
As-	" " 0.05			Pt- " " 0.002					
Ba-	" " 0.10			P- " " 0.50					
Cs-	" " 0.20			Re- " " 0.005					
Cb-	" " 0.02			Ru- " " 0.01					
Ge-	" " 0.003			Rb- " " 0.20					
Au-	" " 0.001			Ta- " " 0.05					
Hf-	" " 0.05			Te- " " 0.04					
In-	" " 0.007			Tl- " " 0.10					
Li-	" " 0.02			Sn- " " 0.003					
Hg-	" " 0.09			Rare Earths Nil					

HEINRICH'S  
**GEOEX**  
Cable: GEOEX

REC'D SEP - 4 1971 REC'D

BOX 5964 TUCSON, ARIZONA 85703  
Phone: (AREA 602) 623-0578

CC: Heinrichs Teoexploration Company  
ADD: Box 5964  
CITY: Tucson, Arizona 85703

REMARKS:  
P.O. #002844

Analysis Cert. By *H. G. ...*

Preparation \$ 1.80  
Analysis \$ 40.00  
\$ 41.80

ACC: HEINRICHS GEOEXPLORATION CO. Date Spl. Received 8/20/71 Date Compl. 9/2/71 TUC 345568



VERTICAL: 1" = 500 GAMMAS  
 HORIZONTAL: 1" = 100 FEET

SCALES ON ALL LINES:

VERTICAL INTENSITY MAGNETIC TRAVERSE PROFILES  
 OF  
 CUPRITE AREA  
 FOR  
 NORTH AMERICAN MINES  
 BY  
 HEINRICHS GEODEXPLORATION COMPANY

MMY 1971

624-71

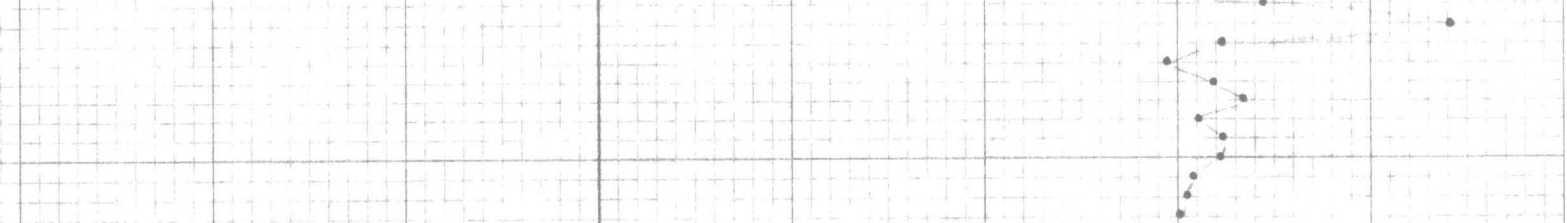
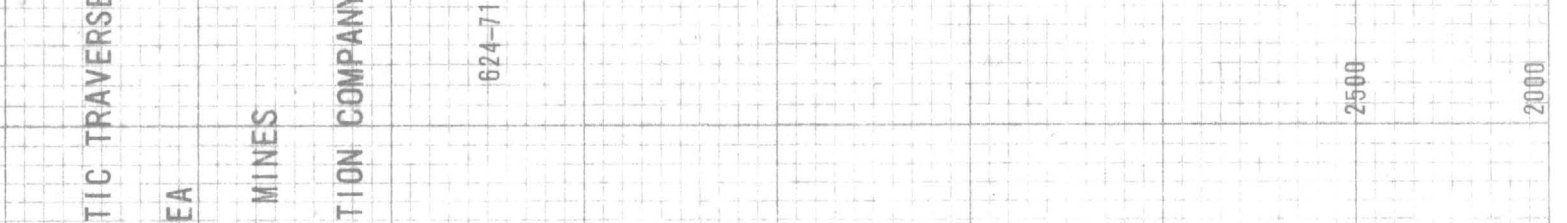
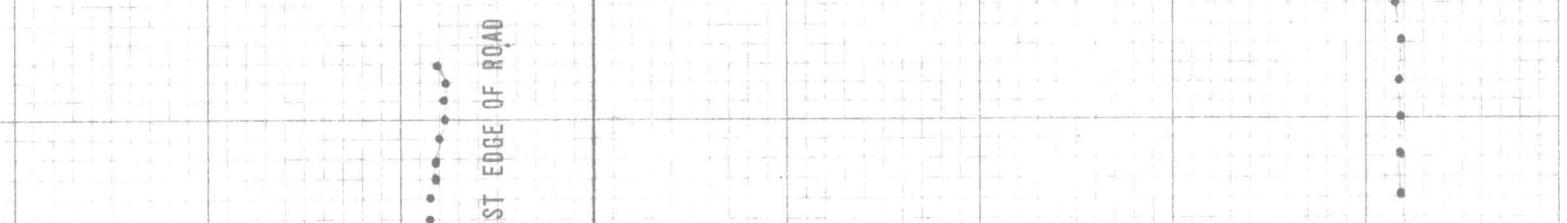
MAG LINE #1

MAG LINE #3

I.P. LINE #2

MAG LINE #2 (ON ROAD)

MAG LINE #4



4COR 17/20

4COR 17/20

4COR 17/20

4COR 17/20

BASE #1

BASE #3

BASE #1

BASE #1

BASE #1

BASE #1

BASE #1

BASE #1

BASE #1

WEST EDGE OF ROAD ON MAG LINE #1

WEST EDGE OF ROAD

WEST EDGE OF ROAD

WEST EDGE OF ROAD

WEST EDGE OF ROAD

WEST EDGE OF ROAD

WEST EDGE OF ROAD

WEST EDGE OF ROAD

WEST EDGE OF ROAD

KEIFFEL & ESSER CO.  
MADE IN U.S.A.

KEIFFEL & ESSER CO.  
MADE IN U.S.A.

KEIFFEL & ESSER CO.  
MADE IN U.S.A.

KEIFFEL & ESSER CO.  
MADE IN U.S.A.

KEIFFEL & ESSER CO.  
MADE IN U.S.A.

KEIFFEL & ESSER CO.  
MADE IN U.S.A.

KEIFFEL & ESSER CO.  
MADE IN U.S.A.

KEIFFEL & ESSER CO.  
MADE IN U.S.A.

KEIFFEL & ESSER CO.  
MADE IN U.S.A.

STANDARD CROSS SECTION  
 10 X 10 TO THE INCH

STANDARD CROSS SECTION  
 10 X 10 TO THE INCH

STANDARD CROSS SECTION  
 10 X 10 TO THE INCH

STANDARD CROSS SECTION  
 10 X 10 TO THE INCH

STANDARD CROSS SECTION  
 10 X 10 TO THE INCH

STANDARD CROSS SECTION  
 10 X 10 TO THE INCH

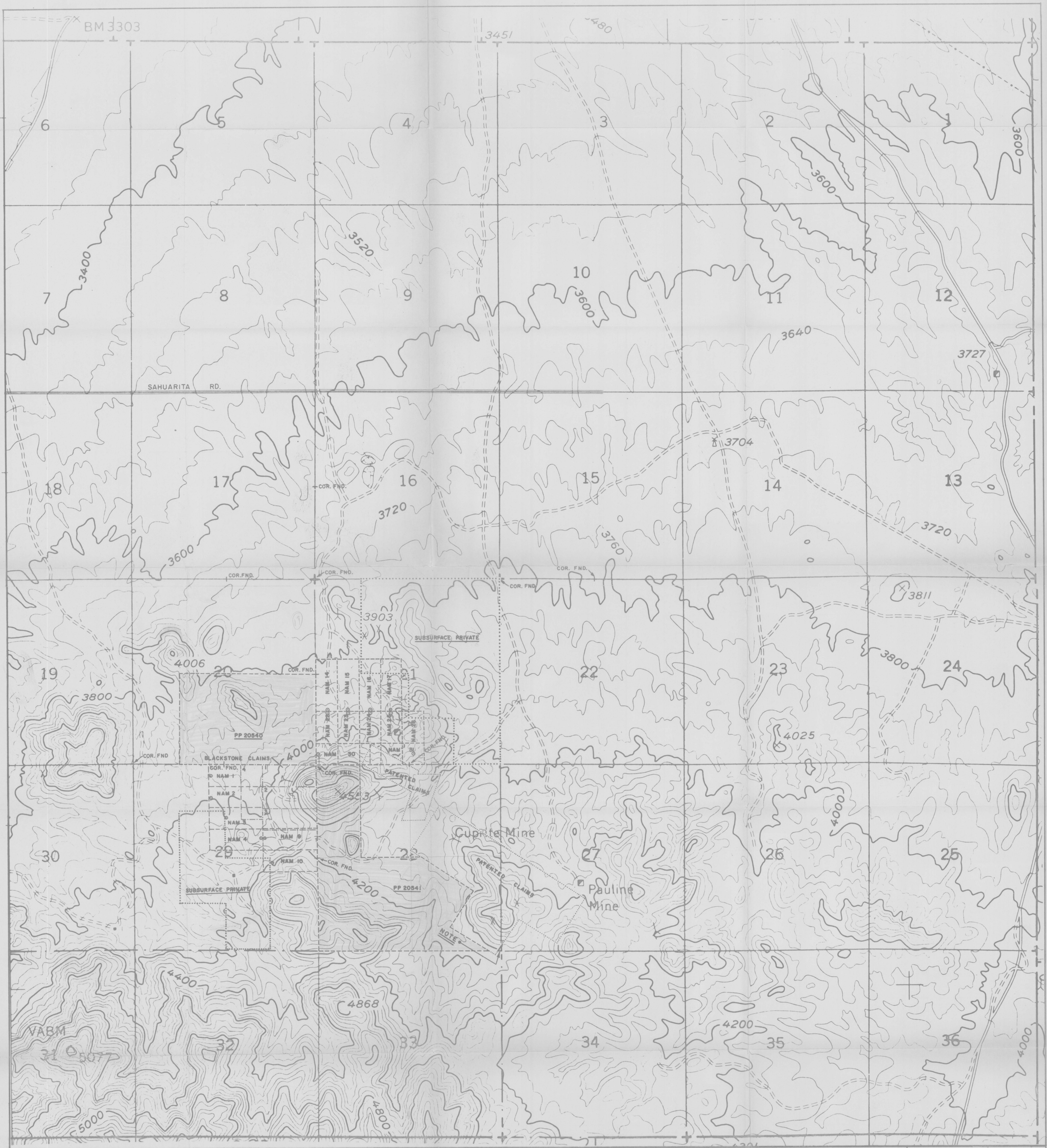
STANDARD CROSS SECTION  
 10 X 10 TO THE INCH

STANDARD CROSS SECTION  
 10 X 10 TO THE INCH

STANDARD CROSS SECTION  
 10 X 10 TO THE INCH

Handwritten notes: S-11, P-1-100, P-500





T 17 S R 16 E



- ..... OUTLINE OF AREAS OF PRIVATE SUBSURFACE RIGHTS
- OUTLINE OF NAM CLAIMS & PROSPECTING PERMITS ISSUED TO NORTH AMERICAN MINES
- OUTLINE OF BLACKSTONE CLAIM GROUP
- ..... OUTLINE OF PATENTED CLAIM GROUPS (OTHER INTERESTS)
- o LOCATION MONUMENT

HEINRICHS  
**GEOEXPLORATION COMPANY**  
 205 S. 11th St. Box 5964, Tucson, AZ 85703  
 Phone: 602/623-0578 Cable: GEOEX Tucson  
 geophysical engineers Vancouver recovery  
 624-71

**LAND STATUS & TOPOGRAPHY**  
 OF  
 CUPRITE AREA  
 PIMA COUNTY, ARIZONA  
 FOR  
 NORTH AMERICAN MINES

SCALE: 1" = 1000' DRAWN BY: JAY DOWNS DATE: AUG 1971





BM 3303

3451

480

3600

6

4

3

2

12

3727

3640

14

13

3720

18

17

16

15

3720

APPROXIMATE CONTACT OF SEDIMENTARY AND INTRUSIVE ROCKS AS BASED ON MAGNETICS.

19

20

21

22

4006

3760

3811

24

30

29

28

27

23

26

25

Cuprite Mine  
(U.S.G.S. LOCATION)

Pauline Mine

4025

4000

VABM

31

32

33

34

35

36

4400

4868

4200

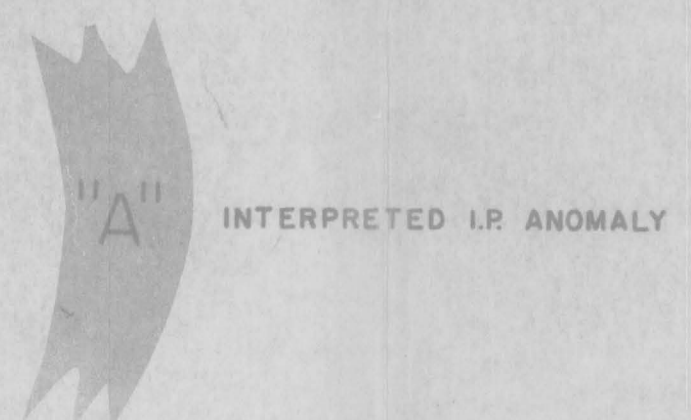
4800

T 17 S, R 16 E



- |                                    |  |
|------------------------------------|--|
| <b>Rg</b> GARDNER CANYON FORMATION | <b>Gy</b> PEDIMENT, TERRACE, & FAN GRAVELS |
| <b>PWb</b> BLACK PRINCE LIMESTONE  | <b>Thm</b> QUARTZ MONZONITE                |
| <b>Me</b> ESCABROSA LIMESTONE      | <b>Kd</b> QUARTZ DIORITE                   |
| <b>Dm</b> MARTIN FORMATION         | <b>Hg</b> GLANCE CONGLOMERATE              |
| <b>Ea</b> AMBRIGO LIMESTONE        | <b>Ha</b> APACHE CANYON FORMATION          |
| <b>cb</b> BOLSA QUARTZITE          | <b>Kw</b> WILLOW CANYON FORMATION          |
| <b>pcg</b> GRANITOID IGNEOUS ROCK  | <b>Tql</b> QUARTZ LATITE PORPHYRY          |
| <b>Q</b> RECENT ALLUVIUM           |  |

NOTE 1 — THIS IS THE LOCATION OF THE CUPRITE MINE AS REFLECTED IN THE BROWNE THESIS.



"A" INTERPRETED IR ANOMALY

HEINRICHS GEOEXPLORATION COMPANY  
 POST OFFICE BOX 8984 TUCSON, ARIZONA, 85703  
 Phone: 602/622-0374 Cable: GEOEX Tucson  
 geophysical engineers sydney 624-71

TOPOGRAPHY, GEOLOGY & GEOPHYSICAL INTERPRETATION OF  
 CUPRITE AREA  
 PIMA COUNTY, ARIZONA  
 FOR  
 NORTH AMERICAN MINES

SCALE: 1" = 1000' DRAWN BY: JAY DOWNES [DATE: AUG 1971]





+ T 17 S, R 16 E

- △ INDUCED POLARIZATION TRAVERSE LINE NO. (DIPOLE-DIPOLE)
- GROUND MAGNETICS TRAVERSE LINE NO.
- GR-30 GRADIENT ARRAY TRAVERSE LINE NO.
- ⊕ EXISTING DRILL HOLE
- + SECTION CORNER
- + 1/4 SECTION CORNER

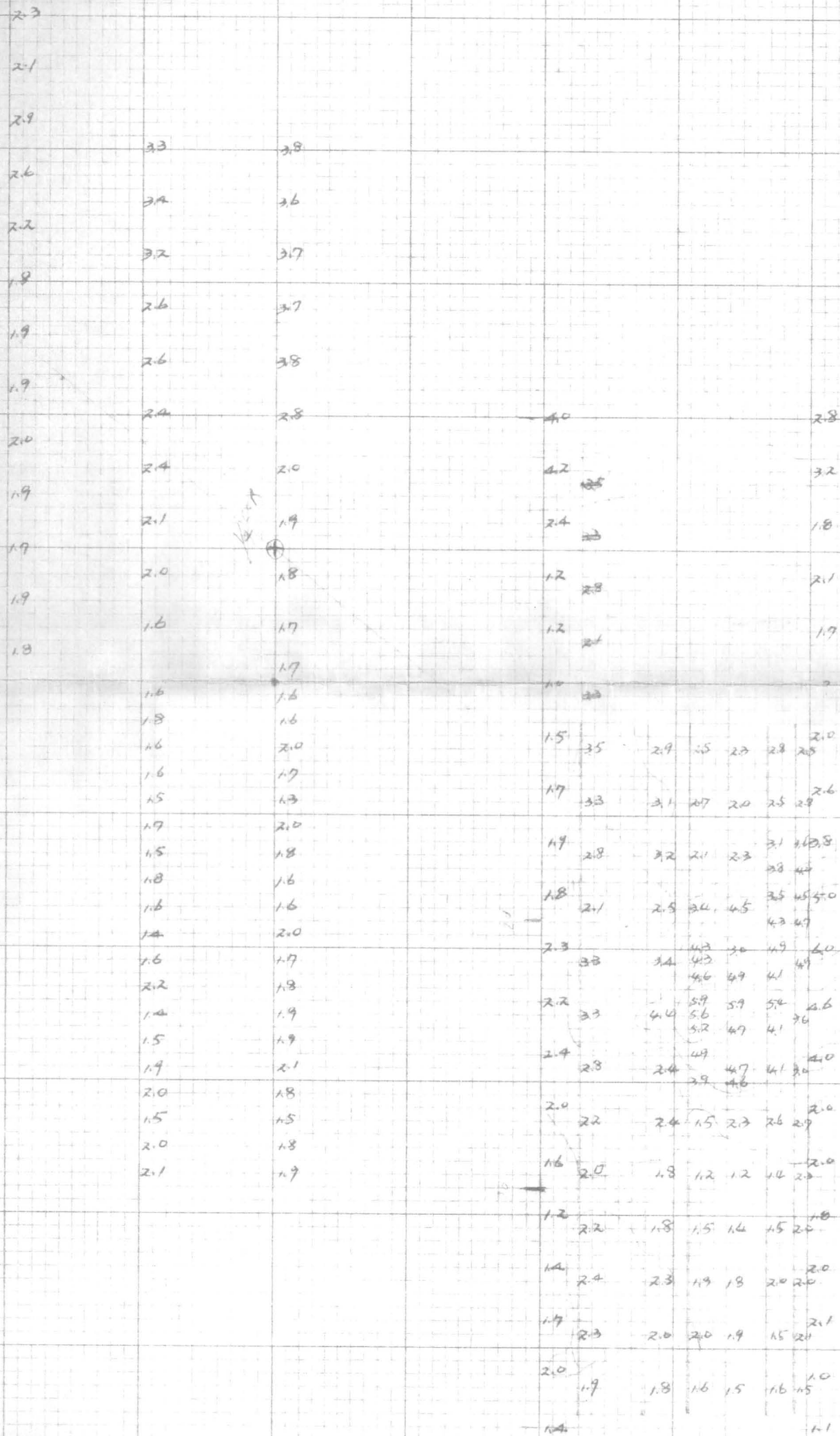


**HEINRICHS GEOEXPLORATION COMPANY**  
 POST OFFICE BOX 5284 TUCSON, ARIZONA, 85705  
 Phone: 402/423-8578 Cable: GEOEX, Tucson  
 geophysical engineers resource systems 624-71

**LOCATION PLAN OF GEOPHYSICAL WORK  
 OF  
 CUPRITE AREA  
 PIMA COUNTY, ARIZONA  
 FOR  
 NORTH AMERICAN MINES**

SCALE: 1" = 5000' DRAWN BY JAY DOWNS DATE: AUG 1971

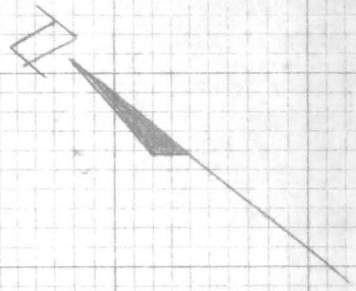




GRADIENT ARRAY LOCATION PLAN  
(SCHEMATIC)  
PERCENT FREQUENCY EFFECT  
of  
CUPRITE AREA  
PIMA COUNTY, ARIZONA  
for  
NORTH AMERICAN MINES  
by  
HEINRICHS GEEXPLORATION COMPANY

SCALE: 1" = 500' AUGUST 1971

95										
94										
90										
92	10.1	4.3								
92	12.1	15.9								
92	9.7	12.8								
99										
63	12.4	12.9								
63	7.2	11.9								
53	18.0	7.5	26.9			9.0				
58	7.5	8.0	12.7	9.8		14.8				
43	4.8	7.3	7.4	8.4		8.1				
48	6.4	5.1	4.9	10.6		6.9				
42	4.4	5.9	3.4	4.4		3.2				
46		4.9	3.6	8.8		?				
	4.8	3.3								
	3.6	5.1	4.2	8.5	11.4	12.6	18.1	15.4	13.0	6.2
	3.3	3.7								
	3.8	5.2								
	3.5	3.1	4.1	8.1	14.2	15.6	26.3	22.4	17.7	10.6
	5.2	4.2								
	2.7	3.5	5.1	10.6	18.6	13.7	20.0	24.8	20.3	3.4
	3.0	3.5						18.3	22.1	
	3.4	3.6	5.3	6.0	10.2	14.6	15.1	16.4	20.0	17.2
	3.1	4.0						14.9	15.5	
	3.5	4.4	5.9	8.8	15.8	20.8	17.8	10.5	26.5	
	3.9	4.6				18.1	24.6	23.3	8.8	21.0
	3.3	4.2	5.7	8.7	12.7	15.0	17.2	21.5	12.6	
	3.8	3.6				15.3	14.9	15.2	4.6	8.6
	3.2	3.4	6.5	7.1	8.7	14.6	13.6	9.6	7.7	15.6
	2.5	2.8				13.7	14.4			
	3.1	3.8	4.6	6.6	13.1	5.5	7.6	7.0	9.0	6.7
	6.2	3.9	5.2	4.8	5.6	4.3	4.8	4.0	5.5	6.4
	3.3	5.1								
			3.9	5.0	5.5	6.3	4.9	3.9	4.1	4.8
			4.1	4.6	6.8	4.6	5.3	3.9	4.4	5.1
			6.6	4.5	4.6	5.2	4.1	2.9	4.5	3.8
			5.4	4.0	4.9	4.4	4.3	3.9	4.3	4.9
			3.5							5.2



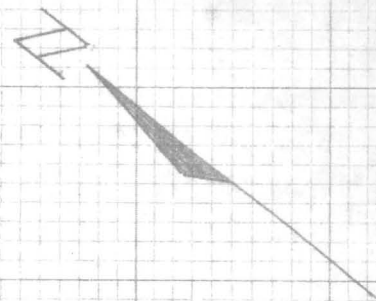
GRADIENT ARRAY LOCATION PLAN  
(SCHEMATIC)  
METALLIC CONDUCTION FACTOR  
of  
CUPRITE AREA  
PIMA COUNTY, ARIZONA  
for  
NORTH AMERICAN MINES  
by  
HEINRICHS GEOEXPLORATION COMPANY

SCALE: 1" = 500'

AUGUST 1971



305									
223									
361									
284	370	407							
239	281	227							
234	330	289							
342	209	266							
355	256	319							
347	241	294	149					312	
241	319	252	286					216	
423	476	259	325					222	
458	314	356	243					304	
393	260	289	356					526	
	367		276					?	
335	481								
505	313		353	414	254	198	128	181	322
484	540							192	
421	325		418	408	218	173	76	117	244
430	423							153	
327	477		369	265	172	153	115	125	283
556	521							190	
596	462							202	166
491	450		337	349	244	236	298	214	291
456	501							289	234
457	382		393	373	215	237	217	445	226
566	392							187	210
418	450		386	381	345	393	307	251	265
400	532							366	400
605	617		369	376	277	336	338	423	257
814	626							284	327
486	393		434	333	193	275	303	372	301
323	459							299	
636	370		307	415	321	282	268	353	313
								479	
			307	443	325	237	285	385	376
								483	
			338	520	339	440	839	515	393
								450	
			259	512	431	387	465	323	552
								477	
			374	474	368	360	346	437	211
								454	
			395						211



GRADIENT ARRAY LOCATION PLAN  
(SCHEMATIC)  
RESISTIVITY  
of  
CUPRITE AREA  
PIMA COUNTY, ARIZONA  
for  
NORTH AMERICAN MINES  
by  
HEINRICH'S GEOEXPLORATION COMPANY

SCALE: 1" = 500' AUGUST 1971