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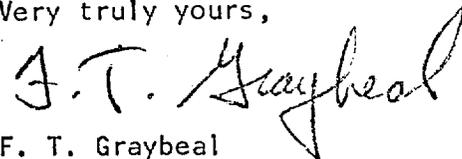
January 17, 1977

At this time I recommend a detailed drilling program to determine both continuity of the higher grade zone and variation of assays within the zone. The program is designed to expand from the area of SC-19 and 24 on a 500 ft. grid as shown on the attached map. Initially six rotary holes will be extended to bedrock to be followed by diamond drilling with two drill rigs. Two additional holes will be located based on the results of the initial work. In addition to drilling costs, payments on the Ritchey and Smith mortgages will be required in January 1977. I estimate drilling and land costs as follows:

drill 8 holes averaging 2300 ft. @ \$15.00/ft.	\$276,000
drill road; site construction	4,000
assaying, supervision, geologic studies, engineering	75,000
land payments	<u>25,000</u>
Total	\$380,000
Less current balance	<u>8,000</u>
TOTAL REQUESTED	\$372,000

With two diamond drills operating I estimate the 8 holes will be completed by early June. Additional drilling will be recommended at that time if the results of this program are favorable. If you agree with the proposed program please request a Supplemental Exploration Authorization for \$372,000. Forms 302-EA and 302-EB are attached.

Very truly yours,



F. T. Graybeal

FTG:lb

Atts: Map

Forms 302-EA & 302-EB

cc: WLKurtz - w/atts.
 WGKellogg - w/forms only
 HGKkreis - w/map only
 RBCrist - " "
 NPWhaley - " "

Santa Cruz file

January 4, 1977



Portion of personal letter to J. J. Collins passed on to J. H. Courtright by Collins' letter of December 29, 1976:

"...Grande, Ariz., about 8 miles S.W. of your Sacaton. The discovery was made by deep diamond drilling, 1500-3000 ft., following hydrothermal alteration pattern, in the seventh hole. Now 5 drills are working outlining the orebody & fill-in drilling -- unless something drastically unexpected turns up it will be a major discovery -- very large tonnage hypogene ore very much like San Manuel; a large oxidized supergene chalcocite blanket and then much exotic oxide ore in the later valley fill -- plus 250 million tons -- underground mining and water will be a problem and meeting all the E.P.A. requirements. Solvent extraction tests look good now but much work to do."



Southwestern Exploration Division

October 26, 1976

F. T. G.
OCT 29 1976

TO: F. T. Graybeal

FROM: H. G. Kreis

Santa Cruz Project
Monthly Progress Report
October 1976

During the month of October 2445' of rotary drilling and 1822' of NQ core drilling were completed on the Santa Cruz Project. The monthly advance for each hole is summarized in the following table.

OCTOBER DRILLING PROGRESS

Hole	From	To	Rotary Rig	Core Rig	Total Advance	Remarks
SC-32	310'	1298'TD	--	988'	988'	Bottomed
SC-33	1414'	2004'TD	--	590'	590'	Bottomed
SC-34	80'	2769'	2445'	244'	2689'	In Progress
Total Monthly Advance			2445'	1822'	4267'	

Assaying of SC-31 has been completed and the results are summarized.

SC-31

From	To	Rock Type	Interval	% Copper	Type of Copper
0	2952'	Conglomerate	2952'	N.A.	--
2952'	2975'	Volcanic agglom.	23'	N.A.	--
2975'	3052'	GrBx capping	77'	0.23	Cc Remnants
3052'	3323'	GrBx	271'	1.14	Cc, Cpy
3323'	3605'TD	Gr	282'	0.14	Cpy

Drill hole SC-32 was bottomed at 1298'. The results are summarized.

SC-32

From	To	Rock Type	Interval	% Copper	Type of Copper
0	255'	Conglomerate	255'	N.A.	--
255'	278'	QmpBx capping	23'	N.A.	--
278'	393'	QmpBx capping	115'	0.03	--
393'	460'	Qmp & Gr	67'	0.86	Cc
460'	520'	Gr	60'	0.37	Cc
520'	1069'	GrBx	549'	0.04	Cc
1069'	1298'TD	GrBx > QmpBx	229'	0.09	Cpy

Drill hole SC-33 was bottomed at 2004'. The results are summarized.

SC-33

From	To	Rock Type	Interval	% Copper	Type of Copper
0	1380'	Conglomerate	1380'	N.A.	--
1380'	1491'	GrBx & QmpBx capping	111'	0.05	--
1491'	1630'	GrBx & QmpBx	139'	1.14	Cc
1630'	2004'TD	Qmp	374'	0.37	Cpy

Drill hole SC-34 is at a depth of 2769' and is continuing in conglomerate. SC-34 is expected to be finished in November or early December, and the core rig will be released at that time.

The bottoming of SC-34 will be the termination point of all drilling on the Santa Cruz project for 1976. Drilling of the Peripheral Lands during 1977 will depend on the land situation. Drilling of The Lands during 1977 is expected to start in January.

On October 7, 1976, Hanna and Getty announced the discovery of 250 million tons having an average copper grade of about 1%. Hanna and Getty are continuing to drill with four core rigs and a rotary rig. They have completed the coring of N-18, -20, and -21 and rotary portion of N-26. N-22, -23, -24, and -25 are being cored and N-27 is being rotary drilled. Most of the present drilling is evaluating the N/2 NE/4 Section 24 (T6S, R4E).

Kennecott Exploration Services was observed running a ground gravity survey on the NAAC property. Homestake Mining had their Vice President of Exploration and Exploration Manager at the Francisco Grande.

The estimated balance of the authorization for The Lands is \$14,400 and the estimated balance of the authorization for Peripheral Lands is \$7,000.

H. G. Kreis
H. G. Kreis

HGK:1b

September 24, 1976

J. H. C.

SEP 27 1976

FILE MEMORANDUM

Santa Cruz Project

On Sept. 23, 1976 I met with R. Lehner of Freeport to establish future land policy, exclusive of NAAC, around which a 1977 budget might be designed. The attached memo to R. B. Crist outlines information necessary to make these decisions. In addition, Freeport wished to rank the various Peripheral land parcels northeast of the NAAC according to their priority as ore-bearing, within a cave line, and surface use which was done as follows:

	<u>mineral</u>	<u>cave line</u>	<u>surface</u>
Howard	X		
Rasch	X		
Abernathy	X		
Dunlap	X		
Transamerica Title	X	X	
El Paso	?	X	
O'Brien	?	X	
Guilmette	?	X	X
other AMOCO (sec. 4)		?	X
Sam Fox		?	X
Mormino		?	X
Polk		?	X
SPRR - county hwy.		?	X

Mr. Lehner inquired as to our drilling programs. I suggested he budget for 5 holes on Peripheral lands in case the NAAC is resolved, but failing this no drilling would be done other than as required by possible short-term options. I indicated that our drilling expenditures in The Lands would total the difference between ASARCO and Freeport expenditures -- or seven to 10 holes. He suggested using an 800 ft. grid; I noted that 800 ft. offsets in the SC-19 area failed to demonstrate continuity of grade and suggested no more than 500 ft. offsets.

Freeport may suggest metallurgical work in The Lands as soon as drilling starts. I indicated that such work would be premature as we do not as yet know the distribution and abundance of the various copper minerals, nor do we know if an ore body is present. Their suggestion to start ground water studies now may also be premature.

not-locks standard
probably - we could do more logging of the conglomerate

F. T. Graybeal
F. T. Graybeal

FTG:lb

cc: WLKurtz
RBCrist
HGKreiss



C-12700
JHE ✓

Southwestern Exploration Division

September 24, 1976

TO: R. B. Crist
FROM: F. T. Graybeal

Land Status - Peripheral Land
Santa Cruz Project

Please acquire the following information as soon as possible:

- 1) Howard - present status of offer
- 2) Rasch - status of AMOCO option at exercise date
- 3) Abernathy - current status; will they give us a first-right-of-refusal?
- 4) Dunlop - is the option with Hanna still available; if so, at what price?
- 5) O'Brien - is our offer of \$50,000 over 3 years with 3% NSR acceptable?
- 6) Transamerica Title - status of AMOCO agreement.

Please acquire the following information as soon as convenient:

- 1) Guilmette - current land status
- 2) other AMOCO land in sec. 4 - status of current options
- 3) Mormino - did Hanna extend to July 1977?
- 4) Sam Fox - availability of land
- 5) Polk - availability of land
- 6) ownership of mineral rights under S.P.R.R. and Maricopa highway

F. T. Graybeal

FTG:1b

cc: WLKurtz ✓

JHR → file

RECEIVED

Right

AUG 9 1976

W.L.K.

AUG 6 1976

EXPLORATION DEPARTMENT

Air Mail

August 4, 1976

Mr. F. T. Graybeal
ASARCO Incorporated
Tucson Office

Arizona
Santa Cruz Project

Dear Mr. Graybeal:

With reference to your memorandum of July 28, I agree that we should not consider exchanging water or other information with the Hanna group as there would be little or no advantage to us. I would say this should be our continuing policy, as they need us a lot worse than we need them.

Very truly yours,
Original Signed By
T. C. Osborne
T. C. Osborne

cc: WLKurtz

July 12, 1976

RECEIVED

JUL 12 1976

EXPLORATION DEPARTMENT

Mr. T. E. Scartaccini
Assistant Manager
Southwestern Mining Department

Dear Sir:

Santa Cruz Project
Pinal County, Arizona

The following is a report on a hypothetical underground mine in the northwest quarter of Township 6 South, Range 5 East, G&SRB&M, Pinal County, Arizona, presently known as the Santa Cruz Project. The area is easily accessible with utilities readily available. The following assumptions were made to initiate the study on information supplied by the Exploration Department:

1. The orebody would be 64,000,000 tons at a grade of 1.26% Cu.
2. This ore would be a chalcocite blanket more or less horizontal or with a very slight dip and would be between 170 and 200 feet thick. The zone bottoms at approximately 2900 feet below surface.
3. Below the chalcocite zone there would be a chalcopyrite zone possibly 120 feet in thickness assaying 0.5% Cu which would not be considered for mining at the present time.
4. The ore would be milled at the Sacaton mill at a rate of 10,000 tons per day.
5. At the present time Ag values would not be considered.

MINING PLAN

General.--Cost estimates were not detailed but are based on operating local data and proposed operations and are considered to be minimum until additional information is available. No inflation has been considered.

Shaft.--For 10,000 tons per day, one shaft would be required plus an auxiliary ventilation raise to exhaust contaminated air and also to serve as an emergency escapeway. A shaft depth of 3500 feet is proposed with a haulage level at 3300 feet depth and operating levels at 2900 feet and 2700 feet depth depending on stoping method. Completed shaft cost is estimated at \$2,000 per foot for a total of \$7,000,000. The completed mine installation with overland conveyor system to Sacaton mill would be \$30,000,000.

Stoping.--Estimates were calculated for block caving and cut and fill mining. In situ leaching was considered, but cost estimates of this type of mining are unknown. The capping of conglomerate over the hypothetical orebody would probably seal the leaching solutions from contaminating the ground water in the alluvium. However, the control of acid solutions laterally into foreign owned claims would be a problem.

From core samples and knowledge of similar rock types in the area, the chalcocite zone would cave easily and also the overlying conglomerate, but at a slower rate. However, the ore zone may lie beneath the gravels of the North Santa Cruz Wash or the main Santa Cruz River channel and, although opinions differ, this could be a large water bearing channel. If so, the hazards of block caving to surface are obvious, and the mine would be lost when the conglomerate caved to the base of the alluvium with the large inflow of water. Depending on shaft location water might also be a problem during the sinking phase through the alluvium. Fault zones in or near the orebody may be water bearing, but it is felt that these channels could be successfully grouted.

I doubt

Present block caving mining costs in the Tucson area are \$3.50 per ton, and this is considered to be minimum with a more realistic cost being \$4.50 per ton at the proposed tonnage rate. Dilution by block caving would reduce the grade to 1.01% copper. Net smelter value would be 22 cents less than quoted copper price.

*vs projected
1.70/T at
Open holes
room + pillar*

From similar block caving operations in southern Arizona the speed and exact location of where the cave will first come to surface is very difficult to predict. Both operating mines were in error on their original predictions.

Environmental problems of relocating gas line, roads, homes, etc. due to surface subsidence have not been considered, as the exact location of the orebody is unknown at this date. Depending on where the orebody is located, it may well lie in the 25-year or 100-year flood plain. The alluvium is thought to be between 300 and 800 feet in thickness, but this will have to be determined later.

For conventional cut and fill stoping, a cost of \$20.00 per ton (direct plus indirect) has been estimated with no dilution of ore grade. If a delayed system of filling could be established with a capping of cemented fill, then this cost could possibly be lowered. From the data available, cut and fill stoping would be the most appropriate method for the risks involved.

General.--Milling costs for either method would be \$2.00 per ton with an 85 percent recovery of copper.

Water temperatures underground may be 123°F, but it has been assumed that refrigerated air would not be required and normal forced ventilation would be sufficient.

Mr. T. E. Scartaccini

3

July 12, 1976

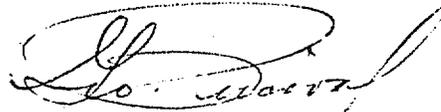
SUMMARY

Standard Tucson computer calculations for return on investment are attached for block caving at various copper prices and for cut and fill stoping at a copper price of \$1.30 and \$1.40 per pound.

Because of potential danger of water inflow, I would not recommend block caving. ✓

All of the above comments were presented and discussed with the Freeport Sulphur group and the Asarco Exploration Department at the meeting in Tucson on July 7, 1976.

Yours very truly,



George Percival

GP:ka

Attachments

cc: NVisnes, w/attachments
RBMeen, " "
TCOsborne, " "
SAAzalone, " "
WLKurtz, " "

YEAR CASH FLOW D.C.F.

1	-10000000.	-10000000
2	-10000000.	-8337827
3	-10000000.	-6951936
4	7538000.	4369329
5	7538000.	3643071
6	7538000.	3037530
7	7538000.	2532640
8	7538000.	2111671
9	7538000.	1760675
10	7538000.	1468020
11	7538000.	1224010
12	7538000.	1020558
13	7538000.	850924
14	7538000.	709485
15	7538000.	591557
16	7538000.	493230
17	7538000.	411246
18	7538000.	342890
19	7538000.	285896
20	7538000.	238375
21	7538000.	198753

64,000,000 Tons @ 1.26% Cu
 Copper recovery 85%
 Milling rate 10,000 tons per day, 356 days per year
 Mining costs \$20.00 per ton
 Milling cost \$2.00 per ton
 Development costs \$30,000,000
 Copper price \$1.40
 Net after smelting and refining \$1.18 per pound
 Depletion 15%
 Depreciation - straight line
 Taxes 50%

TOTAL 105684000. 97.

CUT AND FILL

RETURN ON INVESTMENT = 19.935 %

END OF ROI PROGRAM. HAVE A GOOD DAY, SIR.

YEAR CASH FLOW D.C.F.

1	-10000000.	-10000000
2	-10000000.	-9359887
3	-10000000.	-8760748
4	3154000.	2586268
5	3154000.	2420717
6	3154000.	2265764
7	3154000.	2120730
8	3154000.	1984979
9	3154000.	1857918
10	3154000.	1738990
11	3154000.	1627675
12	3154000.	1523486
13	3154000.	1425965
14	3154000.	1334687
15	3154000.	1249252
16	3154000.	1169286
17	3154000.	1094438
18	3154000.	1024382
19	3154000.	958810
20	3154000.	897435
21	3154000.	839989

64,000,000 tons @ 1.26% Cu diluted to 1.01% Cu
Copper recovery 85%
Milling rate 10,000 tons per day, 356 days per year
Mining costs \$20.00 per ton
Milling cost \$2.00 per ton
Development costs \$30,000,000
Copper price \$1.30
Net (smelting and refining) \$1.08 per pound
Depletion 15%
Depreciation - straight line
Taxes 50%

TOTAL 26772000. 136

CUT AND FILL

RETURN ON INVESTMENT = 6.839 %

END OF ROI PROGRAM. HAVE A GOOD DAY, SIR.

YEAR CASH FLOW D.C.F.

1 -10000000. -10000000
2 -10000000. -7780415
3 -10000000. -6053487
4 11356000. 5348522
5 11356000. 4161373
6 11356000. 3237721
7 11356000. 2519081
8 11356000. 1959950
9 11356000. 1524923
10 11356000. 1186453
11 11356000. 923110
12 11356000. 718218
13 11356000. 558803
14 11356000. 434772
15 11356000. 338271
16 11356000. 263188
17 11356000. 204771
18 11356000. 159321
19 11356000. 123958
20 11356000. 96444
21 11356000. 75038

64,000,000 Tons @ 1.26% Cu diluted to 1.01% Cu
Copper recovery 85%
Milling rate 10,000 tons per day, 356 days per year
Mining costs \$3.50 per ton
Milling cost \$2.00 per ton
Development costs \$30,000,000
Copper price 84¢
Net (smelting and refining) 62¢ per pound
Depletion 15%
Depreciation - straight line
Taxes 50%

TOTAL 174408000. 15

BLOCK CAVE

RETURN ON INVESTMENT = 28.528 %

END OF ROI PROGRAM. HAVE A GOOD DAY, SIR.

YEAR	CASH FLOW	D.C.F.	
1	-10000000.	-10000000	64,000,000 Tons @ 1.26% Cu diluted to 1.01% Cu
2	-10000000.	-8537293	Copper recovery 85%
3	-10000000.	-7288538	Milling rate 10,000 tons per day, 356 days per year
4	6445000.	4010361	Mining costs \$3.50 per ton
5	6445000.	3423763	Milling cost \$2.00 per ton
6	6445000.	2922967	Development costs \$30,000,000
7	6445000.	2495423	Copper price 70¢
8	6445000.	2130415	Net (smelting and refining) 48¢ per pound
9	6445000.	1818798	Depletion 15%
10	6445000.	1552761	Depreciation - straight line
11	6445000.	1325638	Taxes 50%
12	6445000.	1131736	
13	6445000.	966196	
14	6445000.	824870	
15	6445000.	704216	
16	6445000.	601209	
17	6445000.	513270	
18	6445000.	438194	
19	6445000.	374099	
20	6445000.	319379	
21	6445000.	272663	

TOTAL 86010000. 127

BLOCK CAVE

RETURN ON INVESTMENT = 17.133 %

END OF ROI PROGRAM. HAVE A GOOD DAY, SIR.

*

YEAR CASH FLOW D.C.F.

1	-10000000.	-10000000
2	-10000000.	-8284789
3	-10000000.	-6863773
4	7851000.	4464465
5	7851000.	3698715
6	7851000.	3064307
7	7851000.	2538714
8	7851000.	2103271
9	7851000.	1742516
10	7851000.	1443638
11	7851000.	1196023
12	7851000.	990880
13	7851000.	820923
14	7851000.	680118
15	7851000.	563463
16	7851000.	466817
17	7851000.	386748
18	7851000.	320413
19	7851000.	265455
20	7851000.	219924
21	7851000.	182202

64,000,000 Tons @ 1.26% Cu diluted to 1.01% Cu
Copper recovery 85%
Milling rate 10,000 tons per day, 356 days per year
Mining costs \$3.50 per ton
Milling cost \$2.00 per ton
Development costs \$30,000,000
Copper price 74¢
Net (smelting and refining) 52¢ per pound
Depletion 15%
Depreciation - straight line
Taxes 50%

TOTAL 111318000. 30

BLOCK CAVE

RETURN ON INVESTMENT = 20.703 %

END OF ROI PROGRAM. HAVE A GOOD DAY, SIR.

July 7, 1976

J. H. C.

JUL 8 1976

SANTA CRUZ

Meeting with Freeport at Tucson Office

The following was agreed upon:

- 1) All in favor of acquiring the NAAC -- possible approaches to be discussed tomorrow with the lawyers.
- 2) Additional drilling west and north of SC-23, 29, 30 not necessary at this time (i.e., not necessary for the NAAC decision).
- 3) Drill one hole immediately in the southwest corner of the Matthewman ground.
- 4) R. Crist will present Howards a proposal
\$15,000 down upset \$150,000 3-4% NSR
payout over 12-15 years at 7-8% interest.
- 5) R. Crist will contact and present Sam Fox estate a "Newmont-Type" option.
- 6) R. Lehner and F. Graybeal (upon conclusion of 3, 4, 5) determine if a hole along the west side of Howard boundary necessary.
- 7) Two weeks deadline on Greisbach option.
- 8) If no more drilling than 3 and 6 above, then after Collins anniversary (Oct. '76) Asarco will consider a drill program in Oxide area.
- 9) Copy of drill contracts to Freeport.

W. L. Kurtz

WLK:lb

cc: TCOsborne
JHCourtright 
RBCrist
HGKreiss
FTGraybeal

June 1, 1976

TO: F. T. Graybeal

FROM: H. G. Kreis

Santa Cruz Project
 Monthly Progress Report
May 1976

During the month of May 925' of rotary drilling and 1125' of NQ core drilling were accomplished. The advance for each hole is summarized in the following table. Core drilling in SC-29 was completed, and core drilling will continue through the following month and as long as necessary to complete SC-26, -27, -28, and -30.

MAY DRILLING PROGRESS

Hole	From	To	Rotary Rig	Core Rig	Total Advance	Notes
SC-28	1666'	2591'	925'	0'	925'	Bottom of casing
SC-29	2525'	3385' T.D.	0	860	860	Bottomed
SC-30	2805'	3070'	0	265	265	In Progress
Total Monthly Advance					2050'	

During the month SC-28 was bottomed at a depth of 2591' in conglomerate. This hole will be cored following the completion of SC-30.

Drill hole SC-30 continued in ferruginously cemented capping conglomerate to a depth of 2832'. From 2832' to 2834' was volcanic agglomerate, and from 2834' to 2875' was leached, sericite altered granite capping. From 2875' to 2989' were sericite altered granite and granite breccia with estimated ore grade copper in the form of secondary chalcocite enrichment. Below a strong fault at 2989' and down to a present depth of 3070' was quartz monzonite porphyry with alteration and primary mineralization (estimated at less than 0.2% copper), the same as in the bottom of SC-18, -19, and -21. SC-30 is expected to be bottomed shortly.

SC-29 was bottomed at a depth of 3385' and the results are summarized:

From	To	Rock Type	Interval	% Copper	Type of Copper
0'	2440'	Conglomerate	2440'	N.A.	----
2440'	2618'	Capping congl.	178'	N.A.	----
2618'	2626'	GrBx capping	8'	1.28	CuOx and Native
2626'	2702'	Gr & Qmp	76'	0.94	Cc
2702'	2798'	Gr	96'	0.56	Cc, Cpy
2798'	3219'	GrBx >> QmpBx	421'	0.47	Cpy (Loc.Cc)
3219'	3385' T.D.	Qmp	166'	0.63	Cpy
Or2626	3385 T.D.	Gr&GrBx&Qmp	759'	0.56	Cpy, Cc

SC-30 2875 - 114' 2.03 cc.

The Hanna-Getty joint venture moved their core rigs from N-12 and N-13 to N-14 and N-16. The rotary rig moved to N-17, located approximately 300' southeast of SC-25.

The estimated balance of the authorization for The Lands is \$28,000, and the estimated balance of the authorization for Peripheral Lands is \$105,000.

H. G. Kreis

H. G. Kreis

HGK:1b



January 30, 1976

JHC
J. H. C.

FEB 2 1976

Memorandum for T. C. Osborne

Santa Cruz
Arizona

On January 29, 1976, Mr. Graybeal and I met at Freeport's Reno office with Messrs. Cook, Flint, Karras, Buckner, and Cornelius. Though a difference of opinion on when to initiate drilling exists, there is little difference of opinion on number and location of drill holes needed on "The Lands" and on "Peripheral Lands".

The following was agreed upon:

1. Purchase Dunlap's option now.
2. Drill ^{one} hole on "The Lands" east of SC-16 near the National Exhibition Company (San Francisco Giants) to evaluate the desirability of acquiring this land. Drilling to commence in the second quarter.
3. Contact El Paso Natural Gas to determine time schedule and dollars relative to moving the pipeline.
4. Mr. Osborne and/or Mr. Hecox communicate directly with Mr. Cook (Freeport Reno telephone #702-323-2251) concerning status of NAAC negotiations.
5. T. D'Ambrosio offer to purchase Mormino's option with Newmont to learn terms of option.
6. Asarco drill a minimum of five holes on "Peripheral Lands". Drilling to commence after the anniversary date of the Mormino option unless data from 3, 4, 5 above indicate necessity of an earlier starting date. Encouraging drill results would lead to additional drilling.
7. D. Cook will send letter to Collins Trust (draft read by Graybeal and Kurtz).
8. Should Asarco's drilling and related expenses not aggregate \$300,000 on the "Peripheral Lands", Asarco will seriously consider drilling two or more holes in the oxide zone on "The Lands" (drilling to start after anniversary of Collin's option).
9. Freeport, specifically K. Cornelius, will be consulted prior to spudding any hole.

January 30, 1976

10. Asarco will provide Freeport with key to core shed.

Not considering any land payments, the estimated cost for the minimum program is estimated at:

"The Lands" (1 rotary hole, spot core)	\$40,000	Asarco account
"Peripheral Lands" (5 holes)	\$240,000	(\$120,000 Asarco's share)


W. L. Kurtz

WLK:lb

cc: D. Cook, Freeport-Reno
K. Cornelius, Freeport-Tucson
FT Graybeal
RBCrist

ASARCO

~~97 16~~

~~FIG-303~~
~~ABC~~
Southwest Exploration Division

J. H. C.
DEC 18 1975

December 1, 1975

An interesting summation — without looking up my notes I think this 175 million tons is what Crist and I projected prior to the current drilling program.

TO: W. L. Kurtz

FROM: H. G. Kreis

Santa Cruz Possible
Geologic Copper Reserves

Enclosed for your information is an estimation of the possible geologic copper reserves in the copper oxide area of the Santa Cruz Project. The lack of sufficient drill hole information precludes a more detailed study at this time.

H. G. Kreis
H. G. Kreis

HGK:lb
Enc.



December 1, 1975

FILE MEMORANDUM

Santa Cruz Possible
Geologic Copper Reserves

The possible geologic copper reserves in the Santa Cruz copper oxide area are presented in the following tabulations. The three copper horizons (upper, intermediate, and lower) are separated by very low grade (0.03% to 0.2% total copper) capping. The intervening low grade material between the copper horizons is excluded in all the tabulations except for the last chart where it is included for potential bulk mining consideration. Potential copper reserves exist in a 300' to 800' wide strip along the west, south, and east sides of the possible reserves and are not considered in this evaluation.

The possible geologic reserves as summarized in the following tables and plan map are subject to the following qualifications.

- a) Projections and interpretations of widely spaced drill holes.
- b) No mine plan considerations whatsoever.
- c) A geologic cutoff grade of approximately 0.3% total copper.
- d) A minimum copper intercept thickness of 50'.
- e) Exclusion of copper intercepts of unusual occurrence.
- f) Variable continuity of grade and thickness within each copper horizon.
- g) Rotary cuttings and lack of depth penetration in SC-16.
- h) 12.5 cubic feet per ton.

ASARCO-FREEPORT POSSIBLE GEOLOGIC COPPER RESERVES

Copper Horizon	Polygon (Hole)	Area (ft ² x10 ⁴)	Depth of Interval		Thickness	Tons (mm)	Copper Grade (%)	Copper Form
			From	To				
Upper	SC-19	114.0	1193	1320	127	11.6	0.84	CuOx
	SC-24	171.7	1180	1280	100	13.7	0.51	CuOx
Subtotal		285.7			111	25.3	0.66	CuOx
Intermediate	SC-18	183.3	1670	1790	120	17.6	0.71	CuOx
	SC-19	114.0	1620	1770	150	13.7	2.98	CuOx
	SC-24	171.7	1550	1660	110	15.1	1.10	CuOx
	SC-24	171.7	1740	1820	80	11.0	0.73	CuOx
	SC-16	104.5	1500	1650	150	12.5	1.19	CuOx
	SC-24 So.	98.5	—	—	190	15.0	0.94	CuOx
Subtotal		843.7			126	84.9	1.26	CuOx
Lower	SC-18	183.3	2160*	2225*	65*	9.5	0.65*	CuOx
	SC-19	114.0	2160	2220	60	5.5	0.72	CuOx
	SC-19	114.0	2360	2440	80	7.3	0.58	Cc
	SC-24	171.7	2220	2420	200	27.5	0.58	Cc
	SC-24 So.	98.5	2220	2420	200	15.8	0.58	Cc
Subtotal		681.5			120	65.6	0.60	Cc>CuOx
Total		1810.9			121	175.8	0.93	CuOx>Cc

*Av. of SC-14's 90' @ 0.76% and SC-18's 40' @ 0.41%.

NEWMONT AND PARTNERS POSSIBLE GEOLOGIC COPPER RESERVES

Copper Horizon	Polygon (Hole)	Area (ft ² x10 ⁴)	Depth of Interval		Thickness	Tons (mm)	Copper Grade (%)	Copper Form
			From	To				
Intermediate	N-7*	123.0	—	—	190*	18.7	0.94*	CuOx
Lower	N-7*	123.0	—	—	200*	19.7	0.58*	Cc
Total	N-7				195	38.4	0.76	CuOx&Cc

*Thickness and grade from SC-24.

TOTAL ASARCO-FREEPORT AND NEWMONT-PARTNERS POSSIBLE GEOLOGIC COPPER RESERVES

	Tons (mm)	Grade (% Cu)
Asarco-Freeport	175.8	0.93
Newmont-Partners	38.4	0.76
Total	214.2	0.90

not sure I'd include the
 upper section — of can we
 mine the lower section probably
 leave this upper part.

ASARCO-FREEPORT POSSIBLE GEOLOGIC RESERVES
 FOR POTENTIAL BULK MINING CONSIDERATION

Polygon (Hole)	Area (ft ² x 10 ⁴)	Depth of Interval		Thickness	Tons (mm)	Copper Grade (%)	Copper Form
		From	To				
SC-18	183.3	1670	1790	120	17.6	0.71	CuOx
SC-19	114.0	1193	1770	577 150'	52.6	1.10	CuOx
SC-24	171.7	1550	1820	270	37.1	0.69	CuOx
SC-16	104.5	1500	1650	150	12.5	1.19	CuOx
SC-24 So.	98.5	1550	1820	270	21.3	0.69	CuOx
	672.0			263	141.1*	0.89*	CuOx

*Important Note: 46% of total pounds of copper are in the SC-19 polygon.
 SC-19 is very anomalous in both thickness and grade.

H. G. Kreis
 H. G. Kreis

HGK:1b

Att.

July 30, 1975

TO: W. L. Kurtz

FROM: H. G. Kreis

Santa Cruz Project
Monthly Progress Report
July 1975

On July 1, 1975, Asarco's last drill rig left the project and on July 2 Newmont's rig left the area. There has been no Asarco or Newmont drilling or field activity since then. Both companies, however, are actively competing for Desert Carmel and land north of Desert Carmel.

Recent assay intervals of interest are: SC-18, 1560' to 1790', 230' at 0.97% copper as chrysocolla and minor atacamite in granite and volcanic agglomerate; and SC-24, 2220' to 2420', 200' at 0.58% copper as chalcocite in granite with 50% total oxidation and leaching. Copper and molybdenum composite assaying is in progress at this time. All but approximately 1700' of core shall have been split and assayed by next week. As requested, the remaining 1700' of core shall not be split and assayed at this time.

A short geologic report will be issued next month following the completion of assaying. The geologic conclusions will be along the lines we have discussed during the last few months. The following paragraphs summarize these conclusions.

The Santa Cruz copper oxide deposit is interpreted to be an oxidized chalcocite enrichment blanket faulted off on the northeast and southeast sides. SC-23, a step-out hole between Santa Cruz and Sacaton drilled through an intact but fault thinned chalcocite enrichment blanket of unknown extent.

The Santa Cruz copper oxide deposit and the chalcocite blanket in SC-23 are part of a large buried sulfide system. The extent of the system is only partially defined with the Santa Cruz horst on the southwest, SC-2 just to the north, and the Sacaton barren basement complex on the northeast. The southeast side is completely open. The Santa Cruz sulfide system is believed to be 12,000 to 20,000' long and at least 2,500' wide.

Geologic studies to date suggest a low total sulfide system (2-3% average by volume) hosted by Precambrian granite with small Laramide quartz monzonite porphyry intrusives. The stronger primary copper mineralization appears to have been distributed within 2000' of a large quartz monzonite porphyry mass (intercepted in SC-14, -16, -18, -19, and -21). In the portions of the sulfide system explored to date, the highest primary grades are estimated to have been about 0.5-0.6% copper.

July 30, 1975

Multiple cyclic enrichment has produced and destroyed chalcocite enrichment blankets. In SC-23 and at Sacaton these enrichment blankets remain. Chalcocite blankets in the Santa Cruz horst block, containing a high chalcocite to pyrite ratio, were oxidized without significant leaching to form copper oxide deposits. The enrichment blankets have been offset by horst-graben faulting and more recent low angle (flat) faulting. Sacaton appears to have been faulted from an unknown position within the Santa Cruz sulfide system.

The results of the 1974-75 drilling program are encouraging and more drilling is needed in the Santa Cruz horst block between SC-16, -18, and -19, in the SC-23 area, between SC-23 and Sacaton, and in the area south and east of SC-16 (sections 17 and 19). Testing of the latter three areas would require additional land acquisition. Exploration in these three areas is enhanced by the potential for chalcocite mineralization rather than copper oxide mineralization.

H. G. Kreis
H. G. Kreis

HGK:1b

JHC

ASARCO Incorporated
Tucson Arizona

July 29, 1975

Mr. T. C. Osborne
Assistant Director of Exploration
New York Office

Supplemental Exploration
Authorization Request
for "Peripheral Lands"
Santa Cruz Project
Pinal County, Arizona
(Freeport Joint Venture)

Dear Sir:

With the approval of Freeport Minerals we drilled hole SC-23 outside the original area of joint-venture interest. As you are well aware, this hole intersected, between 2430 feet and 2650 feet, 220 feet of a typical porphyry copper secondarily enriched chalcocite zone averaging 1.27% copper. This is the first drill hole within the entire Santa Cruz area where the secondarily enriched zone has not been destroyed, or partially destroyed, by post chalcocite oxidation. This enhances the exploration chances for finding a deposit of mineable size and grade. Additional drilling is required. At the present time, however, it is recommended to defer this drilling and continue the land acquisition program.

Since completion of hole SC-23 on May 19, 1975, we have acquired one additional 70-acre parcel of land and spent much time, effort, and money attempting to acquire additional land. It now seems appropriate to obtain a formal authorization to cover these expenses.

Costs incurred to date: Peripheral Lands

Mansabach Option (3/19/75)	\$ 12,800*
Waldron (Sweetow) outright purchase (6/2/75)	75,400**
Legal fees, Title Company, Land Agents	10,000
Asarco personnel time, expenses	<u>4,800</u>
	\$103,000
Asarco's 1/2	\$ 51,500

*Option \$50,400 payable at \$5,000 per year plus 7-1/2% interest on unpaid balance

**Outright purchase subject to mortgage of \$14,259.37 + interest payable at \$240 per month thru 11/81

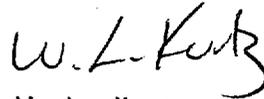
July 29, 1975

We are trying to negotiate options on the Matthewman (\$15,000 down payment, \$120,000 upset) and Transamerica (\$15,000 down payment, \$100,000 upset) lands and are continuing study of the NAAC lands. We are experiencing keen competition from our competitors.

I now request \$51,500 for Asarco's half of costs incurred to date plus \$10,500 for Asarco's half of continuing land and legal work. If you approve, please request a Supplemental Exploration Authorization in the amount of \$62,000. Forms 302-EA and 302-EB are attached.

A separate Supplemental Exploration Authorization Request for "the lands" as originally described in the Freeport Joint Venture letter of agreement accompanies this request.

Respectfully submitted,



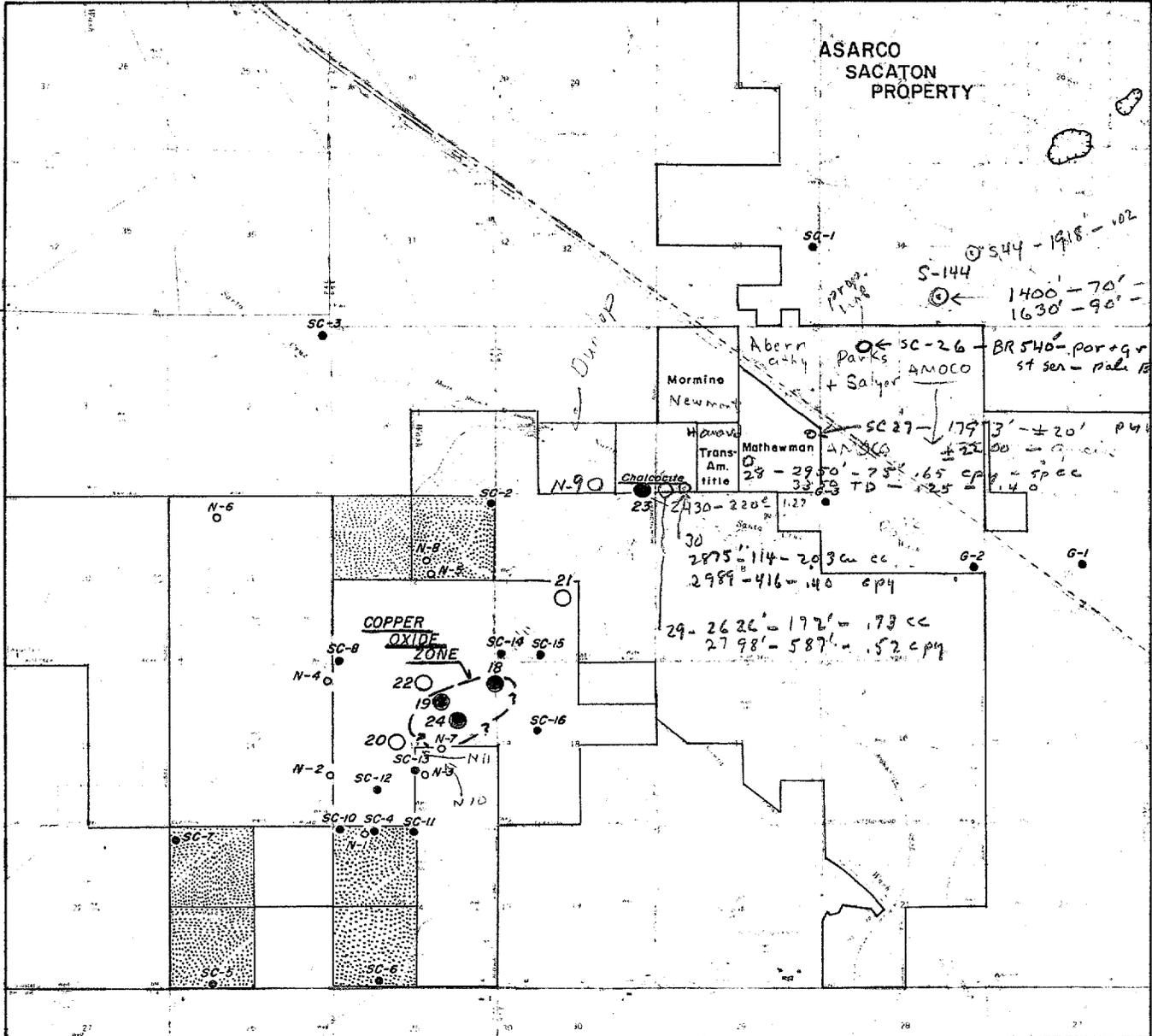
W. L. Kurtz

WLK:1b

Atts: Map & Forms as noted

cc: JHCourtright - w/atts. ✓
RBCrist - w/o atts.
HGKkreis - w/o atts.
WGKeillogg - w/forms only

R. 4 E. R. 5 E.



R. 4 E. R. 5 E.

Base from USGS Casa Grande West & Stanfield 7.5' Quads.

EXPLANATION

- ASARCO-FREEPORT
- Newmont Federal Lode Claims
- NEWMONT
- Newmont Federal Lode Claims
- NAAC

ASSAY DATA KEY

depth-length - % Cu
1620'-150'-2.92

- PREVIOUS ASARCO DRILL HOLES
- RECENT ASARCO DRILL HOLES
- NEWMONT DRILL HOLES

SIGNIFICANT INTERCEPTS

SC-18	1670'-120'-0.71 ox (2513' T.D.)
SC-19	1193'-127'-0.84 ox 1620'-150'-2.98 ox (2826' T.D.)
SC-20	(2423' T.D.)
SC-21	(2969' T.D.)
SC-22	(2326' T.D.)
SC-23	2430'-220'-1.27 sulf (2671' T.D.)
SC-24	1180'-100'-0.51 ox 1550'-110'-1.10 ox (2441' T.D.)

TO ACCOMPANY *Supplemental*
Explanation
 DATED *July 29, 1975*
 BY *W. D. [Signature]*



DRILLING PROGRESS

for the 2nd quarter of 1975

SANTA CRUZ PROJECT

(ASARCO-FREEPORT JOINT VENTURE)

Pinal County, Arizona

SCALE 1" = 1 mile

H.G.K

June-1975

APPLICATION FOR SUPPLEMENTAL EXPLORATION AUTHORIZATION

..... July 29, 1975 ..

Originating Office ... SWED. - Tucson

Application is hereby made for supplemental Authorization to cover cost, in excess of original estimate, of work authorized by New York.

SANTA CRUZ PROJECT
No. 0075-00 ... Pinal County, Arizona

Present total Estimated Cost (Form 302-EA attached)	(Asarco's share - this authorization request only)	\$ 62,000...
Amount previously authorized (date.....)		\$
Balance for which Authorization is now requested		\$ 62,000...

ADDITIONAL WORK CONTEMPLATED:

Make land option payments and outright purchase payments.

Continue negotiations for additional land.

EXPLANATION OF INCREASED COST:

The secondarily enriched copper zone intersected in drill hole SC-23 warrants an aggressive land acquisition program.

Reviewed by <i>[Signature]</i>	Approved by
Acct. Mgr. or Chief Acct.	Vice President
Recommended by <i>[Signature]</i>	Approved by
Supervisor	Comptroller

Account Chargeable to
To be designated by Comptroller

Approved by Advisory Committee	Approved by Board of Directors
..... 19 19

Secretary

PROSPECT SANTA CRUZ PROJECT
 LOCATION Pinal County, Arizona

COST ESTIMATE, MINERAL EXPLORATION

OFFICE SWED - Tucson
W. L. Kurtz

No.	Type of Work	Salaries/Wages		Material	Fees Rent. Services	Traveling	Taxes	Other	Total Estimate Cost
		Days	Amount						
501	Outright Purchase				16,000			75,400	91,400
502	Option Payments				15,000			12,800	27,800
503	Bonus Payments								
504	Minimum Royalties- Deductible from Future Production								
505	Minimum Royalties-Not Deductible from Future Production								
506	Rental Payments								
507	Staking Claims								
511	Surface Excavating								
512	Underground "								
521	Surface Drilling								
522	Underground "								
530	Geologic								
540	Sampling, Assaying, Lab.								
550	Geophysics								
560	Geochem								
570	Engineering								
580	Construction (temp.)								
590	Construction (perm.)								
610	Administration, Field Offices and Camps								
620	Administration, General		4,000			800			4,800
641	Autos and Vehicles								
642	Aircraft and Boats								
650	Partner's Share		2,000		15,500	400		44,100	62,000
	ASARCO'S SHARE		2,000		15,500	400		44,100	62,000
661	Commission or Fees								
663	Exchange								
			4,000		31,000	800		88,200	124,000

ASARCO Incorporated
Tucson Arizona

JHC
J. H. C.
AUG 19 1975

July 29, 1975

Mr. T. C. Osborne
Assistant Director of Exploration
New York Office

Supplemental Exploration
Authorization Request
for "Original Lands"
Santa Cruz Project
Pinal County, Arizona
(Freeport Joint Venture)

Dear Sir:

We have completed our initial \$350,000 commitment on "the lands" described in the Asarco-Freeport joint venture letter agreement. Our drilling on these lands has defined an area of oxide copper mineralization lying 1600 feet beneath the surface. Based on four drill holes (SC-22 barren; SC-19 150' @ 2.92% Cu; SC-24 110' @ 1.1% Cu; SC-18 120' @ 0.71% Cu), the potential of the copper oxide zone is believed to be between 15 and 40 million tons grading plus one percent copper. Additional drilling will be recommended next year.

Our agreement with Freeport requires us to pay one half the mortgage, interest, and taxes on the NAAC purchase. Our half of the mortgage and interest due August 1, 1975 is \$8,100 and our half of the taxes is estimated at \$3,000. Asarco's one half of remaining mortgage and interest payments is tabulated below.

1/15/76	\$25,987.50
8/1/76	7,858.50
1/15/77	24,715.39
8/1/77	7,680.00
1/15/78	23,443.27
8/1/78	7,260.00
1/15/79	22,671.15
8/1/79	6,840.00
1/15/80	20,899.04
8/1/80	6,420.00
1/15/81	8,376.93
1/15/82	7,892.31
1/15/83	7,407.65

Mr. T. C. Osborne

- 2 -

July 29, 1975

I request \$8,100 for land payment, \$3,000 for taxes, and \$5,900 for project expenses thru December 31, 1975. If you approve, please request a Supplemental Exploration Authorization in the amount of \$17,000. Forms 302-EA and 302-EB are attached.

A separate Supplemental Exploration Authorization Request for the "peripheral lands" accompanies this request.

Respectfully submitted,

W. L. Kurtz

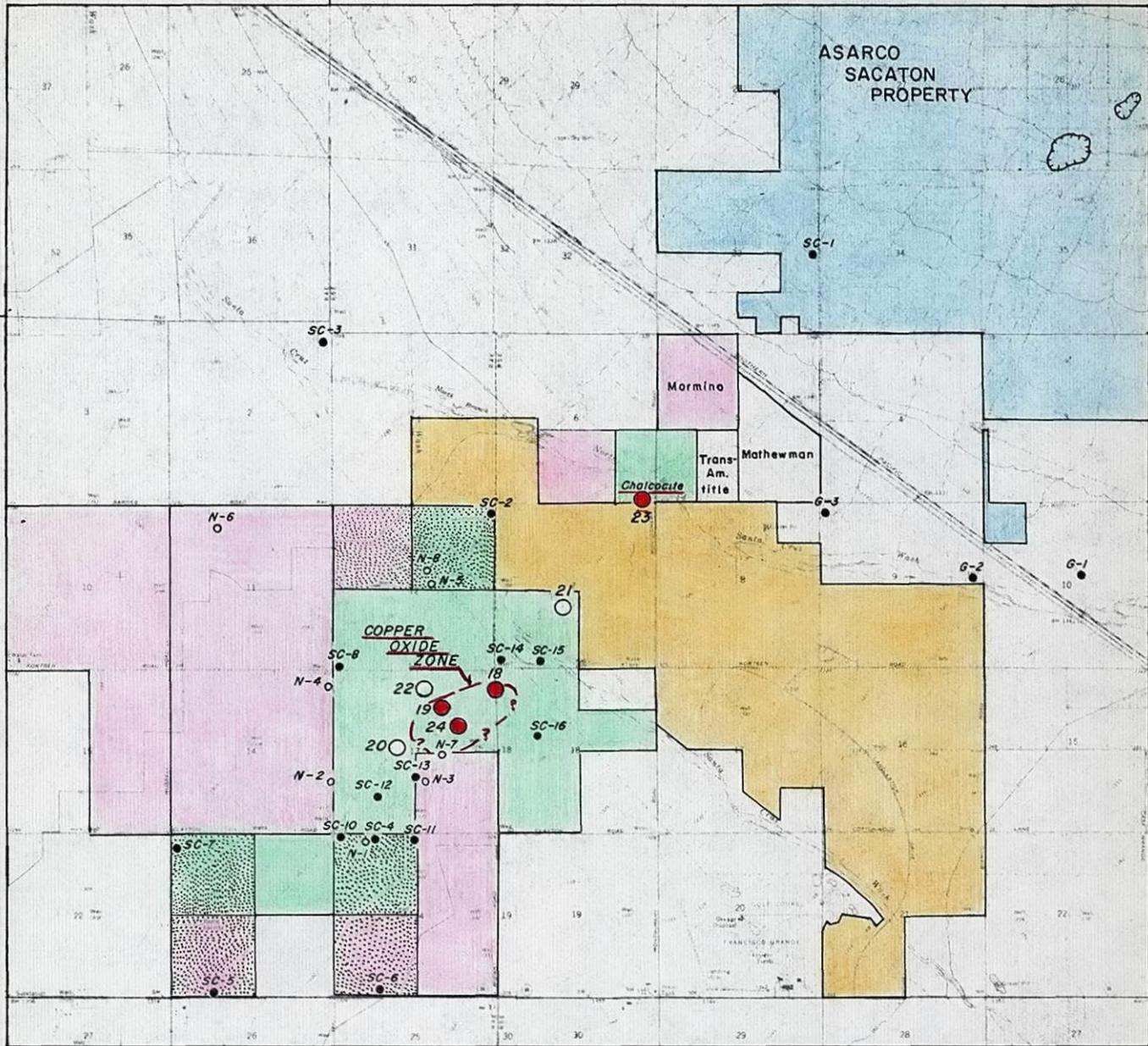
W. L. Kurtz

WLK:lb

Atts: Map & Forms as noted

cc: JHCourtright - w/atts. ✓
RBCrist - w/o atts.
HGKreiss - w/o atts.
WGKellogg - w/forms only

R. 4 E. R. 5 E.



R. 4 E. R. 5 E.

Base from USGS Casa Grande West & Stanfield 7.5' Quads.

EXPLANATION

- ASARCO-FREEPORT
- Newmont Federal Lode Claims
- NEWMONT
- Newmont Federal Lode Claims
- NAAC

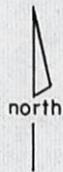
ASSAY DATA KEY
 depth-length - % Cu
 1620'-150'-2.92

- PREVIOUS ASARCO DRILL HOLES
- RECENT ASARCO DRILL HOLES
- NEWMONT DRILL HOLES

○ SIGNIFICANT INTERCEPTS

<u>SC-18</u>	1670'-120'-0.71 ox	(2513' T.D.)
<u>SC-19</u>	1193'-127'-0.84 ox	
	1620'-150'-2.98 ox	(2826' T.D.)
<u>SC-20</u>		(2423' T.D.)
<u>SC-21</u>		(2969' T.D.)
<u>SC-22</u>		(2326' T.D.)
<u>SC-23</u>	2430'-220'-1.27 sulf	(2671' T.D.)
<u>SC-24</u>	1180'-100'-0.51 ox	
	1550'-110'-1.10 ox	(2441' T.D.)

TO ACCOMPANY *Supplemental*
Exploration Outdrifts
 DATED *July 29, 1975*
 BY *W.D. Hasty*



DRILLING PROGRESS
 for the 2nd quarter of 1975

SANTA CRUZ PROJECT
 (ASARCO-FREEPORT JOINT VENTURE)

Pinal County, Arizona

SCALE 1" = 1 mile

APPLICATION FOR SUPPLEMENTAL EXPLORATION AUTHORIZATION

.... July 29, 19.75..

Originating Office ... SWED. - Tucson

Application is hereby made for supplemental Authorization to cover cost, in excess of original estimate, of work authorized by New York.

SANTA CRUZ PROJECT

No. 0075-00 Pinal County, Arizona

Present total Estimated Cost (Form 302-EA attached) (Asarco's share)	\$.367,000...
Amount previously authorized (date. 12/31/74.....)	\$.350,000...
Balance for which Authorization is now requested	\$.17,000...

ADDITIONAL WORK CONTEMPLATED:

- Make mortgage, interest, and tax payments.
- Geologic study of drill results.

EXPLANATION OF INCREASED COST:

Favorable oxide copper drill intercepts justify retaining property.

Reviewed by .. <i>[Signature]</i>	Approved by
Acct. Mgr. or Chief Acct.	Vice President
Recommended by .. <i>W. L. Kutz</i>	Approved by
Supervisor	Comptroller

Account Chargeable to
To be designated by Comptroller

Approved by Advisory Committee	Approved by Board of Directors
.....19.....19.....

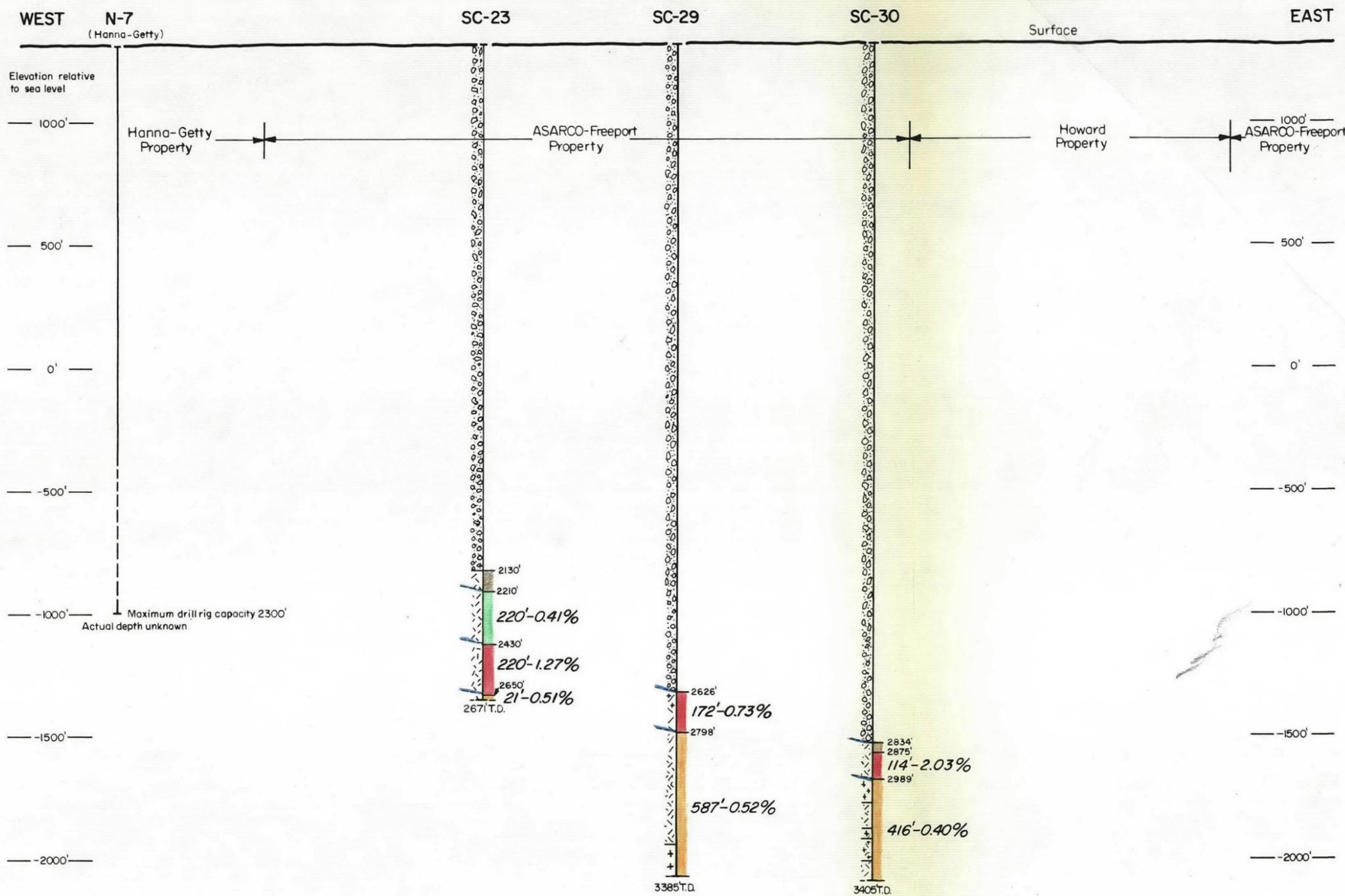
.....
Secretary

PROSPECT SANTA CRUZ PROJECT
 LOCATION Pinal County, Arizona

COST ESTIMATE, MINERAL EXPLORATION

OFFICE SWED - Tucson
W. L. Kurtz

No.	Type of Work	Salaries/Wages		Material	Fees Rent. Services	Traveling	Taxes	Other	Total Estimate Cost
		Days	Amount						
501	Outright Purchase						12,000	912,800	924,800
502	Option Payments							46,000	46,000
503	Bonus Payments								
04	Minimum Royalties- Deductible from Future Production								
05	Minimum Royalties-Not Deductible from Future Production								
06	Rental Payments								
07	Staking Claims								
11	Surface Excavating								
12	Underground "								
21	Surface Drilling		6,000	31,000	266,700	2,500			306,200
22	Underground "								
30	Geologic		3,000			1,000			4,000
40	Sampling, Assaying, Lab.				5,500				5,500
50	Geophysics								
60	Geochem								
70	Engineering								
80	Construction (temp.)								
90	Construction (perm.)								
10	Administration, Field Offices and Camps		7,000			1,400			8,400
20	Administration, General		3,000						3,000
41	Autos and Vehicles								
42	Aircraft and Boats								
50	Partner's Share ASARCO'S SHARE		19,000	31,000	272,200	4,900	6,000	924,900	930,900
51	Commission or Fees						6,000	33,900	367,000
53	Exchange								
	TOTAL		19,000	31,000	272,200	4,900	12,000	958,800	1,297,900



EXPLANATION

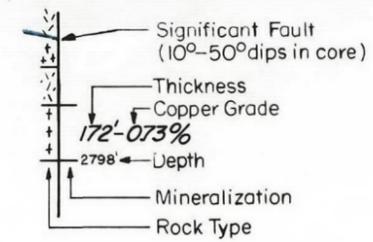
ROCK TYPE:

- Post-mineral Conglomerate
- Laramide Quartz Monzonite Porphyry
- Precambrian Granite

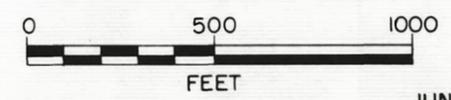
MINERALIZATION:

- Leached Capping
- Copper Oxides in Capping
- Chalcocite
- Chalcopyrite

STRUCTURE:



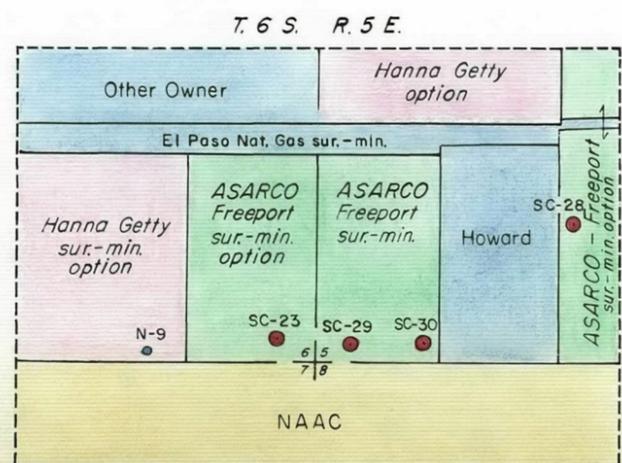
SANTA CRUZ PROJECT
 PINAL COUNTY ARIZONA
 CROSS SECTION thru SC-23, SC-29, and SC-30
 EAST-WEST SECTION LOOKING NORTH



H.G.K

SCALE: 1" = 500'

JUNE 7, 1976



INDEX MAP
 Showing Location of Drill Holes
 & Land Status
 SCALE: 1" = 2000'

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

JHC

J. H. C.

JUN 27 1975

June 26, 1975

TO: W. L. Kurtz

FROM: H. G. Kreis

Santa Cruz Project
Monthly Progress Report
June 1975

The Santa Cruz Project drilled a total of 1513' (see following table) during the month of June. There will be no rigs on the property as soon as the casing is pulled on SC-24. Although additional drilling is warranted, there are no plans to initiate another drill program at this time. Land acquisitions, budgeting, and the completion of geologic studies will determine the time for future drilling.

JUNE DRILLING PROGRESS

<u>Hole</u>	<u>From</u>	<u>To</u>	<u>Cored</u>	<u>Rotary</u>	<u>Total Advance</u>
SC-22	2104'	2326' T.D.	222'	0	222'
SC-24	1150'	2441' T.D.	1291'	0	1291'
Total Monthly Advance			1513'	0	1513'

During the month SC-22 continued in granite with alternating leached capping and remnants of very weakly enriched sulfides to a depth of 2249'. From 2249' to 2326' T.D. were granite and quartz monzonite porphyry with low total sulfides (pyrite with traces of chalcocite and chalcopyrite and weak oxidation). No intact supergene zone was encountered and no significant copper intercepts were penetrated by SC-22.

SC-24 encountered 100' of 0.51% total copper (chrysocolla and atacamite) from 1180' to 1280' in quartz monzonite porphyry and granite, leached capping in granite from 1280' to 1550', 110' of 1.10% total copper (chrysocolla and atacamite) from 1550' to 1660' in granite and quartz monzonite porphyry, leached capping in granite breccia and quartz monzonite porphyry from 1660' to 1740', and 80' of 0.73% total copper (chrysocolla) from 1740' to 1820' in quartz monzonite porphyry breccia. Although not assayed, sporadic copper oxides continue from 1820' to 1880' in granite and diabase. From 1880' to 2224' is leached capping in granite, and from 2224' to 2358' is granite with alternating intervals of sulfide (pyrite and chalcocite) remnants and leached capping. Low grade primary sulfides with traces of chalcocite and very weak oxidation were encountered from 2358' to 2441' T.D.

June 26, 1975

The Santa Cruz Project has completed the drilling program funded by exploration authorization No. 0075-00 for the amount of \$350,000. Seven holes and one wedge out hole (SC-21W) were completed, for a total drilling footage of 18,484' (10,083' of rotary drilling and 8,401' of core drilling). The results of this program are summarized in the following two tables.

TOTAL DRILLING PROGRESS

<u>Drill Hole</u>	<u>Rotary</u>	<u>Core</u>	<u>Total</u>
SC-18	1,505'	1,008'	2,513' (T.D.)
SC-19	1,205	1,621	2,826 (T.D.)
SC-20	1,206	1,217	2,423 (T.D.)
SC-21	2,364	605	2,969 (T.D.)
SC-21W	-0-	315	315 (2,417' T.D.)
SC-22	600	1,726	2,326 (T.D.)
SC-23	2,150	521	2,671 (T.D.)
SC-24	1,053	1,388	2,441 (T.D.)
Total	10,083'	8,401'	18,484'

SELECTED COPPER INTERCEPTS
(Geologic Cutoff Grades, Approx. 0.3% Cu)

<u>Hole</u>	<u>From</u>	<u>To</u>	<u>Interval</u>	<u>% Copper</u>	<u>Copper Minerals</u>
SC-18	1670'	1790'	120'	0.71%	Chrysocolla
SC-19	1193	1320	127	0.84	Chrysocolla & Atacamite
	1620	1770	150	2.98	Atacamite
SC-23	2430	2650	220	1.27	Chalcocite & Chalcopyrite
SC-24	1180	1280	100	0.51	Chrysocolla
	1550	1660	110	1.10	Chrysocolla & Atacamite
	1740	1820	80	0.73	Chrysocolla

At this time Newmont has completed seven drill holes and is in the process of completing another hole. There have been no rumors or field indications of future Newmont drill holes.

Estimated balance of authorization is \$10,000.

H. G. Kreis

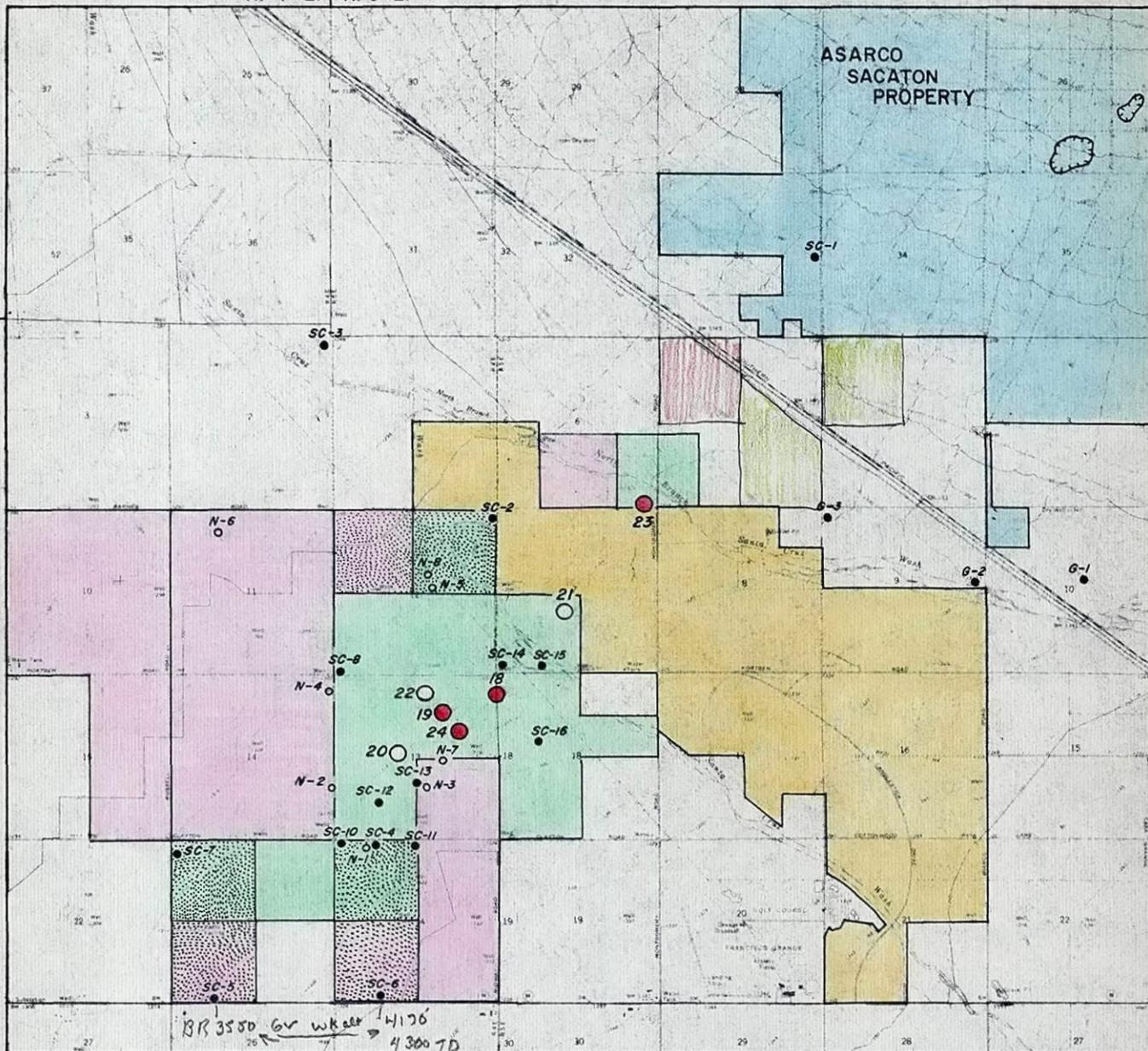
H. G. Kreis

HGK:lb
Att.

R. 4 E. R. 5 E.

T. 5 S.
T. 6 S.

T. 5 S.
T. 6 S.



R. 4 E. R. 5 E.

Base from USGS Casa Grande West & Stanfield 7.5' Quads.

EXPLANATION

- ASARCO-FREEPORT
Newmont Federal Lode Claims
- NEWMONT
Newmont Federal Lode Claims
- NAAC

ASSAY DATA KEY
depth-length - %Cu
1620'-150'-2.92

- PREVIOUS ASARCO DRILL HOLES
- RECENT ASARCO DRILL HOLES
- NEWMONT DRILL HOLES

- **SIGNIFICANT INTERCEPTS**
- SC-18 1670'-120'-0.71 ox (2513' T.D.)
- SC-19 1193'-127'-0.84 ox
1620'-150'-2.98 ox (2826' T.D.)
- SC-20 (2423' T.D.)
- SC-21 (2969' T.D.)
- SC-22 (2326' T.D.)
- SC-23 2430'-220'-1.27 sulf (2671' T.D.)
- SC-24 1180'-100'-0.51 ox
1550'-110'-1.10 ox (2441' T.D.)



DRILLING PROGRESS

for the 2nd quarter of 1975

SANTA CRUZ PROJECT

(ASARCO-FREEPORT JOINT VENTURE)

Pinal County, Arizona

SCALE 1"=1 mile

TO ACCOMPANY <i>Quarterly</i>
<i>Missing Report</i>
DATED <i>June 26, 1975</i>
BY <i>H. G. K.</i>

J.H.C.

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

June 4, 1975

J.H.C.

JUN 4 1975

Memorandum to: W. L. Kurtz

From: G. J. Stathis

Petrographic Thin Section
Examination of Drill Core from the
Santa Cruz Project;
Pinal County, Arizona

Sixty-eight petrographic thin sections were examined of drill core from the Santa Cruz Project. Purpose of this examination was to study nature and intensity of the alteration mineralogy which, perhaps, would aid in predicting in what direction or part of the Santa Cruz Project area better primary copper mineralization might be expected at depth.

Results of the petrographic examination are summarized on Table I. Under the rock classification column, two varieties of Precambrian granite were recognized; e.g., a microcline variety and an orthoclase variety. One or the other of the K-feldspar varieties occurs at the exclusion of the other. Other than that, the two granites appear to be very similar mega and microscopically.

Both a biotite-rich and a quartz-rich monzonite porphyry (Laramide) have been noted microscopically. The porphyries appear to be similar microscopically. The classification "biotite monzonite porphyry" was used when the quartz phenocryst volume content was down to 5 percent or less. This is usually accompanied by a corresponding increase in the biotite phenocryst content. Megascopically there appears to be a real textural and color difference between the two Laramide monzonite porphyries. H. Kries has used the textural designation "aplitic" and "aphanitic" porphyry to differentiate between the two porphyries. The aplitic porphyry is lighter in color and more siliceous looking. The aphanitic porphyry is darker and perhaps this is due to a slight increase in groundmass biotite.

Table II is an attempt to compare the two Laramide porphyry rocks and see if the megascopic and microscopic classifications are directly comparable; e.g., is the biotite monzonite porphyry the same as the aphanitic porphyry; if not, is the difference influenced by alteration (increase of). Results show that the two classification schemes are not always directly comparable, that is bmp does not always = aphanitic, nor qmp = aplitic. The discrepancies do not appear to be caused by alteration.

TABLE I

SUMMARY OF PETROGRAPHIC THIN SECTION EXAMINATION
SANTA CRUZ PROJECT, PINAL CO., ARIZONA

Drill Hole #	Thin Section Depth (in feet)	Rock Classification	Degree of Alteration	Alteration Mineralogy (approximate order of abundance)
2	2591	andesite	moderate to strong	kaolinite, chlorite
2	2661	granite (microcline)	weak	sericite, kaolinite
2	2705	granite (microcline)	weak	sericite, kaolinite
4	1608	granite (orthoclase)	weak to moderate	sericite
4	1892	biotite porphyry	strong	biotite, orthoclase, kaolinite, epidote
4	1895	brecciated porphyry?	moderate to strong	sericite
4	1912	basaltic andesite	moderate to strong	epidote, sericite, chlorite, tremolite
4	1984	monzonite porphyry (qtz)	weak to moderate	kaolinite, chlorite, tremolite
4	2038	monzonite porphyry (qtz)	weak	chlorite, epidote
5	2662	basaltic andesite	weak	iddingsite, carbonate
5	3135	granite (orthoclase)	fresh to weak	sericite
5	3559	basic dike	moderate to strong	sericite, chlorite
5	3600	granite (microcline)	weak	sericite
6	3951	brecciated granite (microcline)	moderate	sericite, kaolinite
6	4259	brecciated granite (microcline)	weak	sericite
6	4298	brecciated granite (microcline)	?	heavy iron staining
7	2785	granite (microcline)	weak	sericite
8	873	porphyry	moderate	sericite, chlorite, epidote
8	899	granite (microcline)	weak to moderate	sericite, hydromica
10	1417	granite (microcline)	fresh	
11	1580	breccia or conglomerate?		
11	2124	brecciated granite (microcline)	weak to moderate	chlorite, biotite, sericite
12	1415	granite (microcline)	moderate	sericite
12	1578	monzonite porphyry (quartz)	moderate	hydromica
12	1585	monzonite porphyry (biotite)	moderate to strong	kaolinite, sericite
12	1603	monzonite porphyry (biotite)	weak	sericite
12	1633	monzonite porphyry (quartz)	moderate to strong	kaolinite, quartz, sericite
12	1654	monzonite porphyry (quartz)	moderate to strong	biotite, kaolinite
12	1674	granite (microcline)	weak	chlorite
12	1699	diabase	strong	biotite, epidote
12	1724	granite (microcline)	weak	sericite, chlorite
12	1731	diabase	strong	biotite, epidote
12	1778	diabase or gabbro	moderate to strong	chlorite, epidote
12	1817	granite (microcline)	weak	sericite
12	1855	granite (microcline)	moderate	kaolinite, sericite
12	1901	granite (microcline)	weak	sericite

TABLE I — Continued

Drill Hole #	Thin Section Depth (in feet)	Rock Classification	Degree of Alteration	Alteration Mineralogy (approximate order of abundance)
13	1674	granite (orthoclase)	strong	orthoclase, sericite, clay veinlets
13	2155	granite (orthoclase)	weak to moderate	sericite
13	2192	granite??	very strong	sericite, quartz
13	2250	diabase	strong	biotite, sericite, kaolinite
13	2251	monzonite porphyry (quartz)	strong	biotite, kaolinite, sericite
14	2320	monzonite porphyry (quartz)	strong	biotite, sericite, kaolinite
14	2472	monzonite porphyry (biotite)	weak to moderate	sericite, biotite, kaolinite
14	2580	monzonite porphyry (quartz)	weak	chlorite, carbonate
15	2818	basaltic glass	—	—
15	2921	brecciated granite (orthoclase)	—	—
16	1420	basaltic glass	—	—
16	1511	brecciated basaltic glass	—	—
16	1512	brecciated basaltic glass/monzonite porphyry (quartz) fragments	—	—
16	1516	basaltic glass	—	—
16	1841	monzonite porphyry (quartz)	moderate	biotite, kaolinite, sericite, quartz
18	2159	recrystallized granite	moderate	quartz, biotite
18	2272	monzonite porphyry (biotite)	fresh	—
18	2340	monzonite porphyry (biotite)	moderate	sericite, kaolinite, carbonate
18	2434	monzonite porphyry (quartz)	moderate to strong?	sericite, carbonate, quartz, hydromica, chlorite
19	1233	granite (orthoclase)	weak to moderate	sericite, kaolinite, quartz, chlorite
19	1318	brecciated granite (orthoclase)	moderate	kaolinite, biotite, sericite
19	2031	granite (orthoclase)	moderate	sericite, kaolinite
19	2258	monzonite porphyry (quartz)	weak to moderate	kaolinite, sericite
19	2525	monzonite porphyry (quartz)	moderate to strong	biotite, kaolinite, sericite
19	2619	monzonite porphyry (quartz)	moderate to strong?	biotite, kaolinite, sericite
20	1533	granite (microcline)	weak	sericite, chlorite
20	1566	brecciated granite (microcline)	weak to moderate	sericite, quartz, epidote, hydromica
20	1703	granite (microcline)	weak	sericite, hydromica
21	2400	monzonite porphyry (biotite)	moderate	kaolinite, quartz, chlorite, biotite
21	2444	monzonite porphyry (biotite)	moderate	kaolinite, chlorite, biotite, sericite
21	2543	monzonite porphyry (biotite)	moderate to strong	sericite, kaolinite, chlorite, biotite
21	2592	monzonite porphyry (biotite)	fresh	—

TABLE II

COMPARISON OF MONZONITE PORPHYRY ROCKS
FROM SANTA CRUZ PROJECT, PINAL CO., ARIZONA

<u>SC Drill Hole Number</u>	<u>Thin Section Depth (in feet)</u>	<u>Megascopic Classification</u>	<u>Microscopic Classif.*</u>	<u>Degree of Alteration**</u>
4	1984	aplitic	qmp	W-M
4	2038	aphanitic	qmp	W
12	1578	aplitic	qmp	M
12	1585	aphanitic(?)	bmp	M-S
12	1603	aphanitic	bmp	W
12	1633	aphanitic(?)	qmp	M-S
12	1654	aphanitic	qmp	M-S
13	2251	aphanitic	qmp	S
14	2320	aphanitic	qmp	S
14	2472	aphanitic	bmp	W-M
14	2580	aplitic	qmp	W
16	1841	aplitic	qmp	M
18	2272	aplitic	bmp	F
18	2340	aplitic	bmp	M
18	2434	aplitic	qmp	M-S?
19	2258	aphanitic	qmp	W-M
19	2525	aphanitic	qmp	M-S
19	2619	aphanitic	qmp	M-S?
21	2400	aplitic	bmp	M
21	2444	aphanitic	bmp	M
21	2543	aplitic	bmp	M-S
21	2592	aplitic	bmp	F

* qmp = quartz monzonite porphyry
bmp = biotite monzonite porphyry

** F = fresh
W = weak
M = moderate
S = strong

Under the heading "Degree of Alteration" found in Table 1, the designation weak, moderate, or strong alteration is based on degree of replacement of primary minerals, especially plagioclase and biotite, and not to progressive destruction of the primary texture in the rock. Obviously, under conditions of strong alteration, the primary texture will be affected (destroyed). It was readily noted that the two main rock units (granite and monzonite porphyry) show a basic difference in their comparative mineralogies as alteration intensity increases. The mineralogic changes for the two rocks is summarized as follows:

a) Granite

1. Weak Alteration

Plagioclase - 1/3 to 1/2 of its volume altered to sericite with trace kaolinite.
Biotite - minor chloritization and partial oxidation.

2. Moderate Alteration

Plagioclase - complete sericitization or 1/2 sericite & 1/2 kaolinite by volume.
Biotite - mostly altered to hydromicas with minor chlorite and epidote.

3. Strong Alteration

Texture destroyed. Recrystallization of sericite after plagioclase and local replacement by quartz.
Secondary orthoclase. Some orthoclase, kaolinite, and quartz veining.

b) Monzonite Porphyry

1. Weak Alteration

Plagioclase phenocrysts - mostly fresh, trace epidote.
Biotite phenocrysts - 1/3 to 1/2 chloritized.

2. Moderate Alteration

Plagioclase phenocrysts - mostly altered to kaolinite, locally 2/3rds sericitized. Epidote clots.
Biotite phenocrysts - chloritized or locally partly altered to hydromica.
Biotite groundmass - partly chloritized or partly altered to hydromica. Some development of secondary biotite and minor biotite veining.
Quartz phenocrysts - resorbed by groundmass.

3. Strong Alteration

Plagioclase phenocrysts - completely kaolinized or completely sericitized.

Quartz phenocrysts - strongly resorbed (corroded).

Groundmass - strong biotization of groundmass and corresponding increase in sericite as well. Biotite content exceeds sericite.

Results of the petrographic study are shown on Plates 1 & 2. Plate 1 summarizes the situation based on drill hole information available up to April 1, 1975 and shows the petrographic classification of alteration intensity noted at the bottom of 14 drill holes. Drill hole 13 had, by far, the strongest alteration noted in thin section. It is concluded that the SW1/4 of the map area is of no interest. The indications are that the best primary copper mineralization potential would be approximately in the central portion of the E1/2 of the map area. Plate 2 shows distribution of holes that bottomed in Precambrian granite versus those bottomed in Laramide porphyry.

Only 16 of the 68 thin sections showed evidence of disseminated sulfide (pyrite, chalcopyrite) mineralization and only 4 of these thin sections were estimated to have more than 2 percent sulfide by volume. None of the 4 sections had more than 4 percent sulfide by volume.

In conclusion, once again it is important to note the difference in alteration (especially in the moderate thru strong intensity range) between the two major mineralized units at Santa Cruz. The Precambrian granite has a phyllic alteration assemblage and the Laramide monzonite porphyry a potassic alteration assemblage. Under extreme or strong alteration conditions, there is a coexistence of sericite and secondary orthoclase in the granite and sericite and secondary biotite in the monzonite porphyry.

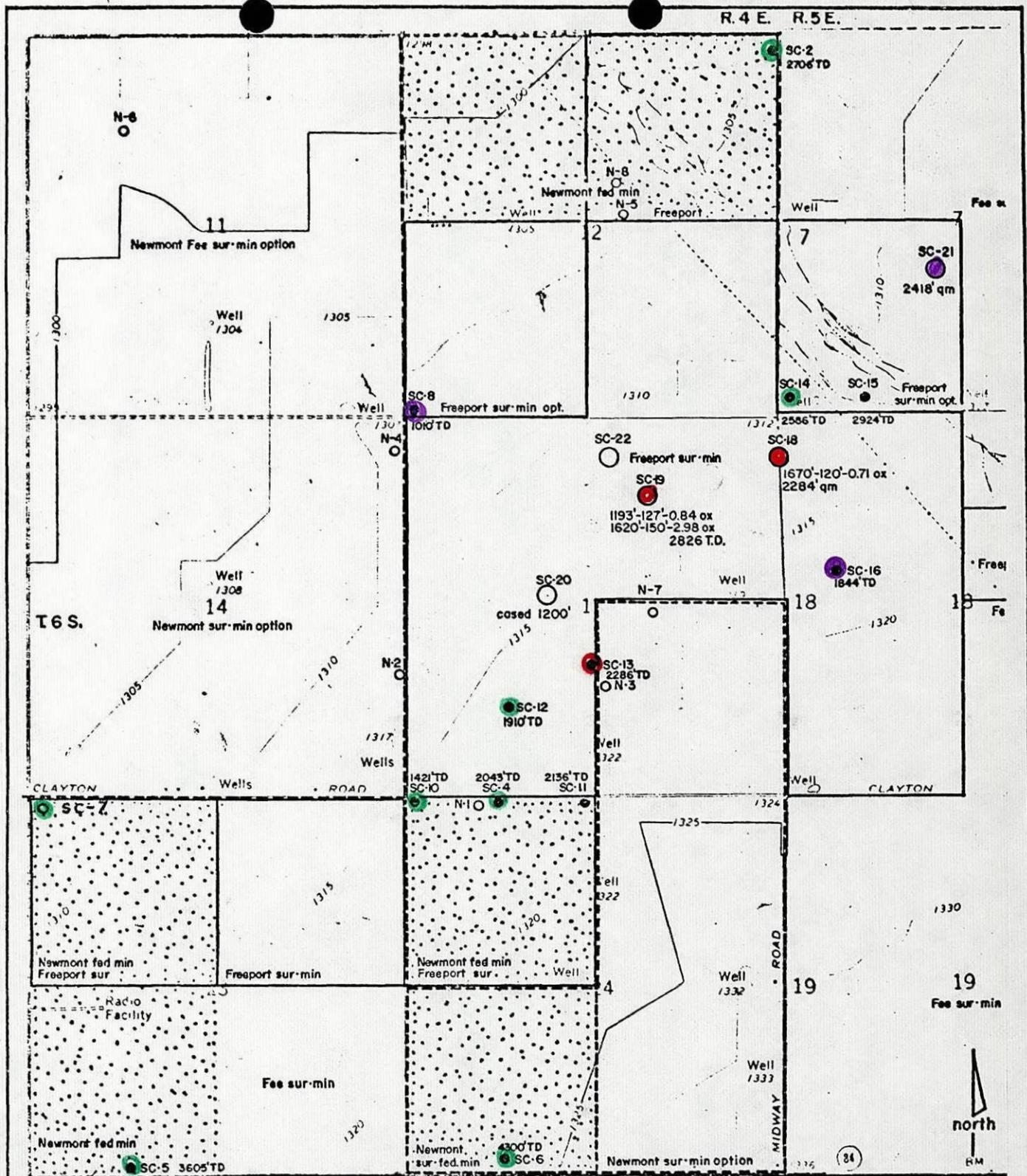
I believe that the difference in alteration between the two rock units is a reflecting bulk rock chemistry variation (microscopically, at least, this variation does not appear to be that great between the two rock types) rather than spatial position within a sulfide system, as in the classic Kalamazoo model. The few diabase dikes examined in thin section all show very strong development of pervasive secondary biotite accompanied by considerable disseminated epidote. Apparently, these altered diabase dikes can occur anywhere within the granite section.

The occurrence of potassic alteration (mostly secondary biotite) in the monzonite porphyry should not be regarded as being in the core zone (consequently "barren" by implication) of the sulfide system (Kalamazoo model). In reality, the potassically altered monzonite porphyry noted at Santa Cruz may equate in position to the upper phyllic zone level of alteration of the Kalamazoo model.


G. J. Stathis

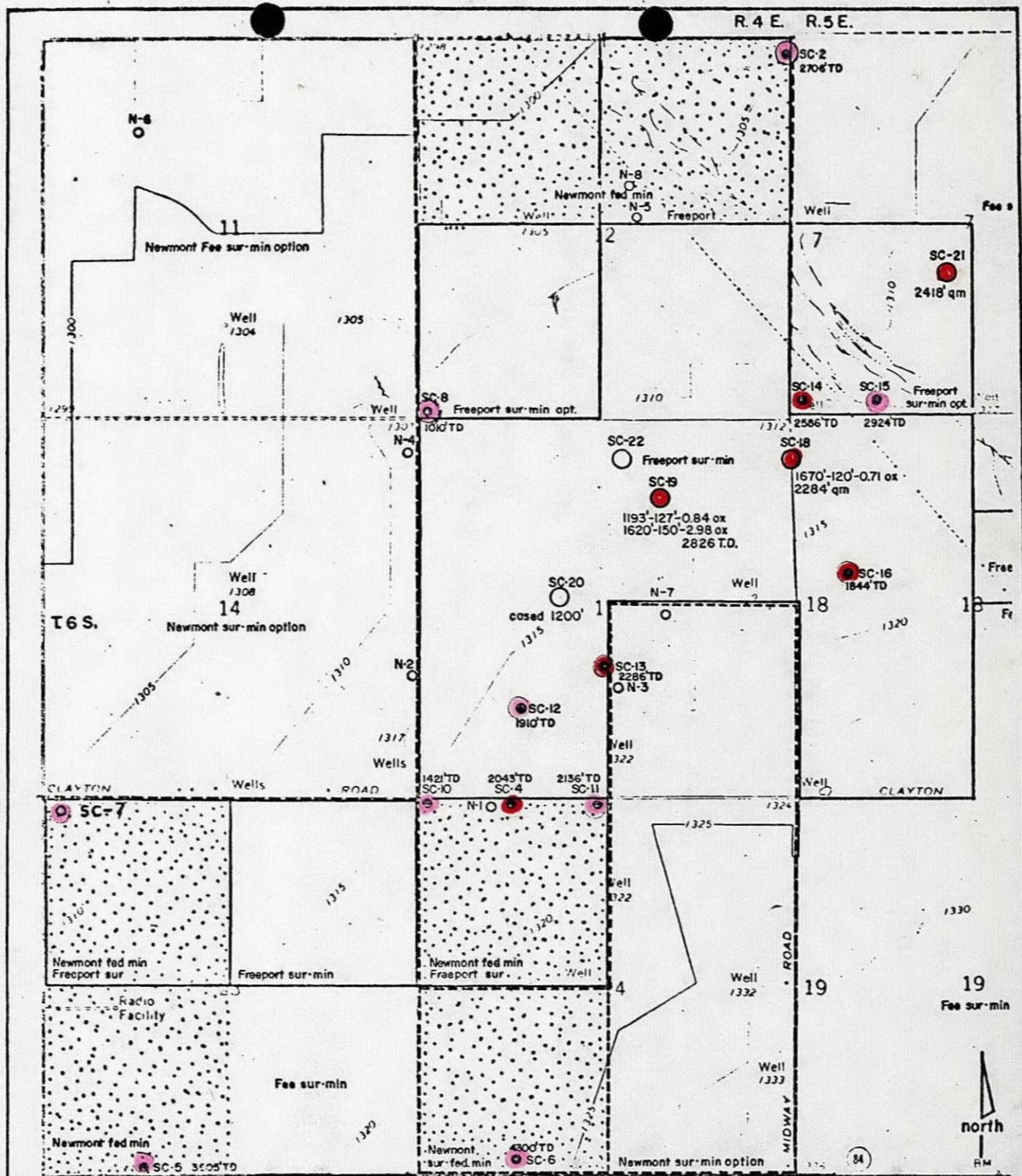
GJS:lb
Attachs.

cc: JHCourtright, HGKreiss



- Weak Alteration
- Moderate Alteration
- Strong Alteration

AMERICAN SMELTING AND REFINING COMPANY				
<i>area</i>	SANTA CRUZ PROJECT	<i>data by</i>	GJS	<i>state</i> Arizona
<i>title</i>	ALTERATION	<i>drawn by</i>	GJS	<i>township-range</i>
				<i>county</i> Pinal
<i>mining district</i>	Casa Grande	<i>date</i>	April 75	<i>map number</i>
				PLATE 1
				<div style="display: flex; justify-content: space-between; width: 100%;"> 2000 0 2000 4000ft </div>



- LARAMIDE PORPHYRY (qtz. monzonite & biotite monzonite)
- PRECAMBRIAN GRANITE (mostly microcline gr. Some orthoclase granite)

AMERICAN SMELTING AND REFINING COMPANY							
area	SANTA CRUZ PROJECT	data by	GJS	state	Arizona	township-range	revisions - date
title	IGNEOUS ROCK TYPE (bottom of drill hole)	drawn by	GJS	county	Pinal	map number	PLATE 2
mining district	Casa Grande	date	April 75				

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

JHC

J. H. C.
JUN 2 1975

May 29, 1975

TO: W. L. Kurtz

FROM: H. G. Kreis

Santa Cruz Project
Monthly Progress Report
May 1975

The Santa Cruz Project drilled a total of 2,431' (all core; no rotary) during the month of May. The following table summarizes the advance for each hole. Drill holes SC-22 and SC-24 are currently in progress.

Hole	May Drilling Progress		Cored	Rotary	Total Advance
	From	To			
SC-20	2113'	2423' T.D.	310'	0	310'
SC-22	600'*	2104'	1504'	0	1504'
SC-23	2154'*	2671' T.D.	517'	0	517'
SC-24	1050'*	1150'	100'	0	100'
Total Monthly Advance			2431'	0	2431'

*Bottom of Casing

SC-23, located on the Mansabach property north of Desert Carmel, encountered the most encouraging assay results during the month of May. From 2430' to 2650' SC-23 penetrated 220' of 1.27% total copper (assay results via telephone) in uniformly disseminated chalcocite and chalcopyrite form. The results of SC-23 are summarized:

SC-23 Summary Results					
From	To	Rock Type	Interval	% Copper	Type of Copper
0	2130'	Conglomerate	2130'	N.A.	—
2130'	2155'	Altered granite	25'	N.A.	—
2155'	2210'	Altered granite	55'	0.06	—
2210'	2430'	Altered granite	220'	0.41	} Erratic CuOx & Cc Cc & Cpy Cpy > Cc
2430'	2650'	Altered granite	220'	1.27*	
2650'	2671' T.D.	Altered granite	21'	0.51*	

*Assays via telephone

During the month of May SC-20 continued and bottomed (2423' T.D.) in leached, weakly altered granite and very minor diabase and quartz monzonite porphyry. The plagioclase of the granite was weakly to moderately weakly altered to quartz and sericite. The biotite was fresh to weakly altered. The former total sulfides averaged about 1/2-3/4% by volume. The entire interval was leached except for minor local chalcocite and pyrite remnants (2350' to 2362').

8 samples

Au	Ag	Mo
.0015	± .20	.01 to .03

May 29, 1975

SC-22 drilled conglomerate from 600' to 627'; thoroughly leached altered granite capping from 627' to 1010'; from 1010' to 1587' altered granite, altered quartz monzonite porphyry, and minor quartz diorite(?) with minor local pyrite and chalcocite remnants (mostly about 1516' to 1527' and 1549' to 1587'); and from 1587' to 1953' leached altered quartz monzonite porphyry with local minor pyrite and chalcocite remnants (1587' to 1601'); from 1953' to 2015' granite leached capping; from 2015' to 2050' quartz monzonite porphyry leached capping (chalcocite and pyrite remnant from 2027' to 2037'); and from 2050' to 2104' granite leached capping (chalcocite and pyrite remnant from 2084' to 2091'). It appears that enrichment of copper in SC-22, other than local chalcocite remnants, will be limited to chalcocite enrichment at the base of oxidation and leaching. The lack of copper oxide enrichment in SC-22 to date probably relates to high pyrite to chalcocite ratios in former enrichment horizons that allowed thorough leaching to occur. ||

SC-24 drilled quartz monzonite porphyry and granite leached capping from 1054' to 1106' and quartz monzonite porphyry leached capping from 1106' to 1150'.

On May 20th Newmont moved their core rig off N-8 and onto N-7.

During the month of May \$51,500 was spent on the Santa Cruz Project. A total of about \$329,500 has been spent on the Santa Cruz Project to date and the estimated balance of the authorization is \$20,500.

H. G. Kreis

H. G. Kreis

HGK:1b

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

J. H. C.

MAY 20 1975

May 20, 1975

Memorandum for T. C. Osborne

Santa Cruz Project
Pinal County, Arizona

Yesterday afternoon, Messrs. Courtright, Kreis, Kurtz of Asarco and Cornelius of Freeport examined the core from drill hole SC-23 which represents the discovery hole of a secondarily enriched porphyry copper zone. The hole is located in the southeast corner of section 6, T6S, R5E, and approximately 4500 feet northeast of SC-21.

Hole SC-23 has cored, from 2435 to present depth of 2617, 182 feet of a typical, secondarily enriched, porphyry copper chalcocite blanket that has not suffered the destructive post-enrichment oxidation found elsewhere in the Santa Cruz area. Total chalcocite replacement exists for forty feet and then chalcocite rimming chalcopyrite. Importantly, intensity of chalcocite and chalcopyrite does not decrease with depth in this mixed zone. About 80% of the mineralization is truly disseminated. Original chalcopyrite to pyrite ratio is estimated at 1:1 to 2:1. Original primary mineralization is estimated at plus 0.5% copper — highest grade primary drilled to date at Santa Cruz. Assays from 2430 to 2480 average 1.29% copper and visual estimates place the entire 182 feet at plus 1.0% copper. Total thickness of the zone cannot be predicted. Host rock is Precambrian granite.

The type of mineralization and the grade of copper justify acquisition of all land within a 2,000-foot radius of SC-23. If options cannot be obtained on this fee land, then outright purchase is recommended.

W. L. Kurtz
W. L. Kurtz

WLK:ib

cc: JHCourtright ✓
HGKreis
RBCrist

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

May 6, 1975

W. L. K.

MAY 8 1975

TO: W. L. Kurtz
FROM: F. T. Graybeal

J. H. C.
MAY 8 1975

Petrography of Sacaton rocks

I have reviewed 24 thin sections in various detail from the Sacaton deposit and have sent the data to Bob Cummings. The following comments are of general interest. Four rock types were represented:

- This may be?* ←
- 1) Sacaton granite — coarse grained, equigranular, and altered to sericite
 - 2) quartz monzonite porphyry — usually variable sericite alteration of the feldspar phenocrysts and weak biotitic replacement of former hornblende; phenocryst:matrix = 40:60
 - 3) quartz latite porphyry — characterized by usually abundant (to 25%) fine-grained biotite and kaolinite with variable sericite; phenocryst:matrix = 20:80; possibly some orthoclase present; this rock is very strongly altered
 - 4) post-mineral andesite porphyry — weak chlorite and montmorillonite

The alteration mineralogy suggests both phyllic and potassic/argillic alteration. The amount of phyllic and argillic alteration which may be supergene is unknown. Small amounts of calcite, alunite, anhydrite, and dickite(?) were noted in some of the rocks. The pervasiveness of alteration is much greater at Sacaton than in hole SC-19 from the Santa Cruz project.

Many of the rocks are pervasively brecciated. In several samples mixing of the quartz monzonite porphyry and the granite was so intimate that minerals or clasts of both rocks were seen in the same thin section.

F. T. Graybeal
F. T. Graybeal

FTG:1b

cc: RBCummings

copy ltr to JHC ✓
TCO
copy ltr: map (Xerox) to Cornelius

NEWMONT EXPLORATION LIMITED

200 West Desert Sky Road
R. R. No. 6
Tucson, Arizona 85704
(602) 297-1142

RECEIVED

MAY 5 1975

S. W. U. S. EXPL. DIV.

W. L. K.

MAY 8 1975

J. H. C.
MAY 8 1975

May 2, 1975

Mr. William L. Kurtz
ASARCO, INC.
Southwest Exploration Division
1130 N. 7th
Tucson, Arizona 85705-

file:
San to Amy

Re: File No. 1690
Casa Grande West

Dear Bill:

Enclosed is the map of our drill holes that we discussed recently.

Let us know when you wish to continue discussions of our adjacent mineral properties in the Casa Grande area.

Very truly yours,

Byron S. Hardie

Byron S. Hardie

BSH:re
Att. (1)

J.H.C.

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

April 29, 1975

J.H.C.
MAY 6 1975

TO: W. L. Kurtz

FROM: H. G. Kreis

Santa Cruz Project
Monthly Progress Report
April 1975

During the month of April a total of 5822' of drilling was performed, consisting of 3804' of rotary and 2018' of core drilling. The following table summarizes the advance for each hole.

April Drilling Progress					
Hole	From	To	Rotary Drilled and Spot Cored	Cored	Total Advance
SC-18	2284'	2513' T.D.		229'	229'
SC-20	1200*	2113		913	913
SC-21	2410	2969 T.D.		559	559
SC-21W	2100	2417 T.D.		317	317
SC-22	0	600*	600'		600
SC-23	0	2154*	2,154		2,154
SC-24	0	1050 B.C.*	1,050		1,050
Total			3,804'	2,018'	5,822'

*Bottom of casing.

SC-18 continued and bottomed (2513' T.D.) in altered biotite quartz monzonite porphyry with low total sulfides and an estimated copper grade of less than 0.1% copper (chalcopyrite).

SC-20 started and is continuing in altered, leached granite capping with local, low grade copper values.

SC-21 continued and bottomed in altered biotite quartz monzonite porphyry with low total sulfides and an estimated copper grade of 0.1% copper (chalcopyrite). SC-21W wedged out of SC-21 at 2100' and cored in conglomerate to 2178'; leached, altered biotite quartz monzonite porphyry breccia from 2178' to 2311', a fault; partially to totally leached quartz monzonite porphyry breccia with local chalcocite from 2311' to 2383'; and weakly oxidized biotite quartz monzonite porphyry with low total sulfides and trace of chalcocite from 2383' to 2417' T.D. Fault evidence in SC-21 and SC-21W suggests that the leaching capping and enriched zone in the SC-21 area has been structurally thinned.

April 29, 1975

SC-22 was cased in conglomerate at 600'.

SC-23 penetrated conglomerate to 2100' and conglomerate(?) with capping clasts from 2100' to 2130'. The cuttings (2130' to 2150') and spot core (2150' to 2154') suggest a bedrock contact at 2130' and from 2130' to 2154' (bottom of casing) is strongly altered, leached porphyry with minor granite and traces of chrysocolla.

SC-24 drilled conglomerate to 1020', conglomerate with altered leached clasts from 1020' to 1040', and altered, leached capping in bedrock(?) from 1040' to 1050'.

During April about \$105,500 was spent on the Santa Cruz Project. About \$264,000 has been spent on the Santa Cruz Project to date and the estimated balance of the authorization is \$86,000.

H. G. Kreis
H. G. Kreis

HGK:1b

J.H.C.

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

March 27, 1975

J. H. C.
APR 2 1975

TO: W. L. Kurtz

FROM: H. G. Kreis

Santa Cruz Project
Monthly Progress Report
March 1975

During the month of March SC-18 was cored from 1505', the bottom of the casing, to 2284', depth to date. Rotary drilling of SC-21 was continued from 600' to 2360', and then cored from 2360' to 2410', depth to date. Coring of SC-20 is expected to start in March. The site for SC-22 has been selected 750' northwest of SC-19. The top hole for SC-22 will be drilled next week and coring should start within the coming month. SC-22 will test the northwest extent of the copper oxide intercepts drilled in SC-19.

Detailed core logging and assaying of the Santa Cruz core has fallen behind. Tony Benavidez has been assigned to the Santa Cruz full time to help correct the situation.

SC-18 was cored from 1505' to 1562' in conglomerate, 1562' to 1633' in volcanic agglomerate, 1633' to 1790' in granite, 1790' to 1950' in granite breccia, 1950' to 2021' in biotite quartz monzonite porphyry breccia, 2021' to 2041' in volcanic breccia, 2041' to 2098' in granite, 2098' to 2118' in diabase, 2118' to 2170' in granite, and 2170' to 2284' (depth to date) in biotite quartz monzonite porphyry. The breccia from 1790' to 2098' may represent a steeply (60°-80°) dipping fault zone. Leached capping, indicative of former chalcocite mineralization, was present from 1633' to 1670' and from 1790' to about 2260'. Between 1670' and 1790' was 120' of chrysocolla and atacamite mineralization averaging 0.71% total copper. At 2260' (2244' to 2247' and 2260' to 2263' are 60° dipping faults) primary sulfides were encountered and have continued to 2284'. The primary sulfide zone averages an estimated 0.2% copper with one-half to one percent total sulfides having a ratio of about one pyrite to one chalcopyrite. The alteration above 2260' is dominantly sericite replacement of plagioclase and some biotite and some K-feldspar. Alteration of plagioclase in the primary sulfide zone varies from totally altered to totally fresh. In SC-18 and other holes, the biotite quartz monzonite porphyry (with an aplitic textured groundmass) in the primary sulfide zone exhibits evidence of potassic type alteration, but more drilling and alteration studies are needed to classify the alteration.

SC-21 continued in conglomerate to about 2300', and in biotite quartz monzonite porphyry (aplitic textured groundmass) from about 2300' to 2418', depth to date. Although not logged in detail, SC-21's rotary

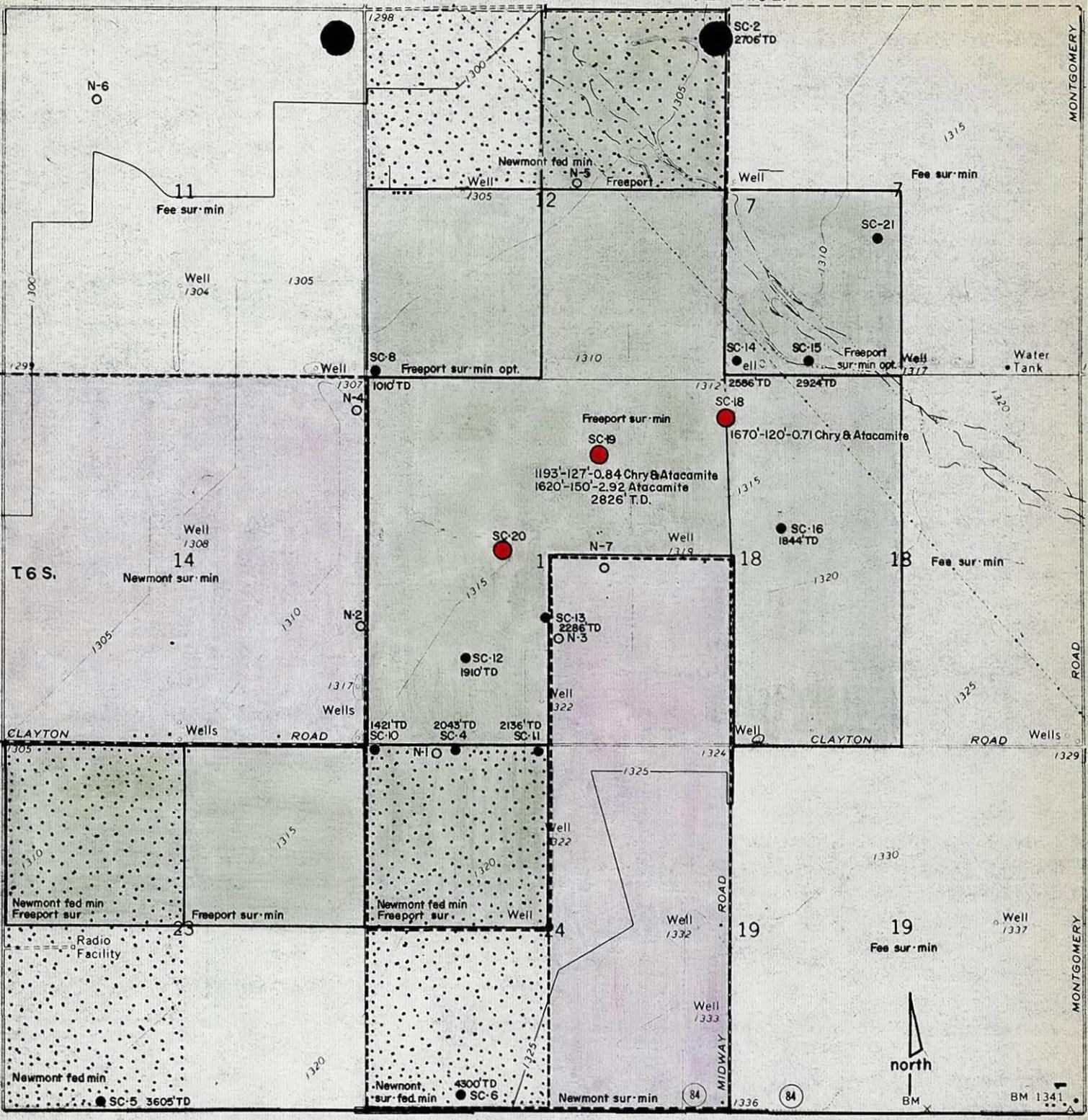
March 27, 1975

drilling penetrated 60' (2300' to 2360') with pyrite, chalcocite, and limonite averaging 0.66% total copper. The first core, from 2364' to 2367', appeared to be the same as from 2300' to 2360'. There was no core from 2367' to 2379'. From 2379' to 2388' was a fault zone. Below this fault and down to the present depth of 2418', the hole was in primary sulfides, pyrite and chalcopyrite, with traces of chalcocite and oxidation. The alteration in the primary sulfide zone is similar to that in other holes, such as SC-18 and SC-19, having biotite quartz monzonite porphyry in the primary sulfide zone. It appears that both the top and the bottom of the chalcocite enrichment intercept in SC-21 is bounded by faults. Wedging out of the casing of SC-21 and redrilling of the enrichment zone is being considered.

During March about \$76,000 was spent on the Santa Cruz Project. About \$181,000 has been spent to date, and the estimated balance of the authorization is \$169,000.

H. G. Kreis
H. G. Kreis

HGK:lb
Att.



EXPLANATION

- NEWMONT, fee surface and/or fee mineral
- FREEPORT, fee surface and/or fee mineral
- Federal lode claims (NEWMONT)
- DRILLING —
- Previous ASARCO drill holes
- ASARCO drill holes in progress
- NEWMONT drill holes

ASSAY DATA KEY
 depth-length-%Cu
 1620'-150'-2.92

TO ACCOMPANY <i>Progress</i>
<i>Report</i>
DATED <i>March 27, 1975</i>
BY <i>H. G. Kreis</i>

DRILLING PROGRESS REPORT
 for the month of JAN-MAR, 1975

SANTA CRUZ PROJECT
PINAL CO., ARIZONA
 (ASARCO-FREEPORT JOINT VENTURE)
 H.G.K. scale 1" = 2000'

RECEIVED
FEB 24 1975
EXPLORATION DEPT.

Air Mail

February 20, 1975

J. H. C.
FEB 24 1975

Mr. W. L. Kurtz
Southwestern Division
Tucson Office

Arizona
Santa Cruz Project

Dear Mr. Kurtz:

In reply to your letter of February 14, and confirming our brief telephone discussion, I agree that in view of the potential cost of additional NAAC land, we should postpone thoughts of acquisition until such time as you have positive drill information in Section 7.

Very truly yours,
ORIGINAL SIGNED BY
T. C. OSBORNE
T. C. Osborne

cc: ✓ JHCourtright

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

February 14, 1975

J.H.C.
FEB 18 1975

Mr. T.C. Osborne
Assistant Director of Exploration
New York Office

Santa Cruz

Dear Mr. Osborne:

Sometime ago I mentioned to Mr. Collins that as a result of the findings in drill hole SC-19 Freeport-Asarco were considering acquiring additional land at Santa Cruz. The thought was to increase land holdings to tie into Asarco's Sacaton ground.

No. Am Accept Corp

We now have obtained enough information concerning the NAAC subdivisions to determine the order of magnitude to acquire the NAAC land (see Land Status Map sent you recently and terms of a possible option to purchase sent Feb. 13, 1975). Currently there are about 35 occupied houses and trailers at NAAC and utilities are in to several of the individual subdivisions.

Though there are several objectionable clauses in the proposed option, it essentially represents the monies involved. The following summarizes the total costs as we now see them:

Purchase price	\$4,000,000
Less \$10,000/month option (\$60,000 guaranteed)	<u>120,000</u>
	\$3,880,000
Less estimated \$30,000/month cash flow due NAAC on 740 mortgages*	<u>360,000</u>
Total due NAAC at end 1st year	\$3,520,000

Estimated Additional Cost if Necessary to purchase sold lots in "Area of Interest"

CASE I: (Moving 1000 lots to other areas & purchasing 800 lots) \$3,500,000

CASE II: Purchasing 1700 lots in "Area of Interest" \$7,500,000

CASE III: By resubdividing, space can be created to move the 1700 lots in the "Area of Interest"

T. C. Osborne

- 2 -

February 14, 1975

Possible Total Cost of NAAC purchase and acquiring lots
in "Area of Interest":

CASE I:	\$ 7,020,000
CASE II:	\$11,020,000
CASE III:	\$ 3,520,000

*The 740 mortgages held by NAAC will return \$3 million dollars
and currently are producing an income of \$30-\$50,000 per month.

To this point in time I have refrained from drilling near the NAAC boundary so as not to draw attention to this area by our competitors or by NAAC. Now, however, after seeing the possible funds involved to acquire the NAAC ground, I plan to collar a drill hole in the northeast quadrant of the Southwest quarter of Section 7. This hole will test for the deeper (estimated 2500 feet to bedrock) extension of the mineralized zone and hopefully give some concrete data to help in evaluating the mineral potential beneath the NAAC ground and whether to purchase the NAAC ground.

Very truly yours,



W. L. Kurtz

WLK:lb
Enc: Data Sheet

cc: JHCourtright ✓
HGKreiss
RBCrist

Freeport:KCornelius

GENERAL DATA

① TOTAL LOTS	6801	A. TOTAL ACRES	3169.6
② TOTAL LOTS SOLD	4553	SUBDIVIDED ACRES	
TOTAL UNSOLD LOTS HELD BY NAAC	2248	B. LESS AREA T4	2929.6
④ TOTAL LOTS SOLD w/ MTGE. RETAIN. BY NAAC	740	C. ESTIMATED ACREAGE HELD BY NAAC:	
⑤ TOTAL LOTS SOLD w/ MTGE. HELD BY OTHERS	3813	UNSUBDIVIDED	240
		740 LOTS	207.2
		UNSOLD LOTS	629.4
		ANCILLARY	1021.4
		D. ACREAGE OF LOTS w/ MTGE. HELD BY OTHERS	1067.6

AREA OF INTEREST

① TOTAL LOTS	3072	A. TOTAL ACRES	1464.6	ACRES
② TOTAL LOTS SOLD	1783	B. UNSOLD LOTS	257.8	"
TOTAL UNSOLD LOTS HELD BY NAAC	1289	C. UNSUBDIVIDED	240.0	"
LOTS HELD BY NAAC MTGE.	73	SOLD w/ NAAC MTGE.	14.6	"
LOTS HELD BY OTHER MTGE. CO.	1710	D. OTHER MTGE.	342.0	"
⑥ AV. PRICE PER LOT PER AREA		E. ANCILLARY	610.2	"
R	\$ 4854.53			
T 1-3	\$ 6234.46			
N	\$ 8630.52			
F _A	\$ 6296.15			

JHC.

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

January 30, 1975

Atacamite ± 40% Cu

Cop - 14.9

CuO Cupric oxide - 55.8

Cl - 16.6

H₂O - 12.7

100.0

TO: W. L. Kurtz

FROM: H. G. Kreis

Santa Cruz Project
Monthly Progress Report
January 1975

Coring of SC-19 progressed from 1318 feet to 2436 feet during the month. The rock type was dominantly granite to 2060 feet, granite with minor porphyry dikes to 2160 feet, and mixed granite and porphyry to 2433 feet. Although not logged in detail, the total sulfides prior to oxidation appear to have been about 1-1/2 to 3% by volume in veinlets and disseminations. The assay results, estimated copper grades, and copper mineralogy are shown in the following table. The primary alteration is of a phyllic grade with local minor evidence of potassic type alteration. At 1450 feet crushing and brecciation of rock increased from an average of about 15% of the total rock to an average of about 35 to 45% of the total rock. About one to two percent of the whole rock is a ferruginously cemented gouge-like material. In general the rock strength is strong with post-oxidation fracturing alternating from weak to moderate on 200-foot increments.

SC-19 Assay Results
(Geologic Cutoff Grades, Approx. 0.3% Cu)

	From To	Interval	Cu	Mo	Copper Minerals
BIR	840-1193	353'	0.01%* to nil	0.0033%	
	1193-1320	127'	0.84%* / sp. limonite	0.0081	Chrys & Atacamite ← Cu ₂ Cl ₂ · Cu ₂ O
start coring	1320-1400	80'	0.15*	0.0054	Chrysocolla
	1400-1460	60'	0.81%* / sp. limonite	0.0039	Chrys & Atacamite
	1460-1620	160'	0.13*	0.0064	
	1620-1770	150'	2.92%* no limonite	0.0091	Atacamite
	1770-2160	390'	0.14**	NA	Local chalcocite
600-1620	2160-2204	44'	0.5 Est.***	--	Chrysocolla — sp. py, cpn?
Reddish brown	2204-2361	157'	0.1 Est.***	--	
limonite - sp.	2361-2433	72'	1.0 Est.***	--	Chalcocite, partially leached

± 2500 — in oxidized rock - leached

- *Written assays
- **Telephone assays
- ***Estimate prior to logging

± 2720 — mp — sp py cpn — ± .10
2826 — bot

The geology of SC-19 and the previous ASARCO drill holes suggests that the copper oxide intercepts in SC-19 represent the oxidation of successively formed chalcocite enrichment blankets. Drill hole SC-19 indicates that the center of Section 13 is closer to the center of mineralization than drill holes in the northwest and southwest corners of the section.

January 30, 1975

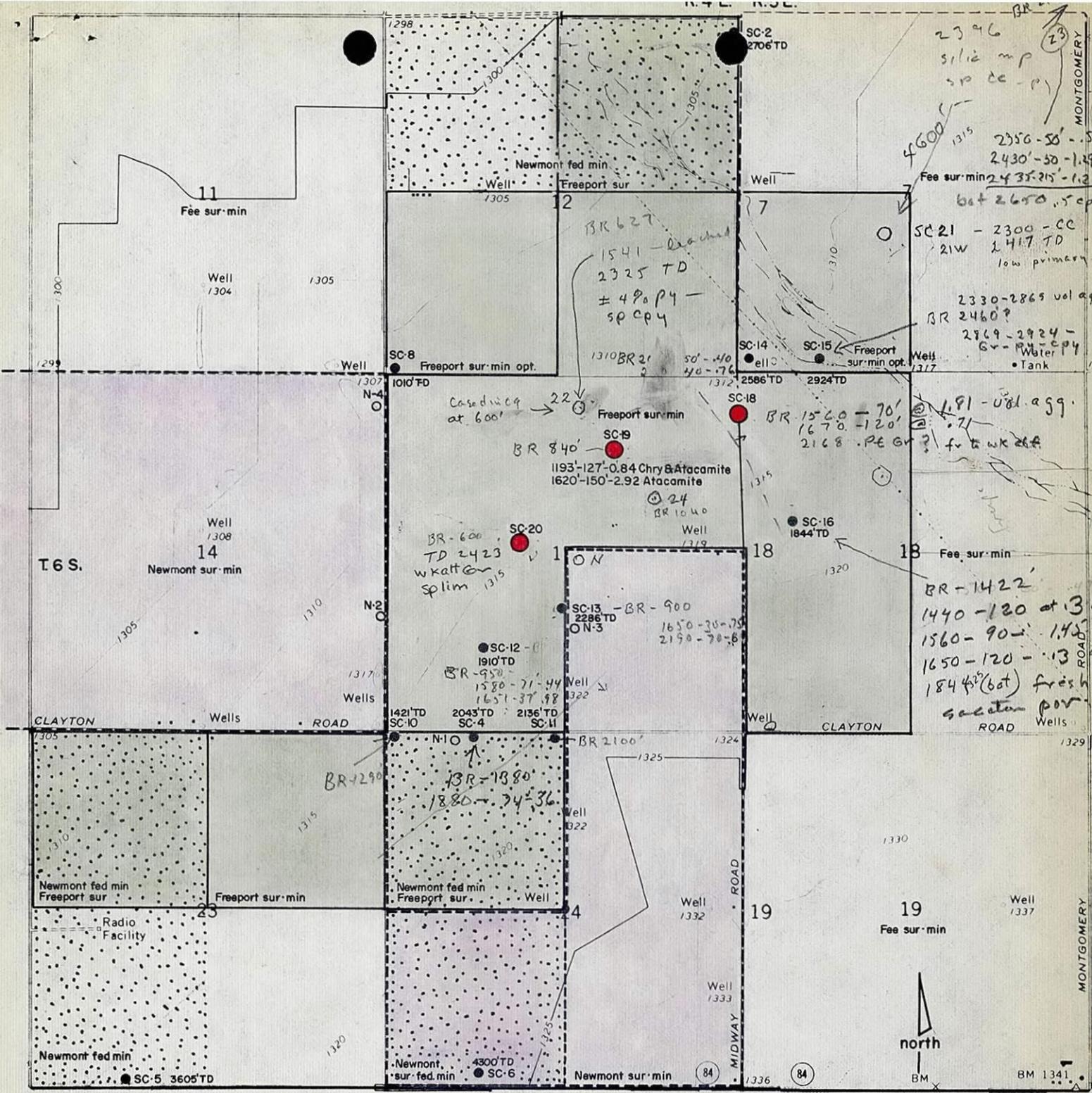
Preliminary interpretive cross-sections and plan maps of the Santa Cruz-Sacaton area suggest evidence that the Santa Cruz copper mineralization is fault terminated on the east along a northwest trend through SC-15 and on the south along the trend of SC-11 and SC-16. Also, a fault is known to terminate the copper ore on the west side of Sacaton and suggests a continuance of ore to the west prior to faulting. Faulting on the west side of Sacaton and on the east side of the Santa Cruz copper deposit suggests potential copper mineralization in the graben block between these two deposits. Land negotiations have commenced, and geologic evaluation of the general area will be continued.

Newmont started another drill hole, N-4, on January 11th. Rumored information and counting of drill rods suggest that none of Newmont's previous three drill holes drilled below 2150 to 2200 feet in depth. These holes probably stopped in capping 200 to 400' above the enrichment zone.

About \$34,000 was spent on the Santa Cruz Project during January. About \$90,500 has been spent to date, and the estimated balance of the authorization is \$259,500.

H. G. Kreis
H. G. Kreis

HGK:lb
Attach.



EXPLANATION

- NEWMONT, fee surface and/or fee mineral
- FREEPORT, fee surface and/or fee mineral
- Federal lode claims (NEWMONT)
- DRILLING —
- Previous ASARCO drill holes
- ASARCO drill holes in progress
- NEWMONT drill holes

ASSAY DATA KEY
 depth-length-%Cu
 1620-150'-2.92

TO ACCOMPANY Monthly
Drilling Report
 DATED Jan. 30, 1975
 BY H. G. Kries

DRILLING PROGRESS REPORT
 for the month of Jan., 1975

SANTA CRUZ PROJECT
PINAL CO., ARIZONA
 (ASARCO-FREEPORT JOINT VENTURE)
 H.G.K. scale 1" = 2000'

JHC

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

December 27, 1974

TO: W. L. Kurtz .

FROM: H. G. Kreis

Santa Cruz Project
Monthly Progress Report
December 1974

Rotary drilling of three top holes, SC-18, SC-19, and SC-20, was started on November 25, 1974, and completed December 19th. A total of 3,912 feet was rotary drilled and cased (SC-18, 1,500 ft.; SC-19, 1212 ft.; and SC-20, 1,200 ft.). Core drilling of SC-19 began December 21st and has progressed to 1,318 feet.

Difficulty was experienced in distinguishing altered granite bedrock from conglomerate with altered granite clasts in the cuttings, and the drillers and the geologist were unable to provide any conclusive information for recognizing the contact. SC-19 and SC-20 apparently intersected the bedrock-conglomerate contact at 840 feet and 1015 feet, respectively. In SC-18 at 1460 feet, there was a change from obviously conglomerate cuttings to dominantly granitic cuttings which may or may not be from conglomerate.

Coring of SC-19 from 1205 to 1300 feet has shown 95 feet of altered granite (kaolinite and possibly sericite after plagioclase and some biotite) with copper oxides (chrysocolla and brochantite) with an estimated grade of 0.5% total copper. The core from 1300 to 1318 feet has not been examined at this time.

Plans for January include continued core drilling (SC-18 will be the next hole), core logging, and plotting geology on cross sections.

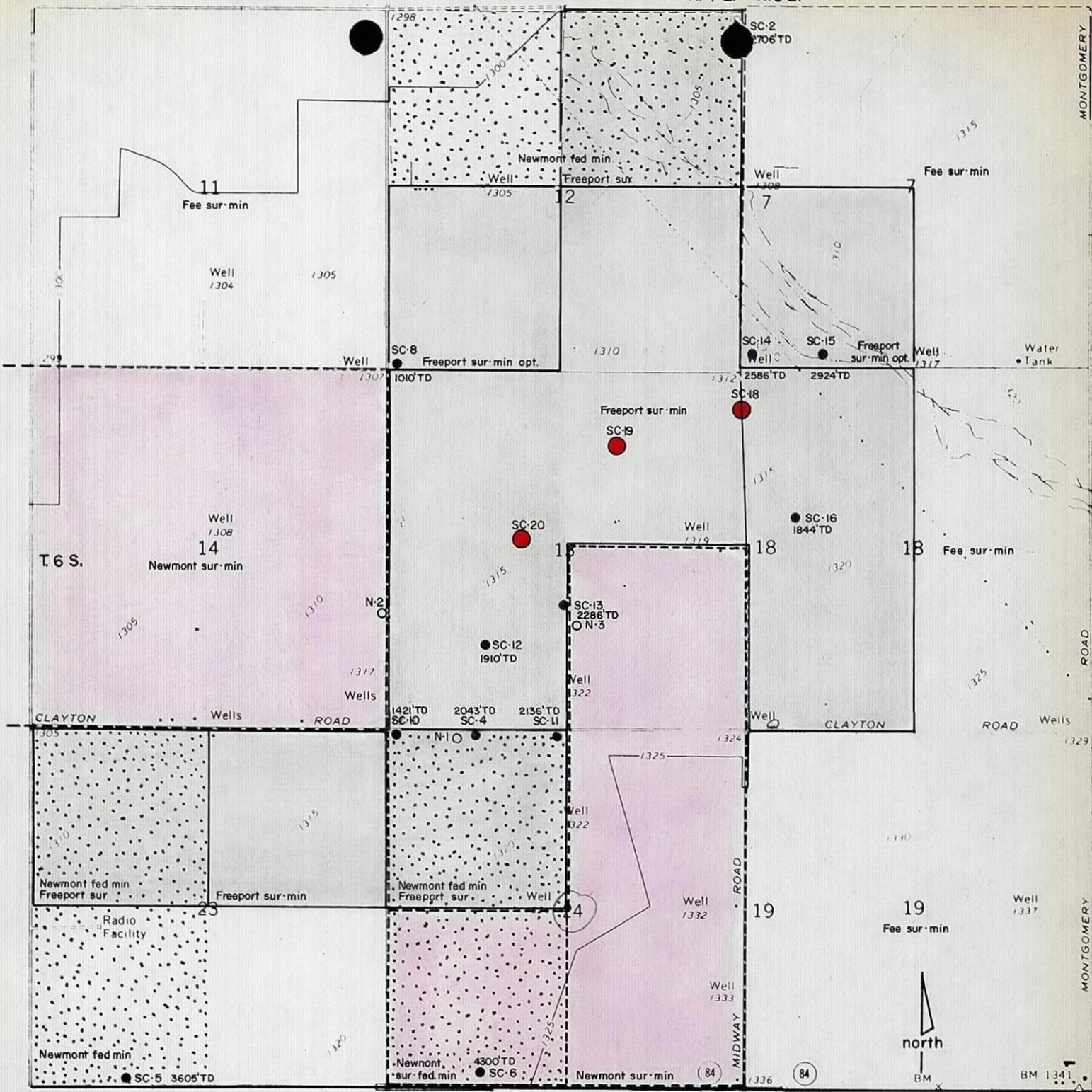
The competition (Still, Lowell, and Still) is drilling its third hole, COMP-3. Counting of the rods indicates the hole is at a depth of about 1,100 feet. Drill hole SC-13, located about 300 feet northwest of COMP-3, penetrated the conglomerate-granite contact at 1410 feet (1320-1410 ft. conglomerate [?] with clasts of capping).

Estimated balance of authorization is \$318,400.

H. G. Kreis

H. G. Kreis

HGK:lb
Attach.



EXPLANATION

- NEWMONT, fee surface and/or fee mineral
- FREEPORT, fee surface and/or fee mineral
- Federal lode claims (NEWMONT)
- DRILLING —
- Previous ASARCO drill holes
- ASARCO drill holes in progress
- NEWMONT drill holes

TO ACCOMPANY Monthly
Drilling Report
 DATED Dec. 27, 1974
 BY H.G. Kreis

DRILLING PROGRESS REPORT
 for the month of Dec., 1974

SANTA CRUZ PROJECT
 PINAL CO., ARIZONA
 (ASARCO-FREEPORT JOINT VENTURE)
 H.G.K. scale 1" = 2000'

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

August 23, 1974

J. H. C.
OCT 1 1974

FILE MEMORANDUM

✓
Santa Cruz *project*
Pinal County, Arizona

Dave Lowell made an appointment with Mr. Courtright today. When it became apparent that Mr. Lowell wished to discuss Santa Cruz, Mr. Courtright called me in.

Mr. Lowell says he is representing three major companies and would like to joint venture the area with Asarco. I informed Lowell that we did not want to joint venture at this time and were not prepared at this time to give him any information from our previous work. I further informed Mr. Lowell that we have been continually watching the land since 1970, were aware of his staking claims, and were aware of his Clark Arnold's efforts to option fee land. Finally, I informed Mr. Lowell that we were active in the area through an agent and that we would be in a better position to discuss a possible joint venture in about six weeks.

W. L. Kurtz

W. L. Kurtz

WLK:lb

cc: TCOsborne
JHCourtright 
RBCrist
Ken Cornelius, Freeport
Douglas Cook, Freeport

P.S. Mr. Lowell just called to state that he has talked to the operating partner, Newmont, and they would like us to seriously consider a joint venture in the area. I informed Lowell I would discuss the possibility with our New York office.

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

August 19, 1974

J. H. C.

AUG 19 1974

Mr. T. C. Osborne
Asst. Director of Exploration
New York Office

Arizona
Santa Cruz

Latest report is that the court mailed notices August 15th to all stockholders requesting approval of sale. Stockholders must answer within 30 days, so guess we sit tight until September 15th.

It was reported that Clark Arnold of Still-Lowell-Still made an offer, on behalf of a mining company, to North American Acceptance Corp.

W. L. Kurtz
W. L. Kurtz

WLK:1b

cc: JHCourtright ✓

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

J. H. C.
AUG 7 1974

July 11, 1974

FILE MEMORANDUM

Santa Cruz
Pinal County, Arizona

Bob Cummings checked the land with Federal mineral and found that all had been staked July 2, 1974 by William Mounts, locator; Jeff John, witness. Claims called Nick. This includes N1/2 sec. 12; W1/2 23; W1/2 24.

W. L. Kurtz

WLK:1b

cc: JHCourtright ✓

JHC

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

July 23, 1971

RECEIVED

JUL 26 1971

EXPLORATION DEPT.

Mr. J. J. Collins
New York Office

Authorization Request
Santa Cruz Project
Pinal County, Arizona

Dear Sir:

The Santa Cruz porphyry copper prospect was discovered by Asarco in 1964. This prospect probably represents the root of the Sacaton ore body. Drilling indicated typical porphyry copper type alteration and mineralization that was subjected to a long and complicated postmineral faulting, oxidation, and enrichment history similar to that at Sacaton.

Based predominantly on rotary drill cutting assays, four drill holes (see Attachments 1 and 2) intersected copper values grading between 0.5 and 1.45 percent Cu oxides and chalcocite. This represents the one best lead in porphyry copper search. More than sufficient room exists for a very significant copper ore body between holes SC-13, 14, and 16 since the distance between SC-13 and 16 is 3700'; between SC-13 and 14, 4500'; and between SC-16 and 14, 2500'. The Sacaton ore bodies have dimensions of 1100' x 500' and 1400' x 1100' representing approximately 12-1/3 acres and 23-1/3 acres --- and well illustrates the possible potential within the unexplored portion of the Santa Cruz zone.

An upper and lower zone of copper mineralization is shown on the cross-section. Projecting this assay data gives the following tonnage and grade of copper as oxide and chalcocite:

UPPER ZONE

<u>Block</u>	<u>Acres</u>	<u>Interval</u>	<u>Tons</u>	<u>Grade</u>
SC-12	44.1	108.7	16.7	0.62
SC-13	160.7	29.0	16.2	0.75
SC-16	159.9	150	<u>83.0</u>	<u>1.06</u>
		TOTAL	115.9	0.95

LOWER ZONE

<u>Block</u>	<u>Acres</u>	<u>Interval</u>	<u>Tons</u>	<u>Grade</u>
SC-12 & 13	204.8	70	50.0	0.60
SC-14 & 16	233.4	90	<u>72.9</u>	<u>0.76</u>
		TOTAL	122.9	0.70
		GRAND TOTAL	238.8	0.82

The experience at the Sacaton deposit indicates higher grade blocks should exist within the acreage at Santa Cruz.

As Mr. Saegart previously discussed with you in New York, the best method of land acquisition is by direct purchase.

To date we have not been able to negotiate a purchase price with North American Acceptance Corporation (subsidiary of Transcontinental Investing Corp.) or the Collins Estate. I now recommend making a firm purchase offer as follows:

North American Acceptance Corp.	\$1,200,000
Collins Estate	300,000
McIntyre	<u>100,000</u>
TOTAL	\$1,600,000

Purchase of the Collins Estate and McIntyre land would be contingent upon first receiving title to the North American Acceptance Corp. land.

In the event that a significant ore body is not developed, the land may be resold or retained as an alternate water farm for Sacaton. The land is desirable for subdividing for housing lots or trailer lots.

Upon acquiring the land, five drill holes averaging 2500 feet in depth should be completed for a test of the copper potential of the area.

July 23, 1971

Mr. Courtright and Mr. Saegart agree that the Santa Cruz porphyry copper prospect represents a high priority target and that the land should be immediately acquired. Enclosed are forms 302M and 302MA covering land acquisition costs and first phase drilling costs. If you approve, please request a mining authorization in the amount of \$1,780,000.

W. L. Kurtz
W. L. Kurtz

WLK:sh
encl.
attach.

cc: JHCourtright w/attach ✓
WESaegart w/attach. & encl.
KAvondenSteinen w/encl.
RBCrist w/attach. & encl.

J. H. C.
DEC 19 1969

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

December 18, 1969

W.E.S.

TO: J. H. Courtright
FROM: A. Dalla Vista

DEC 23 1969

MR. WES
READ AND RETURN _____
PREPARE ANSWERS _____ HANDLE _____
FILE INITIALS _____

SANTA CRUZ AREA
GEOCHEMICAL SAMPLES

Attached is a list of the geochemical copper values from overburden samples of five drill holes.

Starting at the top of the conglomerate, samples were taken at 100' intervals to bedrock depth. Samples were assayed by the colorimetric method.



A. Dalla Vista

ADV:lab

cc: WESaegart
NPWhaley

PS: Note the different results between core samples and rotary cuttings of SC-5.

ADDITIONAL OVERBURDEN SAMPLES

<u>Hole No.</u>	<u>Depth to Bedrock</u>	<u>Sample No.</u>	<u>Interval</u>	<u>Total Cu ppm</u>
S-5	1260' <u>+</u>	S-5-255	235-255	30
		S-5-355	335-355	55
		S-5-455	435-455	45
		S-5-555	535-555	40
		S-5-655	635-655	45
		S-5-755	735-755	45
		S-5-855	835-855	40
		S-5-955	935-955	35
		S-5-1055	1045-1055	30
		S-5-(1175-1181)	Core int.	15
S-39	1830' <u>+</u>	S-39-1	230-250	35
		S-39-2	330-350	55
		S-39-3	430-450	35
		S-39-4	530-550	55
		S-39-5	630-650	40
		S-39-6	730-750	40
		S-39-7	830-850	35
		S-39-8	930-950	50
		S-39-9	1030-1050	35
		S-39-10	1130-1150	40
		S-39-11	1230-1250	35
		S-39-12 (core)	1288-1292	40
		S-39-13	1330-1350	40
		S-39-14	1430-1450	35
		S-39-15	1530-1550	35
		S-39-16	1630-1650	30
S-61	1000' <u>+</u>	S-61-1	110-130	35
		S-61-2	210-230	45
		S-61-3	310-330	35
		S-61-4	410-430	40
		S-61-5	510-530	50
		S-61-6	610-630	45
		S-61-7	710-730	40
		S-61-8	810-830	50
G-3	2091' <u>+</u>	G-3-1	190-200	40
		G-3-2	290-300	40
		G-3-3	390-400	45
		G-3-4	490-500	40
		G-3-5	590-600	75
		G-3-6	690-700	45
		G-3-7	790-800	40
		G-3-8	890-900	35
		G-3-9	990-1000	35
		G-3-10	1075.5-1078	35

<u>Hole No.</u>	<u>Depth to Bedrock</u>	<u>Sample No.</u>	<u>Interval</u>	<u>Total Cu ppm</u>
G-3 cont'd	2091' ±	G-3-11	1190-1200	90
		G-3-12	1290-1300	80
		G-3-13	1390-1400	35
		G-3-14	1490-1500	30
		G-3-15	1618.8-1623.8	1100
		G-3-16	1690-1700	351
		G-3-17	1790-1800	1700
		G-3-18	1890-1910	419
SC-5	3550' ±	SC-5-1	210-240	85
		SC-5-2	330-360	25
		SC-5-3	420-450	30
		SC-5-4	540-570	40
		SC-5-5	630-660	30
		SC-5-6	720-750	40
		SC-5-7	830-840	35
		SC-5-8	930-960	45
		SC-5-9	1020-1050	25
		SC-5-10	1110-1140	25
		SC-5-11	1230-1240	35
		SC-5-12	1330-1340	40
		SC-5-13	1430-1440	30
		SC-5-14	1530-1540	25
		SC-5-15	1630-1640	35
		SC-5-16	1730-1740	25
		SC-5-17	1830-1840	25
		SC-5-18 (core)	1913-1918	40
		SC-5-19	1930-1940	15
		SC-5-20	2030-2040	15
		SC-5-21	2130-2140	30
		SC-5-22- (core)	2266-2271	465
		SC-5-23	2330-2340	30
		SC-5-24	2430-2440	-10
		SC-5-25	2530-2540	30
		SC-5-26 (core)	2659-2665	45
		SC-5-27	2730-2740	25
		SC-5-28	2830-2840	25
		SC-5-29	2930-2940	25
		SC-5-30	3030-3040	15
		SC-5-31 (core)	3134-3141	340
		SC-5-32	3230-3240	70
		SC-5-33	3330-3340	50
		SC-5-34 (core)	3558-3564	340

FOR SUMMARY OF WORK ON SANTA CRUZ PROSPECT see

"SANTA CRUZ SUMMARY"
Pinal County, Ariz.
JRwojcik May 1966

A BOUND REPORT FILED IN JHC'S REPORT FILE (Library)

J. H. C.

NOV 18 1965

AIRMAIL

November 17, 1965

Mr. S. I. Bowditch
Tucson Office
Tucson, Arizona

Re: Santa Cruz Prospect
State Prospecting Permits

I received your memorandum of November 15th concerning
Federal Insurance Company's Bonds Nos. 80168338 and
80168329 and in accordance with your instructions, we have
cancelled these items.

ORIGINAL SIGNED
S. METZGER III

SM:rk

cc: JHCourtright ✓
KvdSteinen
Comptroller's Department

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

W.E.S.

NOV 2 1965

November 1, 1965

J. H. C.

NOV 3 1965

Mr. Samuel Metzger, III
American Smelting and Refining Company
120 Broadway
New York, N. Y. 10005

Santa Cruz Prospect
State Prospecting Permits

Dear Mr. Metzger:

We have recently received a copy of an extension certificate for Bond No. 80168332 dated October 1, 1965, and signed for the Federal Insurance Company. This bond applies to State Prospecting Permit No. 5688. This permit was cancelled at our request by letter from the State Land Department of July 8, 1965, a copy of which was sent to you with my letter of July 9, 1965. I enclose a Xerox copy for your easy reference.

Will you please have any charges for this extension certificate cancelled, as we do not need this extension. I am returning the extension herewith.

Sent at the same time were extensions of Bonds Nos. 80168338 and 80168329, in connection with Prospecting Permit 5687. Through oversight this permit was not cancelled with the others, but it should be officially cancelled soon, as we requested cancellation two months ago. We will keep these extensions until we hear from the state.

Yours very truly,

S. I. Bowditch

SIB:bam
Enclosures
cc: JHCourtright ✓
KvdSteinen

Santa Cruz

W.E.S.

OCT 26 1965

J. H. C.

NOV 3 1965

October 25, 1965

Mr. Walter V. Murphy
Leasing Supervisor
State Land Department
State Office Building
Phoenix 7, Arizona

Prospecting Permit 5687

Dear Mr. Murphy:

On September 1 I wrote you asking you to cancel
Prospecting Permit No. 5687. Since then I have not
heard from you. Could you please advise us when we
may expect official word that this permit has been
cancelled so that we may in turn cancel our bond.

Yours very truly,

S. I. Bowditch

SIB:bam
cc: JHCourtright ✓
KvdSteinen

AMERICAN SMELTING AND REFINING COMPANY
Tucson

Arizona

1465
J. H. C.

OCT 5 1965

October 1, 1965

MR. *JFK*

READ AND RETURN *JFK*

PREPARE ANSWERS _____ HANDLE _____

FILE _____ INITIALS _____

TO: R. J. LACY

FROM: W. G. FARLEY

I. P. AND RESISTIVITY SURVEY
SANTA CRUZ PROJECT
PINAL COUNTY, ARIZONA

The attached map No. 1 shows the total Wenner 800 foot "a" I. P. - resistivity traverses run to date in the southwest corner of the Casa Grande Valley. The traverse lines completed in this area since the last report (September 18, 1965 - W. G. Farley) are the east - west lines 1 through 5 in the west half of R4E, T6S and T7S, and the two lines one mile northeast of Stanfield. Also on map No. 1 are values of molybdenum in ground water from deep water wells. (Taken from Geochemical Map by D. B. Beck dated April, 1965) Map No. 2 is an overlay map of relative gravity and U. S. G. S. total intensity aeromagnetics.

The geophysics carried out in this area was a continued study of the northeast - southwest Sacaton mineral trend and an attempt to locate the source of the anomalous molybdenum. (740 PPB)

On map No. 1 resistivity values have been contoured to show relative depths to bedrock. The areas with resistivity less than 200 ohm.feet are indications of deep bedrock, probably greater than 600 feet in depth. The truck borne I. P. cannot detect sulfides below 500 or 600 feet in desert environments where low resistivity occurs near the surface. Normal I. P. background in the surveyed area ranges from 2.0 to 5.0 m.v.lv. In the deep bedrock areas extraneous I. P. response from clay was as high as 8.5 m.v.lv. Several of these clay anomalies areas were checked out by depth probes, time ratios or decay measurements. In the areas where bedrock was reachable with the truck borne I. P., no indications of sulfides were obtained. In the deep bedrock area near the molybdenum anomaly, an attempt is being made to reach bedrock with the new Huntco I. P. using the gradient array. Theoretically this I. P. technique can detect sulfides at a depth of three thousand feet while minimizing the response from clay. To date two east - west gradient I. P. lines have been run along the north and south sides of section 17 and 18, T7S, R4E. Sections 16, 17 and 18 are occupied by a magnetic low which cuts across the gravity contours. Two possible explanations for this magnetic low are (1) an area of less magnetic granitic rock or (2) the destruction of magnetite by sulfide mineralization. The above mentioned gradient I. P. lines showed anomalous values. However, it is not certain

October 1, 1965

that those anomalous values are valid because some extraneous I. P. response appeared to be coming from the barbed wire fences with iron post which ran parallel (about 1000 feet away) to the I. P. lines. The next step is to run gradient I. P. lines north - south over the same area to check the validity of the anomalous I. P. response. It has been my experience that barbed wire fences with iron post give no I. P. response when they are crossed perpendicular.

WAYNE G. FARLEY

WGF/pjc

cc: CPPollock

JHCourtright

WESaegart

APPENDIX
RESULTS OF WATER WELL DETERMINATIONS
Molybdenum Content in Ground-Water

<u>Location</u> (<u>Township-Range-Section-Quadrant</u>)	<u>Beck 1961</u>	<u>Beck 1963</u>	<u>Hawley & Hawley 1965</u>	
	<u>Mo-PPB</u>	<u>Mo-PPB</u>	<u>Mo-PPB</u>	<u>Cu-PPB</u>
6 - 3 - 22 - SE		5-	5-	-
6 - 3 - 24 - SE	5-		2	-
6 - 3 - 25 - NE	10			
6 - 3 - 25 - SW			8	-
6 - 3 - 28 - NW		20		
6 - 3 - 34 - C			50	-
6 - 3 - 34 - W		50	50	-
6 - 3 - 34 - SE			40	-
6 - 3 - 34 - SE		60		
6 - 3 - 35 - N			20	-
6 - 3 - 35 - W			20	-
6 - 3 - 35 - C			40	-
6 - 3 - 35 - S			50	-
6 - 3 - 35 - SE			60	-
6 - 4 - 30 - SE	5-			
6 - 4 - 31 - SE	5-			
6 - 4 - 32 - SE	5-			
6 - 4 - 33 - SE	10			
7 - 4 - 3 - SE			8	-
7 - 4 - 4 - SE			5	5
7 - 4 - 5 - SW			20	-
7 - 4 - 6 - SW			50	-
7 - 4 - 10 - NE	5-			
7 - 4 - 9 - SW	40			
7 - 4 - 11 - SE	5-			
7 - 4 - 13 - N			10	-
7 - 4 - 14 - SE			15	-
7 - 4 - 14 - S	20			
7 - 4 - 14 - SW			50	-
7 - 4 - 16 - SW	20	20	40	-
7 - 4 - 16 - S			60	-
7 - 4 - 17 - C			20	-
7 - 4 - 17 - SW	15			
7 - 4 - 17 - W			20	-
7 - 4 - 18 - S		20		
7 - 4 - 22 - SE	50	20		
7 - 4 - 23 - SE	30		20	-
7 - 4 - 24 - N			15	-
7 - 4 - 24 - NW			10	-
7 - 4 - 24 - S	10	10	5	-
7 - 4 - 25 - S		30		
7 - 4 - 26 - SW	50	40		
7 - 4 - 26 - SE	50	50	6	2

Note: Some wells may be plotted as much as 500' off true ground location and thus be located in a different section rather than the one shown on the enclosed map.

APPENDIX
WELL INFORMATION
FROM GROUND WATER BRANCH
GEOLOGICAL SURVEY

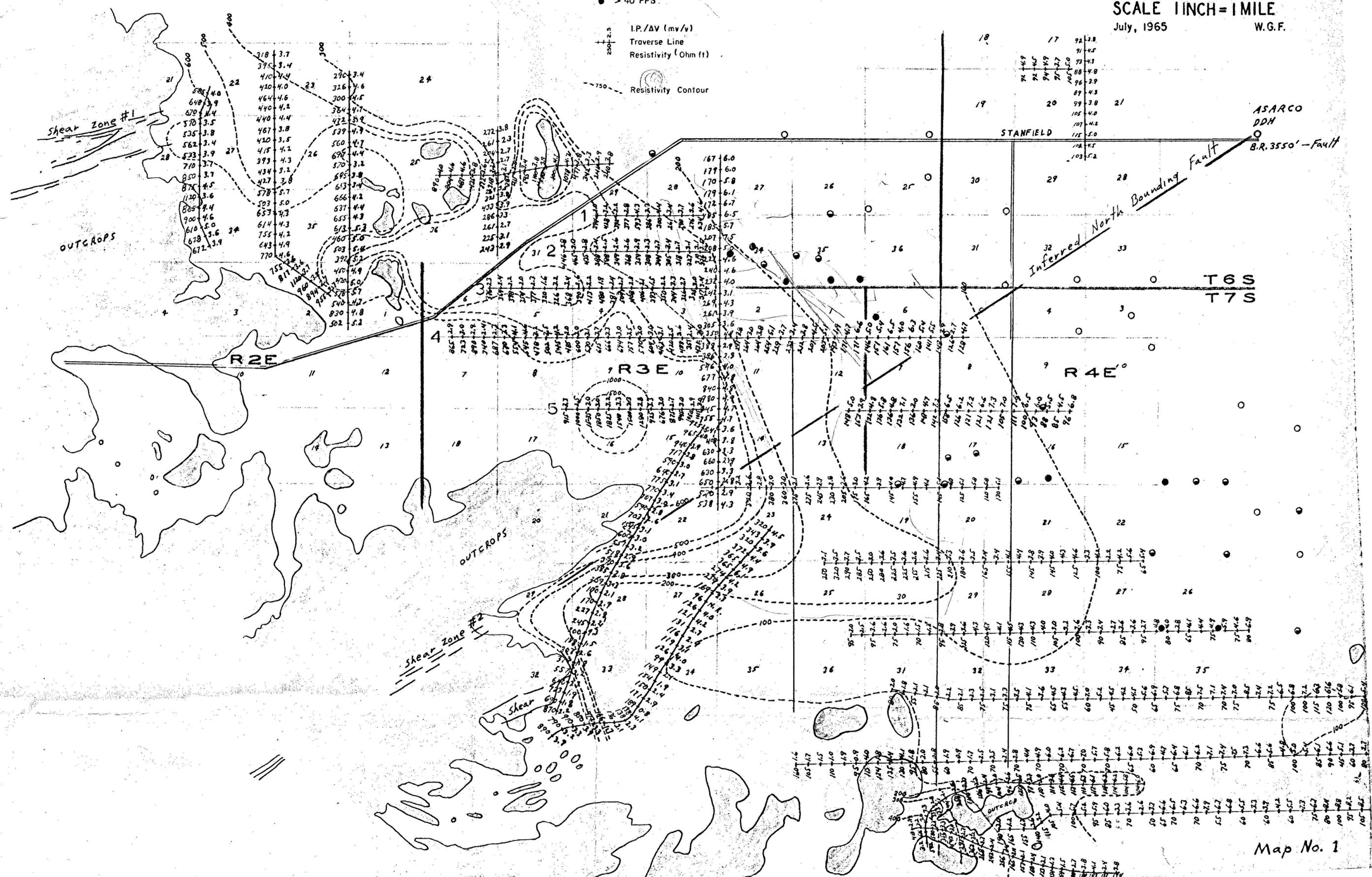
Name and Location	Depth of Well	Depth to Water	Formations	Temp (°F) 1960	Mo-PPB Geochemical Results	Perforated Casing
-3-22-SE	750	380	750' cemented gravel	82°	5-	400'-740'
-3-24-SE			No information		5-	
-3-25-NE	1215	340	1215' packed gravel	--	10	457'-1210'
-3-25-SW	1080	230	1080' cemented sand	83°	8	380'-1076'
-3-28-NW			No information	--	20	
-3-34-C			No information	--	50	
-3-34-W	681	365	681' gravel	--	50	400'-558'
-3-34-SE			No information		40	
-3-34-SE	615	402	515'-615' rock	91°	60	420'-515'
-3-35-N			No information		20	
-3-35-W			No information		20	
-3-35-C	1254	465	1254' cemented sand	--	40	525'-1000'
-3-35-S	1007	410	1007' sandy gravel	--	50	450'-1005'
-3-35-SE	1500	455	1500' sand	--	60	500'-1485'
-4-30-SE	1160		1157'-1160' solid rock	--	5-	410'-1150'
-4-31-SE			No information		5-	
-4-32-SE			No information		5-	
-4-33-SE			No information		10	
-4-3-SE			No information		8	
-4-4-SE			No information		5	
-4-5-SW	910	229	990'-1000' hard rock	83°	20	400'-900'
-4-6-SW	1170		1170' gravel	85°	50	500'-1150'
-4-9-SW			No information		40	
-4-10-NE			No information		5-	
-4-11-SE			No information		5-	

Name and Location	Depth of Well	Depth to Water	Formations	Temp (°F) 1960	Mo-PPB Geochemical Results	Perforated Casing
-4-13-N	917	356	895'-917' hard rock	81°	10	400'-760'
-4-14-SE			No information		15	
-4-14-S			No information		20	
-4-14-SW			No information		50	
-4-16-SW			No information		30	
-4-16-S			No information		60	
-4-17-C			No information		20	
-4-17-W	1410	475	1410' clay & gravel		20	550'-1400'
-4-17-SW	1014	512	878'-1013' hard rock	93°	15	600'-875'
-4-18-S	1067	380	1060'-1067' granite	82°	20	534'-973'
-4-22-SE			No information		30	
-4-23-SE			No information	82°	20	
-4-24-N	840	270	836'-840' black lava rock	82°	15	235'-560'?
-4-24-NW			No information		10	
-4-24-S			No information		10	
-4-25-S			Shallow bedrock close to Andesite hill	--	30	
-4-26-SW			No information		50	
-4-26-SE			No information		50	

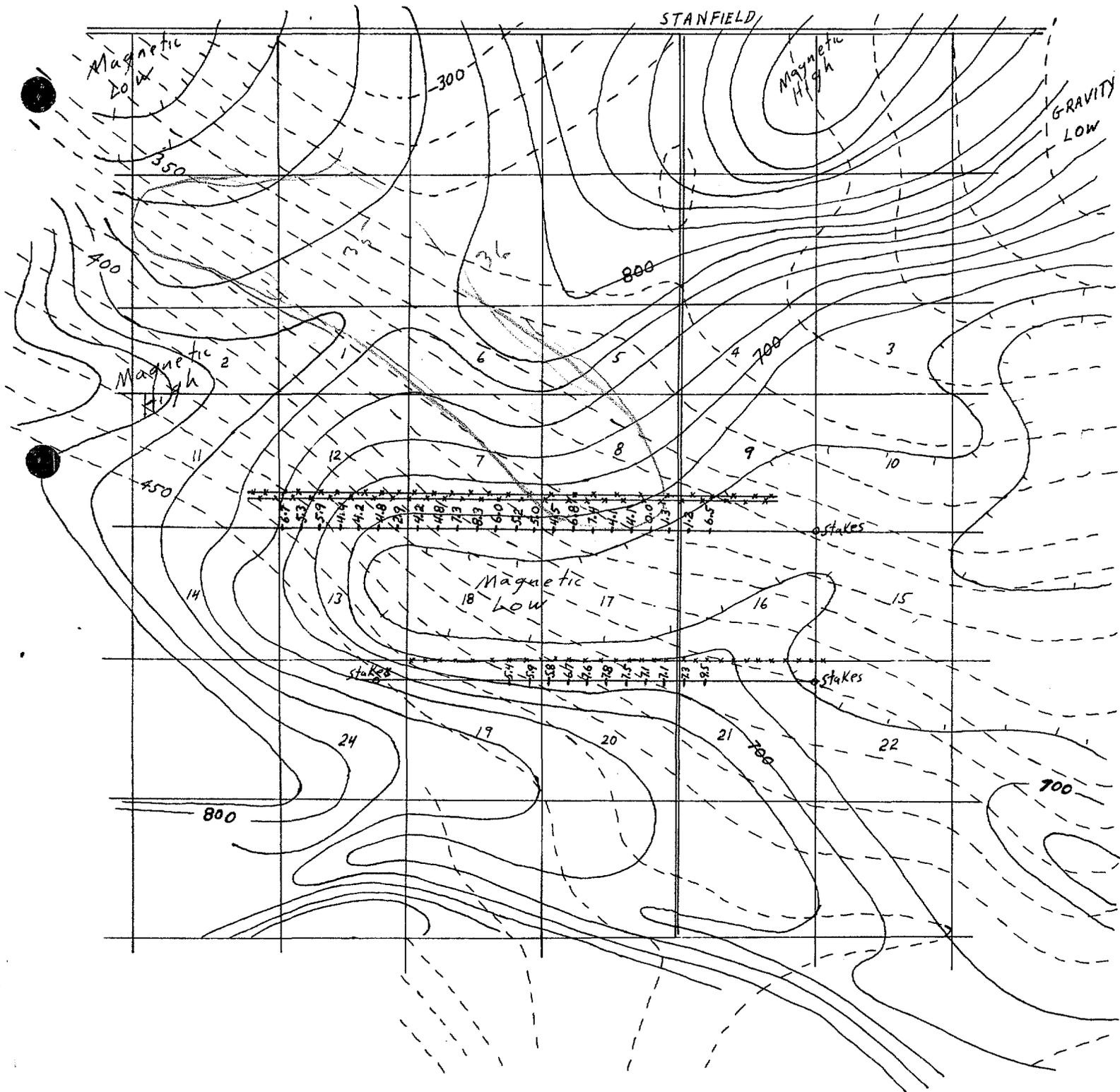
EXPLANATION

- Mo in Ground Water
- < 15 PPB
- ◐ 15-40 PPB
- > 40 PPB

I.P./ΔV (mv/v)
 Traverse Line
 Resistivity (Ohm ft)



Map No. 1



Explanation

- 700 ← Aeromagnetics
Contour Interval = 20 gammas
- 300 ← Relative Gravity
Contour Interval = 10 milligals
- 4.1 5.2 6.8 7.1 ← Hunter I.P. (m.v. 1/4)

GEOPHYSICS

SANTA CRUZ PROJECT

Pinal County, Arizona

Scale 1 inch = 1 mile

Oct., 1965

W. G. F.

J. H. C.

SEP 3 1965

September 1, 1965

State Land Department
State Office Building
Phoenix 7, Arizona

Attn: Mr. Walter V. Murphy, Leasing Supervisor

Prospecting Permit 5687

Dear Sir:

This refers to your notice of August 31, calling attention to the fact that Prospecting Permit 5687, covering all of Section 21, T6S, R4E, terminates on Nov. 21, unless renewed.

Through an oversight we neglected to include this permit in the list of those we asked you to cancel in my letter of June 3. Therefore, this is to advise you that we wish to cancel this permit also, and will appreciate your advising us when this cancellation has been approved, so that we may then cancel our bond.

We have done no work on the ground covered by this permit.

Yours very truly,

S. I. Bowditch

SIB:bam

cc: JHCourtright ✓
KvdSteinen



AMERICAN SMELTING AND REFINING COMPANY
 EXPLORATION DEPARTMENT
 120 BROADWAY, NEW YORK, N.Y. 10005

JHC

J. H. C.

L.P.F.

JUL 1 1965

AUG 27 1965

KENYON RICHARD
 CHIEF GEOLOGIST
AIR MAIL

~~MR. WES~~ ~~WES~~ ~~WES~~

READ AND RETURN
 PREPARE ANSWERS HANDLE
 FILE INITIALS

June 30, 1965
T.C.

AUG 3 1965

W.E.S.

JUL 7 1965

Mr. J. H. Courtright
 American Smelting & Refining Company
 Box 5795
 Tucson, Arizona

Santa Cruz Project

Dear Sir:

I believe you held three classes of property under this project:

1. Lease and options to purchase
2. State prospecting permits
3. Federal claim locations

In order to terminate our interest in these properties, we should have a letter from you listing the various parcels and giving their legal descriptions. This should be accompanied by a request from you that they be dropped. Although this is a formality, approval is required from the Advisory Committee.

Of more importance, the Tax Department here requires copies of any formal notices of relinquishments. We should have copies for our files also. In the case of Item #1 above, please have your local attorneys prepare the necessary formal documents. For Item #2, I am not sure whether a document to the State will serve as termination. You should check with your local attorneys about this point and if documents are required, we would want copies of them also. For Item #3, there is no way to cancel a federal mining claim held by location. These claims will merely have to be considered as dropped now.

You will understand that where a document of formal relinquishment can be made, the Tax Department here will need copies in order to write off this project as reasonably soon as possible.

Yours very truly,

Kenyon Richard

Kenyon Richard

CC-HLGoodenough
 PABarrese
 SIBowditch

W.E.S.

S. I. B.

Santa Cruz

JUL 19 1965

J. H. C.

JUL 26 1965

JUL 19 1965

New York, N. Y., July 14, 1965

MR. W.E.S.

READ AND RETURN _____

PREPARE ANSWERS _____ HANDLE _____

FILE ✓ INITIALS _____

Mr. C. P. Pollock

The following is an extract from the minutes of the meeting of the Advisory Committee held today:

Power of Attorney

At the meeting of the Advisory Committee held on September 23, 1964, the proper officers of the Company were authorized to execute a Power of Attorney in favor of R. B. Meen, Manager, and A. C. Hall, Assistant Manager, of the Company's Southwestern Mining Department, authorizing them to negotiate option agreements on behalf of the Company to purchase lands at the Santa Cruz Prospect, Pinal County, Arizona, to expire June 30, 1965. It was reported that it is necessary that this Power be extended for 60 days. After discussion, the proper officers of the Company were authorized to execute a similar Power of Attorney to Messrs. Meen and Hall, to expire August 31, 1965.

W. T. Reed

- CKNelson
- RMGreene
- TASnedden
- RMMeen
- JHCourtright
- ACHall

POWER OF ATTORNEY

Know all men by these presents, that AMERICAN SMELTING AND REFINING COMPANY, a New Jersey corporation, with an office at 120 Broadway, New York City, New York, (hereinafter called "the Company"), has made, constituted and appointed, and by these presents does make, constitute and appoint R. B. Meen, Manager, and A. C. Hall, Assistant Manager, of the Company's Southwestern Mining Department, jointly and severally, in the name of the Company and on its behalf, to negotiate and enter into agreements (and any and all amendments thereof) whereby the Company is granted the option to purchase lands in connection with the Santa Cruz prospect, Pinal County, Arizona, on such terms and conditions as to them or him may seem proper, with authority generally in said agents and attorneys-in-fact, and each of them, to do and perform all matters and things and execute all writings and instruments, requisite or proper to effectuate or in furtherance of the premises; hereby ratifying all that they or he have heretofore done in the premises, including all such option agreements heretofore executed in the name of the Company.

Unless sooner terminated, this power of attorney and all the authority given herein shall in any event expire August 31, 1965.

In witness whereof, the Company has executed these

presents by its duly authorized officers and affixed its corporate seal this 14th day of July, 1965.

AMERICAN SMELTING AND REFINING COMPANY

By /s/ R. L. Hennebach
Vice President

Attest:

ORIGINAL SIGNED BY
W. T. REED
Assistant Secretary

STATE OF NEW YORK)
) SS:
COUNTY OF NEW YORK)

On the 14th day of July, 1965, before me personally came R. L. Hennebach, to me known, who being by me duly sworn, did depose and say that he resides in Short Hills, New Jersey; that he is Vice President of AMERICAN SMELTING AND REFINING COMPANY, the corporation described in and which executed the above instrument; that he knows the seal of said corporation; that the seal affixed to said instrument is such corporate seal; that it was so affixed by order of the Board of Directors of said corporation, and that he signed his name thereto by like order.

/s/ Morris Schoen

Notary Public

Santa Cruz

J. H. C.

JUL 7 1965

¹³
July 7, 1965

Mr. Thomas D'Ambrosio
144 West Highland
Phoenix, Arizona

Dear Mr. D'Ambrosio:

As I intimated to you some time ago, our work in the Casa Grande area failed to come up with anything of interest to us, and accordingly we are regretfully canceling our options with you and your partners. I am enclosing a copy of my letter to the Arizona Title Insurance and Trust Company, whom I have sent the originals of the Relinquishments to be recorded and then delivered to you, and also am enclosing signed copies of the Relinquishments.

I am sorry that our work in the area did not turn out more favorably for all of us, but that is the way things go in the exploration game.

Yours very truly,

S. I. Bowditch

SIB:bam

Encs.

bcc: JHCourtright ✓

J. H. C.
JUL 7 1965

July ¹³ 7, 1965

Certified Mail
Return Receipt Requested
Arizona Title Insurance and Trust Company
P. O. Box 3915
Phoenix, Arizona 85030

Attn: Mr. Alfred J. Vadney, Escrow Officer

Your Escrow No. 228867

Gentlemen:

Enclosed are fully executed Relinquishments of the seven options dated November 1, 1964, covering the undivided interests of Thomas D'Ambrosio and his partners in the SW 1/4 of Sec. 12, T6S, R4E, Pinal County, Arizona.

Will you please have these recorded in Pinal County and then given to Mr. D'Ambrosio to distribute. The charges for this will be for our account.

Now that we have relinquished this option, we will expect your final charges for our share of this escrow.

Yours very truly,

S. I. Bowditch

SIB:bam

Encs.

cc: Thomas D'Ambrosio
JHCourtright ✓
KvdSteinen

J. H. C.
JUL 7 1965

July ¹³ 7, 1965

Mr. and Mrs. R. C. Smith
Casa Grande,
Arizona

Dear Mr. and Mrs. Smith:

Our work in the Casa Grande area has proved disappointing, and so we are regretfully canceling our option with you. I am enclosing a copy of my letter to Surety Title and Trust Company, to whom I have sent the original of our Relinquishment to be recorded and then given to you, and a copy of the Relinquishment.

I am sorry that this business did not turn out more favorably for both of us, but that is the way things go in the exploration game.

It has been a pleasure meeting you both.

Yours very truly,

S. I. Bowditch

SIB:bam

Enc.

bcc: JHCourtright

J. H. C.
JUL 7 1965July ¹³ 7, 1965

Mr. and Mrs. Alvin T. Ethington
P. O. Drawer RR
Casa Grande, Arizona 85222

Dear Mr. and Mrs. Ethington:

Our work in the Casa Grande area has proved disappointing, and so we are regretfully canceling our option with you. I am enclosing a copy of my letter to Surety Title and Trust Company, to whom I have sent the original of our Relinquishment to be recorded and then given to you, and a copy of the Relinquishment.

I am sorry that this business did not turn out more favorably for both of us, but that is the way things go in the exploration game.

It has been a pleasure meeting you both.

Yours very truly,

S. I. Bowditch

SIB:bam

Enc.

bcc: JHCourtright ✓

J. H. C.
JUL 7 1965

13
July 7, 1965

Mr. and Mrs. Chester Ethington
Rte. 2, Box 368
Casa Grande, Arizona

Dear Mr. and Mrs. Ethington:

Our work in the Casa Grande area has proved disappointing, and so we are regretfully canceling our option with you. I am enclosing a copy of my letter to Surety Title and Trust Company, to whom I have sent the original of our Relinquishment to be recorded and then given to you, and a copy of the Relinquishment.

I am sorry that this business did not turn out more favorably for both of us, but that is the way things go in the exploration game.

It has been a pleasure meeting you both.

Yours very truly,

S. I. Bowditch

SIB:bam
Enc.

bcc: JHCourtright ✓

J. H. C.

JUL 7 1965

13
July 7, 1965

Certified Mail
Return Receipt Requested
Arizona Land Title and Trust Company
199 North Stone
Tucson, Arizona

Attn: Mr. H. L. Badger, Escrow Officer

Your Escrow No. 87655-H-B

Gentlemen:

Enclosed is a fully executed Relinquishment of the option dated November 1, 1964, between First National Bank of Arizona, Trustee for Dr. A. J. McIntyre and Leonin M. McIntyre and Asarco, covering Lots 3 and 4 and the E 1/2 SW 1/4 of Sec. 7, T6S, R5E, Pinal County, Ariz.

Will you please have this recorded in Pinal County and then given to the First National Bank of Arizona. The charges for this will be for our account.

Now that we have relinquished this option, we will expect your final charges for our share of this escrow.

Yours very truly,

S. I. Bowditch

SIB:bam

Enc.

cc: J. R. Barlow, Trust Officer w/enc.
First National Bank of Arizona
411 N. Central Ave.
Phoenix, Arizona 85004

JHCourtright ✓
KvdSteinen

13
July 7, 1965

J. H. C.
JUL 7 1965

Certified Mail
Return Receipt Requested
Surety Title and Trust Company
P. O. Drawer S
Casa Grande, Arizona 85222

Your Escrow No. 1080-604

Gentlemen:

Enclosed is a fully executed Relinquishment of the Option Agreement with Alvin T. and Lorraine Ethington dated January 25, 1965, covering the E 1/2 of Sec. 14, T6S, R4E, Pinal County, Arizona.

Will you please have this recorded and then given to the Ethington's. The charges for this will be for our account.

Now that we have relinquished the option, we will expect your final charges for our share of this escrow.

Yours very truly,

S. I. Bowditch

SIB:dam
enc.

cc: Mr. and Mrs. Alvin T. Ethington w/enc.
JHCourtright
KvdSteinen

J. H. C.

JUL 7 1965

13
July 7, 1965

Certified Mail
Return Receipt Requested
Surety Title and Trust Company
P. O. Drawer 8
Casa Grande, Arizona 85222

Your Escrow No. 1080-683

Gentlemen:

Enclosed is a fully executed Relinquishment of the option agreement dated April 8, 1965, with Richard C. and Mattie Blanche Smith, covering various parcels of ground in Sec. 12 and 13, T6S, R4E and in Sec. 18, T6S, R5E, all in Pinal County, Arizona.

Will you please have this recorded and then given to the Smith's. The charges for this will be for our account.

Now that we have relinquished our option we will expect your final charges for our share of this escrow.

Yours very truly,

S. I. Bowditch

SIB:bam

Enc.

cc: Mr. and Mrs. R. C. Smith w/enc.
Howard Kerman w/enc.
JHCourtright ✓
KvdSteinen



AMERICAN SMELTING AND REFINING COMPANY
 EXPLORATION DEPARTMENT
 120 BROADWAY, NEW YORK, N.Y. 10005

J. H. C.

JUL 13 1965

KENYON RICHARD
 CHIEF GEOLOGIST
 Air Mail

MR. WES
 READ AND RETURN _____
 PREPARE ANSWERS _____HANDLE _____
 FILE ✓ INITIALS _____

W.E.S.
 JUL 27 1965

July 12, 1965

Mr. J. H. Courtright
 American Smelting & Refining Company
 Box 5795
 Tucson, Arizona

Santa Cruz Property

Dear Sir:

Reference is made to the last paragraph of your letter of July 8.

One copy each of Relinquishments go to Mr. H. L. Goodenough,
 Mr. R. Richter, Tax Section; Mr. T. A. Wegener, Document Book.
 The original, of course, goes to Mr. Grose.

Yours very truly,

Kenyon Richard
 Kenyon Richard

CC-HLGoodenough
 RRichter
 TAWegener
 SIBowditch

Oa-16A.2, 19C

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

July 8, 1965

Mr. K. E. Richard, Chief Geologist
American Smelting and Refining Company
120 Broadway
New York, N. Y. 10005

SANTA CRUZ PROPERTY

Dear Sir:

Reference is made to your letter of June 30 regarding property involved in the Santa Cruz Project.

Enclosed is Mr. Bowditch's letter listing all Santa Cruz land parcels with the legal description of each. Permission is requested herewith to drop all Santa Cruz property under option, all State land held under prospecting permits, and to allow all federal mine claims to lapse. This request is occasioned by the out come of an extensive drilling program, the results of which indicate that there is no reasonable chance to find a mineable copper deposit on the Santa Cruz property.

You will note that Mr. Bowditch states (Page 2, Paragraph below Item #3) that the State does not require formal notices in the case of prospecting permits, they simply expire if the terms are not met. However, a letter advising the State of our intention to relinquish is sent promptly so that the bonds may be released as soon as possible.

Please note also the last paragraph of page 2 wherein Mr. Bowditch points out that copies of all instruments, including cancellation notices or quit claim deeds, are sent to Mr. Wegener as a matter of routine. Should copies be sent also to Mr. Goodenough, or directly to the Tax Department, and if so, to whose attention?

Yours very truly,

J. H. COURTRIGHT

JHC/pjc
Enclosures
cc: SIBowditch

J. H. C.

JUL 2 1965

July 2, 1965

Mr. Walter Murphy, Leasing Division
State Land Department
State Office Building
Phoenix 7, Arizona

Prospecting Permit 3200

Dear Sir:

On May 12 I wrote asking you to cancel Prospecting Permits 3198 and 3200. In that letter I stated we had done no work on the ground covered by either permit. I find I was mistaken, for we did drill a hole on the east side of Lot 8, Section 2, T6S, R4E, part of Permit 3200. The hole has been plugged, and the sludge pit filled in.

When may we expect word from you that these permits have been cleared on your books so that we may cancel the bonds?

Yours very truly,

S. I. Bowditch

SIB:bam

bcc: JHCourtright

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

July 2, 1965

J. H. C.

JUL 2 1965

To: J. H. Courtright

From: S. I. Bowditch

Santa Cruz Project
Property

As requested by Mr. Richard in his letter of June 30, below is a list of the various parcels of land involved in the Santa Cruz project:

1. Options to purchase.

- a) SW 1/4, Sec. 12, T6S, R4E - Owners: Thomas D'Ambrosio and Bella D'Ambrosio 2/12; Harold Blum and Carol Blum 1/12; James R. Lara, Sr. and Virginia Lara 1/12; Lawrence Liefert 1/12; Frank de Palma and Immocalata de Palma 2/12; Lawrence Rambo and Mable Rambo 4/12; Cesare Spero and Kay Rita Spero 1/12.
- b) Lots 3 and 4 and E 1/2 SW 1/4 (equal all SW 1/4) Sec. 7, T6S, R5E - Owner: First National Bank of Arizona, as Successor to Phoenix Savings Bank and Trust Company, as Trustee for Dr. A. J. McIntyre and Leonin M. McIntyre under Trust Agreement dated February 13, 1946.
- c) E 1/2, Sec. 14, T6S, R4E - Owners: Alvin T. Ethington and Lorraine Ethington.
- d) W 1/2, Sec. 13, T6S, R4E - Owners: Chester H. Ethington and Elda N. Ethington.
- e) Lots 3 and 4 and W 1/2 SE 1/4 (equal all SE 1/4) Sec. 12; Lots 1 and 2 and W 1/2 NE 1/4 (equal all NE 1/4) Sec. 13, all in T6S, R4E; Lots 1 and 2 and E 1/2 NW 1/4 (equal all NW 1/4) and Lots 3 and 4 and E 1/2 SW 1/4 (equal all SW 1/4) Sec. 18, T6S, R5E - Owners: Richard C. Smith and Mattie Blanche Smith.

2. State Prospecting Permits.

P.P. 3198 E 1/2 and E 1/2 NW 1/4 Sec. 17, T6S, R4E
3200 Lots in NE 1/4 Sec. 2, T6S, R4E
3563 E 1/2 SE 1/4 Sec. 12, T7S, R5E
4404 Land in Sec. 35, T6S, R4E
5309 S 1/2 Sec. 13, T5S, R4E
5604 N 1/2 SW 1/4, Sec. 23, T5S, R4E
5605 Land in NW 1/4, Sec. 32, T5S, R4E
5688 All, except Comm Lease, Sec. 27, T6S, R4E
5690 W 1/2 Sec. 32, T6S, R4E
5691 All Sec. 33, T6S, R4E
5692 E 1/2, W 1/2 SW 1/4, NE 1/4 SW 1/4, Sec. 34,
T6S, R4E
5693 Land in Sec. 35, T6S, R4E
5694 All Sec. 2, T7S, R4E

3. Federal Claim Locations.

W1 - W20 - N 1/2 Sec. 12, T6S, R4E
G1 - G20 - W 1/2 Sec. 23, T6S, R4E
Lot 1 - Lot 20 - W 1/2 Sec. 24, T6S, R4E

Prospecting Permits 3198 and 3200 expired by their own terms on June 2, 1965, as we did not renew them. Permit 3563 will expire on July 8. On May 12 I wrote the State Land Department advising them that we would not renew these permits. On June 3 I advised the State Land Department that we wished to cancel the remaining permits which are due for renewal at various dates from September 15 to December 3. The Land Department advises us when the permits are canceled on their records, so that we may in turn cancel our bonds. Usually this is done within six weeks after notice, but the department has been snowed under with permits for potash in the northeast part of the State, and have not as yet sent us their advice. This is what we generally put in the document books to show that our liability is terminated.

In connection with the document books, copies of all instruments, including cancellation notices or quit claim deeds, are sent to Mr. Wegener as a matter of routine. I had been under the impression that copies also went to Mr. Goodenough's office, but on reviewing the file I see that this has not been done. Originals, of course, go to Mr. Grose. Should copies be sent to Mr. Goodenough, or directly to the Tax Department, and if so, to whose attention?

Mr. Courtright

-3-

July 2, 1965

We will arrange with the attorneys to prepare the necessary relinquishment of the various options.

Yours very truly,

S. I. Bowditch

S. I. Bowditch

SIB:bam
cc: KERichard

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

June 10, 1965

7/8/65
J.H.C.
JUN 11 1965

MR. WEST
READ AND RETURN _____
PREPARE ANSWERS _____ HANDLE _____
FILE ✓ INITIALS _____

TO: J. H. COURTRIGHT
FROM: J. E. KINNISON

W.E.S.
JUL 7 1965

CASA GRANDE OFFICE BUILDING

It has occurred to me that since termination of drilling on the Santa Cruz project there might be some suggestion that we abandon the Casa Grande office which we presently rent on a monthly basis. This office is filled with core, and as far as I know there is no place to which to move this volume of drill core and other samples. In addition, the office furnishes a useful base of operation for any further work which might be undertaken in the Casa Grande Valley or westward therefrom.

S. I. B.
JUL 8 1965

In view of the expense of moving the core, and losing the accessibility to a well-equipped building which we rent at a modest rate of, I believe, about \$170 per month, it is my opinion that we should hold onto this office for some indefinite time, perhaps an additional one or two years at least. In addition, since we now control the mineral rights of an indicated ore body at Sacaton the core should logically remain there until other facilities at the property might become available.

J. E. Kinnison
J. E. KINNISON

JEK/jak
cc: JRWojcik

I agree we should continue to hold the building at least until contemplated exploration SW of the Santa Cruz project is completed. We should investigate the possibility of obtaining a long term lease at a lower rate than now paid by the month.

JHE

I believe Mr. JHC is a good one.

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

June 7, 1965

J. H. C.
JUN 8 1965

TO: J. H. COURTRIGHT

FROM: J. R. WOJCIK

SANTA CRUZ DRILLING
MAY, 1965

H²
EF 1422
1440-1500 = .3
1630-1650 = .3

During the month of May, drill hole SC-16 advanced from 631' to 1844.5' bottoming in fresh Sacaton porphyry. This hole passed through a strong fault zone indicated by a thick interval of chloritic gouge and "mylonite?" between 1400' and 1470'. Below this fault, copper oxides and sulphates occurred in the conglomerate as introduced cementing agent, in fractures, and as oxidized copper minerals in place in the altered fragments included in the conglomerate. A core taken in the interval 1511' to 1521' showed the copper oxide cemented conglomerate in fault contact with a reddish hematite cemented conglomerate.

→ udc as shown

The conglomerate-bedrock contact appeared to be depositional although the interval was not cored. Rotary drill cuttings indicate that bedrock was first penetrated at 1680'.

Sludge samples from 1440' to 1650' showed the following assay results:

Interval	Tot. Cu %	Ox Cu %
1440 - 50	0.26	0.12
1450 - 60	0.14	0.08
1460 - 70	0.27	0.15
1470 - 80	0.14	0.08
1480 - 90	0.30	0.11
1490 - 1500	0.17	0.05
1500 - 10	0.86	0.63
1530 - 40	0.32	0.21
1540 - 50	0.38	0.25
1550 - 60	0.32	0.19
1560 - 70	0.47	0.30
1570 - 80	1.04	0.84
1580 - 90	2.13	1.78
1590 - 1600	2.75	2.46
1600 - 10	2.55	2.35
1610 - 20	0.60	0.34
1620 - 30	1.50	1.20
1630 - 40	1.60	1.34
1640 - 50	0.43	0.31

90'
@
1.45% Cu

June 7, 1965

A core in the interval 1511'-1517' ran 2.32% with 1.85% as non-sulfide.

Two cores in the porphyry at 1810'-1816' and 1841'-1844.5' averaged 0.10 and 0.05 total copper and oxide copper respectively.

Drill hole SC-17 was collared on May 12 and by 8:00 A.M. on May 23 was 2975' still in sediments probably equivalent to the Sacaton conglomerate in age. Some thickness of older deformed sediments probably underlies this.

Cost of these two holes is tabulated below.

	<u>SC-16</u>		
631'-1800' = 1169'	@ \$3.65/ft.	\$4266.85	
1800'-1841' = 13.25 hrs.	@ \$25.00/hr.	331.25	
Coring = 21.50 hrs.	@ \$25.00/hr.	537.50	
Bits below 1800' = 1	@ \$37.00/bit	37.00	
Sales tax on bits	@ 3½%	1.30	
	Total SC-16	\$5173.90	\$ 5,173.90
	<u>SC-17</u>		
0-1800' = 1800'	@ \$3.65/ft.	\$6570.00	
1800'-2975' = 119 hrs.	@ \$25.00/hr.	2975.00	
Bits below 1800' = 8	@ \$37.00/bit	296.00	
Sales tax on bits	@ 3½%	10.36	
	Total SC-17	\$9851.36	9,851.36
Casing couplings (40 carried from SC-12)		\$ 49.22	
Reset core bit		297.19	
2 sacks Soda Ash	@ \$6.50	13.00	
1 sack Quebracho	@ \$31.90	31.90	
3 sacks CC-16	@ \$9.00	27.00	
2 sacks Cellex	@ \$31.95	63.90	
1 sack Dextrid	@ \$20.75	20.75	
		\$ 502.96	
Less credit for 1 sack Mud-Gel		1.25	
		501.71	501.71
Total drilling cost for May			\$15,526.97

The unexpended balance in M.A. 998 as of June 1 is approximately \$8600.

JRWojcik
J. R. WOJCIK

JRW/jak
cc: KvdSteinen

J. H. C.

JUN 3 1965

June 3, 1965

Mr. Walter V. Murphy, Supervisor
Leasing Division
State Land Department
State Office Building
Phoenix, Arizona

Dear Sir:

We wish to cancel the following Prospecting Permits, effective as soon as possible.

<u>Permit No.</u>	<u>Description</u>	<u>Renewal Date</u>
P.P. 4404	Land in Sec 35, T6S, R4E	9-15-65
P.P. 5309	SW & SE Sec 13, T5S, R4E	10-12-65
P.P. 5604	N 1/2 SW 1/4 Sec 23, T5S, R4E	10-29-65
P.P. 5605	Land in Sec 32, T5S, R5E	10-29-65
P.P. 5688	All, except Commercial Lease Sec 27, T6S, R4E	12- 3-65
P.P. 5690	W 1/2 Sec 32, T6S, R4E	12- 5-65
P.P. 5691	All Sec 33, T6S, R4E	12- 3-65
P.P. 5692	Land in Sec 34, T6S, R4E	12- 3-65
P.P. 5693	Land in Sec 35, T6S, R4E	12- 3-65
P.P. 5694	All Sec 2, T7S, R4E	12- 3-65

The only permit on which we have done any work is Permit 4404. There we drilled one hole in the very Northwest corner of the section. The hole has been plugged and the sludge pits filled in.

We would appreciate being advised when these permits are officially cancelled so that we may cancel our bonds.

Yours very truly,

AMERICAN SMELTING AND REFINING COMPANY

By _____
S. I. Bowditch

SIB:eme

cc: JHCourtright
KvdSteinen

5/11/65
JRW, JHK, WLS
READ AND RETURN
PREPARE ANSWERSHANDLE
FILE..... INITIALS.....

J. H. C.

MAY 13 1965

May 12, 1965

Mr. Walter Murphy, Leasing Division
State Land Department
State Office Building
Phoenix 7, Arizona

Prospecting Permits
Numbers 3198 and 3200

Dear Sir:

In reference to Prospecting Permits 3198 and 3200, which are due for renewal on June 2, 1965, this is to notify you that we do not intend to renew them, and wish you to cancel them as soon as you may legally do so. I am enclosing Extension Certificates for bonds numbers 80082749 and 80082750, which apply to these two permits, because I know you require these bonds kept in force until the permits are officially cancelled or terminated.

For your information, we have done no work on the ground covered by either of these permits.

Will you please notify us when these permits are officially cancelled so that we may cancel the bonds.

Yours very truly,

AMERICAN SMELTING AND REFINING COMPANY

By _____
S. I. Bowditch

Enclosures
SIB:bam
cc: JHCourtright
KvdSteinen

MR. ~~WES SIB~~ ^{3/11/65} AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona
READ AND RETURN _____
PREPARE ANSWERS _____HANDLE _____
FILE INITIALS _____

May 7, 1965

J. H. C.

MAY 10 1965

S. I. B.

MAY 21 1965

TO: J. H. COURTRIGHT

FROM: J. R. WOJCIK

SANTA CRUZ DRILLING
APRIL, 1965

During the month of April, drill hole SC-14 advanced from 2469' to 2585' in the Sacaton porphyry. The rock is weakly to moderately altered with weak pyrite, chalcopryrite and chalcocite. Chalcocite is strong locally, a 70' interval between 2300' and 2370' averaged 1.00% Cu in the sludges. Three short cores in this interval averaged 17' of .31% Cu indicating the erratic distribution of chalcocite. Considerable copper has been transported and deposited in the oxidized zone as chrysocolla and antlerite. The 180' interval from 2060' to 2240' averaged .51% Cu mostly as oxides. A 6.5' core of porphyry at the bottom of the hole assayed .17% Cu.

Drill hole SC-15 entered strongly altered granite at 2600' and showed sparse pyrite from 2640' to 2690'. Weak chalcocite rims on pyrite continued to the bottom of the hole at 2923.5'. Sludges from 2690' to 2919' averaged .22% Cu. Two cores in this interval averaged .23% Cu. The core at the bottom of the hole (2919'-2923.5') has not been returned from the assayer.

Drill hole SC-16 was still in recent sediments at 631' at month's end.

Boyles Bros. core drill arrived late on 4/12/65 and set up on SC-4. Coring began on 4/13/65 at 1876.0' in leached moderately altered granite breccia passing into weakly altered Sacaton porphyry breccia at 1912'. Weak pyrite, chalcocite and corellite were observed at 1949' along and near a fracture. Sixty-nine feet of oxides (1876'-1945') averaged .33% Cu. The next 72' (1945'-2017') of partially oxidized sulphides averaged .26% Cu. The bottom 25.7' (2017'-2042.7' T.D.) averaged 0.05%.

Hole SC-12 began coring at 1577.5' in moderately altered Sacaton porphyry passing into weakly altered granite at 1672'. The first 52.5' (1577.5'-1635') averaged .42% Cu as oxides. The remainder of the assays have not yet been returned. The hole has since been stopped in very weakly altered granite at 1910'.

The direct costs of these holes is tabulated below:

ROTARY DRILLING COSTS

SC-14

Drilling below 1800':			
19 hrs. (2469'-2585')	@\$25.00/hr.	\$475.00	
Circulating: 1.25 hrs.	@\$25.00/hr.	31.25	
Coring: 15.25 hrs.	@\$25.00/hr.	381.25	
Standby: .5 hr.	@\$12.00/hr.	6.00	
Bits below 1800': 2	@\$37.00/bit	74.00	
3-1/2% tax		<u>2.59</u>	
Total SC-14		\$970.09	\$ 970.09

SC-15

0-1800': 1800'	@\$3.65/ft.	\$ 6,570.00	
Drilling below 1800':			
238.8 hrs. (1800'-2924')	@\$25.00/hr.	5,970.00	
Circulating: 3.5 hrs.	@\$25.00/hr.	87.50	
Coring: 32.00 hrs.	@\$25.00/hr.	800.00	
Standby: 1.00 hr.	@\$12.00/hr.	12.00	
Bits below 1800': 20	@\$37.00/bit	740.00	
3-1/2% tax		<u>25.90</u>	
Total SC-15		\$14,205.40	\$14,205.40

SC-16

0-631': 631'	@\$3.65/ft.	\$2,303.15	<u>\$ 2,303.15</u>
	Total drilling costs		\$17,478.64
=	Mud & Chemicals		<u>643.01</u>
	Total rotary drilling and mud costs		\$18,121.65

MUD & CHEMICALS FOR ROTARY DRILLING

100	50 lb. sacks Mud-Gel	@\$1.25	\$125.00	
3	50 lb. sacks Cellex	@\$31.95	95.85	
4	100 lb. sacks Soda Ash	@\$6.50	26.00	
6	50 lb. sacks Dextrid	@\$20.75	124.50	
14	50 lb. sacks CC-16	@\$9.00	126.00	
5	5 gal. cans Con-Det	@\$16.00	80.00	
1	110 lb. sack Quebracho	@\$31.90	31.90	
1	100 lb. can Caustic Soda	@\$12.00	12.00	
			<u>\$621.27</u>	
	3-1/2% tax		21.74	
	Total Mud & Chemicals		\$643.01	

J. O. Barnes Drilling Service

1312 N. PARK AVENUE CASA GRANDE, ARIZONA P. O. BOX 141
PHONE TE 6-8061

J. H. C.

MAY 10 1965

DATE May 4, 1965

To American Smelting & Refining Co.

P O Box 5795

Tucson, Arizona 85701

K.V.D.S.
MAY 7 1965

COPY

Well SC-14		
Drilling below 1800' (2519-2585) 19 hrs. @ \$25.00 hr.	\$475.00	
Circulating 1.25 hrs. @ \$25.00 hr.	31.25	
Coring 15.25 hrs. @ \$25.00 hr.	381.25	
Standby .5 hr. @ \$12.00 hr.	6.00	
Bits below 1800' 2 @ \$37.00	74.00	
3 1/2% Sales Tax on Bits	<u>2.59</u>	\$970.09

SC-15		
0-1800': 1800' @ \$3.65 ft.	\$6570.00	
Drilling below 1800' (1800'-2924') 238.8 hrs. @ \$25.00	5970.00	
Circulating 3.5 hrs. @ \$25.00 hr.	87.50	
Core: 32 hrs. @ \$25.00 hr.	800.00	
Standby 1 hr. @ \$12.00 hr.	12.00	
Bits below 1800' 20 @ \$37.00	740.00	
3 1/2% Sales Tax on Bits	<u>25.90</u>	14205.40

SC-16		
0-631' 631 @ \$3.65 ft.		2303.15
Total Drilling Costs		<u>17478.64</u>

Mud and Chemicals for Rotary Drillings:		
100 50 lb. sacks MudGel @ \$1.25	125.00	
3 50 lb. sacks Cellex @ \$31.95	95.85	
4 100 lb. sacks Soda Ash @ \$6.50	26.00	
6 50 lb. sacks Dextrid @ \$20.75	124.50	
14 50 lb. sacks CC-16 @ \$9.00	126.00	
5 5 gal. cans ConDet @ \$16.00	80.00	
1 110 lb. sack Quebracho @ \$31.90	31.90	
1 100 lb. can Caustic Soda @ \$12.00	12.00	
	<u>621.25</u>	
3 1/2% Sales Tax on Mud and Chemicals	<u>21.74</u>	

Total Drilling & Mud Costs		642.99
		<u>18121.63</u>
Less	18121.63	
	2495.95 Labor	
	<u>15625.68 @ 1 1/2% Sales Tax</u>	234.39
		<u>18356.02</u>

*Approved for payment
5/5/65 J.R. Wojcik
MA 498*

JHC desk

Bl.: Santa Cruz Prospect
Richard C. Mattie Blanche Smith

J. H. C.

APR 28 1965

W.E.S.
APR 12 1965

April 12, 1965

Surety Title and Trust Co.
Drawer 8
Casa Grande, Ariz. 85222

Gentlemen:

Our attorneys have reviewed the Preliminary Title Report on the property of Richard C. and Mattie Blanche Smith, and found it to be in order. Therefore, you may release our check for \$12,454 to the Smiths, and record the memorandum of option.

Yours very truly,

S. I. Bowditch */barn*

SIB:bam
cc: Richard C. Smith
Howard Karman
bcc: JHCourtright ✓

JHC F26

W.E.S.
APR 9 1965

J.H.C.
APR 28 1965

April 8, 1965

Surety Title and Trust Company
Casa Grande, Arizona

Gentlemen:

Enclosed you will find our check in the amount of \$12,454.00 payable to Richard C. Smith and Mattie Blanche Smith, two copies of an Option Agreement dated April 8, 1965 between the Smiths and American Smelting and Refining Company, and three copies of a Memorandum of Mining Option of the same date between the same parties, each of which has been duly signed and acknowledged by the parties thereto. These agreements cover certain land in Pinal County, Arizona, a full description of which appears in said Agreement.

Your company is designated as Escrow Agent in Paragraph 2 of said Option Agreement, and you are hereby authorized and instructed to deliver the enclosed check and also a copy of the Agreement and Memorandum to Mr. and Mrs. Smith when you have issued or caused to be issued a preliminary report for title insurance showing that you will insure the title to the covered property in fee simple, without mineral reservations, liens or encumbrances other than roadways, recorded easements and current taxes, and any matters adversely affecting title to the property filed after the issuance of such preliminary report for title insurance, in the sum of \$529,295. This preliminary report for title insurance should be submitted to us for our approval. It is understood that all sums due under existing mortgages and contracts, if any, that presently constitute liens upon said property, will have been paid prior to the issuance of said title insurance.

Surety Title and Trust Company
April 8, 1965
Page 2

We call your attention to Paragraph 3 of the Option which provides that if you are unable, because of defects in the title, to issue a preliminary report for title insurance as set forth above, then, and in such event, the check for \$12,454 will be returned to the undersigned.

This letter will authorize you to open an escrow as contemplated in said Option Agreement. Will you please record the Memorandum of Mining Option and return such recorded copy to us.

Yours very truly,

AMERICAN SMELTING AND REFINING COMPANY

By

S. I. Bowditch

SIB:bam
Enclosures

cc: Mr. & Mrs. Richard C. Smith
Casa Grande, Arizona

bcc: JHCourtright ✓
KvdSteinen

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

March 30, 1965

Mr. K. E. Richard, Chief Geologist
American Smelting and Refining Company
120 Broadway
New York, N. Y. 10005

Dear Sir:

Enclosed is a map of the Santa Cruz project with drill hole locations shown up to date including SC-14, the current hole.

Detail on this drilling will be included in the monthly report for March, however I am sending this map showing progress so that you will be informed on the position of the various holes.

The current hole, SC-14, reached moderately altered and mineralized bedrock at 2000'. Drilling by rotary and occasional coring is continuing; at 2150' the hole had not yet encountered sulfides.

All holes showing mineralization and alteration, whether weak or strong, are indicated by pink color.

Yours very truly,

J. H. COURTRIGHT

JHC/jak
Encl.

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

J. H. C.
MAR 2 1965

March 2, 1965

MR. WES JER 3/8/65
AD AND RETURN _____
PREPARE ANSWERS _____ HANDLE _____
FILE ✓ INITIALS _____

TO: J. H. COURTRIGHT

FROM: J. R. WOJCIK

W.E.S.
I.R. 5 1965

SANTA CRUZ DRILLING
FEBRUARY, 1965

During the month of February, drill hole SC-11 advanced from 1281' to 2136' penetrating weakly altered preCambrian granite from 2090' to 2136'.

Hole SC-12 entered a highly sheared fault zone at 860' and passed into leached granite at 950'. This granite was thoroughly altered with some silicification and minor quartz-sericite veinlets. It showed weak to moderate (+1%) sulfide cavities with boxworks after pyrite and chalcopyrite. Some of the limonites are after chalcocite and occasional blebs to 1/8" are observed. The drill passed through the granite into a moderately altered porphyry at 1560'. The porphyry shows only occasional boxworks although it carries chrysocolla. A split core from 1573' to 1578' assayed 0.73% total copper. Casing was set at 1578' and the hole is ready for a diamond core drill.

Hole SC-13 was spudded February 22, 3/8 mile north and 1/4 mile east of SC-4. It was at 1447' on March 1 in a conglomerate composed almost entirely of altered granite fragments.

Cost of these holes is tabulated below.

SC-11

1281' - 1800': 519'	@ \$3.65/ft.	\$1894.35	
Drilling below 1800': (1800' - 2136') 86.75 hrs.	@ \$25.00/hr.	2168.75	
Coring: 10.0 hrs.	@ \$25.00/hr.	250.00	
Circulating: 2.0 hrs.	@ \$25.00/hr.	50.00	
Bits below 1800': 6	@ \$37.00/bit	222.00	
	3½% tax on bits	7.77	
	<u>Total SC-11</u>	\$4585.10	\$4585.10

Mr. Courtright

-2-

March 2, 1965

Total previous page

\$ 4585.10

SC-12

0 - 1573': 1573'
Coring: 20.75 hrs.
Circulating: 2.5 hrs.
Casing: 6.5 hrs.

@ \$3.65/ft. \$5741.45
@ \$25.00/hr. 518.75
@ \$25.00/hr. 62.50
@ \$25.00/hr. 162.50
Total SC-12 \$6485.20

6485.20

SC-13

0 - 1447': 1447'

@ \$3.65/ft. \$5281.55

5281.55

Mud & Chemicals

2 109 lb. sacks Quebracho
1 100 lb. drum Caustic Soda

@ \$31.90 \$ 63.80
@ \$12.00 12.00
 $\frac{1}{2}\%$ tax 2.65

Total Mud & Chemicals

\$ 78.45

78.45

Reset core bit

272.06

Total Drilling February

\$16,702.36

J. R. Wojcik
J. R. WOJCIK

JRW/jak
cc: KvdSteinen

J. H. C.

FEB -8 1965

February 4, 1965

Mr. Alvin T. Ethington
P. O. Drawer RR
Casa Grande, Arizona

Dear Mr. Ethington:

Thank you for sending the letter, signed by Mr. W. L. Tillman, approving Article 13 of the Option Agreement between us.

As you and he may wish copies of this letter for your records, I am returning herewith the two carbon copies which Mr. Tillman had signed.

Let us hope this business will prove beneficial to all parties.

Yours very truly,

ORIGINAL SIGNED BY
S. I. BOWDITCH

S. I. Bowditch

SIB:bam

Enclosures - 2

bcc: JHCourtright ✓

J. H. C.
FEB -8 1965

February 3, 1965

Surety Title and Trust Company
P. O. Drawer S
Casa Grande, Arizona

Your Escrow 1080-603

Gentlemen:

We have received your preliminary memorandum title report in connection with the above escrow, showing title, without mineral reservations, to the W 1/2, Sec. 13, T6S, R4E to be in Chester H. Ethington and Elda Naomi Ethington, husband and wife, and this has been approved by our attorneys.

Therefore, you are authorized to release our check to Mr. and Mrs. Ethington, and record the Memorandum of Mining Option.

You have three copies of the Option Agreement and three of the Memorandum. One copy of each should be given to the Ethingtons, and one copy of the Option and the recorded copy of the Memorandum should be sent to us.

Yours very truly,

ORIGINAL SIGNED BY
S. I. BOWDITCH

S. I. Bowditch

SIB:bam
cc: Chester H. Ethington
bcc: JHCourtright ✓

J. M. C.
FEB - 3 1965

February 3, 1965

Surety Title and Trust Company
P. O. Drawer S
Casa Grande, Arizona

Your Escrow 1080-604

Gentlemen:

We have received your preliminary memorandum title report in connection with the above escrow, showing title, without mineral reservations, to the E 1/2, Sec. 14, T6S, R4E, to be in Alvin T. Ethington and Lorraine V. Ethington, husband and wife, and this has been approved by our attorneys.

Therefore, you are authorized to release our check to Mr. and Mrs. Ethington, and record the Memorandum of Mining Option.

You have three copies of the Option Agreement and three of the Memorandum. One copy of each should be given to the Ethingtons, and one copy of the Option and the recorded copy of the Memorandum should be sent to us.

Yours very truly,

ORIGINAL SIGNED BY
S. I. BOWDITCH

S. I. Bowditch

SIB:bam
cc: Alvin T. Ethington
bcc: JHCourtright

MR. ~~WES~~

READ AND RETURN

PREPARE ANSWERS HANDLE

FILE INITIALS

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

February 2, 1965

J. H. C.

FEB - 8 1965

W.E.S.

FEB 12 1965

TO: J. H. COURTRIGHT

FROM: J. R. WOJCIK

SANTA CRUZ DRILLING
JANUARY, 1965

During the month of January, 4 drill holes were completed. Drill hole SC-7 advanced from 1883' to 2787' having entered fresh p6 granite at 2700'. Hole SC-8 penetrated 70' of monzonite porphyry from 860' to 930' and then passed into very weakly altered p6 granite. Hole SC-9 was drilled to 292' on claim W-18 as location work for claims W-11 through W-20. It stopped in alluvium. Hole SC-10, located $\frac{1}{4}$ mile west of SC-4 entered fresh p6 granite at 1290' and was stopped at 1421'. There was a "boulder" zone of about 20' immediately overlying the granite which consisted of monzonite porphyry boulders. The monzonite cores taken in SC-8 could have been closely packed boulders rather than a dike although I don't think so. Hole SC-2 had a 50' dike of a similar though finer-grained porphyry overlain by 60' of p6 granite.

As of the end of January, Hole SC-11 is still drilling at 1281' in conglomerate.

Cost of these holes is tabulated below.

SC-7

Drilling below 1800':			
197 hrs. (901')	@ \$25.00/hr.	\$4925.00	
Bits below 1800': 15	@ \$37.00/bit	555.00	
Coring: 17 hrs.	@ \$25.00/hr.	<u>425.00</u>	
	Total SC-7	\$5905.00	\$5905.00

SC-8

0-993': 993'	@ \$3.65/ft.	\$3624.45	
Coring: 16.5 hrs.	@ \$25.00/hr.	<u>412.50</u>	
	Total SC-8	\$4036.95	\$4036.95

SC-9

0-292': 292'	@ \$3.65/ft.	\$1065.80	\$1065.80
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SC-10

0-1416': 1416'	@ \$3.65/ft.	\$5168.40	
Coring: 14.5 hrs.	@ \$25.00/hr.	<u>362.50</u>	
	Total SC-10	\$5530.90	\$5530.90

Mr. Courtright

-2-

February 2, 1965

Total previous page \$16,538.65

SC-11

0-1281': 1281' @ \$3.65/ft. \$4675.65 \$4,675.65

Mud & Chemicals Used

80	50# Sacks Mud-Gel	@ \$1.25	\$ 100.00	
80	50# Sacks Mud-Gel	@ \$1.25	100.00	
18	50# Sacks Dextrid	@ \$20.75	373.50	
14	50# Sacks CC-16	@ \$9.00	126.00	
5	50# Sacks Cellex	@ \$31.95	159.75	
2	110# Sacks Quebracho	@ \$31.90	63.80	
2	100# Drums Caustic	@ \$12.00	24.00	
8	5 Gal. Cans Con-Det	@ \$16.00	128.00	
			<u>128.00</u>	
			\$1075.05	\$1,075.05

3 $\frac{1}{2}$ % tax on Mud & Chemicals	37.63
3 $\frac{1}{2}$ % tax on Bits (below 1800')	19.42
Reset core bit	<u>291.87</u>
Drilling Cost	\$22,638.24

J. R. Wojcik
J. R. WOJCIK

JRW/jak
cc: KvdSteinen

J.H.C
1/25/65

January 25, 1965

Mr. Richard E. Fulton, President
Surety Title and Trust Company
P. O. Drawer S
Casa Grande, Arizona

Your Escrow 1080-604

Dear Mr. Fulton:

Enclosed are three copies of the revised Alvin Ethington option and three copies of the accompanying Memorandum of Mining Option. The option has been revised to take care of Mr. Ethington's wish concerning the farm lease. These have been executed for us by Mr. Hall.

Will you please have all these copies signed and acknowledged by Mr. & Mrs. Ethington. Please return one fully signed copy of the option to me (and one fully signed copy of the Chester Ethington option).

One copy of the option and memorandum is to be given to the Ethingtons after we have approved the title report.

Yours very truly,

ORIGINAL SIGNED BY
S. I. BOWDITCH

Sm

S. I. Bowditch

SIB:bam
Enclosures

bcc: JHCourtright 

J. H. C.
JAN 26 1965

January 25, 1965

Surety Title and Trust Company
Casa Grande, Arizona

Gentlemen:

Enclosed you will find our check in the amount of \$6400.00 payable to Chester H. Ethington and Elda N. Ethington, two copies of an Option Agreement dated January 25, 1965 between the Ethingtons and American Smelting and Refining Company, and three copies of a Memorandum of Mining Option of the same date between the same parties, each of which has been duly signed and acknowledged by the parties thereto. These agreements cover certain land in Pinal County, Arizona, a full description of which appears in said Agreement.

Your company is designated as Escrow Agent in Paragraph 2 of said Option Agreement, and you are hereby authorized and instructed to deliver the enclosed check and also a copy of the Agreement and Memorandum to Mr. and Mrs. Ethington when you have issued or caused to be issued a preliminary report for title insurance showing that you will insure the title to the covered property in fee simple, without mineral reservations, liens or encumbrances other than roadways, recorded easements and current taxes, and any matters adversely affecting title to the property filed after the issuance of such preliminary report for title insurance, in the sum of \$256,000. This preliminary report for title insurance should be submitted to us for our approval. It is understood that all sums due under existing mortgages and contracts, if any, that presently constitute liens upon said property, will have been paid prior to the issuance of said title insurance.

J. H. C.
JAN 25 1965

January 25, 1965

Surety Title and Trust Company
Casa Grande, Arizona

Gentlemen:

Enclosed you will find our check in the amount of \$6400.00 payable to Alvin T. Ethington and Lorraine Ethington, two copies of an Option Agreement dated January 25, 1965 between the Ethingtons and American Smelting and Refining Company, and three copies of a Memorandum of Mining Option of the same date between the same parties, each of which has been duly signed and acknowledged by the parties thereto. These agreements cover certain land in Pinal County, Arizona, a full description of which appears in said Agreement.

Your company is designated as Escrow Agent in Paragraph 2 of said Option Agreement, and you are hereby authorized and instructed to deliver the enclosed check and also a copy of the Agreement and Memorandum to Mr. and Mrs. Ethington when you have issued or caused to be issued a preliminary report for title insurance showing that you will insure the title to the covered property in fee simple, without mineral reservations, liens or encumbrances other than roadways, recorded easements and current taxes, and any matters adversely affecting title to the property filed after the issuance of such preliminary report for title insurance, in the sum of \$352,000. This preliminary report for title insurance should be submitted to us for our approval. It is understood that all sums due under existing mortgages and contracts, if any, that presently constitute liens upon said property, will have been paid prior to the issuance of said title insurance.

MR. SIB
 READ AND RETURN
 PREPARE ANSWERS HANDLE
 FILE ✓ INITIALS

AMERICAN SMELTING AND REFINING COMPANY
 Tucson Arizona

January 21, 1965

J. H. C.
 JAN 21 1965

S. I. B.

JAN 21 1965

TO: J. H. COURTRIGHT

FROM: J. R. WOJCIK

SANTA CRUZ
FEDERAL CLAIM CORNER POSTS

Corner posts on all Asarco Federal mining claims W-11 thru W-20 and Lot-1 thru Lot-20 have been set by December 16, 1964. This work was performed during the previous week by N. P. Whaley, A. Dalla Vista, R. H. Luning, C. H. Miles and myself using chain and transit.

Corner posts on claims G-11 thru G-18 were set on January 4 and 5, 1965, by A. Boggero, C. H. Miles and myself.

Location work requirements on all claims have been met by drill holes.

Claims No. W-1 thru W-10 by drill hole SC-2
 W-11 thru W-20 by drill hole SC-9
 G-1 thru G-10 by drill hole SC-5
 G-11 thru G-18 by drill hole SC-7
 Lot-1 thru Lot-10 by drill hole SC-4
 Lot-11 thru Lot-20 by drill hole SC-6.

Drill hole SC-9 was drilled and completed on January 15, 1965, at a depth of 292'. Disregarding cost of mud and overhead, this amounts to an expenditure of \$1,065.80. Representative samples were taken at intervals as in all other drill holes.

JR Wojcik

J. R. WOJCIK

JRW/jak

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

January 12, 1965

J. H. C.

JAN 12 1965

TO: J. H. COURTRIGHT

FROM: J. R. WOJCIK

SANTA CRUZ DRILLING
DECEMBER, 1964

During December, drill hole SC-6 was completed at 4300' in weakly altered pre Cambrian granite. The top of the granite was at 4170'. Sludge samples assayed as follows:

	<u>Total Cu</u>	<u>Oxide Cu</u>
4170-4180	.08	.02
4180-4190	.08	.02
4190-4200	.16	.03
4200-4208	.18	.02
4204-4214	.38	.02
4214-4230	.11	Trace
4230-4240	.08	Trace
4240-4250	.06	Trace
4250-4258	.04	Trace
4258-4270	.05	.02
4270-4280	.04	Trace
4280-4290	.08	Trace
4290-4296	.10	Trace

Cores assayed:

4256-4263	Trace	Trace
4297-4300	Trace	Trace

Drill hole SC-7 was still drilling in recent valley fill at 1883' at month's end.

Contract cost of these holes is tabulated below.

<u>SC-6</u>		
<u>Drilling below 1800'</u>		
295 hrs.: 3235'-4300'	@ \$25.00/hr.	\$7375.00
17 bits	@ \$37.00/bit	629.00
Coring: 44 hrs.	@ \$25.00/hr.	1100.00
Mud & chemicals		737.70
3 1/2% tax on mud & chemicals		<u>47.83</u>
Total SC-6		\$9889.53
		\$9889.53

J. H. C.
JAN 11 1965

January 11, 1965

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
Pinal County Recorder
Pinal County Courthouse
Florence, Arizona

Dear Madam:

Enclosed are three Affidavits of Completion of Location Work by Drilling, and our check for \$9.75, which I believe is the correct amount. Will you please record these documents and return them to me.

Yours very truly,

DESIGNED BY
S. I. BOWDITCH

S. I. Bowditch

SIB:bam
Enclosures
bcc: JHCourtright 
KvdSteinen

12/29/64 Copied for: JHCourtright

RECEIVED

New York, N. Y., December 28, 1964

J. H. C.

51 1964

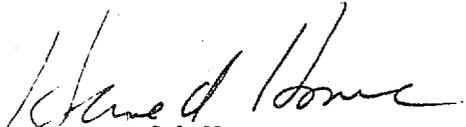
Mr. C. P. Pollock

The following is an extract from the minutes of the meeting of the Advisory Committee held on December 23, 1964:

Mining Authorization No. 1950
Santa Cruz Prospect
Casa Grande Area
Pinal County, Arizona

It was reported that results of the drilling program at the Santa Cruz copper prospect in Pinal County, Arizona, authorized by the Advisory Committee at the meeting of May 20, 1964, are sufficiently encouraging to warrant the drilling of six additional holes at an estimated cost of \$160,000.

After discussion, subject to ratification by the Board of Directors, there was approved an expenditure of \$160,000 for the drilling of six additional holes at the Santa Cruz copper prospect.


Harold Howe

PGHamrick
CEWelsch
HLGoodenough-2
TASnedden
RBMeen

*Samuel Metzger*AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

December 28, 1964

J. H. C.
DEC 29 1964

Mr. Samuel Metzger, III
American Smelting and Refining Company
120 Broadway
New York, New York 10005

Dear Sir:

In answer to your letter of December 23, Federal Insurance Company Bond #8016-83-30, issued for Prospecting Permit #5689, S 1/2 Section 28, T6S, R4E, was returned by the State Land Office to this office, but has since been inadvertently destroyed. However, I have been talking to the local representative of Federal Insurance about the matter, and she says she will advise her New York office, and that they will arrange for cancellation of this Bond.

Yours very truly,

ORIGINAL SIGNED BY
S. I. BOWDITCH

S. I. Bowditch

SIB:bam

cc: Georgia Loughrin
Tucson Realty & Trust Company
P. O. Box 990
Tucson, Arizona

bcc: JHCourtright 
KvdSteinen

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

December 18, 1964

Mr. K. E. Richard, Chief Geologist
American Smelting and Refining Company
120 Broadway
New York, N. Y. 10005

SANTA CRUZ PROJECT
PINAL COUNTY, ARIZONA

Dear Sir:

The following contains a brief review of Santa Cruz progress and a request for additional funds to continue the drilling.

The attached plan map shows ground controlled by the Company, drill holes completed, and proposed locations for additional holes. Results to date are summarized below:

	<u>Depth to Bedrock</u>	<u>Character of Bedrock</u>	<u>Total Depth</u>
SC-1	2861'	Barren Pinal Schist	2886'
SC-2	2530'	Wk alt. PreC Gr. Leached-- .11% Cu	2785'
SC-3	640'	Barren PreC Gr.	654'
SC-4	1380'	Strongly alt. PreC Gr. (Leached capping) .18% Cu	1876'
SC-5	3550'	Diss. py in wk alt. PreC Gr.	3605'
SC-6	4170'	Wk alt. PreC Gr. with sparse pyrite and sparse chalcocite	4300'

At present the rig is being moved to location P-3 which will become SC-7.

The four holes that encountered mineralization are colored red on the map; the barren holes are shown in green. The leached capping encountered in hole SC-4 is the type which characteristically overlies enriched disseminated copper deposits. The nature of the alteration-mineralization encountered in the other three holes indicates that these holes are probably on the fringe of a porphyry copper zone.

December 18, 1964

Hole SC-4 was cased and later will be extended into the sulfide zone by diamond drill.

Although there is so far very little supporting evidence, it appears probable that the zone of mineralization penetrated by the recent drilling represents the "root" of the Sacaton deposit. If so, the hanging wall portion of the zone, represented by the Sacaton deposit, has moved six to eight miles northeasterly on the Basement fault. Structural data suggests that this movement took place in a trough bounded by two major, northeast trending faults. Extreme variations in bedrock depths from hole to hole indicate severe displacements on probable cross-trending faults. An alternative interpretation of the Santa Cruz zone of mineralization would be that it does not represent the root of the Sacaton zone, but another occurrence farther along the southwest trend. If the latter is correct, the roots of both zones may exist southwest of the area presently being explored.

Obviously, 3,000 to 4,000 feet of conglomerate overburden is a serious handicap in exploration, and whatever ore is found would have to be well above the average porphyry copper grade to be commercial. However, there still remains the possibility that relatively shallow blocks of mineralized bedrock (such as in the area of SC-4) contain a mineable copper deposit. Also, several clues of possible importance have been found on the trend southwest of the current drilling. These include anomalously high moly values in water samples taken from wells and, alteration in granite bedrock at the edge of the valley alluvium.

Accordingly, it is recommended that at least five or six more holes should be drilled, principally in the vicinity of SC-4, and that three or four of these be cased and deepened by diamond drill to test the sulfide zone. The positions of proposed locations are shown as blank circles numbered 1 to 6. At least four relatively shallow scout holes are proposed in the general area of the high moly water samples.

The cost of this extension of the program is estimated as follows:

6 rotary holes, 2500' each:	15,000' @ \$6.50/per foot	\$ 97,500
4 rotary holes, 1000' each:	4,000' @ \$5.00/per foot	20,000
Diamond drilling, 3000' @ \$14.00/per foot		<u>42,000</u>
	TOTAL	\$159,500

If this meets with your approval, please request a Mining Authorization in the amount of \$160,000.

Total estimated expenditures - \$132,238.03
 Estimated unexpended balance of authorization - \$12,000.00

Yours very truly,

Original signed by
 J. H. Courtright
 J. H. COURTRIGHT 

JHC/jk
 Attachment
 cc: RBMeen
 WESaegart
 mlt:ik

La-16A-319C (JHC)

J. H. C.

DEC 8 1964

December 7, 1964

**CERTIFIED MAIL
RETURN RECEIPT REQUESTED**

Mr. Walter V. Murphy, Leasing Supervisor
State Land Department
State of Arizona
State Office Building
Phoenix 7, Arizona

Prospecting Permit 5687

Dear Mr. Murphy:

Enclosed are two copies of Prospecting Permit No. 5687, signed by R. B. Meen, Manager of American Smelting and Refining Company.

In due course we will expect a fully signed copy of the permit.

Yours very truly,



S. I. Bowditch

SIB:bam
Enclosure

Santa Cruz

J. H. C.

DEC 2 1964

December 2, 1964

Mr. Sam Sweetow
1301-N. Havenhurst Avenue
Los Angeles 46, California

Dear Mr. Sweetow:

Mr. Welch has turned over to me your letter of November 30, as I am the one who handles land matters here. I have discussed this with our geologists, and am sorry to have to tell you that at present we are not interested in doing anything with your property.

However, we appreciate your calling it to our attention, and if at some later time our interest should turn in that direction we will get in touch with you.

Yours very truly,

ORIGINAL SIGNED BY
S. I. BOWDITCH

S. I. Bowditch

SIB:bam
cc: Reed Welch
blcc: JHCourtright 

Conrad for J. H. C. Santa Cruz



AMERICAN SMELTING AND REFINING COMPANY
SOUTHWESTERN EXPLORATION DEPARTMENT
311 VALLEY NATIONAL BLDG., TUCSON, ARIZONA

J. H. COURTESHT
CHIEF GEOLOGIST
L. P. ENTWISLE
ASSISTANT CHIEF GEOLOGIST

December 1, 1964

J. H. C.
DEC 2 1964

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Walter V. Murphy
Leasing Supervisor
State Land Department
State of Arizona
State Office Building
Phoenix 7, Arizona

Prospecting Permits
Nos. 5688, 5690 - 5694

Dear Mr. Murphy:

Enclosed are two copies of Prospecting Permits Nos. 5688, 5690 - 5694, signed by R. B. Meza, Manager of American Smelting and Refining Company.

In due course we will expect a fully signed copy of the permit.

Yours very truly,

S. I. Bowditch

S. I. Bowditch

SIB:bam
Enclosures

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

December 1, 1964

J. H. C.

DEC 1 1964

TO: J. H. COURTRIGHT

FROM: J. R. WOJCIK

SANTA CRUZ DRILLING
NOVEMBER

During November, drill hole SC-5 was completed at 3605', passing into bedrock through a strong, apparently high angle fault at 3550'. Bedrock was weakly altered preCambrian granite with weak pyrite. The samples assayed .02% Cu.

Drill hole SC-6 is still drilling at 3235', still in well indurated conglomerate. Three cores have been taken from this hole to date:

- 1806'-1814' Cgl. medium to coarse sand with interbedded silt lenses to $\frac{1}{2}$ ". Gravel less than 20% up to 1". Apparent dip 25°.
- 2431'-2440' Same as 1806'-14' except apparent dip 45°-50°.
- 2831'-2840' Cgl., coarse, bouldery, more than 75% granite, 20% schist. Boulders to 1', very well rounded, tabular pebbles are horizontal.

Footage drilled in November is 3418' at a contract drilling cost of \$17,752.55. Total footage drilled since July 19 is 14,961'. November costs are detailed below.

SC-5

Drilling below 1800'	41.75 hrs.	@ \$25.00/hr.	\$1043.75	
Bits below 1800'	3	@ \$37.00	111.00	
Coring	10.75 hrs.	@ \$25.00/hr	268.75	
	Total SC-5		\$1523.50	\$ 1,523.50

SC-6

0-1800'	1800'	@ \$3.65/ft.	\$6570.00	
Drilling below 1800'	290.5/hrs.	@ \$25.00/hr.	7262.50	
Bits below 1800'	22	@ \$37.00	814.00	
Coring	16.5 hrs.	@ \$25.00/hr.	412.50	
	Total SC-6		\$15,059.00	\$15,059.00

Mud & Chemicals

100-50 lb. sacks Mud-Gel	@ \$1.25/sack	\$125.00	
7-50 lb. sacks Dextrid	@ \$20.75/sack	145.25	
2-50 lb. sacks Cellex	@ \$31.95/sack	63.90	
15-50 lb. sacks CC-16	@ \$9.00/sack	135.00	
1-109 lb. sack Quebracho	@ \$31.90/sack	31.90	
2-100 lb. sacks Soda Ash	@ \$6.50/sack	13.00	
1-100 lb. drum Caustic Soda	@ \$12.00/drum	12.00	
9-5 gal. cans Con-Det	@ \$16.00/can	<u>144.00</u>	
Total Mud & Chemicals		\$670.05	\$ 670.05
Reset Core Bit (est.)		\$500.00	500.00
Total previous page			<u>16,582.50</u>
Total contract cost for November			\$17,752.55

J. R. Wojcik
J. R. WOJCIK

JRW/jk
cc: KvdSteinen

December 1, 1964

Arizona Title Insurance and Trust Company
101 West Monroe
Phoenix, Arizona

Attention: Alfred J. Vadney

Escrow No. 228867

Gentlemen:

Enclosed are escrow instructions for escrow No. 228867, signed by my company and our check to your order in the amount of \$4500.00, which represents the combined amounts due under the seven Option Agreements covering the SW 1/4 of Section 12, T6S, R4E, Pinal County, Arizona, all dated November 1, 1964, which are the subject of the above escrow.

Also enclosed are two copies each of Option Agreements and three copies of a Memorandum of Mining Option between the following persons who own undivided interest in the above described property as shown below:

- 4/12 - Lawrence and Mabel Rambo
- 2/12 - Frank and Immacolata de Palma
- 2/12 - Thomas and Bella D'Ambrosio
- 1/12 - Lawrence Liefert
- 1/12 - James R., Sr., and Virginia Lara
- 1/12 - Harold and Carol Blum
- 1/12 - Cesare and Kay Rita Spero

and AMERICAN SMELTING AND REFINING COMPANY, all fully executed by the various parties.

Our attorneys have approved the preliminary title report which you prepared at the request of Mr. D'Ambrosio, and you are hereby authorized to disperse the proceeds of the above check as the optionors may direct you, and to give one copy each of the Option Agreement and Memorandum of Option to the proper optionors.

Will you please record one copy of each of the Memorandums and return such recorded copies to me.

Yours very truly,

J. H. C.

DEC 1 1964

ORIGINAL SIGNED BY
S. I. BOWDITCH

S. I. Bowditch

SIB:bam

Enclosures

cc: Thomas D'Ambrosio

blcc: JHCourtright 
KvdSteinen

J. H. C.
DEC 1 1964

December 1, 1964

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
Pinal County Recorder
Pinal County Courthouse
Florence, Arizona

Dear Madam:

Enclosed are two affidavits of Completion of Location Work on Mining Claims by Drilling, and one Mining Deed, and our check for \$11.00. Will you please record these documents, recording the deed first, please, and then return them to me.

If the check is for more than necessary, please return us any excess.

Yours very truly,

ORIGINAL SIGNED BY
S. I. BOWDITCH

S. I. Bowditch

SIB:bam
Enclosures

blcc: JHCourtright 
KvdSteinen

J. H. C.

NOV 30 1964

November 30, 1964

**CERTIFIED MAIL
RETURN RECEIPT REQUESTED**

Mr. Walter V. Murphy, Leasing Supervisor
State Land Department
State of Arizona
State Office Building
Phoenix 7, Arizona

Prospecting Permit 5687

Dear Mr. Murphy:

In accordance with the last paragraph of your letter of November 18, 1964, enclosed is a \$22,000.00 bond issued by the Federal Insurance Company covering Prospecting Permit 5687.

Very truly yours,

ORIGINAL SIGNED BY
S. I. BOWDITCH

S. I. Bowditch

Enclosure

SIB:bam

blcc: Samuel Metzger, Jr. w/copy of bond
JHCourtright
KvdSteinen

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

November 30, 1964

J. H. C.

NOV 30 1964

Mr. Samuel Metzger, III
American Smelting and Refining Company
120 Broadway
New York, N. Y. 10005

Dear Sir:

According to the Federal Insurance Company's representative here, the Bond number for the bond for Prospecting Permit 5689 - S 1/2 Section 28, T6S, R4E - \$2000 - is 8016-83-30. The bond was issued on November 13, 1964.

I hope this will enable you to find the right bond, which may not have yet reached you, and cancel it.

Yours very truly,

ORIGINAL SIGNED BY
S. I. BOWDITCH

S. I. Bowditch

SIB:bam
cc: JHCourtright ✓
KvdSteinen

J. H. C.
NOV 20 1964

November 20, 1964

**CERTIFIED MAIL
RETURN RECEIPT REQUESTED**

Mr. Walter V. Murphy, Leasing Supervisor
State Land Department
State of Arizona
State Office Building
Phoenix 7, Arizona

Prospecting Permits

Dear Mr. Murphy:

Enclosed are six bonds issued by the Federal Insurance Company and our check in the amount of \$5420.82 in connection with Prospecting Permits Nos. 5688 and 5690-5694.

I note that Permit 5690 is only for the W 1/2 of Section 32, T6S, R4E, while we applied for the whole section. Would you please tell us who has the other half.

Yours very truly,

ORIGINAL SIGNED BY
S. I. BOWDITCH

S. I. Bowditch

SIB:bam

Enclosures

blcc: JHCourtright ✓
KvdSteinen
Samuel Metzger, Jr. w/copy of bonds

J. H. C.
NOV 19 1964

November 19, 1964

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
Pinal County Recorder
Pinal County Courthouse
Florence, Arizona

Dear Madam:

Enclosed are twenty claim location notices for the Lot 1 - 20 claims, and our check for \$20.00. Will you please record these notices and then return them to me.

Yours very truly,

ORIGINAL SIGNED BY
S. I. BOWDITCH

S. I. Bowditch

SIB:bam

Enclosures

blcc: JHCourtright 
KvdSteinen

J. H. C.

NOV 19 1964

November 19, 1964

Mr. Walter V. Murphy, Leasing Supervisor
State Land Department
State of Arizona
State Office Building
Phoenix 7, Arizona

Prospecting Permits
Nos. 5687 and 5689

Dear Mr. Murphy:

Enclosed is our claim for refund in the amount of \$640.00 representing the advance rental payment of Prospecting Permit application no. 5689, covering the S 1/2 of Section 28, T6S, R4E, as per your letter of November 18.

In connection with our Prospecting Permit Application no. 5687, all of Sec. 21, T6S, R4E, I note that you have raised the bond requirements on lands covered by Agricultural Leases. I think this is a wise move, and we are glad to go along. However, in order to furnish the additional bond of \$22,000.00, we will need copies of your bond form, so will you please send us some.

Yours very truly,

ORIGINAL SIGNED BY
S. I. BOWDITCH

S. I. Bowditch

SIB:bam
Enclosure

blcc: JHCourtright 
KvdSteinen

J. H. C.

NOV 19 1964

November 19, 1964

Mr. Samuel Metzger, Jr.
American Smelting and Refining Company
120 Broadway
New York, N. Y. 10005

Santa Cruz Project
State Prospecting Permits

Dear Sir:

Recently we applied for a State Prospecting Permit on the S 1/2 of Section 28, Township 6 S, Range 4 E. This application was accepted and given the number 5689. A bond form was sent us, for \$2000, which we had signed by the Federal Insurance Company attorney-in-fact here.

Now, as you can see by the enclosed copy of a letter from Mr. Murphy, Leasing Supervisor, it has been discovered that the State had sold this land, so they have returned our bond. Will you please advise Federal Insurance Company to cancel this bond. A Thermofax copy of the bond was sent you with your copy of my letter of November 13.

Yours very truly,

ORIGINAL SIGNED BY
S. I. BOWDITCH

S. I. Bowditch

SIB:bam

Enclosure

cc: JHCourtright w/copy of Murphy letter
KvdSteinen

STATE LAND DEPARTMENT

OSCAR M. LASSEN
STATE LAND COMMISSIONER
PHONE 271-4621

STATE OF ARIZONA
STATE OFFICE BUILDING
PHOENIX 7, ARIZONA

LOUIS C. DUNCAN
MANAGER
PHONE 271-4621

S. I. B

NOV 19 1964

November, 18, 1964

ACCOUNTING DIVISION
PHONE 271-4622

LEASING DIVISION
PHONE 271-4634

LEGAL DIVISION
PHONE 271-4626

MINERAL, OIL & GAS
PRODUCTION DIVISION
PHONE 271-4628

SALES DIVISION
PHONE 271-4631

RE DIVISION
PHONE 271-4637

SOIL CONSERVATION
DIVISION
PHONE 271-4625

WATER DIVISION
PHONE 271-4629

WATERSHED
MANAGEMENT DIVISION
PHONE 271-4633

Re Prospecting
Permits 5687 & 5689

American Smelting and Refining Co.
813 Valley National Bldg.
Tucson, Arizona

Gentlemen:

Enclosed please find claim for refund in the amount of \$610.00 representing the advance rental payment on Prospecting Permit Application no. 5689, covering the $\frac{8}{16}$ of Section 28, Township 6 South, Range 4 East. This application was approved in error as the land was sold at public auction in 1949. Also returned is the bond pertaining thereto.

Regarding Prospecting Permit application no. 5687, covering all of Section 21, Township 6 South, Range 4 East, advance rental together with bond in the amount of \$2000.00 has been received. This entire section is under Agriculture Lease no. 199.

It has been determined that in instances where prospecting permit applications cover all, or portions of Agricultural leases, the bond requirement will be determined on the basis of \$6000.00 per quarter section, or \$24,000.00 for an entire section such as this one. Before prospecting Permit no. 5687 can be issued, it will be necessary to furnish an additional bond in the amount of \$22,000.00.

Yours Truly,

Walter V. Murphy
Supervisor of Leasing

WVM/ic

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

November 12, 1964

J. H. C.

NOV 12 1964

FILE MEMORANDUM

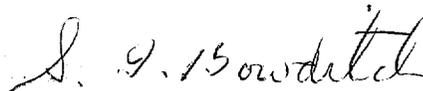
Santa Cruz Project
Federal Claims

On November 5 and 9 corners and end center posts were set on the G 1 to G 10 group of claims covering the SW 1/4 of Section 23, T6S, R4E.

On November 9 and 10 corner and end center posts were set on the W 1 to W 10 claims covering the NE 1/4 of Section 12, T6S, R4E.

This work was done by transit and tape by Charles Miles, Bob Conrad and Tony Dalla Vista under my supervision.

The location notices for these claims will be recorded in the next day or so.



S. I. Bowditch

SIB:bam

OP 19A

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

November 5, 1964

J. H. C.
NOV 4 1964

MEMORANDUM FOR J. H. COURTRIGHT

SANTA CRUZ DRILLING
OCTOBER 1964

During the month of October, drill hole SC-4 advanced from 1074' to 1876', the last 500' in strongly altered granite. Limited quantities of CuSO₃ occurred at 1500' and 1570'. Strong chalcocite occurred in the rotary cuttings at 1850'-1860'; however, a core taken at 1866' was again in leached capping. Cores assayed as follows:

<u>Interval</u>	<u>Total Cu</u>	<u>Non-Sol. Cu</u>
1512-1517'	0.18	0.07
1606-1617'	0.03	tr
1753-1763'	0.03	0.02
1827-1828'	0.04	0.02
1828-1829.6'	0.03	tr
1829.6-1837'	0.03	tr
1866-1876'	0.02	tr

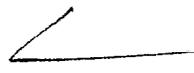
Casing was set at 1876' and the drill moved to location SC-5 in the south center SW $\frac{1}{4}$, Sec. 23, T6S, R4E.

Drill hole SC-5 was collared October 10 and was drilling at 3422' at month's end. Cores were taken at 1913-1918'; 2266-2271'; 2660-2666'; and 3134-3141'.

On the basis of these cores and the rotary cuttings, a condensed log of the drill hole is as follows:

0-360'	Alluvium
360-2480'	Quaternary sediments (valley fill)
2480-2680'	Red speckled andesite (Sell, 9/8/64)
2680-3422'	Pebble conglomerate (Sell, 9/8/64)

It is possible that this hole represents the deepest uncased penetration for this diameter hole in drilling records.



Contract cost of the above holes is tabulated below:

SC-4

726' (1076'-1800')	@ \$3.65/ft.	\$2649.90	
20.75 hrs. (1800'-1866')	@ \$25.00/hr.	518.75	
29.50 hrs. (coring)	@ \$25.00/hr.	737.50	
5.00 hrs. (circulating)	@ \$25.00/hr.	125.00	
5.50 hrs. (casing)	@ \$25.00/hr.	137.50	
1 rotary bit (below 1800')	@ \$37.00/bit	37.00	
1876' casing	@ \$1.0875/ft.	<u>2040.15</u>	
	Total SC-4	\$6245.80	\$ 6245.80

SC-5

1800' (0-1800')	@ \$3.65/ft.	\$6570.00	
284.25 hrs. (1800-3422')	@ \$25.00/hr.	7106.25	
23.75 hrs. (coring)	@ \$25.00/hr.	593.75	
2.00 hrs. (circulating)	@ \$25.00/hr.	50.00	
20 rotary bits (below 1800')	@ \$37.00/bit	<u>740.00</u>	
	Total SC-5	\$15060.00	\$15060.00

Mud & Additives

80 50 lb. sacks Mud-Gel	@ \$1.25	\$ 62.50	
20 50 lb. sacks Dextrid	@ \$20.75	415.00	
1 50 lb. sack Cellex	@ \$31.95	31.95	
5 100 lb. sacks Soda Ash	@ \$6.50	32.50	
3 5 gal. cans Con-Det	@ \$16.00	80.00	
9 50 lb. sacks CC-16	@ \$9.00	81.00	
2 100 lb. cans Caustic Soda	@ \$12.00	24.00	
3 106 lb. sacks Quebracho	@ \$31.90	95.70	
1 sack Lime	@ \$1.70	<u>1.70</u>	
	Total Mud & Additives	\$ 824.35	\$ 824.35

Diamond Core Bits

Total contract cost SC-4, 5

\$22,130.15

J. R. Wojcik

J. R. WOJCIK

JRW/jk

cc: KvdSteinen

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

October 16, 1964

J. H. C.
OCT 16 1964

MEMORANDUM FOR J. H. COURTRIGHT:

Santa Cruz Drilling - September

During the month of September, drill hole SC-2 progressed through Gas line conglomerate type sediments from 1226' to 2530' where it entered weakly altered Pre Cambrian granite. A weakly altered monzonite dike was intersected between 2530' and 2640'. The hole was stopped at 2705.5' in very weakly altered granite.

Drill hole SC-3 entered fresh Pre Cambrian granite at 640'. Lost circulation at the top of bedrock resulted in stuck drill rods. Three days fishing retrieved the rods and the hole was stopped at 654'.

Drill hole SC-4 penetrated 800' of Gas line type sediments and 274' of Sacaton type conglomerate. It was still drilling at month's end.

Contract cost of these holes is as follows:

SC-2

574'	@ \$3.65/ft.	\$2095.10	
900' ... 167.75 hrs	@ \$25.00/hr	4193.75	
Coring ... 37.50 hrs	@ \$25.00/hr	937.50	
Bits below 1800' ... 13	@ \$37.00	481.00	
	Total SC-2	\$7707.35	\$7707.35

SC-3

652'	@ \$3.65/ft.	\$2379.80	
Coring ... 12.50 hrs	@ \$25.00/hr	312.50	
Standby ... 4.0 hrs	@ \$12.00/hr	48.00	
	Total SC-3	\$2740.30	\$2740.30

SC-4

1074'	@ \$3.65/ft.	\$3920.10	
Standby ... 2.0 hrs	@ \$12.00/hr	24.00	
	Total SC-4	\$3944.10	\$3944.10

Total from previous page

\$14,391.75

Mud and Chemicals

114 50# sacks Mud Gel	@ \$1.25	\$142.50	
4 50# sacks Cellex	@ \$31.95	127.80	
4 50# sacks Dextrid	@ \$20.75	83.00	
4 5 gal. cans Con-Det	@ \$16.00	64.00	
8 50# sacks CC-16	@ \$9.00	72.00	
2 108# sacks Quebracho	@ \$31.90	63.80	
2 100# cans Caustic Sod	@ \$12.00	24.00	
1 100# sack Soda Ash	@ \$6.50	6.50	
	Total	<u>\$583.60</u>	583.60

Reset core bit

\$387.04

387.04

Total contract cost September

\$15,362.39

Plus taxes

Cost per foot (3208')

\$4.79

J. R. Wojcik
J. R. WOJCIK

JRW/jk

MR. ~~JRW, JDS, WES, JFH, ESB~~

READ AND RETURN

PREPARE ANSWERS **AMERICAN SMELTING AND REFINING COMPANY**

FILE _____ INITIALS _____

R. J. LACY
CHIEF GEOPHYSICIST

GEOPHYSICAL DIVISION
3422 SOUTH 700 WEST
SALT LAKE CITY, UTAH 84119

October 30, 1964

J. H. C.

NOV 2 1964

J. R. W.

NOV 16 1964
W.E.S.

NOV 5 1964

Mr. J. H. Courtright, Chief Geologist
American Smelting and Refining Co.
813 Valley National Building
Tucson, Arizona 85701

**INDUCED POLARIZATION AND
RESISTIVITY TRAVERSE LINES
SANTA CRUZ PROJECT
PINAL COUNTY, ARIZONA**

Dear Mr. Gourtright:

This is to enclose Mr. Farley's report of October 27, on the subject matter. I agree with his conclusions and recommendations.

You will note that the resistivity appears to reflect the areas of shallow bedrock quite well. There appears to be no significant induced polarization responses in the shallow bedrock areas. Mr. Farley mentions some high values on line #8 near wells with anomalous molybdenum content. It is possible that the molybdenum content in the water in these wells may be contributed from drainage from the Vaiva hills. I agree, however, with Mr. Farley's recommendation for doing more induced polarization work in this area, including decay curve work to try to distinguish between clay and ohmic polarizers.

Very truly yours,

R. J. LACY

RJL:ao
Enc.

cc: C. P. Pollock
W. G. Farley

} ANY
LONGSHOT
work is
probably
justified in
this area
considering the
predicament of
our Santa Cruz
project drilling
W.E.S.

GEOPHYSICAL DIVISION
3422 South 700 West
Salt Lake City, Utah

October 27, 1964

MEMORANDUM TO R. J. LACY:

INDUCED POLARIZATION AND
RESISTIVITY TRAVERSE LINES
SANTA CRUZ PROJECT
PINAL COUNTY, ARIZONA

From October 5 through October 13, 1964, eight working days were utilized to complete approximately 30 line miles of I.P.-resistivity traversing along the western edge of the Casa Grande Valley. These lines were run to indicate possible sulphide mineralization under alluvium along the NE projection of two outcrop shear zones mapped by J. D. Sell (Table Top Region - Geological Reconnaissance Mapping - August 1964), and to determine the relationship of shear zone #2 to the SW-NE striking Sacaton Fault (indicated by aeromagnetics) which extends southwest from the Sacaton Mountains.

The shallow bedrock areas indicated by resistivity are in good agreement with shallow bedrock indicated by aeromagnetics. In areas above 250 ohm-feet bedrock is probably less than 400 feet deep, and above 750 ohm-feet bedrock is probably less than 100 feet deep.

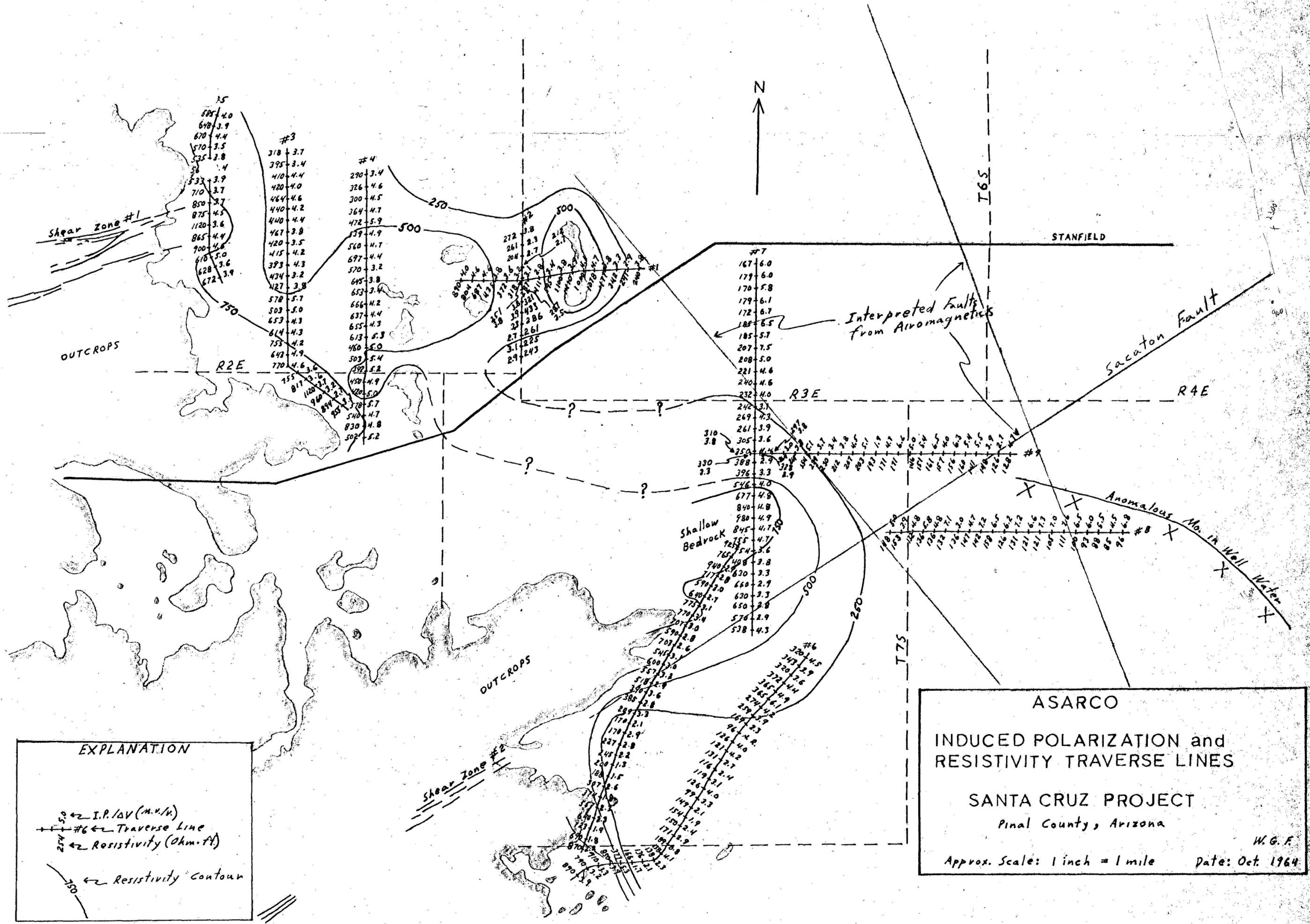
In the areas of shallow bedrock, as indicated by resistivity, I.P. did not detect the presence of any sulphides. On line #8 several readings above 7.0 m.v./V. in a deeper bedrock area may be clay response or may be sulphide response from depth. The higher I.P. response is in a favorable area on the Precambrian side of the Sacaton Fault. Another favorable feature of the higher I.P. response area is its proximity to anomalous molybdenum values in well water (Geochemical Prospecting - D. B. Beck - July 10, 1961). In order to determine the origin of the slightly anomalous I.P. readings on line #8, additional traverse lines and depth probes will have to be run. This additional work will take one to two weeks.

*I believe this has been confirmed
to be the "northern boundary fault"
of Sacaton Mountains JCK*

WGF:ao
Enc.

W. G. FARLEY

cc: C. P. Pollock, w/enc.
✓ J. H. Courtright "



EXPLANATION

I.P. / ΔV (M.V./V)
 #6 ← Traverse Line
 ← Resistivity (Ohm-ft)
 ← Resistivity Contour

ASARCO

INDUCED POLARIZATION and RESISTIVITY TRAVERSE LINES

SANTA CRUZ PROJECT
Pinal County, Arizona

W.G.F.
Approx. Scale: 1 inch = 1 mile Date: Oct. 1964

J. H. C. file

ACT 9 1964

Memorandum for JH Courtright.

Re: Santa Cruz Drilling
September.

During the month of September drill hole SC-2 advanced from 1226' to 2705.5'. ~~Four~~^{Five} core runs were made with the following results.

- 1635' - 1638' schist conglomerate
- 1995' - 1997.5' sandstone with granite cobbles
- 2590' - 2592.7' Monzonite, very weakly altered
- 2655' - 2664' Altered p^t granite with traces of sulfide cast.
- 2700' - 2705.5' Altered p^t granite as above.

The top of bedrock was at 2530' in p^t granite.

Drill hole SC-3 was collared on 9-18 and struck bed rock at 649.5' on 9-20. Lost circulation allowed the hole to cave sticking the drill rods. All the tools were recovered by 9-23 and two core runs were made with the following results.

- 644.5' - 651.0' Fresh p^t granite.
- 651.5' - 654.0' Fresh p^t granite.

Drill hole SC-4 was collared on 9-25 and had reached 1057' by 10-1. The log is as follows.

- 0 - 780' Alluvium and very young valley fill. (Drilling very fast)
- 780' - 1057' Schist conglomerate

DR Warwick

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

September 29, 1964

MEMORANDUM FOR J. H. COURTRIGHT

Santa Cruz Prospect, Arizona
Rotary Hole SC-2

From a brief review of the rotary cuttings I have the opinion that SC-2 penetrated the younger valley gravels, equivalent to the Gas line conglomerate near Sacaton. Lithologic differences appear mainly to be poorly consolidated pebble zones near the top and a 300' interval of schist fragment conglomerate which I would think most likely derives from a source of Sacaton conglomerate, at that time exposed to erosion. The basal portion has a brown to red color, imparted by rusty-coated sand grains and some hematite seen in the cuttings. It is possible that this lower unit may correlate to the Burgess Peak conglomerate, or perhaps was derived from it by erosion.

My log of the hole is:

to 1590'	Gas line conglomerate, typical
1590-1810'	Schist-pre-C gr. congl. Core 1635-38, 50% Rec., 1' Final schist boulder, pre-C gr. cobbles above and below. No matrix recovered.
1810-2590'	Gas line conglomerate; granitic congl with brown tone and few hematite chips in the cuttings. Chips from Coolidge granite (?) boulders near bottom. Core 1995-98.5' Brown sandstone with pre-C granite cobbles. Core not solid but washed and disintegrated.
2590-2630'	Bedrock; red-brown porphyry.
2630-2705.5'	Granite.
	T.D.

Bedrock cores 2632-64 and 2700-2705.5 were similar to those brought to the Tucson Office from higher up in bedrock. Spotty alt., mostly clay, exotic hematite soaked through rock, traces limonite after pyrite. No "live lim" is present in these 2 core runs.

ORIGINAL SIGNED BY
JOHN E. KINNISON

JOHN E. KINNISON

JEK/Jk

c: JHCourtright
JRwojcik
JEKinnison

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

J.H.C.
SEP 21 1964

September 17, 1964

MEMORANDUM FOR MR. J. H. COURTRIGHT

Santa Cruz Prospect
Property

I have investigated the ownership of twelve sections in the north-eastern part of the Santa Cruz area, with the following results. The numbers refer to the accompanying map.

Township 5 South, Range 5 East

Section 33

N1/2 - Federal Mineral rights, covered by our Bidy claims. Surface owned by Edison I. Sarff, c/o Phoenix Title & Trust Company, Tucson.

S 1/2 - Subdivided, with many lots sold. Minerals go with surface.

Section 31

1) All, except S 1/2 Lot 4 (SW 1/4 SW 1/4) - surface and mineral owned by C & V Growers, Box 150, Maricopa, Ariz. This firm also owns Lots 1, 3 & 4 and E 1/2 SW 1/4 (same as all of SW 1/4) Section 30, and the S 1/2 Section 32. Purchase Price was \$414,000.

2) S 1/2 Lot 4 -(S 1/2 SW 1/4 SW 1/4)- Surface and mineral owned by Johanna M. and Ralph Freeman, 429 Rose Ave., Taft, Calif.

Section 32

NW 1/4 - State surface and mineral. We have applied for a prospecting permit here.

3) NE 1/4 - Surface and mineral owned by Arizona Land Title and Trust Company as Trustee under Trust 5665-T. The deed (from Trust 5459-T) carries \$54.55 in revenue stamps, indicating a price of just under \$50,000.

1) S 1/2 - C & V Growers, (see Section 31).

Township 6 South, Range 5 East

Section 5

4) NW 1/4 - Surface and mineral - Rosine Lundy, care of Ed Dantes, 128 E. 87th Place, Los Angeles 3, Calif.

5) NE 1/4, north of railroad, 132 acres. Surface and mineral. Maud L. Abernathy, Box 66, Mt. Lemmon, Arizona.

6) SE 1/4 and NE 1/4, south of Railroad. Surface and mineral rights owned by Frieda J. Mathewman. On the plot map the address is given as 944 Prospect St. , Honolulu, Hawaii, but neither the assessor nor the treasurer have her listed on their other records. There are only a very few addresses shown on the plot maps. If we should become interested in this parcel more research should be done.

Township 6 South, Range 5 EastSection 5 (Continued)

7) W 1/2 SW 1/4 - Surface and mineral - Irvin R. and Sylvia Blumenthal, c/o Sam Sweetow, 1301 N. Havenhurst Ave., Los Angeles 46, Calif.

8) E 1/2 SW 1/4 - Surface and mineral, according to the plot map, owned by R. W. Hackert, 17238 Passage Ave., Bellflower, Calif. I did not find a card for him in the assessors files. However, my notes in 1962 show the name as R. W. Ackert, 11720 E. 215th St., Artesia, Calif.

Section 6

9) N 1/2 - Surface and mineral - Maurice Perkins, c/o Sam Fox et al, 2740 North Kiva Place, Tucson.

10) W 1/2 SW 1/4 - Arizona Land Title & Trust Co., no Trust number given in deed. This is same property that formerly belonged to Marathon Investment Corp., and advertises on the ground as Desert Carmel. Under same ownership is N 1/2 and SE 1/4, Sec. 7, all section 8, T6S, R5E, and SE 1/4 Sec. 1, T6S, R4E, as well as other property outside of the immediate area of this study. Revenue stamps on the deed total \$1029.05, or a consideration of just under a million dollars.

11) E 1/2 SW 1/4 and W 1/2 SE 1/4 - Surface and mineral - 1/2 Mary D. Allen, widow, and 1/2 Agnes V. Allen, 878 Evergreen Road, Prescott, Arizona.

12) E 1/2 SE 1/4 - Surface and mineral - 1/2 Lillian Friedland and 1/2 Ethel Mansbach, 5463 E. Alpine Ave., Tucson. Revenue stamps of \$12.10 indicate a purchase price of \$11,000. The Tucson 1964 phone book gives Mrs. David Friedland's address as 5463 E. 4th, and the city map shows 4th St. & Alpine Ave. to be the same thing.

Section 7

10) N 1/2 and SE 1/4 - Surface and mineral - Arizona Land Title and Trust Co. - (Desert Carmel). See Sec. 6.

13) SW 1/4 - Surface and mineral - Phoenix Savings Bank and Trust Company.

Section 8

10) All, except NE 1/4 NE 1/4 - Surface and mineral. Arizona Land Title and Trust Co., (Desert Carmel).

14) NE 1/4 NE 1/4 - Arizona Land Title and Trust Co., Trustee under Trust No. 5635-T. Deed carries \$3.30 revenue stamps, or \$3000.

Township 6 South, Range 4 EastSection 1

- 15) W 1/2 - Surface and mineral. Paul A. Ollerton, 1121 N. Trekell Road, Casa Grande, Arizona.
- 16) NE 1/4 (Lots 1, 2, 5 and SW 1/4 NE 1/4) - Surface and mineral. William T. and Madeline Moody. I found no address card for them.
- 10) SE 1/4 - Surface and mineral - Arizona Land Title and Trust Co., Desert Carmel.

Section 2

This is a messy section. The north half is divided into 12 lots, the top four having about 20 acres each, and the rest being standard 40 acre lots. It once all belonged to the State, but several small parcels have been sold off. The private land is listed below, the rest still belongs to the State.

- 17) Lot 1 - Surface and mineral. Irene R. Atkinson, 3747 Arboleda St., Pasadena 8 Calif.
- 18) W 1/2 Lot 3 and NW 1/4 Lot 6 - Surface and mineral - Leova Shelton, 440 Quincy NE, Apartment C, Albuquerque, N.M.
- 19) Lot 4 and N 1/2 Lot 5 - Surface and mineral - Sam and Mildred Schantz, 3107 E. Waverly, Tucson, Arizona.
- 20) NE 1/4 Lot 6 - Surface and mineral - Wesley Hayes, 523 E. 4th St., Winslow, Arizona.
- 21) N 1/2 Lot 9 - Surface and mineral - Annabel (Bedgoode) O'Donnell, 740 Nancy St., Barstow, Calif.
- 22) SE 1/4 Lot 9 - Surface and mineral - Florence Beck, Box 803, Winslow, Arizona.
- 23) W 1/2 Lot 10 - Surface and mineral - John A. and Alice Morris, c/o Mrs. Hannah Morris, 2187 Notre Dame Dr., Eureka, Calif.
- 24) SE 1/4 Lot 10 - Surface and mineral - Alma Peterson Est. - c/o Mrs. Charles C. Hanger, 931 Kenwood St., Burbank, Calif.
- 15) NE 1/4 SW 1/4 SW 1/4, SE 1/4 SE 1/4 SW 1/4 and NE 1/4 SE 1/4 SE 1/4 - Surface and mineral - Paul A. Ollerton, 1121 N. Trekell Rd., Casa Grande (See Sec. 1)
- NW 1/4 SE 1/4 SE 1/4 - Surface - Paul Ollerton - minerals reserved to Irma Fern Williams and Walworth Forman Williams by deed recorded in Docket 173 at page 301.

All the rest of Section 2 is State surface and mineral and we have a Prospecting Permit on the State Land in the NE quarter.

Section 3

- 25) Lots 1, 5-15, and S 1/2, except for a one-acre tract described as follows: begin 1800' E of SW corner of section, thence North 210 feet, thence East 210 feet, thence South 210 feet, thence West 210 feet to point of beginning. Surface and mineral of Lots - Del Monte Mortgage Corp., 125 W. Munroe, Phoenix. S 1/2 of section - surface - Del Monte - Federal mineral rights.

Township 6 South, Range 4 East (Continued)

Section 11

25) All - surface and mineral - Del Monte Mortgage Corp.

Section 12

15) NW 1/4 - surface - Paul A. Ollerton. See Sec. 1.
Federal mineral rights.

26) NE 1/4 - Surface - 1/2 Harry H. and Pauline Willis,
1/2 Burgess W. and Jesse Murdock, 528 Willow Lane, Geneva,
Ill. - Federal mineral rights, covered by our "W" claims.

SW 1/4 - surface and mineral - Willis and Murdock.

27) SE 1/4 - Surface and mineral. Richard C. and Mattie
Smith - Star Rte., Casa Grande, Arizona.

S. I. Bowditch
S. I. Bowditch

SIB:bam
2 - extras



AMERICAN SMELTING AND REFINING COMPANY
EXPLORATION DEPARTMENT
120 BROADWAY, NEW YORK 6, N.Y.

W.S.
AUG 28 1964

JK Sep 1

August 27, 1964

C. P. POLLOCK
VICE PRESIDENT

AIR MAIL

Mr. W. E. Saegart
American Smelting and Refining Company
813 Valley National Building
Tucson, Arizona

Santa Cruz Project, Pinal County, Arizona

Dear Mr. Saegart:

This will acknowledge and thank you for your letter of August 21st reporting on the results of the first drill hole at the Santa Cruz Project. As you say, the deep covered area to the southeast of the fault contact with bedrock at depths succeeding 2800 feet does not present a very attractive prospect. Nevertheless, I am inclined to agree that a few additional holes are justified in the search for the root of the Syceton deposit.

You probably will have an opportunity to discuss this program with Mr. Richard during his current visit in Tucson. Assuming that he and Mr. Courtright approve the program, I will go along with the additional holes you propose.

Very truly yours,

C. P. Pollock

CC-KRichard - Tucson
JHCourtright - Tucson

Extra copy

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

August 21, 1964

J.H.C.

SEP 14 1964

Mr. C. P. Pollock, Vice President
American Smelting and Refining Company
120 Broadway
New York, N. Y. 10005

Recommended Drilling
Santa Cruz Project M.A. 970
Pinal County, Arizona

Dear Sir:

The first hole drilled on the Santa Cruz Project, designated SC-1, was completed August 18. This hole bottomed in fresh Pre Cambrian schist at 2886 ft. Bedrock was estimated at 2360 ft. Location of the hole, as shown on the attached map, was approximately 100 ft. north and 100 ft. west of the quarter corner of Sections 33 and 34, T.5S., R.5E.

I have now had an opportunity to review the aeromagnetic and ground magnetic maps of this area. A very large area of high magnetic intensity exists north, west and southwest of the Sacaton deposit. This area is shaded brown on the attached map. A magnetically low area, in a relative sense, occurs within the high. The low is indicated by yellow shading on the map.

The large magnetic high is caused by a change in rock type or shallower bedrock or both. As currently interpreted, the high is related to several phases of Laramide intrusives ranging from granite to diorite. The southeast side of these Laramide rocks are in fault contact with Pre Cambrian granite and schist which are the host rocks of the Sacaton mineralization.

The "root" of the Sacaton deposit will be in Pre Cambrian rocks and therefore it is not likely to be within the magnetic high area. This will apply even if the high is not entirely underlain by Laramide rocks. The altered "root" should be magnetically low as is the upper plate ore zone.

The magnetic low within the large high could be caused by:

- 1) A low susceptibility phase of the Coolidge granite;
- or 2) A Pre Cambrian pendent of granite, porphyry, schist or sediments within the Laramide intrusive.

If the low is related to the latter alternative, the "root" is at least permissible at that location.

Hole SC-1 represents the thickest section of post mineral conglomerate yet penetrated. There is no reason to believe that pre-mineral bedrock will be

Mr. Pollock

-2-

August 21, 1964

any shallower to the southwest on the Pre Cambrian side of the fault. This great depth does not present a very attractive prospect. I do believe, however, that two more holes to the southwest are justified in the search for the "root."

Hole SC-2 is now drilling near the northeast corner of Section 12, T.6S., R.4E. This site is approximately 2000 ft. southeast of the magnetically interpreted fault contact separating Pre Cambrian and Laramide rocks. We staked Federal claims on the NE $\frac{1}{4}$ of this section yesterday.

A third hole is proposed farther southwest near the quarter corner of Sections 26 and 35, T.6S., R.4E. This location is also on the Pre Cambrian side of the fault. We have applied for a State Prospecting Permit for 270 acres in Section 35.

Two holes are proposed to test the magnetic low which occurs within the large high. The recommended sites are the southeast corner of Section 13, T.5S., R.4E. and the northeast corner of the parcel of State ground in Section 2, T.5S., R.4E. We have a State Prospecting Permit on the parcel in Section 2 and will shortly make application for at least the south $\frac{1}{2}$ of Section 13.

A decision concerning additional drilling will be deferred until the above proposed holes are completed, or nearly so.

The unexpended balance in M.A. 970 as of August 1 was \$128,985.22.

Very truly yours,

ORIGINAL SIGNED BY
W. E. SAEGART

W. E. SAEGART

WES/jk

Attachment

cc: JNCourtright w/attch. 
JRwojcik "
SIBowlitch "
R.Lacy "



PAPAGO INDIAN RESERVATION

-  Magnetic high area
-  Magnetic low area
-  Boundary of magnetic anomaly from aeromagnetics
-  Boundary of magnetic anomaly from ground magnetics

EXPLANATION

-  Federal Surface and Mineral Rights
-  Federal Mineral Rights
-  State Surface and Mineral Rights
-  Completed Drill Holes
-  Proposed Drill Holes
-  Drilling
-  Cultivated Land

DRILLING PROGRESS MAP
SANTA CRUZ PROJECT

Pinal County, Arizona
Approx. Scale 1 inch = 1 mile

JHC Desk (Santa Cruz Project)

FORM NO. 100-110

AVO J ORAL ORDERS

Oral Orders are often forgotten or misinterpreted. Use this form for all major oral instructions to Agents.

AUG 25 1964

To File review SEP 14 1964

Application for Proprietary Patent

Case # 572 Sec 13 T-55 R-2K was made

on August 29, 1964. Check for \$15.00

was accompanied the application.

Through oversight, no transmittal letter was written.

ALL

RECEIVED

Date _____ Agent A. J. [Signature]

J. H. C.

SEP 16 1964

JAC Desk

Aa-16A.3.19C

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

August 10, 1964

W.E.S.

AUG 11 1964

J.H.C.

SEP 14 1964

MEMORANDUM FOR J. H. COURTRIGHT

Santa Cruz Drilling
July Expenses

Drilling on Santa Cruz drill hole number SC 1 in the SE cor N $\frac{1}{2}$, Section 33, T5S, R5E began on July 15. By July 31 the hole was 1053' deep having penetrated 185' of recent alluvium and 868' of Gas Line Conglomerate.

Contract drilling charges are as follows:

Footage 1053' @ \$3.65/ft	\$3843.45
Mud 23 sacks @ \$2.40/sack	55.20
Quebracho 1 sack @ \$31.90/sack	31.90
Caustic Soda 1 drum @ \$12.00/drum	12.00
Resettling charge on core bit	147.99
	<u>\$4090.54</u>
1 $\frac{1}{2}$ % Sales tax	43.32
Total contract drilling expense	<u>\$4133.86</u>

J. R. Wojcik

J. R. WOJCIK

JRW/jk

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

July 31, 1964

J. H. C.

SEP 14 1964

Mr. R. J. Lacy, Chief Geophysicist
Geophysical Division
American Smelting and Refining Company
3422 South 700 West
Salt Lake City, Utah

Dear Bob:

I will attend a business meeting in San Francisco Monday, August 3. It will therefore be convenient for me to return by way of Salt Lake City. I will arrive Salt Lake via Western Airlines Tuesday morning, August 4, shortly after 8:00 a.m.

I plan to arrive at your office Tuesday morning to discuss in-hole current electrode methods in the Sacaton area. Wayne Farley suggests, and I agree, that plastic casing will be unnecessary because the current electrodes will be stationary at the bottom of each hole. We will need about 10,000 feet of new insulated wire to place current electrodes in several holes. It will be necessary to place the electrodes immediately after drilling each hole. It would therefore be desirable to have this wire available immediately since the first hole should be completed about August 7. If Cal Moss can obtain this wire, I can carry it with me on my return to Phoenix Wednesday morning.

Very truly yours,

ORIGINAL SIGNED BY
W. E. SAEGART

W. E. SAEGART

WES/jk

cc: JHCourtright 
CKMoss

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

July 21, 1964

J.H.C.
JUL 23 1964

Mr. K. E. Richard, Chief Geologist
American Smelting and Refining Company
120 Broadway
New York, N. Y. 10005

Sacaton-Santa Cruz Projects
Pinal County, Arizona
Preliminary Geologic Map

Dear Sir:

Reconnaissance geologic mapping of outcrop areas which are periferal to the Sacaton deposit and West Casa Grande basin has been essentially completed.

Mr. Kinnison's memo of May 14 with attached geologic map and his supplementary memo of May 28 are enclosed.

An outcrop of weakly altered pre-Cambrian granite with limonite evidence of sparce sulfides was found in the north part of the Viava Hills by Mr. J. D. Sell. Geochemical analyses of outcrop samples and a reconnaissance I.P. traverse support a negative geologic evaluation of the immediate outcrop area. Additional I.P. traverses are planned over the alluvial covered area north and northwest of this showing.

With the possible exception of the weakly altered outcrop mentioned above, no evidence suggesting the location of the Sacaton "root" or direction of upper plate movement was found within the mapped area.

Mr. J. D. Sell will continue geologic reconnaissance west and southwest of the Table Top Mountains.

Mr. Robert Lunning, temporarily hired to work on the Santa Cruz drilling project, is currently extending the mapping in the Haley Hills and Palo Verde Mountains to the west.

Mr. Farley is presently running I.P. traverses south and southwest of the Sacaton area in an effort to locate the "root" mineralization or extensions in the upper plate.

Very truly yours,
ORIGINAL SIGNED BY
W. E. SAEGART
W. E. SAEGART

WES/jk

Enclosures

cc: JHCourtright w/encl.-memos & map 
RJLacy w/encl.-memos & map
JEKinnison w/encl.-memos only
JRWojcik w/encl.-memos only

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

June 22, 1964

J. H. C.

JUN 26 1964

MEMORANDUM FOR J. H. COURTRIGHT

WATER WELL INFORMATION
CASA GRANDE AREA
PINAL COUNTY, ARIZONA

Attached is a water well map of the Casa Grande area showing possible depth to and type of bedrock. The drill holes G-1, G-2, G-3 and a Union Oil drill hole in Section 21 are also included. Only information of a positive nature is plotted; more than two hundred wells were checked but most provided no information of significance to exploration.

Most of the wells within the area outlined in red on the maps were checked in the field for sludge cuttings by J. E. Kinnison, J. R. Wojcik or myself. Some information was obtained from reliable people by informal conversation. The information is separated into three categories on the map: 1) the field checked wells; 2) reliable sources of information including, apparently reliable drillers' logs, and; 3) unverified but interesting information.

Geochemical determinations for Mo and Cu taken recently are included. These samples were analyzed in the same manner as those previously reported (Geochemical Prospecting, 10 July 1961, Beck).

David B. Beck
DAVID B. BECK

DBB/jk
cc: JEKinnison

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

May 18, 1964

J. H. C.

MAY 20 1964

AIR MAIL-SPECIAL DELIVERY

Mr. R. J. Lacy, Chief Geophysicist
Geophysical Division
American Smelting and Refining Company
3422 South 700 West
Salt Lake City, Utah

Dear Sir:

Enclosed find an advance copy of a geologic map showing the Sacaton-Santa Cruz Prospect areas near Casa Grande. This map is preliminary in that land status and section lines will be added later. A brief geologic description accompanies the map, and may be of value in interpreting geophysical surveys recently done. A copy of the final map will be sent when completed.

Yours very truly,

ORIGINAL SIGNED BY
JOHN E. KINNISON

JOHN E. KINNISON

JEK/jk
Enclosure

cc: JHCourtright

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

May 14, 1964

J. H. C!
JUL 23 1964

MEMORANDUM TO MR. J. H. COURTRIGHT

Sacaton-Santa Cruz Prospects
Preliminary Geologic Map

The preliminary geologic map (att.) of the subject area shows some formational groups not previously used in Company correspondence; the following comments describe their salient features.

Pre-Ore Rocks

Pre-Cambrian Basement:

Pinal Schist. Partly typical of the quartz-sericite schist defined as Pinal in other areas. Also here includes banded injection gneiss, granite gneiss, and aplite.

Granite. There are two types undivided on the map. One is "typical" coarse-grained granite with biotite similar to the Mineral Butte granite at Blackwater (Report, A. G. Blucher). A second type is coarse-grained, but with less biotite and with large pink feldspar phenocrysts.

Pre-Cambrian and Paleozoic sediments:

The Apache group of shale and quartzite (Younger pre-Cambrian) is mapped undivided.

Paleozoic sediments represent Bolsa quartzite and Devonian-Carboniferous limestone. Not separated during mapping.

Laramide intrusives:

The Laramide intrusive complex contains many more varieties than are shown; these have been grouped into four units, each of which comprises varieties similar in composition and relative age.

Diorite. The earliest intrusive and/or border phase of Laramide granite is rich in biotite and locally contains magnetite.

Coolidge granite. Defined by Blucher (Report, Blackwater and Sacaton). Equigranular biotite granite which is very uniform in character. The granitic rocks along the west edge of the map which extend from Highway 84 north to the Palo Verde mountains may be pre-Cambrian, but they are most similar to Coolidge in appearance. A better correlation of these granites will be made when mapping is complete.

Micro-granite. This rock is like the Coolidge granite but is fine-grained. Included in the category for mapping purposes are pegmatite, aplite, and alaskite--all in small bodies.

Porphyries. A variety of porphyritic rocks ranging from mafic to acid, with and without quartz, occur as dikes in the mountain ranges. The only larger mass occurs beneath cover in the Sacaton Cu deposit, where it is altered to sericite and clay. There, a monzonite and a dacite have been recognized. The monzonite, in the weakly altered fringe area, is seen to contain much biotite.

Post-Ore Rocks

(1) Volcanics.

The volcanic terrain south and west of Casa Grande is divided into three units:

Sediments. Conglomerate and grit derived from granite and apache group. These rocks are tilted as much as 50°.

Older volcanics. Above the sediments (not always present) are flows of basalt, andesite and latite. These rocks are faulted and tilted.

Basalt. The exposed basalt flows are widely scattered erosional remnants resting on the older volcanics.

(2) Valley conglomerates.

The conglomerates which fill the Casa Grande valley are divisible into three units:

Sacaton conglomerate. This unit is known only near the Sacaton Cu deposit. There are no outcrops of similar type. Its character, as determined by drill cores, is that of an unsorted fanglomerate made of granite and schist/gneiss boulders and grit. The Sacaton conglomerate was deposited against steep relief cut on the Sacaton altered zone, and then displaced along the Basement fault to its present position. Induration is significant and the formation is hard and compact.

Burgess Peak conglomerate. A small hill--Burgess Peak--arises just NW of Casa Grande and is composed of a hard granite-boulder fanglomerate with hematite cement. Our three holes on the Gila prospect penetrated similar conglomerates, and water well drillers' logs indicate that this formation probably extends southeast along the ridge which appears to separate the water basins east and west of Casa Grande. The formation is variable in hardness, but is generally well indurated, although less so than the Sacaton conglomerate.

Gas line conglomerate. The Gas line conglomerate is named for a small outcrop of conglomerate along the El Paso gas line east of Sacaton and drill hole penetrations of the formation in the same area. The formation appears to be younger than known faults and is derived from the granitic rocks of the Sacaton mountains. It is poorly consolidated and consists of conglomerate and sandy stream deposits. A thick clay layer is present east of the Sacaton deposit, which appears to trend south and taper-out across its width of about 2 miles. The Gas line is the aquifer north of Casa Grande. Where it is adjacent to the Sacaton deposit it is dry. The aquifer gravels in the deep basin west of Casa Grande are probably equivalent in age, but they will no doubt contain boulders derived in part from the mountains south and west thereof. The outline of the Gas line basin at Sacaton is shown in green on the map.

(3) Andesite.

Dikes of andesite are post-ore but older than the valley conglomerate.

(4) Quaternary.

Alluvium made of poorly consolidated silt and sand is spread out across the Casa Grande valley, reaching a thickness of about 200 feet near the Santa Cruz River.

Dissected alluvial fans flank Table Top mountain, and are made largely of volcanic rubble.


JOHN E. KINNISON

JEK/jk

cc: JRWojcik w/att.
JEKinnison w/att.
File w/att.
3 extras w/att.

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

May 28, 1964

SUPPLEMENT TO MEMO OF MAY 14, 1964

Recent mapping by Mr. Sell, along the western edge of the Casa Grande basin, north of Highway 84, has clarified the problem of the age of granites which make up the mountain range there (as mentioned under heading "Coolidge granite"). To the south of a major fault zone which strikes east across the range, the rocks are directly continuous with known pre-Cambrian granites, although they do have certain physical features which first suggested to me a correlation with the Laramide Coolidge granite. North of this fault, which must be a major structural feature, the granite is unquestionably Coolidge granite.

The advance copy of the geologic map, sent to Mr. Lacy on May 18, 1964, did not show this corrected interpretation, but all other copies have been modified to show these data.


JOHN E. KINNISON

JEK/jk
cc: JRWojcik
JEKinnison
File
3 extras

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

May 12, 1964

J.H.C!
MAY 12 1964

MEMORANDUM TO MR. R. J. LACY:

Gravity Survey
Santa Cruz Project
Pinal County, Arizona

A gravity survey was conducted over a 300 square mile plus area during the latter part of April and the first part of May. This survey, along with the previous gravity work done in this area (Memo Saegart to Lacy 19 June 1964), is contoured on the attached relative gravity map. The survey was conducted in an effort to locate possible shallow bedrock or any other structural feature which might help in locating possible drill sites for the current drilling program.

Gravity stations were located every mile at section corners except in certain cases where half-mile stations were also read. Elevation control was obtained directly off U.S.G.S. topographic maps using the elevation given at the section corners. If no elevation was given, the elevation was obtained by interpolating contours. Due to the gentle relief of the area surveyed and the wide spacing of stations, a more precise method of obtaining elevations seemed unnecessary.

DAVID B. BECK

DBB/jk
Attachment
cc: JHCourtright w/o att. [initials]
DBBeck

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

J. H. C.
MAY 1 1964

April 30, 1964

1964 T 14W

J. H. C.

MEMORANDUM FOR MR. J. H. COURTRIGHT

Santa Cruz Prospect
Property

At your request I looked up land in Townships 7 and 8 South, Range 6 East, Pinal County, which still has the mineral rights in the Federal Government, and also the mineral rights controlled by the State of Arizona in these townships. Surface ownership over Federal mineral rights was also checked. The results are given below.

T7S, R6E

- Section 9 - NE 1/4 NW 1/4 - Federal mineral rights; Surface owned by Casa Grande Cemeteries
S 1/2 NE 1/4 SE 1/4 and N 1/2 SE 1/4 SE 1/4 - Federal mineral rights; surface owned by Moriss and Zena Zobel.
SE 1/4 NE 1/4 & W 1/2 SE 1/4 & N 1/2 NE 1/4 SE 1/4 & S 1/2 SE 1/4 SE 1/4 - Federal mineral rights - Surface owned by Arizona Title Guarantee and Trust Co.
- Section 10 - SW 1/4 - All Federal - Casa Grande Military Reservation.
- Section 11 - SE 1/4 - State Land - Grazing Lease to William Cox
- Section 14 - NE 1/4 - State Land - Grazing lease to William Cox
W 1/2 - Federal mineral rights - Surface owned by City of Casa Grande
- Section 15 - All - Federal - Casa Grande Military Reservation
- Section 16 - All - State land - Military Department of State of Arizona - no lease to be granted.
- Section 17 - SE 1/4 - Federal mineral rights - Surface owned by Community Gin Co.
- Section 18 - E 1/2 - State land - Grazing lease to Roland Curry and Paul M. Brophy
- Section 22 - NW 1/4 and E 1/2 - Federal mineral rights - Surface owned by City of Casa Grande

T7S, R6E (cont'd)

- Section 23 - W 1/2 and SW 1/4 NE 1/4 and NW 1/4 SE 1/4 -
Same as above
E 1/2 NE 1/4 and NW 1/4 NE 1/4 and SW 1/4 SE 1/4 -
Federal mineral rights - surface owned by Phoenix
Title and Trust Co.
- Section 26 - S 1/2 NW 1/4 and W 1/2 NE 1/4 - Same as above
N 1/2 NW 1/4 - Federal surface and mineral.
- Section 27 - NE 1/4 - Federal mineral rights - surface owned
by Hare Building Corporation
- Section 32 - All - State land - Part under grazing lease to
Noel and Evelyn Martin

T8S, R6E

- Section 4 - N 1/2 & SW 1/4 - State land - grazing lease to
Curry & Brophy
- Section 10 - S 1/2 - same as above
- Section 15 - W 1/2 - Federal mineral rights - Surface owned
by State - grazing lease to Imperial Valley
Cattle Company
- Section 16 - All - Surface owned by State - leased to Imperial
Valley Cattle Co. This section not shown on map
showing State mineral rights, but according to
books in Land Department this is a State Grant
Section and should carry mineral rights. No
record of mineral rights having been sold off.
- Sections 19, 20, W 1/2 21, W 1/2 27, 28, 29, 30, 31, 32, 33,
W 1/2 34 - All State land - North east of a line
about where Quajote wash shows on map there is a
grazing lease to Imperial Valley Cattle Company
(transferred from Curry and Brophy) and south west
of this line an agricultural lease to Chui Chuichu
Ranches, Inc.
- Section 24 - E 1/2 - State land - grazing lease to Imperial
Valley Cattle Co.
- Section 25 - E 1/2 Same as above
- Section 36 - All - Same as above

S. I. Bowditch
S. I. Bowditch

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

April 7, 1964

Mr. Kanyon Richard, Chief Geologist
American Smelting and Refining Company
120 Broadway
New York, N. Y. 10005

SANTA CRUZ
Drilling

Dear Sir:

The attached property map shows the status of land and location of proposed drill holes on the Santa Cruz and Gila Projects. The boundary between the Sacaton and Santa Cruz Projects is the north-south section line one mile west of ASARCO owned property.

The objectives of this proposed drilling are: (1) to explore the possible southwest continuation of the Sacaton zone of copper mineralization above the Basement fault, and (2) to locate the footwall block of mineralization, or "root" (refer to Section, Attachment 3, Sacaton Ore Reserve Report, February 5, 1964). As pointed out by Mr. Kinnison (memo attached) drilling and field studies have eliminated all ground as the possible root area, with the exception of that lying west and south from the Sacaton prospect.

Referring to the attached map of the Sacaton drilling, the three most southwesterly holes reached bedrock at depths ranging from 1830 to 1924 feet. Two of these bottomed in barren gneiss; the third encountered very weak copper mineralization in monzonite porphyry. The latter occurrence may represent the end of the zone, but the holes are widely spaced (> 1400'), so continuity to the southwest is still a possibility.

It is also possible that erosion preceding deposition of the Sacaton conglomerate may have been deeper to the southwest and thus only conglomerate would exist above the Basement fault. Another uncertainty is the depth of recent gravels in the valley to the southwest. Data on water wells indicate a water basin at least 1000' deep. However, the four or five mile stretch of ground between the edge of the basin (near P-4) and the above mentioned holes, may be non-water bearing with relatively shallow recent gravel cover.

We propose to proceed as follows:

- (1) Run aeromagnetic surveys over the entire valley and extend the present coverage of gravimetric surveys south and southwest several miles. The objective of this work is to provide more information on the older conglomerate surface which forms the

April 7, 1964

bottom of the water-bearing basins, and also, if possible, locate any relatively high bedrock that might occur within the gravel covered basin southwest of the Sacaton prospect.

- (2) Drill location P-1 in the northwest corner of Section 9 on the Gila Project. This location is one mile northwest of Gila No. 2 hole which penetrated copper bearing granite boulders in a conglomerate overlying barren gneiss at a depth of 510'. We will attempt to gather more information on this conglomerate in the Gila No. 3 hole, as well as to test bedrock for mineralization.
- (3) Assuming that a deal is completed on the Bloom Property in Section 25, the location of P-2 would be next; otherwise, drilling would be temporarily suspended.

At any stage of the program we would expect to suspend drilling activity and start negotiations for privately held mineral and surface rights, if favorable results were encountered.

Just how many holes might be required for an adequate test cannot be predicted at this stage. Should we progress southwest into excessively deep (+2000') water-bearing gravels without getting favorable results in bedrock, it might then be advisable to move to a more shallow area in the bedrock on the southwest side of the basin (about 2 miles southwest of P-3). It is estimated that at least 4 holes in addition to the 7 holes spotted on the map will be needed.

The cost of the proposed 11 holes is estimated as follows: (Rotary with occasional core runs)

Gila Project

1 hole, 1200' at \$5 per foot (including overhead)	\$6,000
Balance remaining in the Gila appropriation	\$27,582.19

Santa Cruz Project

10 holes, 2400' each at \$6 per foot (including overhead)	\$144,000
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It is recommended that we proceed with the exploration program as outlined in the foregoing. If you approve, please request an appropriation of \$144,000 for drilling on the Santa Cruz Project.

Balance remaining in the Sacaton appropriation	\$110,388
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Yours very truly,

Original signed by
J. H. Courtright
J. H. COURTRIGHT

JHC/jk

Attachments

cc: TAJousson w/attachments
R.L. Loy

RERichard w/attachments

JHCourtright w/o attachments

JEKInnison w/o att.

JWojcik

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

January 27, 1964

FILE MEMORANDUM

Sacaton Basement Fault
Sacaton Prospect, Arizona

The Sacaton "Basement fault" is the most unique feature of that deposit, and thus is here singled out for special discussion.

Briefly, the Basement fault is a low-angle slightly undulating surface of slippage which was activated after initial ore formation and subsequent oxidation-enrichment. It has sliced through the entire Sacaton altered zone and shifted the hanging wall portion several miles at least, to its present position above unmineralized schist; the foot-wall block, or "root", remained stationary and now lies somewhere covered by valley gravel.

I think the age of the faulting is late Miocene or earliest Pliocene -- but this point will not be further elaborated. It is, however, older than the pediment surfaces surrounding the Sacaton mountains.

The magnitude of the fault and rocks cut by it are shown on the attached cross-section (Attachment B).

The Fault Plane

At the outset of exploration at Sacaton, the Basement fault was not known, nor was there any reason to suspect that such a structure existed. D.D.H. 3, drilling in an enriched chalcocite zone, passed through about 10 feet of tight gouge and breccia of obvious post-ore origin, and then into barren gneiss at 1910 feet. A post-ore andesite dike also was cut in this interval. Subsequently other drill holes penetrated the fault, and its physical character, configuration and age relationship with respect to the mineralized and enriched hanging wall block are now well established.

The fault plane has been cored most extensively in the area of the east "ore body" and in the mineralized but non-commercial area just east of that. To the northeast, south, and southwest penetrations are fewer, and mostly made with the rotary drills (non-core). In the vicinity of the east "ore body" the fault is made of wavy, sheared zones of alternating basement rock and mineralized hanging wall. The shear planes and their gouge streaks are rather firm, and have been cored with little core-loss. Thickness of the fault zone is generally 5 or 10 feet, the thickest section cored being about 25 feet.

Effect on mining

The hanging wall rocks of the west "ore body", which are pervasively altered granite and monzonite porphyry, are neither brecciated nor otherwise effected by the fault movement. This is not the case in the east "ore body", however, for there the rocks have suffered intense shattering, brecciation, and granulation, which I attribute to forces set up while the fault was in progress (memo to K. Richard 7/2/63). The apparent porosity of this zone, as observed in the core, has led to the studies which Core Laboratories are now doing; their efforts being a first step to determine the possibility of leaching-in-place. This condition was described in the memo referred to and will not be repeated here. This rock condition will no doubt effect the manner in which the ground responds to block caving.

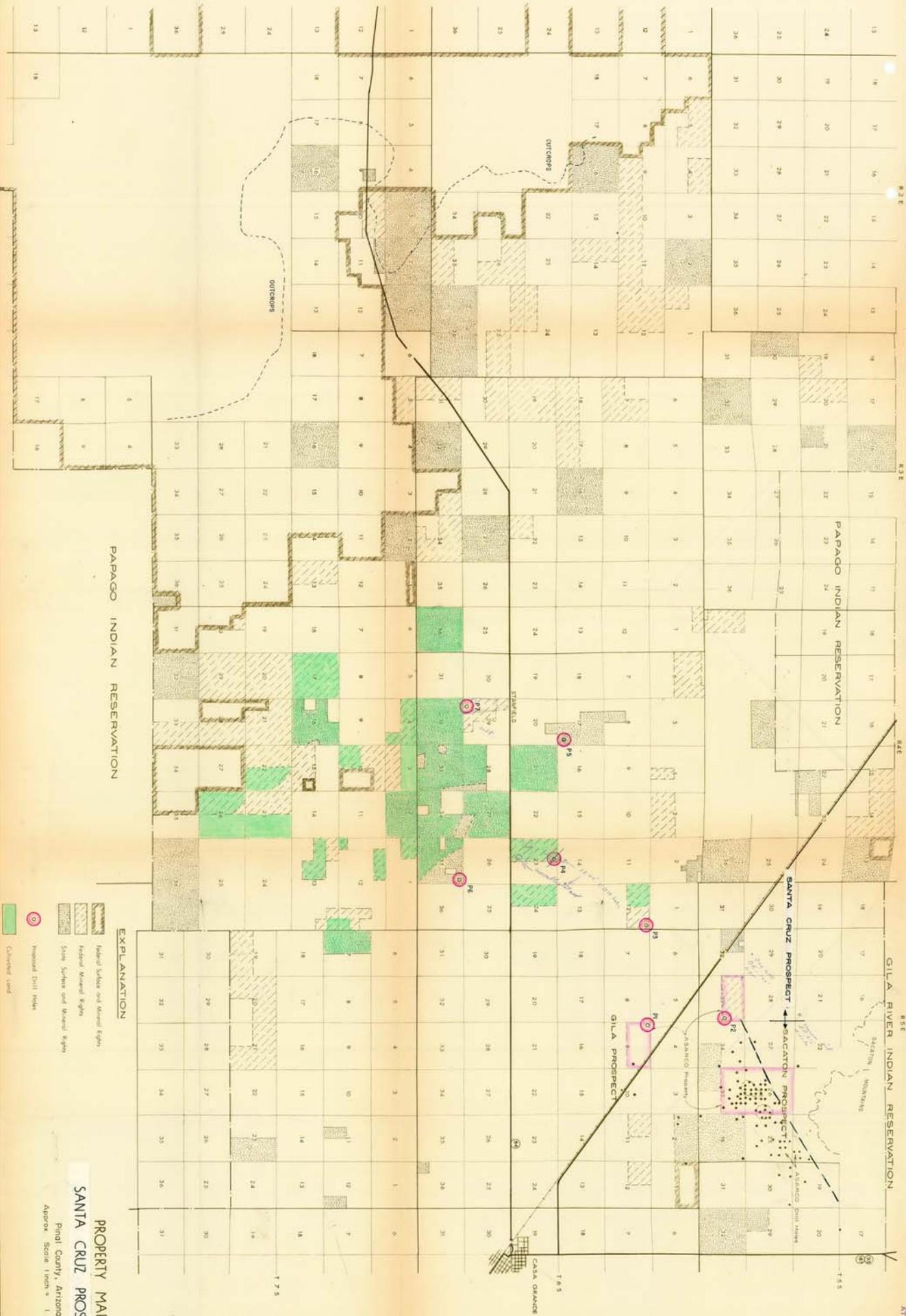
The footwall beneath the east "ore body" shows little or no crushing of the type described in the foregoing, and remains a relatively strong competent rock. I see no reason to think that haulage ways or raises cutting the footwall rocks would offer any unusual mining-stability problems. The effect of the Basement fault on raises which penetrate through it is principally a problem which must be determined at the outset of development. Post-ore, gougy faults have in some cave mines caused difficulty from swelling under static load; however, the Basement fault may be strong enough to hold without difficulty. If necessary, of course, the entire development may be placed in the hanging wall block, and held open with appropriate support.

Exploration possibilities

The Sacaton porphyry copper deposit is known to be 2-1/2 miles long and one mile wide. The NE end is terminated by faults and the SE by middle Tertiary erosion, so originally the zone was of greater extent in length. The altered zone generally grades .2 to .4% Cu as chalcopryrite. The enriched blanket which covered this protore has been segmented by faults, eroded in some portions of the zone, leached in others, and cut off by the Basement fault in the vicinity of the east "ore body." It is not unreasonable to estimate that, at one time in the geologic past, a copper deposit existed which was comparable in size to Ray or Miami.

The "root" of an altered zone of this size is a target worth searching for, as has been pointed out by Mr. Courtright in earlier letters. Both leached capping with live limonite, as well as strongly enriched chalcocite bodies were cut through by the fault, and their lower portions left behind. On the basis of regional mapping and drilling, the Sacaton mountains proper as well as the covered areas between them and the Sacaton deposit have been virtually eliminated as possible "root" areas. It seems most probable that the "root" lies somewhere to the south or southwest in the Casa Grande valley, part of which is known to be underlain by rock with reasonable reach of mining exploration. More work is planned on this possibility.

John E. Kinnison
J. E. KINNISON



PAPAGO INDIAN RESERVATION

PAPAGO INDIAN RESERVATION

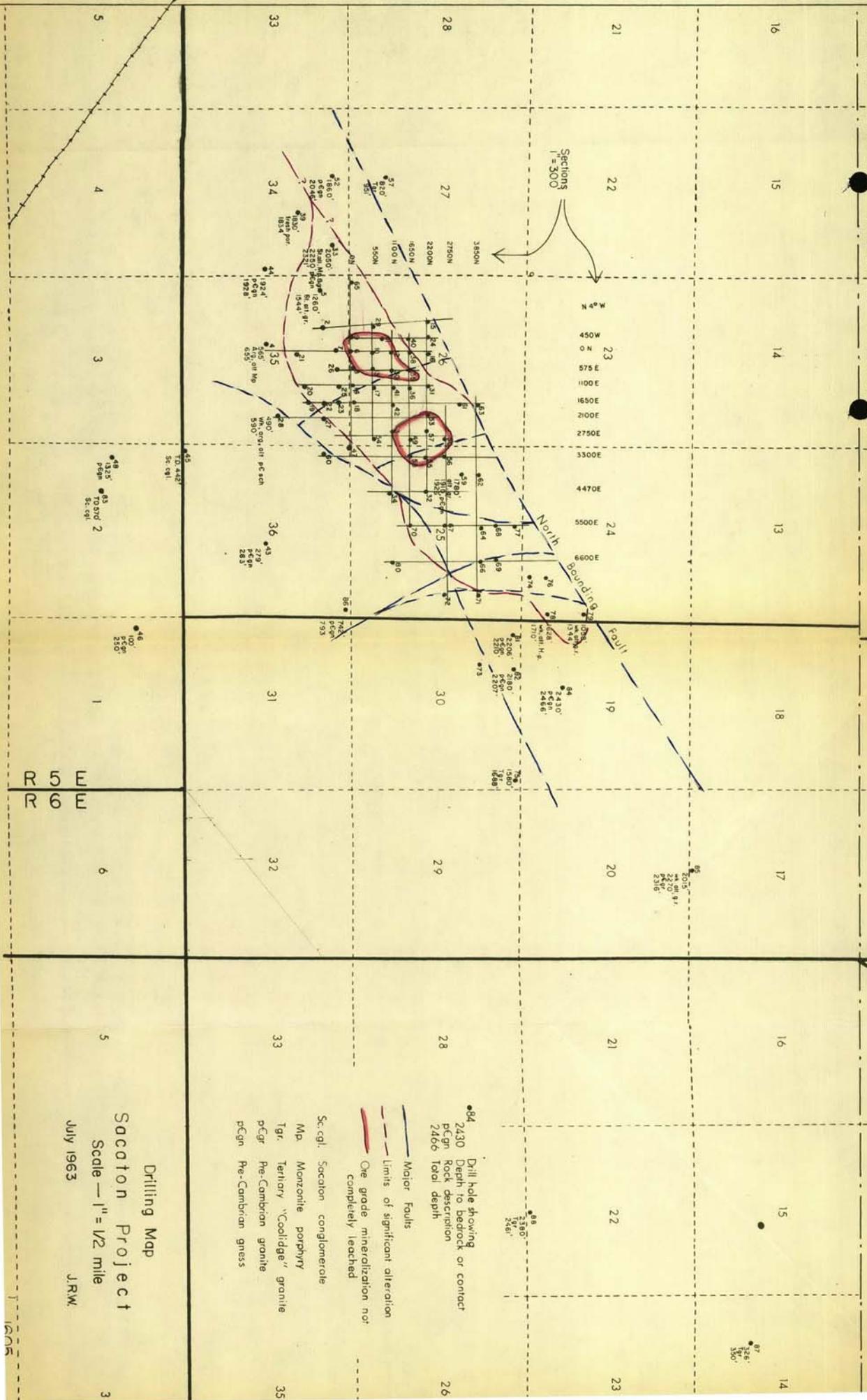
GILA RIVER INDIAN RESERVATION

EXPLANATION

-  Federal Surveys and Mineral Rights
-  Federal Mineral Rights
-  State Surfaces and Mineral Rights
-  Proposed Drill Holes
-  Claimed land

PROPERTY MAP
SANTA CRUZ PROSPECT

Pinal County, Arizona
Approx. Scale 1 inch = 1 mile



Sections
1" = 300'

North Boundary Fault

•84
2430 Drill hole showing
pCgn Rock to bedrock or contact
2466 Rock description
Total depth

- Major Faults
- Limits of significant alteration
- Ore grade mineralization not completely leached
- Sc:qgl. Sacaton conglomerate
- Mp. Monzonite porphyry
- Tgr. Tertiary "Coolidge" granite
- pCgr. Pre-Cambrian granite
- pCgn. Pre-Cambrian gneiss

Drilling Map
Sacaton Project
Scale — 1" = 1/2 mile
July 1963 J.R.W.