CONTACT INFORMATION
Mining Records Curator
Arizona Geological Survey
416 W. Congress St., Suite 100
Tucson, Arizona 85701
520-770-3500
http://www.azgs.az.gov
inquiries@azgs.az.gov

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James Doyle Sell Mining Collection

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Mr. J.H. Courtright

A[redacted]ACAN SMELTING AND REFINING [redacted]MPANY

COMPTROLLER'S DEPARTMENT - TAX SECTION

WES

RECEIVED
DEC 12 1970
S. W. U. S. EXPL. DIV.
R-3
New York, N. Y.

J. H. C.
DEC 21 1970

RECEIVED
DEC 21 1970
EXPLORATION DEPT.

December 18, 1970

W.E.S.
DEC 22 1970

Sacaton Ore Bodies Development Work

Mr. R. B. Meen, Manager
Southwestern Mining Department
Tucson, Arizona

In connection with the development work done on the Sacaton ore bodies during the year 1970, please furnish us with a statement describing the nature of the development work performed and the cost of each phase of the work. Similar information was furnished us for the year 1969 with your letter of March 10, 1970.

We would also appreciate your furnishing us with drill hole maps showing the location of drilling done in the Sacaton Area during the year 1970. Similar information was furnished us for the year 1969 with your letter of March 10, 1970.

ROBERT RICHTER

ROBERT RICHTER
R.A.B.

ABW:jtu

cc: CENelson
TASnedden
JHCourtright
K von den Steinen

RECEIVED
JUN 25 1970
EXPLORATION DEPT

J. H. C.
JUN 29 1970

22 June/70

Mr. W.E. Saegart, Supervisor,
Tucson Office.

Arizona
Sacaton West Orebody
Six-Inch Core Drilling

Dear Bill:

I have read with interest Tony Dalla Vista's memo of May 28th concerning the drilling of six-inch core holes at Sacaton, Arizona.

It is remarkable that there was no lost time due to breakdown, and a core recovery of 100% was achieved. This was obviously a very well run project.

As requested in your accompanying letter of June 11th, I have forwarded the report to Jack Desvaux.

Yours very truly,

Original Signed by
S. A. ANZALONE

S.A. Anzalone.

SAA:sm
CC: JHCourtright, ADalla Vista.

J. H. C.
MAY 1 3 1970

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

May 12, 1970

Dr. Paul E. Damon, Chief Scientist
Laboratory of Geochronometry
University of Arizona
Tucson, Arizona 85719

Dear Dr. Damon:

The following four samples are submitted for age-dating and can be regarded as representative of the intrusive porphyry(ies) of ASARCO's Sacaton project northwest of Casa Grande, Arizona. Each sample represents a single drill hole and is a composite of fragments of half-split, NX-size diamond drill core from the interval shown for that hole. Locations for each hole are expressed in latitude and longitude. Portions of the geologic logs describing the intercepts are attached.

Hole No.	From To	Approx. Wt. Sample (gms)	Location Latitude	Longitude
S-4	621-655	1677	32°56'43"N	111°49'07"W
S-9	754-767	1860	32°57'10"N	111°49'10"W
S-39	1830-1834	753	32°56'54"N	111°49'55"W
S-90	408-422	5103	32°57'21"N	111°48'50"W

Mr. Courtright expressed a general interest in dates for each of the four samples if it would not impose an excessive work load on your facilities. The ultimate selection of the samples, however, is left to your discretion. My work schedule can frequently take me out of town, so please communicate any laboratory results directly to Mr. Courtright.

We sincerely appreciate your interest in undertaking this age-dating.

Very truly yours,

N. P. Whaley

N. P. Whaley

NPW:mt

Attachments

cc: J.H.Courtright w/att

Final Depth 655.0
Collar Elevation 1406'
Coordinates 19229.75 N 21769.92 E
Inclination -90°

ASARCO
GEOLOGIC – ASSAY LOG
Property SACATON

HOLE NO. S4
Sheet No. 1 of 2
Date Completed 6-11-62
Logged By R.K.K.

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay - % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration		Rock Type	Remarks
560.0	10.0	4 3/4		R.B.	0.07	Tr.										BEDROCK REPT. 565 FT ± NW
570.0	10.0	"		"	0.03	0.02										
572.0	2.0	"		"	0.02	Tr.										
576.3	4.3	NX	NONE	16	0.06	Tr			Wk						Mz. Por	Same as described at 621'. Wk. hem frq.
581.3	5.0	NX	"	10	0.02	Tr			Wk.						Mz. Por	" " " " " " " "
590.0	8.7	4 3/4		R.B	Tr	0.04										
600.0	10.0	"		"	0.02	0.23										
610.0	10.0	"		"	Tr	0.12										
618.5	8.5	"		"	Tr	0.05									Mz. Por	Rotary hole adjustment all through into this run. Same as below.
621.0	2.5	NXWL	NONE	21	0.14	Tr			Wk.				Argillic Moderate		Mz Por	Monzonite porphyry, dark green-gray in color. Very abundant subhedral feld. phenos. 1-2 mm, qtz. phenos to 3 mm, a few biotite phenos. 1-4 mm. Groundmass dark and rex. Alt. is moderate and texture clearly visible. Wk. hem. staining on fractures. Leaching wk.
623.5	1.5	"	NONE	12	0.41	0.03			Wk							Same - Hem. in frac. Cu min. not recognized.
626.0	2.5	"	"	20	0.12	Tr			Mod							Same. Hem. in frac. Wk brecciation.
628.6	2.6	"	"	24	0.06	Tr			Wk							Same
631.0	2.4	"	"	13	0.12	Tr.			Wk.							Same

Final Depth 655.0
Collar Elevation
Coordinates
Inclination

ASARCO

GEOLOGIC – ASSAY LOG

Property SACATON

HOLE NO. S 4
Sheet No. 2 of 2
Date Completed 6-11-6
Logged By R.K.K.

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu			Mineralization					Alteration		Rock Type	Remarks
					Total	Non-S	Average	Oxides	Pyrite	Cpy	Cc	Other				
633.3	2.3	NxWL	None	78	0.16				wk.				Argillic moderate		Mz. Porp.	Same as preceding.
635.0	1.7	"	"	82	0.02				wk.							Same porphyry. At 634'± enter fault zone. Porphyry crushed, brecc. and recemented with gouge, clay, and hem.
638.0	3.0	"	"	47	0.06				wk.							Same. Fault zone continues.
641.8	3.8	"	"	50	0.05				wk.							Same. Fault zone end in this run.
645.0	3.2	"	"	34	0.02				wk							Same. No hem.
655.0	10.0	"	"	20	0.04				wk							Same. No hem.
BOTTOM																

Final Depth
Collar Elevation
Coordinates
Inclination

ASARCO

GEOLOGIC – ASSAY LOG

Property SACATON

HOLE NO. S-9
Sheet No. 7 OF 7
Date Completed
Logged By NPW 4-23

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration		Rock Type	Remarks CORE SPLIT PRIOR TO LO
0.6-754.1	3.5	NXWL	2.46	48	0.23				✓	TR			Sericitization & Kaolinization		MZ PORPH	Similar to above. Broken & gouged. Scattered py and traces of cpy
1.1-758.7	4.6	"	2.50	67	0.39				✓	TR			do		MZ PORPH	
8.7-765.8	7.1	"	2.46	97	0.22				✓	TR			do		MZ PORPH	Similar to above. Somewhat less goug Diss. py & cpy - Minor indigenous lim
5.8-776.0	10.2	"	2.55	91	0.36				✓	TR			do		MZ PORPH	Similar to above. Basically light reddi brown ground mass hosting numerous kaolinized white feldspars and scatte biotite. Number of grey-green, silice patches and replacement type bar Hm mottling & fracture deposits. Py wk'ly diss. and in gouge. Traces o cpy.
OTTOM																

Final Depth 1834.8'
Collar Elevation 1399'
Coordinates 1630 S 4420 W (GRID)
Inclination -90°

ASARCO

GEOLOGIC – ASSAY LOG

Property SACATON

HOLE NO. S-39
Sheet No. 1 of 1
Date Completed
Logged By NPW

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration		Rock Type	Remarks
1288.0	1288.0	4 3/4" RB	—	—	—											
1291.8	3.8	NXWL	—	68	—										Tcgl	
1830.0	538.2	4 3/4" RB	—	—	—											BEDROCK EST. ?
1834.8	4.8	NXWL	2.63	58	0.19				wk	wk			wk'ly Ser &	Kaolin.	PORPH	DK gr-grn w/2-4 mm white feld phenocrysts & biot. vfg diss p
BOTTOM																

Final Depth
Collar Elevation
Coordinates
Inclination VERT.

ASARCO

GEOLOGIC – ASSAY LOG

Property SACATON

HOLE NO. S-90
Sheet No. 3 OF 7
Date Completed
Logged By NPW

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu: Total	Non-S	Average	Mineralization: Oxides	Pyrite	Cpy	Cc	Other	Alteration		Rock Type	Remarks
68.2	9.7	NXWL	2.58	92	0.13	0.13		$CuCO_3$					Qtz-	ser	Mz Porph Bx	As above in all respects. Set'ed tr malachit throughout. Cu min tr-wk.
79.7	11.5	"	2.50	97	0.15	0.15		$CuCO_3$					"	"	Mz Porph Bx	Similar to above, bx'ed, healed, and display ing mod hm flooding throughout. Fair percenta of fresh, diss, biotite common. Set'ed fracs of malachite in f. vlts and in fracs wk, dis ind hm. Cu min tr.
89.6	9.9	"	2.52	99	0.05	0.05							"	"	Mz Porph Bx	As above in all respects. Numerous high angle bx zones. No Cu min obs
99.6	10.0		2.58	98	0.03	0.03						Nat Cu	"	"	Mz Porph Bx	Similar in all respects, Very st'ly crumpled and distorted. First tr Nat Cu obs in basal portion this run. Cu min tr.
09.7	10.1	"	2.50	84	0.28	0.13						Nat Cu	"	"	Mz Porph Bx	Similar to above, but displaying far less h flooding. Locally rather chloritic. Fine vlts and small blebs of Nat Cu common. These are gen'ly high angle to vert and cross-cu and/or postdate the high angle bx-hm zone Cu min mod-st.
20.1	10.4	"	2.50	61	0.78	0.33					WK	Nat Cu	Qtz- & chlor	kaolin	Bx'ed Mz Porph	Similar, but considerably less ox'ed bx'e Chlor'ic, hosting diss, fresh biotite. Somew ha vuggy, high angle vls & fracs w/ Nat Cu & partiall ox'ed cc. Cu min st.
29.6	9.5	"	2.57	100	2.63	0.62					Mod-St	Nat Cu	"	"	Bx'ed Mz Porph	Similar to above - Nat Cu and cc in vlts and small blebs and along fracs. Unox'ed zones display vfg diss cc. Cu min st.
31.4	1.8	"	2.60	100	1.36	0.38			Tr		Tr		"	"	Bx'ed Mz Porph	Similar to above - Somewhat chloritic, w/ set'ed, diss py - displaying partial to complet replacement by cc. Cu min tr-wk.

RECOVERY

LINEAR

J. H. C.

DEC 31 1969

W.E.S.

DEC 31 1969

WES

New York, N.Y., December 23, 1969.

Mr. C. P. Pollock

At a meeting of the Advisory Committee held today, there was approved, subject to ratification by the Board of Directors, Saratoa Project application for property appropriation - New York No. 3010, Plant No. Saratoa 5 - in the amount of $150,000 for the drilling of twenty holes to produce an ore sample and for metallurgical tests on this sample, and for the drilling of two proof holes.

A. I. Gillespie, Jr.

CENelson
JPHarrison
HCStringham
EHHaug
TASudden
RBMeen
AOMarsh, Jr.
JHCourtright
KAvdEtelman

J. H. C.

DEC 15 1969

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

December 15, 1969

Sacaton

Mr. Joe W. Shelton
P. O. Box 583
Phoenix, Arizona 85001

Dear Sir:

Your recent bid for the future exploratory drilling program in the Casa Grande area has been received.

We plan to start this work early in January. Since your bid is being considered, we will contact you as soon as something definite is established.

Very truly yours,

A. Dalla Vista

ADV:mt

cc: JHC

T-4.1.1

W.E.S.
DEC 17 1969

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

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

December 10, 1969

J. H. C.

DEC 11 1969

Mr. T. A. Snedden
Building

APPROPRIATION REQUEST SACATON #6
SACATON PROJECT BULK SAMPLES

Dear Sir:

(7)

Attached are the usual copies of appropriation request Sacaton #6 in the amount of $190,000 for a forty-ton bulk sample, metallurgial testing, and for two holes to prove their locations are outside of the mineralized area and may be used as dumps. All are to assist in the continuing study of the open pit or West ore body.

Also attached are Mr. Dalla Vista's memorandum of December 5th, Mr. Williams' of December 5th, and Mr. Bossard's of November 26th. These express the practicability of obtaining a metallurgical sample by large diameter core drilling. The cost and time required will be one third of that for a 500 foot shaft, 1,000 feet of drifts, 400 feet of raises, and 1800 feet of underground drilling, and, we believe the drill samples will be more representative of the entire ore body. The cost estimate includes a geologist to log the core.

If you approve, please transmit the original and four copies to Mr. Nelson for processing and the designated copies to him and to Mr. Haug.

Very truly yours,

R. B. Meen
Manager

FPK:rms
encls.
cc: CENelson, orig. & 4 cops
EHHaug, w/attachs

Sacaton

J. H. C.

DEC 3 1969

AMERICAN SMELTING AND REFINING COMPANY
SOUTHWESTERN EXPLORATION DEPARTMENT
P.O. BOX 5795, TUCSON, ARIZONA 85703

1150 NORTH 7TH AVENUE
TELEPHONE 602-792-3010

December 3, 1969

Mr. Joe W. Shelton
Shelton Drilling Company, Inc.
P. O. Box 583
Phoenix, Arizona 85001

Dear sir:

In reference to your letter to Mr. Saegart of our office, I thought of advising you that we may have about 1600' (minimum) of rotary drilling with 20 to 30 feet of spot coring of the bedrock to be done around January. This involves two holes and is located in the Casa Grande area.

If you are interested, please submit a bid at your earliest convenience.

Very truly yours,

A. Dalla Vista

Antonio Dalla Vista

ADV:lab
cc: JHCourtright

JHC Desk

MR. J. H. COURTRIGHT

AMERICAN SMELTING AND REFINING COMPANY

COMPTROLLER'S DEPARTMENT - TAX SECTION

J. H. C.

AUG 12 1969

MR. RBM - Do you have information requested?

READ AND RETURN WES

PREPARE ANSWERS ..... HANDLE .....

FILE ..... INITIALS .....

E-3

New York, N.Y.
July 18, 1969

W.E.S.

JUL 22 1969

R. B. M.

JUL 22 1969

Sacaton Ore Bodies - Development
Expenditures - Year 1968

Mr. R. B. Meen, Manager
Southwestern Mining Department
Tucson, Arizona

Reference is made to your letter of May 27, 1969 in which you state that a breakdown of the Sacaton development expenditures by ore bodies for 1968 will be submitted to our office as quickly as possible. Also, drill hole maps outlining the Sacaton ore bodies and showing the location of the holes drilled during 1968 are to be furnished by Mr. Courtright. We have not as yet received the above information for the year 1968.

We would appreciate your providing us with this information, at your earliest opportunity.

ROBERT RICHTER

SCZ:mrm

cc: C. E. Nelson
T. A. Snedden
J. H. Courtright
K. A. von den Steinen

Courtright's letter of May 29, 69 furnished wsf
RM

JHC Desk

T-4.5.1

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

W.E.S.
AUG 5 1969

July 31, 1969

J. H. C.
AUG 12 1969

AIR MAIL
Mr. Robert Richter, Assistant Comptroller
American Smelting and Refining Company
120 Broadway
New York, N. Y., 10005

SACATON ORE BODIES
Development Expenditures - Year 1968

Dear Sir:

Further to our letter of May 27, 1969, and in answer to your letter of July 18, 1969, we are giving, below, a breakdown of the Sacaton development expenditures by ore body for 1968, as follows:

	WEST ORE BODY	EAST ORE BODY	TOTAL
Rotary and core drilling	$149,129.	$273,717.	$422,846.
Taxes	1,699.	3,657.	5,356.
Total, as reported in our letter of 3/4/69	$150,828.	$277,374.	$428,202.

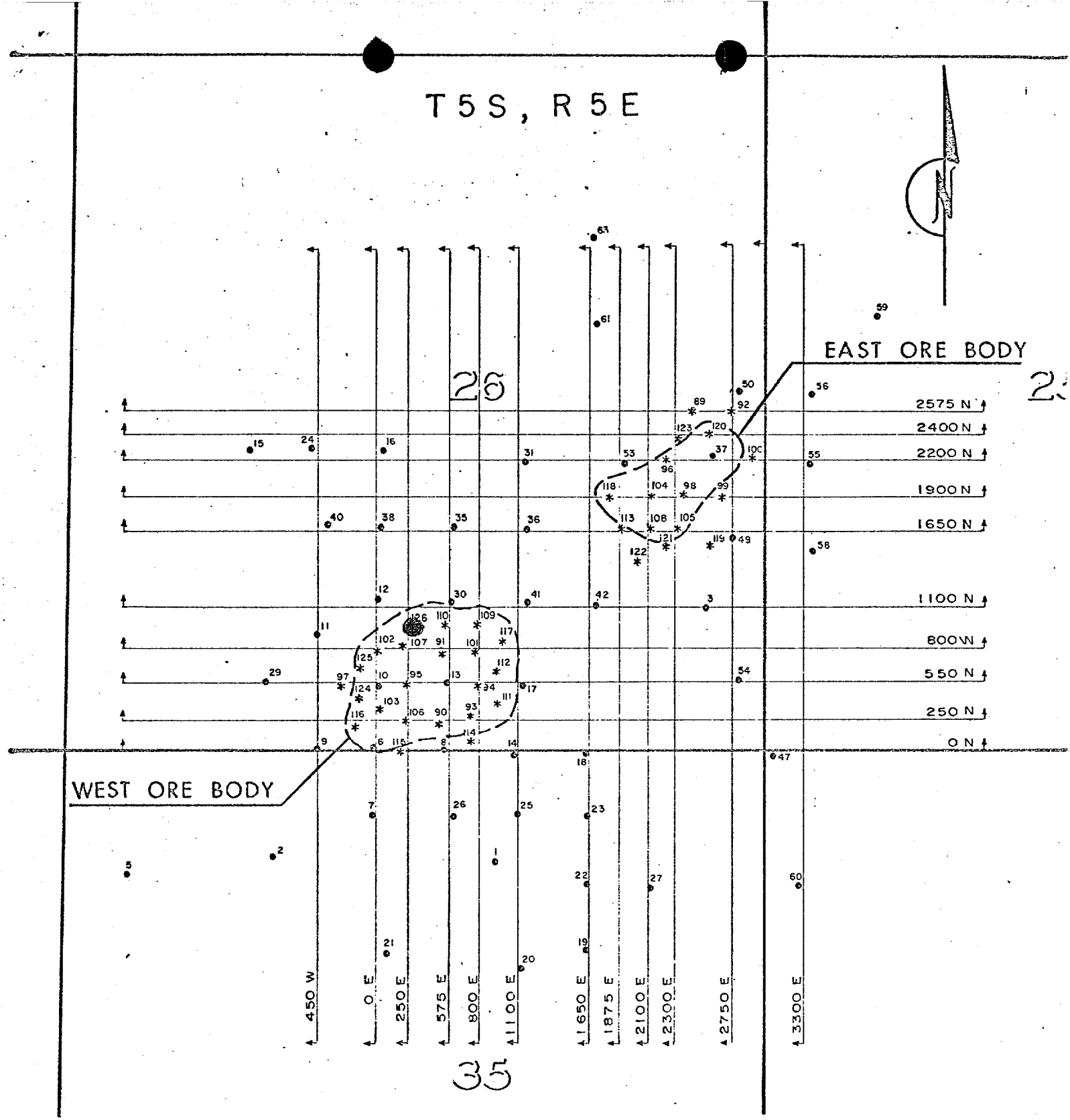
We are also enclosing a Sacaton Project map, as furnished by Mr. Courtright with his letter of May 29, 1969, outlining the Sacaton Ore Bodies, and showing the location of the holes drilled during 1968.

Yours very truly,

ORIGINAL SIGNED BY
R. B. MEEN

R. B. MEEN
Manager

ADC/ms
Encl. (1)
cc: CEHelgen, w/encls.
TASneddon, " "
JHCourtright, " "
K.A.vandenSteinen, " "



• Holes Completed Prior to 1968

* Holes Drilled or Drilling in 1968

⊛ Holes Collard in 1969

SACATON PROJECT

Pinal County, Arizona

SCALE 1" = 1000'

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

May 29, 1969

Mr. R.B. Meen, Manager
Southwestern Mining Department
B u i l d i n g

Sacaton Project

Dear sir:

In reference to your letter of May 27 to Mr. Richter, I am enclosing a Sacaton Project map showing:

1) Holes completed prior to 1968.
2) Holes drilled or drilling in 1968.
3) Holes collared in 1969.

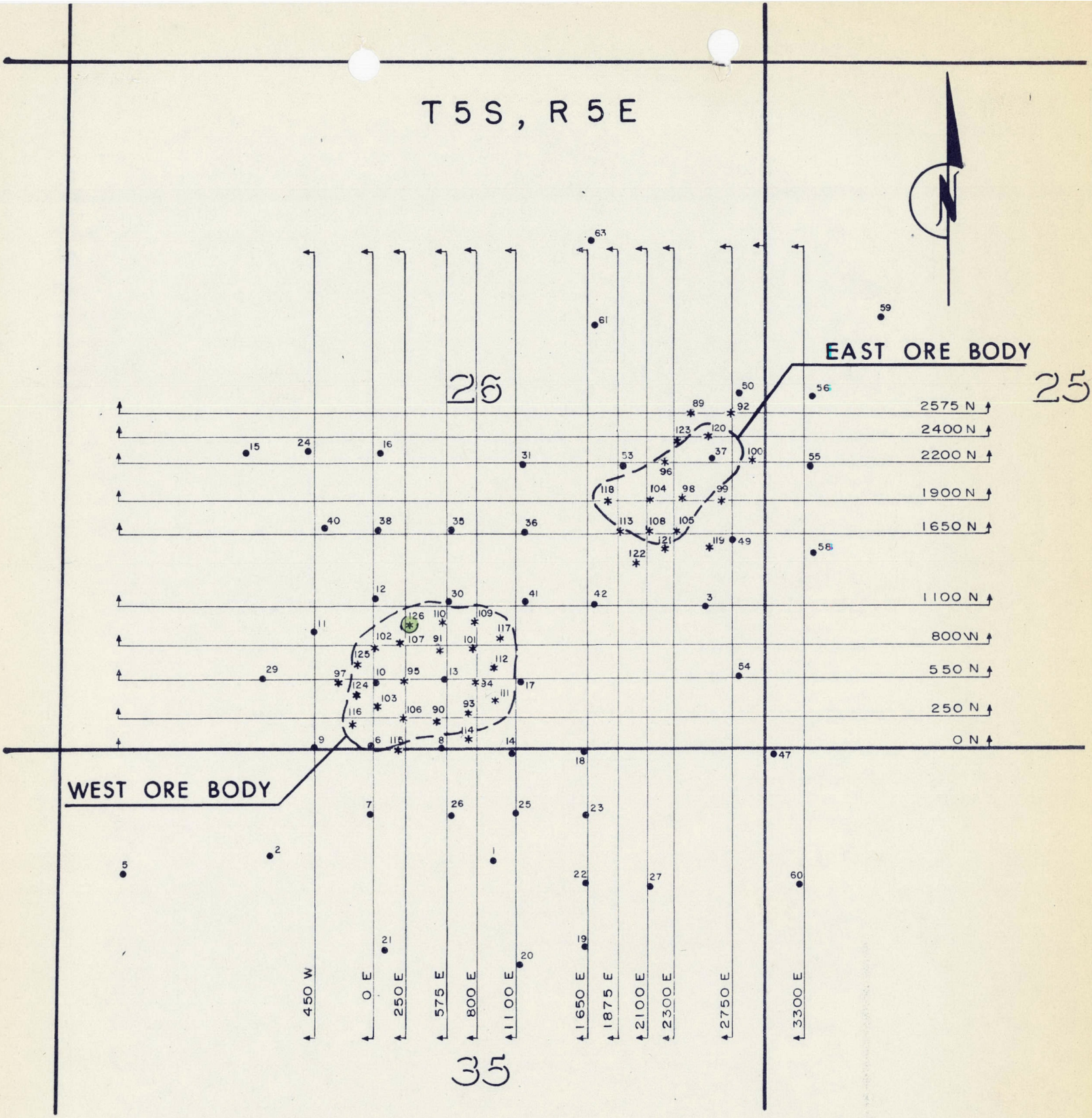
Yours very truly,

J.H. Courtright

J.H. Courtright

JHC:lzb
Encl.

cc: RRichter
TASnedden
KvdSteinen
WESaegart



- • Holes Completed Prior to 1968
- * Holes Drilled or Drilling in 1968
- ⊛ Holes Collard in 1969

SACATON PROJECT

Pinal County, Arizona

SCALE 1" = 1000'

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

J. H. C.
MAY 28 1969

May 27, 1969

AIR MAIL
Mr. Robert Richter, Assistant Comptroller
American Smelting and Refining Company
120 Broadway
New York, N. Y., 10005

TUCSON OFFICE
Sacaton Project - Aggregation of
Operating Mineral Interests

Dear Sir:

Please refer to your letter of April 21, 1969, File 0-1, regarding the Sacaton Project. Inasmuch as it appears the two Sacaton ore bodies will not be developed and operated simultaneously, they should not be aggregated for federal income tax purposes. One of the ore bodies will require underground mining whereas the other will be developed as an open pit. Our studies thus far indicate a better rate of return on investment if we mine the underground ore first and postpone the stripping of the open pit ore until late in the underground period.

Since it is our recommendation these ore bodies not be aggregated, we will provide you as quickly as possible with a breakdown of the 1968 development expenditures by ore body. Copy of this letter to Mr. Courtright will request that he provide you and us with a drill hole map outlining the Sacaton ore bodies and showing the location of the holes drilled during 1968.

Very truly yours,

ORIGINAL SIGNED BY
R. B. MEEN

R. B. MEEN
Manager

KvdS/ms

cc: CENelson
TASnedden
JHCourtright
KAvondenSteinen

J. H. C. ← file

APR 11 1969

SACATON PROJECT
1968 - 1969

Hole No	From To	Int	Recovery by Wt
S-89	1193.8' - 1288.3'	94.5'	94.0% (linear)
	1418.3' - 1560.7'	142.4'	88.0% (linear)
S-90	259.4' - 288.4'	29.0'	99.0% (linear)
	409.7' - 513.7'	104.0'	95.0% (linear)
	542.0' - 571.0'	29.0'	88.0% (linear)
S-91	283.7' - 868.7'	585.0'	90.0% (linear)
S-92	1258.0' - 1329.0'	71.0'	94.0% (linear)
	1412.0' - 1632.7'	220.7'	91.0% (linear)
	1664.2' - 1695.2'	31.0'	94.0% (linear)
	1732.2 - 1771.6'	39.4'	90.0% (linear)
S-93	242.1' - 458.0'	215.9'	93.9%
	518.2' - 555.0'	36.8'	93.1%
	610.8' - 638.7'	27.9'	91.8%
	665.9' - 711.0'	45.1'	93.2%
S-94	375.0' - 739.7'	364.7'	92.1%
S-95	385.7' - 723.2'	337.5'	94.2%
	771.4 - 861.9'	90.5'	87.1%

Continued

S-96	1275.1' - 1370.7'	95.6'	96.3%
	1422.4' - 1698.8'	276.4'	91.3%
S-97	No significant ore grade intercepts.		
S-98	1396.0' - 1417.5'	21.5'	76.6%
	1489.7' - 1815.7'	326.0'	88.4%
S-99	1318.2' - 1460.6'	142.4'	94.0%
	1554.3 - 1839.5'	285.2'	83.0%
S-100	1681.1' - 1860.0'	178.9'	87.2%
S-101	204.1' - 224.9'	20.8'	98.4%
	266.1' - 308.3'	42.2'	85.9%
	566.6' - 678.0'	111.4'	95.3%
	725.2' - 820.2'	95.0'	93.4%
	860.9' - 889.3'	28.4'	94.7%
S-102	468.8' - 670.8'	202.0'	96.7%
	945.2' - 1019.8'	74.6'	88.6%
S-103	307.0' - 366.7'	59.7'	98.2%
	453.8 - 633.8'	180.0'	94.0%
	674.4' - 709.3'	34.9'	60.8%

Continued.

S-104	1360.0' - 1764.7'	404.7'	92.2%
	1949.2' - 1987.5'	38.3'	90.1%
S-105	1579.4' - 1761.8'	182.4'	87.5%
	1761.8' - 1954.5'	192.7'	85.5%
S-106	246.7' - 742.1'	495.4'	90.4%
S-107	178.5' - 236.4	57.9'	97.5%
	308.8' - 390.6'	81.8'	97.9%
	429.1' - 545.5'	116.4'	93.4%
	583.3' - 600.0'	16.7'	85.8%
	622.3' - 806.8'	184.5'	89.1%
S-108	1609.8' - 1998.0'	388.2'	88.0%
S-109	No significant ore grade intercepts.		
S-110	143.8' - 182.9'	39.1'	98.7%
	303.4' - 363.1'	59.7'	70.5%
	385.5' - 471.2'	85.7'	87.2%
	489.0' - 519.0'	30.0'	94.4%
	585.3' - 883.2'	297.9'	94.9%
S-111	243.9' - 261.2'	17.3'	96.3%
	297.4 - 573.2'	275.8'	91.5%

Continued.

S-112	374.2' - 465.5'	91.3'	93.6 %
	549.0' - 649.3'	100.3'	95.1 %
	688.1' - 781.9'	93.8'	88.3 %
S-113	1581.0' - 1653.2'	72.2'	72.6 %
	1690.0' - 1711.3'	21.3'	80.6 %
	1742.0' - 1925.2'	183.2'	82.5 %
	1992.6' - 2108.7'	116.1'	86.3 %
S-114	202.2' - 222.4'	20.2'	98.2 %
	286.1' - 383.9'	97.8'	86.7 %
	408.4' - 475.5'	67.1'	92.6 %
S-115	312.2' - 393.1'	80.9'	92.2 %
S-116	365.5' - 406.5'	41.0'	98.8 %
S-117	Hole not core drilled.		
S-118	1331.8' - 1657.2'	325.4'	74.1 % (linear)
	1687.6' - 1745.8'	58.2'	82.3 % (linear)
	1835.6' - 2018.9'	183.3'	83.1 % (linear)
S-119	1771.5' - 1841.0'	69.5'	31.9 %
S-120	1062.6' - 1389.1'	326.5'	93.0 %
	1430.0' - 1520.0'	90.0'	97.5 %
	1540.3' - 1570.7'	30.4'	96.5 %

Continued.

S-121	1711.4' - 1788.2'	76.8'	87.0%
	1868.8' - 1889.2'	20.4'	101.0%
	1928.4 - 2026.6'	98.2'	68.0%
S-122	Entire hole drilled with Rotary Rig Spot cores not assayed.		
S-123	954.5' - 986.0'	31.5'	96.2%
	1084.2' - 1198.2'	114.0'	95.4%
	1296.7' - 1316.8'	20.1'	98.3%
	1482.4' - 1550.7'	68.3'	93.4%
	1596.8' - 1616.2'	19.4'	92.1%
	1673.6' - 1813.0'	139.4'	94.6%
S-124	567.8' - 610.2'	42.4'	99.6%
	683.2' - 715.0'	31.8'	104.2%
S-125	298.9' - 373.9'	75.0	95.8%
S-126	403.8 - 444.5'	40.7	102.4%
	554.2 - 596.2	42.0	99.5%
	615.8 - 646.2	30.4	101.2%

product: 94452342 ÷ 10,522.8' (sum)
= 8975970
or 89.8% recovery (average)

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

March 11, 1969

Mr. J.J. Collins, Chief Geologist
ASARCO - New York Office

Sacaton Property Appropriation

Dear sir:

As previously reported, drilling on the Sacaton project was completed in January of this year. However, some work remains to be finished, such as sample board preparation, storage of equipment and drafting maps and sections for the ore reserve estimate. Also, metallurgical work on drill hole composites sent to El Paso is yet to be completed.

As of March 1, Property Appropriation (No. 1753, 09-21-68, $235,000) was over-expended in the amount of $27,000 This was due principally to (1) the drilling of several additional fringe holes to better define the limits of the West ore body, and (2) to expenditures for ground water studies and special interim ore estimates.

Requirements for the next few months are estimated as follows:

Metallurgical work and composite assaying	$ 5,000
Ore reserve estimate	4,000
Miscellaneous	6,000
Over-expenditure as of 3/1/69	27,000
Total	$42,000

If you are in agreement, please request a Sacaton Property Appropriation in the amount of $42,000.

Yours very truly,

J. H. Courtright

J.H. Courtright

JHC:lzb

cc: TASnedden
RBMeen
KvdSteinen
WESaegart (file copy)

J. H. C. - file

APR 11 1969

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

March 10, 1969

FILE MEMORANDUM

Sacaton Project 1968
Verticality Surveys of
Drill Holes

Between December 30, 1968 and January 22, 1969, verticality surveys were run on four selected drill holes in the east ore body of the Sacaton Project.

All surveys were run by Mr. Jack Loyd of Joy Manufacturing Company. Tro-Pari drill hole surveying instruments by Parjari Instruments of Quebec, Canada were used.

Tabulated data for the surveys are attached.

N.P. Whaley

NPW:ir

SACATON PROJECT

VERTICALITY SURVEYS:

Run By: Jack Loyd of Joy Mfg. Co.
Tro-Pari Surveying Inst. (s)

Hole No.	Depth	Incl.	Bearing	Remarks
S-123	600'	89°	----- In Casing	Rerun on 12-31-68
	920'	88°	N 06°E	Witness: RH Luning
	1060'	89°	N 82°W	
	1260'	87°	N 46°E	
	1460'	85°	N 23°E	
	1660'	84°	N 57°E	
	1860'	84°	N 63°E	
S-98	600'	87°	---- In Casing	
	1000'	86°	---- do	
	1445'	89°	N 19°E -	Run on 1-2-69
	1581'	87°	N 43°W -	Witness: RH Luning
	1731'	86°	S 57°E -	
	1731'	86°	S 47°E Repeat	
	1731'	87°	N 86°E do	
				Instrument used for above surveys was not clean. Replaced by a different instrument for the following surveys.
S-105	1200'	89°	---- In Casing	Run on 1-18-69
	1565'	89°	N 53°E	Witness: TDalla Vista
	1665'	88°	N 55°E	
	1840'	89°	N 58°E	
	2015'	90°	Vert	
S-104				
	1000'	89°	---- In Casing	
	1410'	88°	N 53°W	
	1530'	89°	N 51°W	Run on 1-22-69
	1665'	88°	N 27°W	Witness: TDalla Vista
	1840'	89°	N 08°E	
	2015'	89°	N 57°W	

N.P. Whaley

3-31-69

SACATON - VERTICALITY SURVEYS (CON'T.)

S-98

SEGMENT	FT	DRIFT /100'	TOTAL DRIFT (ft)
0' - 300'	300'	Assume vert	0
300' - 800'	500'	5.23'	26.15
800' - 1222.5'	422.5'	6.98'	29.47
1222.5' - 1513'	290.5'	1.75'	5.08
1513' - 1656	143'	5.23'	7.47
1656' - 1866' (TD)	210'	6.98'	14.65
		Σ DRIFTS =	82.82'

S-105

0' - 600'	600'	Assume Vert.	0.0
600' - 1382.5'	782.5'	1.75'	13.70
1382.5' - 1615'	232.5'	1.75'	4.07
1615' - 1752.5'	137.5'	3.49'	4.80
1752.5' - 1932.5'	180.0'	1.75'	3.15
1932.5' - 2025' (TD)	92.5'	0.0	0.0
		Σ DRIFTS =	25.72'

S-104

0' - 500'	500'	Assume Vert.	0.0
500' - 1205'	705'	1.75	12.33
1205' - 1470'	265'	3.49	9.25
1470' - 1597.5'	127.5'	1.75	2.23
1597.5' - 1752.5'	155'	3.49	5.41
1752.5' - 2100'	347.5'	1.75	6.07
		Σ DRIFTS =	35.29'

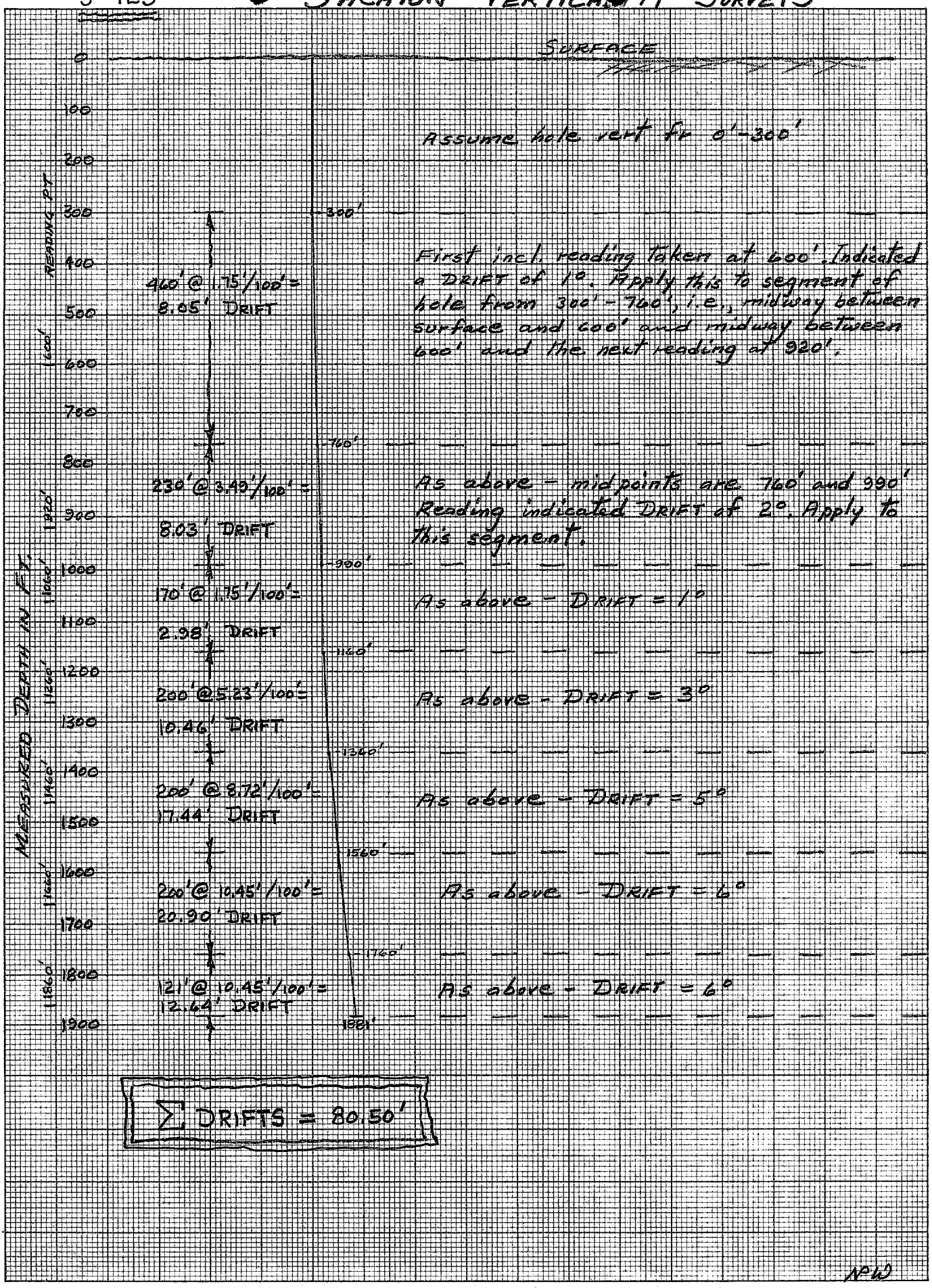
NPW

359-14G MADE IN U.S.A. 10 X 10 TO THE CM. KEUFFEL & ESSER CO.

3-31-69

S-123°

SACATON - VERTICALITY SURVEYS



NPW

10 X 10 TO THE CM. KEUFFEL & ESSER CO. 359-14G MADE IN U.S.A.

98 DRIFT → 8.99 Feet

123 DRIFT → 63.76 Feet

J.H.C.
FEB 4 1969

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

February 4, 1969

TO: J.H. Courtright

FROM: N.P. Whaley

Sacaton Project
Drilling and Significant
Ore-Grade intercepts
January, 1969

Core drilling by Joy Manufacturing Company totaled 1,415.5 ft. for the calendar month of January, 1969.

Rotary drilling, also by Joy Manufacturing Company, totaled 113.8 ft. for the same period.

With the completion of hole S-126 the drilling phase of the present program was terminated. The last drill rig moved off the property January 23.

The following are significant ore-grade intercepts developed from assays received subsequent to my memo on the same subject dated January 3, 1969.

Hole No.	From - To	Interval	Total Cu	Ox Cu
East Deposit S-123	1596.8'-1616.2'	19.4'	1.73	0.03
	1673.6'-1702.1'	28.5'	0.62	0.01
	1722.6'-1761.6'	39.0'	0.63	0.01
	~~1783.1'-1813.0'~~	~~29.9'~~	~~0.44~~	~~0.02~~
	~~ALL ASSAYS RECEIVED~~			
West deposit S-124	567.8'- 610.2'	42.4'	0.55	0.06
	683.2'- 715.0'	31.8'	0.53	0.02
	~~ALL ASSAYS RECEIVED~~			
S-125	298.9'- 373.9'	75.0'	0.77	0.01
	~~ALL ASSAYS RECEIVED~~			
S-126	403.8'- 444.5'	40.7'	1.11	0.03
	554.2'- 596.2'	42.0'	1.54	0.10
	615.8'- 646.2'	30.4'	0.95	0.02
	~~ALL ASSAYS RECEIVED~~			

A tabulation of all drilling done under Appropriations 1634 and 1753 (Sacaton Project) appears below:

Ro Bit (ft)	Ro Bit Core (ft)	DD Core (ft)	Total (ft)
25,650.8	184.7	20,101.9	46,937.4

N.P. Whaley

N.P. Whaley

NPW:lzb

cc: RHLuning
SEZelenkov

"North San Xavier"
Aa-16A.3.19B

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

January 8, 1969

Mr. C.P. Polleck, Vice President
ASARCO - New York Office

Dear sir:

Enclosed are the following:

1. Sacaton plan map (dated January, 1969) showing diamond drill hole assay intercepts for both East and West deposits.

2. North San Xavier plan map (dated May, 1966) showing locations of diamond drill holes, and a set of sections (8) showing ore grade assay intercepts.

Yours very truly,

J.H. Courtright

JHC:lzb
Encl.

Aa-16A.3.19B

J. H. C.

JAN 4 1969

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

January 3, 1969

TO: J.H. Courtright

FROM: N.P. Whaley

Sacaton Project
Drilling and Significant
Ore-Grade Intercepts
December, 1968

Core drilling by Joy Manufacturing Company totaled 1548.2 ft. for the calendar month of December, 1968.

Rotary drilling by J.O. Barnes Drilling Service, Inc., consisted of 1363 ft. of rock bitting and 5 ft. of spot coring.

The following are significant ore-grade intercepts received subsequent to my memo on the same subject dated December 3, 1968.

Hole No.	From - To	Interval	Total Cu	Ox Cu
S-120	1062.6'-1389.1'	326.5'	1.27	1.18
	1430.0'-1520.0'	90.0'	1.18	0.01
	1540.3'-1570.7'	30.4'	0.47	0.02
		ALL ASSAYS RECEIVED		
S-123	954.5'- 986.0'	31.5'	0.84	0.79
	1084.2'-1198.2'	114.0'	1.19	1.02
	1296.7'-1316.8'	20.1'	2.20	0.04
	1482.4'-1550.7'	68.3'	1.61	0.79
		ASSAY DATA INCOMPLETE		

A tabulation of all drilling done under Appropriations 1634 and 1753 (Sacaton Project) in 1968 appears below:

37 holes

Ro Bit (ft)	Ro Bit Core (ft)	DD Core (ft)	Total (ft)
25,537	184.7	18,686.4	45,408.1

The drafting room is preparing an updated edition of the 200 scale "Status of Drilling" map. This should be available within a few days, and a copy will be forwarded to you.

N. P. Whaley (lzb)
N.P. Whaley

NPW:lzb

cc: RHLuning
SEZelenkov

J.H.C.
DEC 4 - 1968

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

December 3, 1968

TO: J.H. Courtright

FROM: N.P. Whaley

Sacaton Project
Drilling and Significant
Ore-grade Intercepts
November, 1968

Core drilling by Joy Manufacturing Company totaled 1331.6 ft.

Rotary drilling by J.O. Barnes Drilling Service, Inc., consisted of 167 ft. of rock bitting and 7 ft. of spot coring.

The following are significant ore-grade intercepts received subsequent to my memo on the same subject dated November 4, 1968.

Hole No.	From - To	Interval	Total Cu	Ox Cu
S-116	365.5'-406.5'	41.0'	0.72	0.66
	ALL ASSAYS RECEIVED			
S-118	1371.8'-1657.2'	285.4'	1.20	0.04
	1687.6'-1745.8'	58.2'	0.59	0.03
	1835.6'-2018.9'	183.3'	0.46	0.01
	ALL ASSAYS RECEIVED			
S-119	1771.5'-1800.0'	28.5'	0.94	0.12
	1800.0'-1841.0'	41.0'	0.79	0.02
	ALL ASSAYS RECEIVED			
S-120	No ore-grade assays received to date, but assay data incomplete.			
S-121	1711.4'-1750.6'	39.2'	1.85	0.12
	1769.8'-1788.2'	18.4'	0.89	0.24
	1868.8'-1889.2'	20.4'	0.46	0.06
	1928.4'-2026.6'	98.2'	1.13	0.02
	ALL ASSAYS RECEIVED			
S-122	Rotary hole-spot cores not assayed.			

The attached sheet shows the current status of all drilling done in 1968.

N. P. Whaley (LZB)
N.P. Whaley

NPW:lzb
Encl.
cc: JRWojcik
SEZelenkov

SACATON – DRILLING
1968

MONTH	RO BIT (ft.)	RO BIT CORE (ft.)	DD CORE (ft.)	TOTAL (ft.)
APRIL	6,930	59	2,026.6	9,015.6
MAY	1,361	51	1,775.0	3,187.0
JUNE	0	0	2,158.9	2,158.9
JULY	2,954.3	5	3,172.2	6,131.5
AUG	2,380.2	22.2	2,360.8	4,763.2
SEPT	6,705	5	2,739.1	9,449.1
OCT	3,676.5	30.5	2,574.0	6,281.0
TO DATE →	24,007.0	172.7	16,806.6	40,986.3
NOV	167	7	1,331.6	1,505.6
TO DATE →	24,174.0	179.7	17,138.2	42,491.9

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

J.H.C.
NOV 15 1968

November 8, 1968

TO: Mr. A.C. Hall

FROM: Mr. S.E. Zelenkov

SACATON PROJECT
ASSESSMENT WORK

J.O. Barnes Drilling service up-dated some state assessment work ASARCO had to have done the early part of February, 1969, on the Sacaton Project. Company witnesses were Mr. N.P. Whaley and myself.

Three holes were drilled in the following locations:

Hole No.	Description	Cost
SA 1	Approximately 192' east of corner $\frac{26\|25}{35\|36}$ T5S, R 5E and approximately 179' south of corner $\frac{26\|25}{35\|36}$ T5S, R5E. This hole was drilled to a depth of 190 feet, and the last 30 feet was sampled.	$417.50
SA 2	Approximately 339' east of corner $\frac{35}{4\|3}$, T5S and T6S, R5E and approximately 363' north of corner $\frac{35}{4\|3}$, T5S and T6S, R5E. This hole was drilled 409 feet, and the last 30 feet was sampled.	$1,249.00
SA 2a	Approximately 772' east of corner $\frac{35}{4\|3}$, T5S and T6S, R5E, and approximately 287" north of corner $\frac{35}{4\|3}$,	$360.00

Cont'd

Hole Number	Description	Cost
	T5S and T6S, R5E. This hole was drilled 150 feet, and the last 30 feet was sampled.	

Please find attached a copy of the bill from J.O. Barnes Drilling Service. A zeroxed map shows the locations of SA 1, SA 2 and SA 2a.

S.E. Zelenkov

S.E. Zelenkov

SEZ:lzb
Encl.

cc: JHCourtright
SIBowditch
NPWhaley

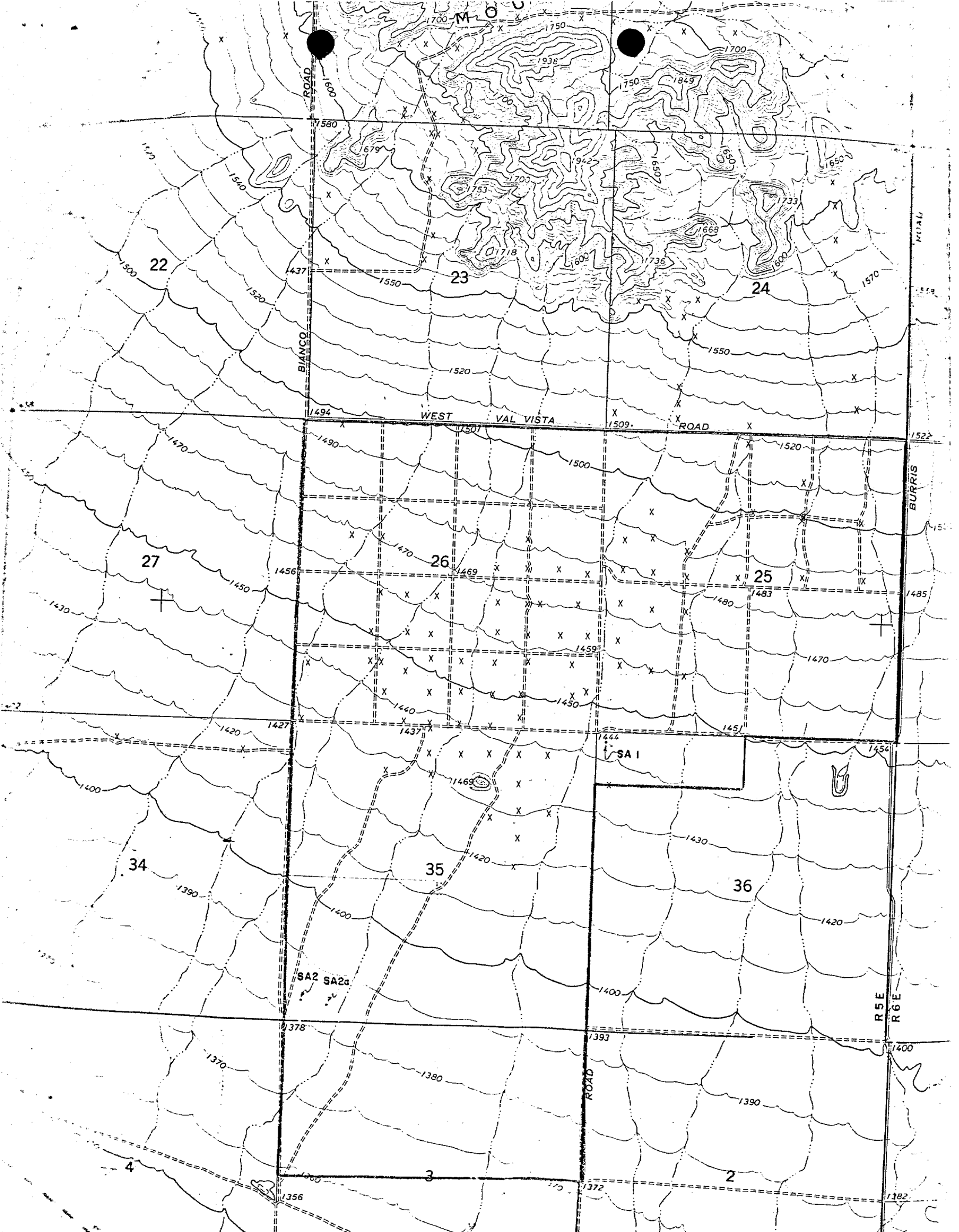
J.O. Barnes Drilling Service, Inc.
1312 N. PARK AVENUE - PHONE 836-8061
P. O. BOX 141 - CASA GRANDE, ARIZONA 85222

DATE Nov. 6, 1968

TO: American Smelting & Refining Co.
Southwestern Exploration Dept.
P O Box 5795, Tucson Arizona 85703

October 1968

Hole # SA 1			
190' @ 1.00 per ft.	190.00		
6½ hrs. Rig Time @ 35.00 per hr.	227.50		
		417	50
Hole # SA 2			
409' @ 1.00 per ft.	409.00		
24 hrs. Rig Time @ 35.00 per hr.	840.00		
		1249	00
Hole # SA2A			
150' @ 1.00 per ft.	150.00		
6 hrs. Rig Time @ 35.00 per hr.	210.00		
		360	00
		2026	50
Less	2026.50 180.00 Labor 1846.50 @ 3% Sales Tax	55	39
		2081	89


ROAD
BIANCO
WEST VAL VISTA ROAD
BURRIS
ROAD
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R6E
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SA I
SA2
SA2a

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

November 4, 1968

TO: J.H.Courtright

FROM: N.P. Whaley

SACATON PROJECT
SIGNIFICANT ORE-GRADE
INTERCEPTS--OCTOBER, 1968

The following are significant ore-grade intercepts received subsequent to Mr. Zelenkov's memo on the same subject, dated September 27, 1968.

Hole No.	From-To	Interval	Total Cu	Ox Cu
S-108	1752.4'-1998.0'	245.6' @	1.08	0.01
	ALL ASSAYS RECEIVED			
S-110	585.3'-883.2'	297.9' @	0.90	0.01
	ALL ASSAYS RECEIVED			
S-111	243.9'-261.2'	17.3' @	0.42	0.38
	297.4'-317.7'	20.3' @	0.96	0.09
	317.7'-358.3'	40.6' @	4.03	1.30
	358.3'-573.2'	214.9' @	0.56	0.03
	ALL ASSAYS RECEIVED			
S-112	374.2'-406.8'	32.6' @	1.51	1.24
	427.6'-465.5'	37.9' @	0.68	0.47
	549.0'-572.4'	23.4' @	0.48	0.31
	612.8'-649,3'	36.5' @	0.73	0.62
	688.1'-781.9'	93.8' @	0.58	0.01
	ALL ASSAYS RECEIVED			
S-113	1581.0'-1653.2'	72.2' @	1.85	0.09
	1690.0'-1711.3'	21.3' @	0.81	0.04
	1742.0'-1925.2'	183.2' @	0.71	0.01
	1992.6'-2108.7'	116.1' @	0.67	0.01
	ALL ASSAYS RECEIVED			
S-114	202.2'-222.4'	20.2' @	0.88	0.81
	286.1'-323.3'	37.2' @	1.05	0.07
	343.2'-383.9'	40.7' @	0.60	0.08
	408.4'-475.5'	67.1' @	0.44	0.01
	ALL ASSAYS RECEIVED			
S-115	312.2'-393.1'	80.9' @	0.61	0.13
	ALL ASSAYS RECEIVED			

SACATON – DRILLING
1968

J. H. C
NOV 4 1968

MONTH	RO BIT (ft.)	RO BIT CORE (ft.)	DD CORE (ft.)	TOTAL (ft.)
APRIL	6,930	59	2,026.6	9,015.6
MAY	1,361	51	1,775.0	3,187.0
JUNE	0	0	2,158.9	2,158.9
JULY	2,954.3	5	3,172.2	6,131.5
AUG	2,380.2	22.2	2,360.8	4,763.2
SEPT	6,705	5	2,739.1	9,449.1
TO DATE →	20,330.5	142.2	14,232.6	34,705.3
OCT	3,676.5	30.5	2,574.0	6,281.0
TO DATE →	24,007.0	172.7	16,806.6	40,986.3

JHC file

SACATON – DRILLING
1968

J.H.C
OCT 23 1968

MONTH	RO BIT (ft.)	RO BIT CORE (ft.)	DD CORE (ft.)	TOTAL (ft.)
APRIL	6,930	59	2,026.6	9,015.6
MAY	1,361	51	1,775.0	3,187.0
JUNE	0	0	2,158.9	2,158.9
JULY	2,954.3	5	3,172.2	6,131.5
AUG	2,380.2	22.2	2,360.8	4,763.2
SEPT	6,705	5	2,739.1	9,449.1
TO DATE →	20,330.5	142.2	14,232.6	34,705.3
OCT.				

J.H.C.
OCT 1 1968

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

October 1, 1968

TO: J.H.Courtright

FROM: S.E.Zelenkov

Sacaton Project
Drilling and Assays
September, 1968

Drilling:

J.O. Barnes Drilling Service reopened hole S-54 for water pump tests. Hole S-54 was opened to a total depth of 1963.0 feet. This depth was reached by September 4, 1968. An air lift pump test was then conducted for about two weeks on this hole by the Water Development Corporation.

Rotary drilling was carried out by the J.O. Barnes Drilling Service, and by the Whatley Drilling Company. The total footage cut by J.O. Barnes to date including 5.0 feet of coring was 4452.0 feet. Whatley Drilling Company started September 24, 1968. To date, they have cut a total of 950 feet of overburden.

Core drilling to date by the Joy Manufacturing and Drilling Company totaled 2385.7 feet.

Maps:

No progress maps were made due to the lack of time to prepare them.

Assays:

Hole No.	From-To	Interval	Total Cu.	Oxide Cu.
~~S-105~~	1680.7-1954.5	273.8' @	1.36	~~0.54~~ .04
		ALL ASSAYS RECEIVED		
S-107	816.9'-826.6'	9.7' @	0.45	0.01
		ALL ASSAYS RECEIVED		
~~S-108~~	1615.0'-1752.4'	137.4' @	1.26	0.05
	1752.4'-1948.4'	196.0 @	1.15	0.01
		ASSAYS INCOMPLETE		
Fast → S-108	1615.0'-1948.4'	333.4 @	1.20	0.02
S-105	1579.4'-1954.5'	375.1 @	1.42	0.05

Assays, cont'd:

Hole No.	From-To	Interval	Total Cu.	Oxide Cu.
S-109	301.2'-311.3'	10.1' @	1.10	0.03
	641.8'-652.3'	10.5' @	0.33	0.77
	673.2'-683.7'	10.5' @	2.59	0.13
	ALL ASSAYS RECEIVED			
West S-110	143.8'-182.9'	39.1' @	0.98	0.03
	223.6'-233.3'	9.7' @	0.63	0.05
	284.5'-295.0'	10.5' @	0.81	0.10
	303.4'-363.1'	59.7' @	1.54	0.06
	385.5'-471.2'	85.7' @	0.60	0.01
	489.0'-519.0'	30.0' @	0.54	0.01
	547.8'-558.2'	10.4' @	0.69	0.01
	566.8'-576.3'	9.5' @	0.44	0.01
	585.3'-655.7'	70.4' @	0.73	0.01
	585.3'-827.3'	242.0' @	.90	0.01
	ASSAYS INCOMPLETE			

S.E. Zelenkov

S.E. Zelenkov

SEZ:lzb

cc: NPWhaley
JRWojcik

J.H.C.
SEP 23 1968

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

September 23, 1968

TO: J.H. Courtright

FROM: S.E. Zelenkov

SACATON PROJECT
ACID ABSORPTION OF
CONGLOMERATE

Please find attached the results of an acid absorption test run by American Analytical and Research Laboratories. The samples were coded as follows:

sample code	Hole number	from	to
A8312	S-98	1146	1151
A8313	S-99	549	554
A8314	S-100	713	783

The samples were picked at random in the conglomerate from each of the three holes. The average acid consumed from the three holes was 33.32 lbs H_2SO_4 per ton of conglomerate. Dollar wise, the loss of acid would be about $0.20 per ton of conglomerate. ?

S.E. Zelenkov
S.E. Zelenkov

SEZ:lzb
Encl.

cc: NPWhaley
JRWojcik

AMERICAN ANALYTICAL and RESEARCH LABORATORIES

3226 East 46th Street
Tucson, Arizona 85713

Phone 624-0049

ASSAYERS - CHEMISTS
METALLURGICAL RESEARCH

ORE TESTING
FLOTATION - LEACHING
ELECTROLYSIS

September 20, 1968.

Mr. Sergei Zelenkov, Mng. Eng.
American Smelting & Refining Co.
1150 North Seventh Ave.
Tucson, Arizona.

Dear Sir:

Pursuant to your request, acid consumption tests have been completed on your samples Nos. A-8312, A-8313 and A-8314.

Each sample, crushed to -3/8" size, was split down to a 200-gram leach portion. Each of these 200-gram batches was rolled in an acid-bottle with 400 milliliters of 4% sulfuric acid at room temperature for 8 hours. At the end of the 8-hour leaching time, each sample was filtered and acid consumption was calculated by difference between start and end strength of solution.

RESULTS

Sample No.	Acid consumption in lbs./ton
A-8312	30.77 lbs. H_2SO_4/ton of solids
A-8313	36.85 lbs. H_2SO_4/ton of solids
A-8314	32.34 lbs. H_2SO_4/ton of solids

It was observed that a large amount of fines and slimes was created by attrition in the 8-hour rolling-bottle tests. It has been our experience in previous leaching tests, that acid consumption following such attrition is appreciably greater than is acid consumption on the same ore in vats wherein the solution is the only factor in motion.

Respectfully submitted,

Pete S. Flores

Pete S. Flores

cc: SZ (2)
file (2)

9/20/68

WES ~~JEK~~

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

J.H.C.
SEP 17 1968

September 13, 1968

W.E.S.
SEP 18 1968

J.E.K.
OCT 17 1968

TO: Mr. J.H. Courtright

FROM: N.P. Whaley

SACATON PROJECT
Drilling and Assays
August 1968

Drilling

Rotary drilling of overburden was carried out by both contractors during the month. Total footage cut by J.O. Barnes Drilling Service, including 22.2 feet of spot coring, was 2,187.2 feet. On August 24 their rotary drill completed the overburden drilling and casing of S-108 and was moved off the property to accommodate one of our other projects. Joy Manufacturing Company drilled 215.2 feet of overburden before initiating coring on S-106. Aggregate footage for the two contractors was 2,402.4 feet.

Core drilling by Joy Manufacturing Company, still using two Joy Model 22 drills, totaled 2,360.8 for the month.

On August 28 the modified Howard-Turner drill belonging to J.O. Barnes was moved onto the property to reopen drill hole S-54. By the end of the month this hole was washed and open to 1745.9 feet.

Brief summaries of the intercepts drilled are listed below.

S-102 (Drilling to 8-2-68)

db	986.1'-992'
gr bx	992'-1079' (TD)

S-103 (Drilling to 8-2-68)

mp & mp bx w/st flt'ing throughout	633.3'-709.3' (TD)

S-104 (8-2-68 to 8-27-68)

Diamond drill footages differ slightly from those of the rotary drill as reported for July. The following are based on the diamond drill.

overburden	0'-1355'
gr & gr bx	1355'-1643.0'

S-104 (8-2-68 to 8-27-68) (cont'd)

gr-mp bx in flt zn	1643.0'-1803.8'
silif mp (?) & micro gr	1803.8'-1833.2'
gr-mp bx	1833.2'-1842.4'
mp bx (flt zn below 1873.5')	1842.4'-1987.5'
flt zn in mp (?)	1987.5'-1998.2'
flt zn in porph'ic meta-gr (?)	1998.2'-2017.2'
meta-gr	2017.2'-2100.1' (TD)

S-105 (Drilling to 8-8-68 and 8-28-68 to drilling)

overburden	1061'-1513'
gr, micro-gr, & dp (?)	1513'-1644.4'

S-106 (8-3-68 to 8-20-68)

overburden	0'-214'
mp bx	214'-396.8'
silif mp (?) or gr (?) bx	396.8'-428.2'
mp bx & silif mp bx	428.2'-478.2'
Core not logged	478.2'-867.8' (TD)

S-107 (8-9-68 and 8-21-68 to drilling)

overburden	0'-120'
mp & mp bx w/some gr	120'-236.4'
Core not logged	236.4'-802.6'

S-108 (8-9-68 to 8-24-68)

overburden	0'-1595' (?)
porph'ic gr w/py-cc	1605.0'-1610.2'

(Rotary hole bottomed w/above core run)

On August 28 the modified Howard-Turner drill belonging to J.O. Barnes Drilling Service, Inc., initiated the reopening of S-54 for a proposed air-lift pump test. At the end of the month the hole was open to 1745.9 feet.

Assays:

Hole No.	From-To	Interval		Total Cu	Oxide Cu
S-102	945.2'-1019.8'	74.6'	@	0.57	0.05
		All assays received			
S-103	453.8'-505.6'	51.8'	@	0.57	0.27
	505.6'-633.8'	128.2'	@	0.56	0.02
	674.4'-709.3'	34.9'	@	0.55	0.06
		All assays received			

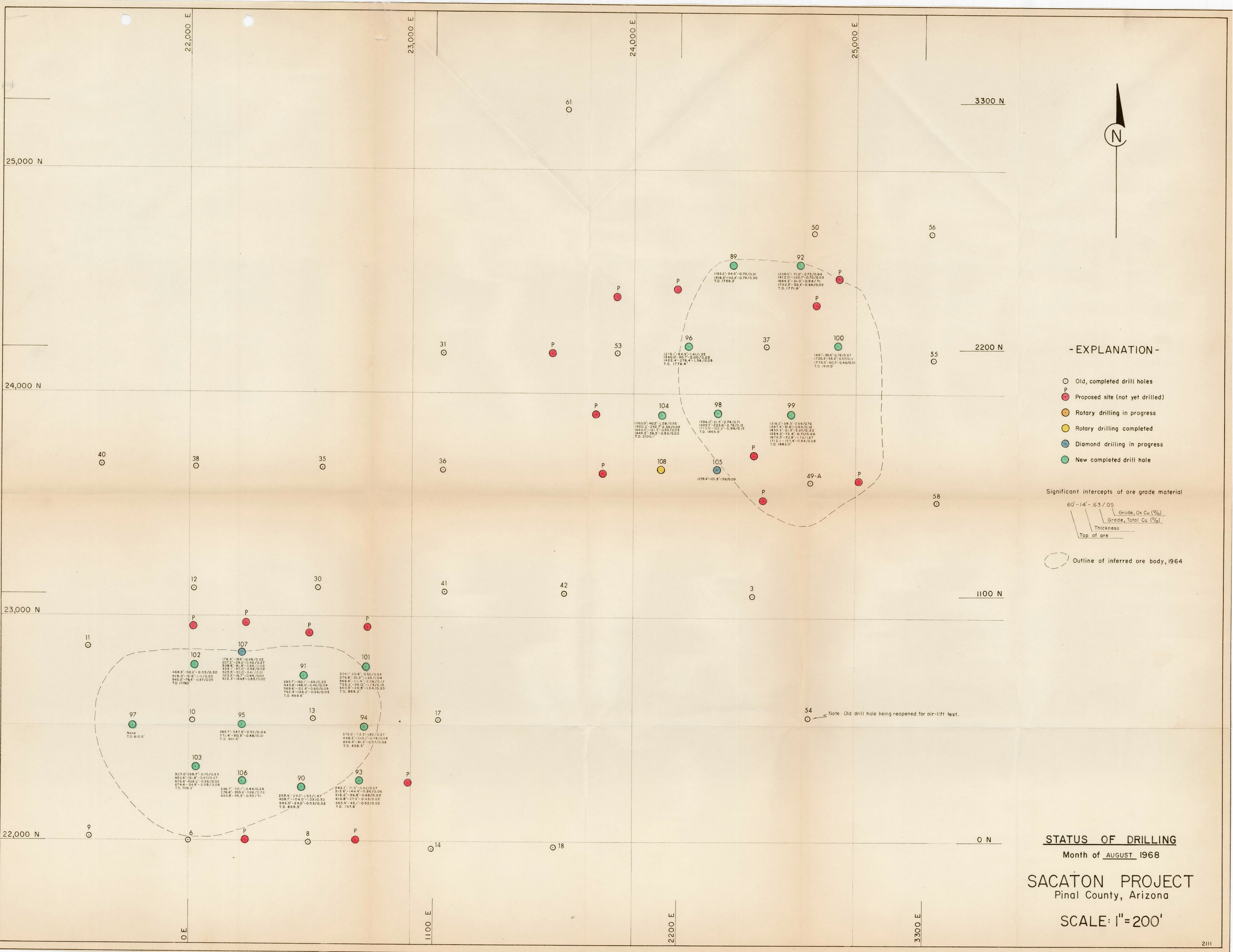
Hole No.	From-To	Interval		Total Cu	Oxide Cu
S-104	1360.0'-1400.2'	40.2'	@	1.28	0.55
	1400.2'-1643.0'	242.7'	@	2.36	0.05
	1643.0'-1764.7'	121.7'	@	0.93	0.03
	1949.2'-1987.5'	38.3'	@	0.53	0.02
	All assays received				
S-105	1579.4'-1680.7'	101.3'	@	1.58	0.09
	Assays incomplete				
S-106	246.7'-276.8'	30.1'	@	0.44	0.26
	276.8'-672.2'	395.4'	@	0.66	0.02
	693.8'-742.1'	48.3'	@	0.50	Tr.
	All assays received				
S-107	178.5'-197.1'	18.6'	@	0.66	0.02
	207.2'-236.4'	29.2'	@	0.45	0.37
	308.8'-390.6'	81.8'	@	0.69	0.03
	429.1'-516.1'	87.0'	@	0.58	0.02
	525.5'-545.5'	20.0'	@	0.41	0.01
	583.3'-600.0'	16.7'	@	0.64	0.03
	622.3'-806.8'	184.5'	@	0.53	0.02
	Assays incomplete				

A map showing the status of drilling as of August 31 is attached.

N.P. Whaley

NPW:lzb

Encl.
cc: JEKinnison
JRWojcik
SEZelenkov



-EXPLANATION-

- Old, completed drill holes
- P Proposed site (not yet drilled)
- Rotary drilling in progress
- Rotary drilling completed
- Diamond drilling in progress
- New completed drill hole

Significant intercepts of ore grade material

60'-14'-.63/.05
- Grade, Ox Cu (%)
- Grade, Total Cu (%)
- Thickness
- Top of ore

Outline of inferred ore body, 1964

STATUS OF DRILLING

Month of AUGUST 1968

SACATON PROJECT

Pinal County, Arizona

SCALE: 1" = 200'

2111

J H C.

J.H.C.
AUG 19 1968

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

August 13, 1968

Mr. J.J. Collins
American Smelting and Refining Co.
120 Broadway
New York, N.Y. 10005

SACATON PROJECT,
SUPPLEMENTAL MINING
AUTHORIZATION REQUEST,
PINAL COUNTY, ARIZONA

Dear Sir:

The unexpended balance of appropriation # 1634 (Sacaton Project Drilling) as of July 31 was $24,820. At our present expenditure rate, this balance should be exhausted by the end of this week.

I am enclosing a 200 scale drilling map of Sacaton, which summarizes the drilling results as of this date.

WEST ORE BODY

Nine holes have been completed in the west ore body during the current drilling program (S-90, 91, 93, 94, 95, 97, 101, 102 and 103) and two are in progress (S-106 and 107). Of the nine completed holes, all but S-97 had ore grade intercepts.

The net effect of the current drilling results is a modest increase in ore tonnage. Hole S-97 limits the extent of this ore zone to the west. This reduction in tonnage, however, is more than offset by the addition of shallow ore intercepts and increased thicknesses of ore columns in the northeast portion of the deposit. The existence of greater thicknesses of ore intercepts in holes S-91 and S-101 may support the stripping of larger volumes of waste on the north side of the deposit, increasing the mineable ore tonnage. Additional drilling is needed to define the northern and southern limits of mineable ore.

Eight additional holes (including S-107, which has just been started) are recommended to determine the ore boundries of the west ore body. These are shown on the attached map, together with estimated rotary and diamond drill footages.

EAST ORE BODY

Six drill holes have been completed under the existing authorization (S-89, 92, 96, 98, 99 and 100). One hole has been rotary drilled to bedrock (S-105) and one hole is presently coring (S-104).

Holes S-99 and S-100 did not have ore intercepts considering the depth involved. These holes crudely define the east boundry of this deposit. Holes S-96, 98 and 104 intersected very good ore columns, the best of which are tabulated below:

HOLE	INTERCEPT From	INTERCEPT Thickness	TOTAL COPPER/ N. SULFIDE COPPER
S-96	1422'	276'	1.36/0.05
S-98	1490'	224'	2.76/0.13
	1714'	102'	0.98/0.15
S-104	1360'	40'	1.28/0.55
	1400'	154' (drilling)	2.23/0.06

The first 72 feet below the base of oxidation in hole S-104 averaged 2.96% Cu. This hole is still in +1% ore at its present depth of 1649'.

The western limit of this deposit has not been defined. Holes S-31 and S-53 cut what could be considered as marginal ore intercepts. The first holes, then, which actually limit the southwest margin of the east ore body are S-36 and S-42. There is sufficient area within this undrilled sector to permit development of substantial additional ore tonnages. Our next proposed drill holes are located to test the west extension of this deposit.

Eleven additional holes are proposed, including S-105 which has already been rotary drilled to bedrock. These holes are plotted on the attached map together with the estimated rotary and diamond drill footages.

The depths plotted for most of the proposed holes in the east ore body extend approximately 100 feet beneath the basement fault. The final 100 to 200 feet of these holes will be for informational purposes at the request of Messrs. Snedden and Meen. The object is to determine rock competence and the degree of fracturing of the footwall block to the extent that development workings might be effected.

- -

Our estimate of the cost to complete the additional drilling as proposed herein is as follows:

West (shallow) ore zone			
	Rotary drilling	1300' @ $4.50/ft	$ 5,850.00
	Coring drilling	5000' @ $12.00/ft	60,000.00
East (deep) ore zone			
	Rotary drilling	13200' @ $5.50/ft	72,600.00
	Core drilling (exploration)	5300' @ $15.00/ft	79,500.00
	Core drilling (information)	1000' @ $17.00/ft	17,000.00
Total		25800'	$234,950.00

These costs include site preparation, supervision, sampling, assaying, and overhead.

A supplemental mining authorization in the amount of $235,000 is recommended to cover the next phase of exploration and measurement drilling on the Sacaton Project.

Very truly yours,

W. E. Saegart

W.E. Saegart

WES:lzb

cc: CENelson
TASnedden
RBMeen
JHCourtright
NPWhaley

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

W.E.S.
AUG 8 1968
J. H. C.
AUG 19 1968

August 7, 1968

TO: Mr. J. H. Courtright

FROM: N. P. Whaley

SACATON PROJECT
Drilling and Assays
July 1968

Drilling

Rotary drilling of overburden was again started by J. O. Barnes Drilling Service on July 3. This was still in progress at the end of the month. Total footage drilled, including five feet of spot coring, was 2,959.3 feet.

Core drilling by Joy Manufacturing Company, using two Joy Model 22 drills, totaled 3,172.2 feet for the month.

Brief summaries of the intercepts drilled are listed below.

S-92 (7-5-68 to 7-19-68)

gr bx w/some db	1258.0'-1432.1'
db and/or micro-gr bx	1432.1'-1599'
db and gr (alternate intercepts)	1599'-1632.7'
bx'ed gr	1632.7'-1751.7'
and (?)	1751.7'-1771.6' (TD)

S-93 (7-3-68 to 7-13-68)

mp bx	180.6'-468.1'
silif mp and dp	468.1'-518.2'
mp bx w/some dp(?)	518.2'-602.4'
mp-gr bx or silif mp	602.4'-757.8' (TD)

S-95 (Drilling to 7-3-68)

silif, feld'ized mp bx	791.4'-901.5' (TD)

S-96 (Drilling to 7-3-68)

bx'ed gr	1778.3'-1779.5 (TD)

S-101 (7-3-68 and 7-15-68 to 7-26-68)

overburden	0'-90'
mp bx w/some gr(?)	90'-638.5'
bx'ed gr	638.5'-755.2'
mp bx (some silif and/or gr)	755.2'-889.2' (TD)

S-102 (7-3-68 to 7-5-68 and 7-20-68 to Drilling)

overburden	0'-170'
bx'ed mp	170'-226.0'
mp-gr (?) bx	226.0'-328.4'
gr(?) bx w/some mp(?)	328.4'-519.0'
st'ly flt'ed, mixed gr & mp	519.0'-763.2'
alternate intercepts bx mp & gr	763.2'-955'
db	955'-986.1'

S-103 (7-5-68 to 7-6-68 and 7-26-68 to Drilling)

overburden	0'-254'
mp bx & mp	254'-633.3'

S-104 (7-11-68 to 7-25-68)

overburden	0'-1360'
chips, prob'ly gr w/$CuSO_4$(?)	1360'-1365'

S-105 (7-25-68 to Drilling)

overburden	0'-1061'

Original Assays:

Hole No.	From - To	Interval		Total Cu	Oxide Cu
S-92	1258.0'-1329.0'	71.0'	@	0.75	0.64
	1412.0'-1632.7'	220.7'	@	0.70	0.03
	1664.2'-1695.2'	31.0'	@	0.54	Tr
	1732.2'-1771.6'	39.4'	@	0.46	0.02
		All assays received			
S-93	242.1'-313.6'	71.5'	@	0.92	0.57
	313.6'-458.0'	144.4'	@	0.96	0.06
	518.2'-555.0'	36.8'	@	0.66	0.02
	610.8'-638.7'	27.9'	@	0.43	0.02
	665.9'-711.0'	45.1'	@	0.52	0.02
		All assays received			
S-95	385.7'-723.2'	337.5'	@	0.92	0.04
	771.4'-861.9'	90.5'	@	0.45	0.01
		All assays received			
S-96	1275.1'-1340.0'	64.9'	@	1.41	1.25
	1340.0'-1370.7'	30.7'	@	2.00	0.20
	1422.4'-1698.8'	276.4'	@	1.36	0.05
	(These intercepts incorporate and/or combine the shorter intercepts used by S.E. Zelenkov in the June report.)	All assays received			
S-101	204.1'-224.9'	20.8'	@	0.60	0.54
	276.8'-308.3'	31.5'	@	1.55	1.04
	566.6'-678.0'	111.4'	@	2.08	0.17
	725.2'-820.2'	95.0'	@	1.73	0.15
	860.9'-889.2'	28.3'	@	1.54	0.53
		All assays received			

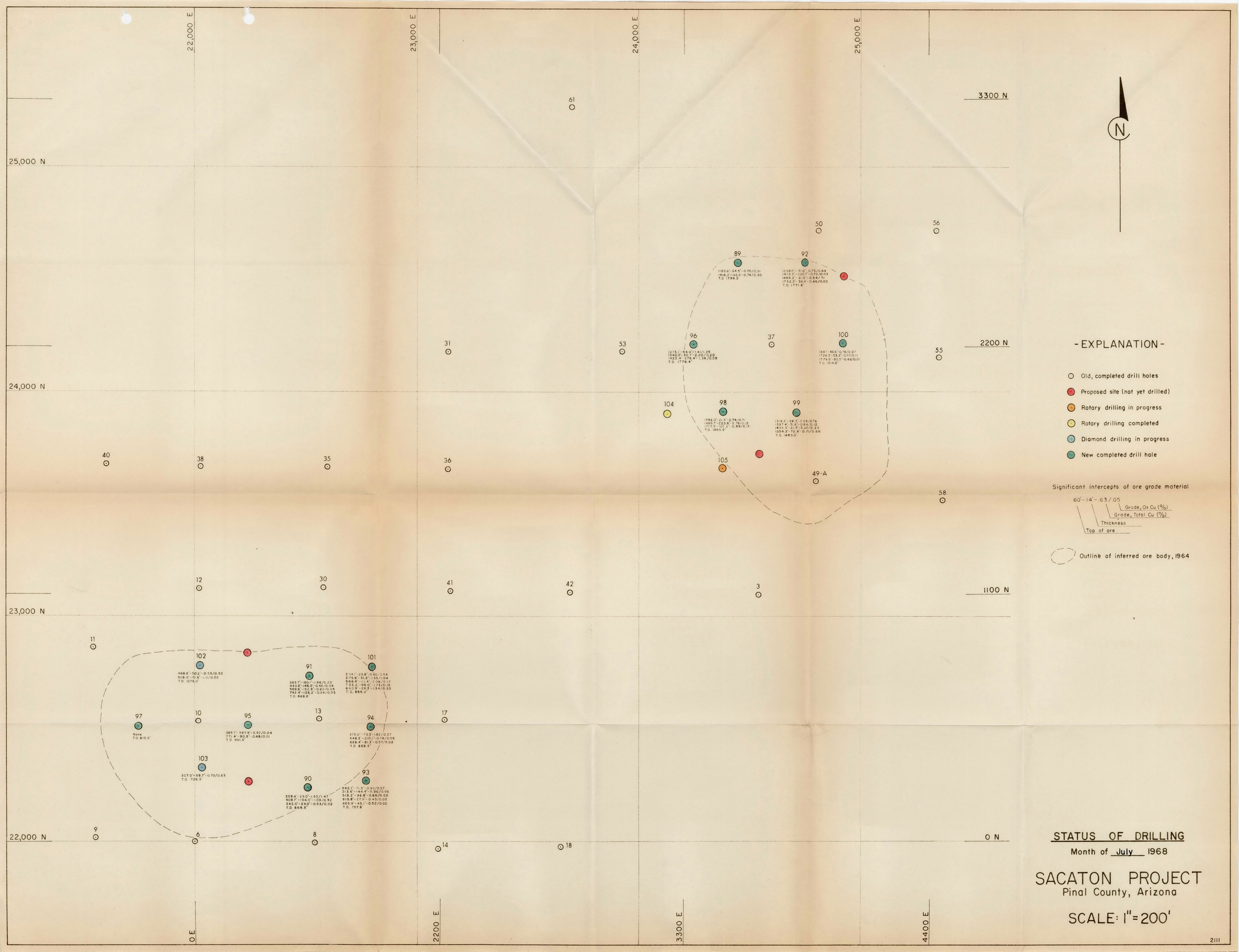
Hole No.	From - To	Interval		Total Cu	Oxide Cu
S-102	468.8'-519.0'	50.2'	@	0.55	0.30
	519.0'-670.8'	151.8'	@	1.11	0.02
S-103	307.0'-366.7	59.7'	@	0.70	0.63

A map showing the status of drilling for July is attached.

NPW:lmi
Attachment

N. P. Whaley

cc: JRWojcik
SEZelenkov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23,000 N
22,000 N
3300 N
2200 N
1100 N
0 N
N
61
50
56
89
1193.8'-94.5'-0.70/0.31
1418.5'-142.4'-0.79/0.30
T.D. 1798.3'
92
1258.0'-71.0'-0.75/0.64
1412.0'-220.7'-0.70/0.05
1664.2'-31.0'-0.54/Tr
1732.2'-39.4'-0.46/0.02
T.D. 1771.6'
96
1275.1'-64.9'-1.41/1.25
1340.0'-30.7'-2.00/0.20
1422.4'-276.4'-1.36/0.08
T.D. 1779.4'
37
100
1681'-36.6'-0.76/0.67
1726.3'-53.2'-0.57/0.11
1779.5'-80.5'-0.48/0.01
T.D. 1919.0'
31
53
55
104
98
1396.0'-21.5'-0.74/0.71
1488.7'-223.8'-2.76/0.13
1713.5'-102.2'-0.98/0.15
T.D. 1865.9'
99
1318.2'-39.3'-0.68/0.76
1397.4'-51.6'-0.64/0.12
1439.3'-213.3'-0.20/0.22
1554.3'-72.6'-0.71/0.66
T.D. 1883.0'
40
38
35
36
105
49-A
58
12
30
41
42
3
11
102
468.8'-50.2'-0.55/0.30
519.0'-15.8'-1.11/0.02
T.D. 1079.0'
91
283.7'-160.1'-1.66/0.20
443.8'-146.0'-0.46/0.04
589.8'-152.6'-0.80/0.05
742.4'-126.2'-0.54/0.03
T.D. 868.6'
101
2'04.1'-20.8'-0.60/0.54
2'76.8'-31.5'-1.55/1.04
346.6'-111.4'-2.08/0.17
725.2'-95.0'-1.73/0.15
860.9'-28.3'-1.54/0.55
T.D. 889.2'
97
None
T.D. 610.5'
10
95
385.7'-337.5'-0.92/0.04
771.4'-90.5'-0.48/0.01
T.D. 901.5'
13
17
94
375.0'-73.3'-1.82/0.27
448.3'-210.1'-0.74/0.05
658.4'-81.3'-0.57/0.02
T.D. 859.5'
103
3C7.0'-59.7'-0.70/0.63
T.D. 709.5'
90
259.4'-29.0'-1.53/1.47
409.7'-104.0'-1.05/0.32
542.0'-29.0'-0.53/0.02
T.D. 669.5'
93
242.1'-71.5'-0.92/0.37
313.6'-144.4'-0.96/0.06
518.2'-36.8'-0.66/0.02
610.8'-27.9'-0.43/0.02
665.9'-45.1'-0.52/0.02
T.D. 757.8'
9
6
8
14
18
-EXPLANATION-
Old, completed drill holes
Proposed site (not yet drilled)
Rotary drilling in progress
Rotary drilling completed
Diamond drilling in progress
New completed drill hole
Significant intercepts of ore grade material
60'-14'-.63/.05
Grade, Ox Cu (%)
Grade, Total Cu (%)
Thickness
Top of ore
Outline of inferred ore body, 1964
STATUS OF DRILLING
Month of July 1968
SACATON PROJECT
Pinal County, Arizona
SCALE: 1"=200'
2111

J. H. C.

SEP 13 1968

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

June 20, 1968

W.E.S.
JUL 1 1968

TO: Mr. J.H. Courtright

FROM: Mr. S.E. Zelenkov

Sacaton Project

Please find attached an updated map of the Diamond drill hole locations. The holes due west and south of hole S-98 were moved 50 feet closer to S-98.

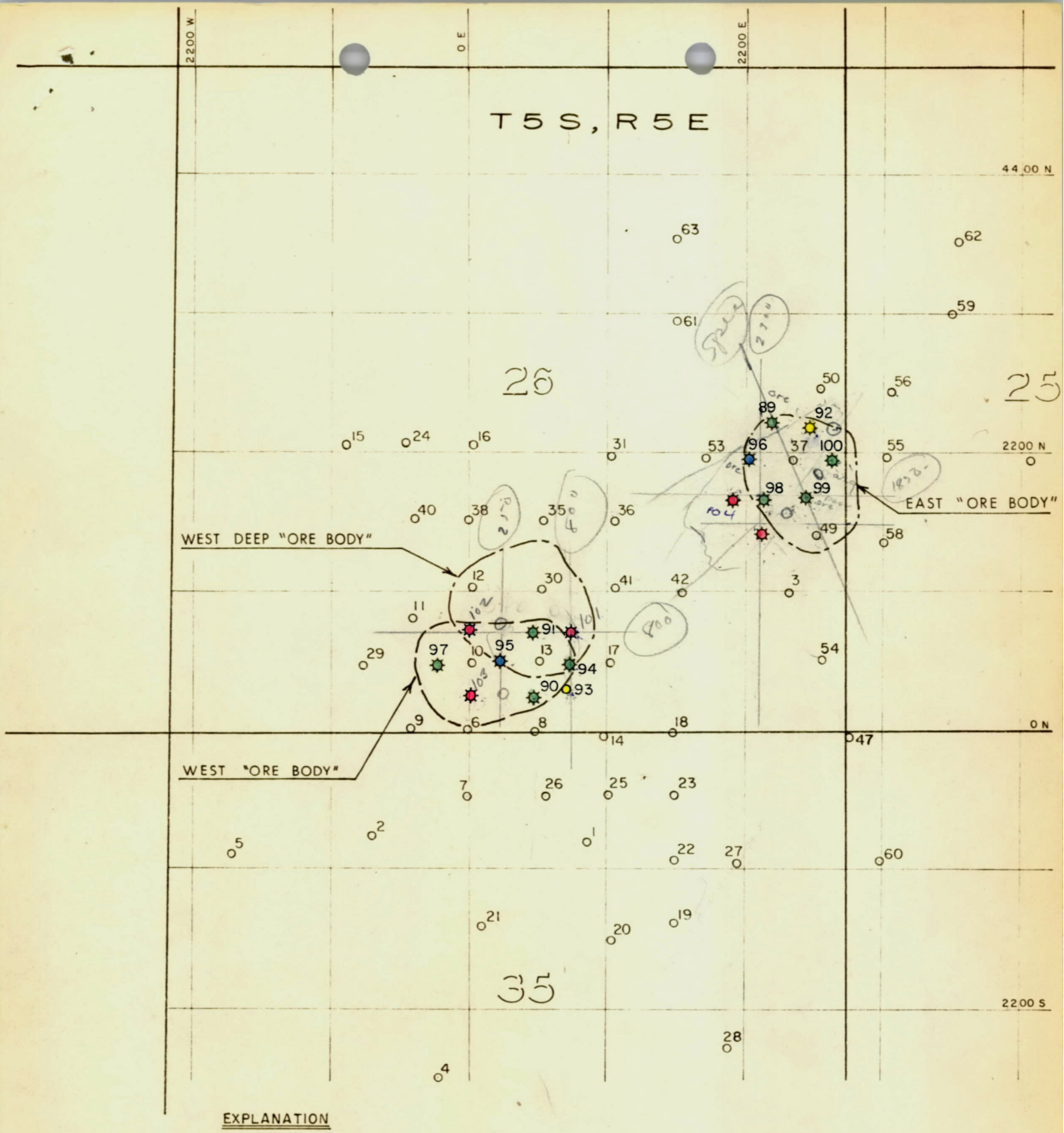
Hole S-100 was bottomed at 1919.0 feet. It was felt that drilling an additional 60 feet below the end of the possible ore zone was justified for determining the extent of the basement shear zone for future cross-section revisions. Drilling should start on S-95 late today or early tomorrow.

A list of assay intervals for S-98 is attached.

S.E. Zelenkov

S.E. Zelenkov

SEZ:ir
cc: J.R. Wojcik w/att
N.P. Whaley w/att



EXPLANATION

- O 37 Old, completed drill hole
- Proposed site (not yet drilled)
- Rotary drilling in progress
- Rotary drilling completed
- Diamond drilling in progress
- New, completed drill hole

STATUS OF DRILLING
MONTH OF JUNE
SACATON PROJECT
Pinal County, Arizona

SCALE: 1" = 1000'

SACATON

Sheet 1 of 1

Date 5 /20 / 68

Hole No. S-98

Interval FROM TO	Sp. G.	SAMPLE CODE	TOTAL Cu	CuO	COMMENTS
1396.0-1397.8	2.54	6621	0.42	0.39	Start of Core
1397.8-1408.7	2.56	6622	0.75	0.75	
1408.7-1417.5	2.52	6623	0.79	0.78	
1417.5-1428.0	2.42	6624	0.11	0.07	
1428.0-1439.0	2.38	6625	0.03	0.02	
1439.0-1446.3	2.36	6626	0.03	0.02	
1446.3-1455.7	2.54	6627	0.03	0.02	
1455.7-1463.3	2.46	6628	0.04	0.01	
1463.3-1471.6	2.68	6629	6.44	0.46	
1471.6-1481.7	2.56	6630	0.04	0.01	
1481.7-1489.7	2.38	6631	0.04	0.01	
1489.7-1498.5	2.56	6632	2.57	0.19	
1498.5-1507.6	2.58	6633	0.41	0.21	
1507.6-1518.1	2.46	6634	3.29	0.10	
1518.1-1528.7	2.48.-2.65	6635	3.39	0.07	
1528.7-1539.7	2.52-2.46	6636	3.09	0.08	
1539.7-1548.5	2.62-2.44	6637	2.88	0.15	
1548.5-1558.3	2.50	6638	3.28	0.22	
1558.3-1568.3	2.54-2.62	6639	2.59	0.21	
1568.3-1578.3	2.54	6640	2.67	0.09	
1578.3-1588.6	2.54	6641	3.54	0.09	Mo=0.033
1588.6-1598.1	2.63	6642	3.80	0.08	
1598.1-1607.7	2.56	6643	2.81	0.12	Mo=0.017
1607.7-1617.8	2.67-2.55	6644	2.45	0.20	
1617.8-1627.5	2.60	6645	3.12	0.18	Mo=0.043
1627.5-1637.4	2.62	6646	3.60	0.12	
1637.4-1647.6	2.59	6647	2.89	0.12	Mo=0.016
1647.6-1657.0	2.64	6648	3.05	0.10	
1657.0-1666.7	2.74	6649	2.11	0.07	Mo=0.018
1666.7-1674.1	2.67	6650	1.99	0.07	
1674.1-1683.3	2.73	6651	2.05	0.08	Mo=0.019
1683.3-1693.6	2.61	6652	2.39	0.08	
1693.6-1703.4	2.54	6653	2.56	0.09	Mo=0.038
1703.4-1713.5	2.56	6654	2.50	0.24	
1713.5-1724.8	2.50	6655	0.84	0.07	
1724.8-1733.6	2.55	6656	0.74	0.07	
1733.6-1743.6	2.50-2.63	6657	0.99	0.06	
1743.6-1753.2	2.57-2.50	6658	1.10	0.11	
1753.2-1763.2	2.61	6659	0.69	0.17	Mo=0.022
1763.2-1771.2	2.65	6660	2.63	0.45	
1771.2-1781.0	2.56	6661	0.81	0.32	Mo=0.029
1781.0-1791.0	2.58	6662	0.64	0.23	
1791.0-1796.2	2.50	6663	0.90	0.08	
1796.2-1806.3	2.65	6664	1.17	0.15	
1806.3-1815.7	2.47	6665	0.49	0.02	
1815.7-1825.4	2.48	6666	0.24	0.05	
1825.4-1835.4	2.52	6667	0.26	0.03	
1835.4-1845.8	2.56	6668	0.30	0.07	
1845.8-1856.3	2.54	6669	0.33	0.04	
1856.3-1865.9	2.48	6670	0.34	0.03	
BOTTOM					

21.5' @ 0.74%

27.5' @ 0.72%

8.3' @ 6.44%

8.3' @ 0.46%

223.8' @ 2.76%

326.0' @ 2.20% Cu

102.2' @ 0.98%

223.8' @ 0.78%

326.0' @ 0.14%

102.2' @ 0.16%

J. H. C.

JUN 7 1968

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

June 7, 1968

To: J. H. Courtright

From: S. E. Zelenkov

Sacaton Project
Drilling and Assays
May, 1968

DRILLING:

The initial rotary drilling was completed May 5, 1968. It is expected that the rotary drill will return to the property once the diamond drills can get caught up to the completed rotary work. The date for the rotary to return is about July 15.

Difficulty was experienced with the drilling mud. Mr. Loyd Hill of the Baroid Division was called to examine the problem. As a result of his examination a low loss mud formula is being used rather than a mud gel formula. The low loss mud has reduced the down time and generally minimized drilling difficulties.

Please find a map showing the status of the drilling at the end of May.

As a matter of policy, all of the drill holes will be washed upon completion of the diamond drilling.

COSTS:

The total cost per foot drilled in May will probably be higher than it was in April for two reasons. First, unusual difficulty was experienced with Hole S-89. One hundred and eighty feet of BX casing was lost in the hole and one hundred feet was damaged beyond repair. Down time on this hole was high. Secondly, a larger proportion of the drilled footage was diamond drilled opposed to the rotary work done in April.

It is estimated that the cost per foot in May will be about $9.95/Ft. The following shows the cost distribution:

Barnes Drilling Co.	$ 7,796.89	(invoice)
Joy Drilling Co.	16,222.85	(approximate)
Cost of water	93.00	
All other costs	9,925.00	(approximate)
Total	$34,037.74	

Total Billed Footage 3,422.0'

A more accurate drilling cost figure will be available when the Accounting Department totals all monies for the month of May.

GEOLOGY:

An extremely brief explanation of the geology is discussed. It is felt the geologic logs of each hole could be referred to for more detail. Dates are given over which each drilling contractor was on the hole for tax purposes.

S-89 (in progress at first of month)

Barnes Drilling Co. 3-30-'68 to 4-5-'68
Joy Drilling Co. 4-12-'68 to 5-15-'68

Granite, dacite porph (?) 1653.3' to 1720.0'
Alternate wedges granite)
dacite porph (?) &)1720.0' to 1764.0'
Precambrian basement complex)
Precambrian basement complex 1764.0' to 1798.3' (T.D.)

S-94

Barnes Drilling Co. 4-10-'68 to 4-11-'68
Joy Drilling Co. 4-24-'68 to 5-8-'68

monzonite porph; Monzonite)
Porph (?)) 459.0' to 859.5' (T. D.)

S-97

Barnes Drilling Co. 4-12-'68 to 4-13-'68
Joy Drilling Co. 5-9-'68 to 5-15-'68

Granite, Bx-cd monzonite porph 304' to 610.5' (T.D.)

S-98

Barnes Drilling Co. 4-18-'68 to 4-26-'68
Joy Drilling Co. 5-16-'68 to 6-3-'68
End of May depth 1811.0'

Granite; Meta-GR (?) 1395 to 1865.9 (T.D.)

S-99

Barnes Drilling Co. 4-26-'68 to 5-2-'68
Joy Drilling Co. 5-15-'68 to 5-31-'68

Overburden 914' to 1014' ±
Granite (very strong Bx, gg, & hm) 1014' to 1195'

S-100

Barnes Drilling Co. 5-2-'68 to 5-8-'68

Overburden 0' to 1220'
Br--Frags of Dp (?)
And GR in a st'ly 1220'± to 1341'
Granuated bx

Special thanks goes to Mr. N. P. Whaley for the advice he has given me on the Sacaton Geology.

ASSAY INTERVALS:

Hole Number	From To	Interval	Total Cu	Oxide Cu
S-89 (Bottomed at 1798.3')				
	1193.8' - 1288.3'	94.5'	0.70%	0.31%
	1418.3' - 1560.7'	142.4'	0.79%	0.31%
S-91 (Bottomed at 869.0')				
	283.7' - 443.8'	160.1'	1.66%	0.20%
	443.8' - 589.8'	146.0'	0.46%	0.04%
	589.8' - 742.4'	152.6'	0.80%	0.05%
	742.4' - 868.6'	126.2'	0.54%	0.03%
S-94 (Bottomed at 859.5')				
	375.0' - 658.4'	283.4'	1.02%	0.11%
	658.4' - 739.7'	81.3'	0.57%	0.02%
S-97 (Bottomed at 610.5')				
	305.2' - 610.5'	305.3'	NO ORE GRADE	
S-98 (Bottomed at 1865.9')				
	1396.0' - 1417.5'	21.5'	0.74%	0.71%
	1463.3' - 1471.6'	8.3'	6.44%	0.46%
	1489.7' - 1791.0'	301.3'	2.31%	0.14%

Remaining assays have not been received.

Moly intervals run:

1578.3' - 1588.6'	10.3'	0.033% Mo
1598.1' - 1607.7'	9.6'	0.017% Mo
1617.8' - 1627.5'	9.7'	0.043% Mo
1637.4' - 1647.6'	10.2'	0.016% Mo
1657.0' - 1666.7'	9.7'	0.018% Mo
1674.1' - 1683.3'	9.2'	0.019% Mo
1693.6' - 1703.4'	9.8'	0.038% Mo
1753.2' - 1763.2'	10.0'	0.022% Mo
1771.2' - 1781.0'	9.8'	0.029% Mo

S-99 (Presently Drilling)				
	1318.2' - 1357.5'	39.3'	0.88%	0.76%
	1397.4' - 1429.0'	31.6'	0.64%	0.12%
	1439.3' - 1460.6'	21.3'	3.20%	0.22%

Moly intervals run:

1439.3' - 1449.9'	10.6'	0.035% Mo
1449.9' - 1460.6'	10.7'	0.017% Mo

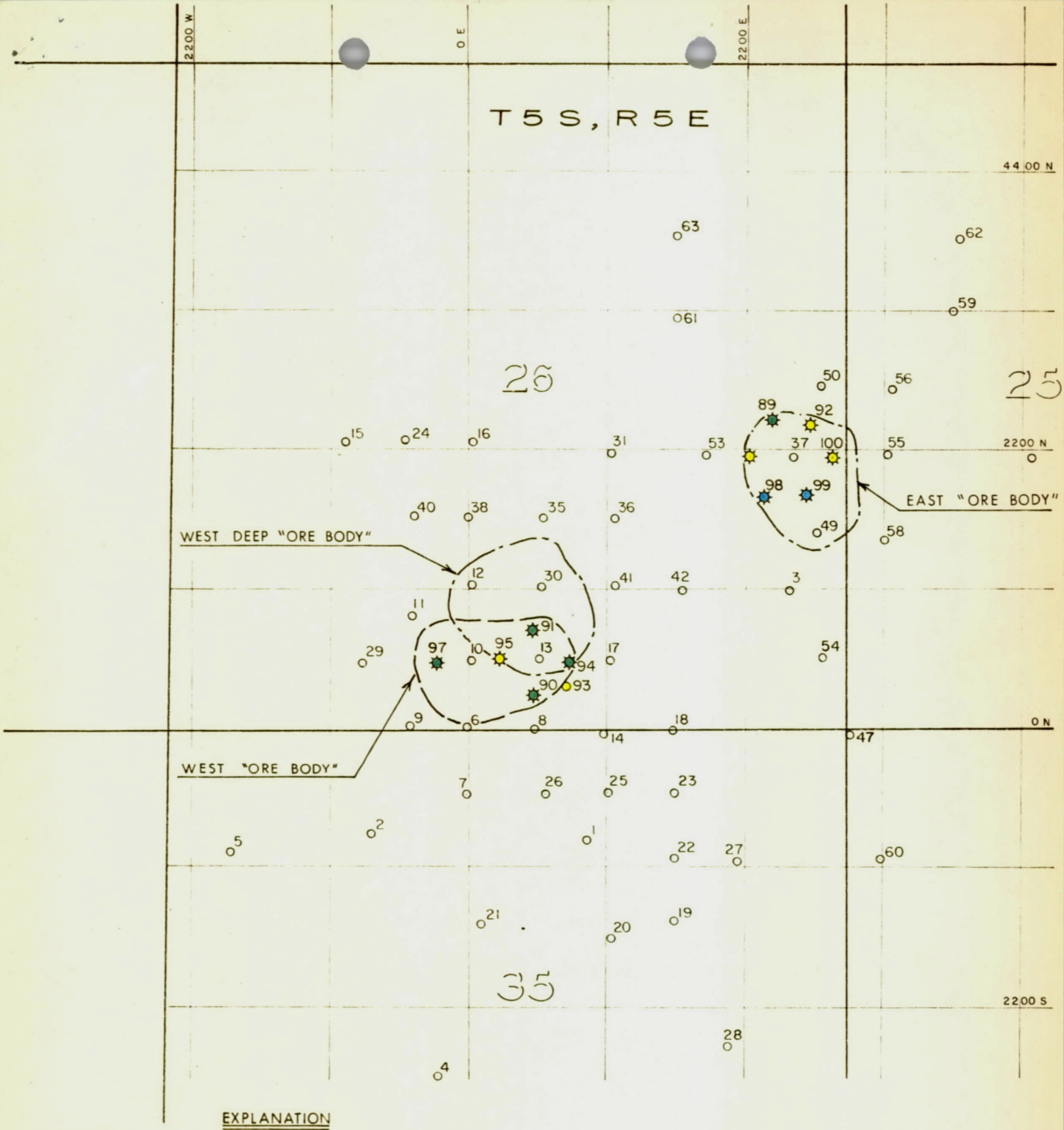
CONCLUSION:

With an extremely good ore intercept on hole S-98, it appears that additional drilling will be required south and west of this hole. Drilling is proceding with three shifts a day. There is a strong possibility that the rotary drill will be required before mid July. A planning session for new drill sites is in order.

S. E. Zelenkov

S. E. Zelenkov

SEZ:kc
Attachment
cc: JRWojcik, w/att.
JHCourtright, w/att.
NPWhaley, w/att.



EXPLANATION

- 37 Old, completed drill hole
- Proposed site (not yet drilled)
- Rotary drilling in progress
- Rotary drilling completed
- Diamond drilling in progress
- New, completed drill hole

STATUS OF DRILLING
MONTH OF MAY
SACATON PROJECT
Pinal County, Arizona

SCALE: 1" = 1000'

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

May 6, 1968

J.H.C.
MAY 7 1968

TO: J.H. Courtright

FROM: N.P. Whaley

Sacaton Project
Drilling and Assays
April, 1968

Drilling

For all intents and purposes the Sacaton Project, initially drilled in the early 1960's was reactivated at the field level on April 1, 1968. Drill holes are numbered in order of succession as a continuation of the earlier series. Thus, drill hole S-89 is the first hole drilled in 1968.

Rotary drilling of overburden, contracted to J.O. Barnes Drilling Service, inc., was actually started in the eastern portion of the project area on March 30 by a modified Howard-Turner drill. Between April 8, and April 16 a Failing 1500 drill, also belonging to J.O. Barnes, completed the presently proposed overburden drilling in the western portion of the project. Combined aggregate footage of overburden drilling done by these two drills, including 59 feet of spot coring, totaled 6,669 feet.

Core drilling, contracted to Joy Manufacturing Company, was carried out by two Joy Model 22 drills. The first one arrived on the property on April 2, and the second on on April 5. Combined aggregate footage for these two machines, including 320.0 feet of rotary drilling through overburden on their initial sites, totaled 2,346.6 feet.

Numerous changes of staff field personnel coincident with a totally inexperienced sampling crew required an unusually high percentage of time for supervision, and very little core logging was done. This is reflected in the limited and nonspecific geologic information contained in the following summaries of the individual holes.

S-89 (3-30-68 to Drilling at end of month)

Overburden	0'-1185'
Monzonite porph., granite(?), and dacite porph(?).	1185'-1653.3'

S-90 (4-3-68 to 4-11-68)

Overburden	0'-185'
Monzonite porph.	185'-669.5' (T.D.)

S-91 (4-6-68 to 4-24-68)

Overburden	0'-104'
Monzonite porph. and granite.	104'-868.6' (T.D.)

S-92 (4-6-68 to (4-11-68)

Overburden	0'-1212'
Rotary drilling in BR	1212'-1250'

S-93 (4-9-68) to(4-10-68)

Overburden	0'-(168'-178')

S-94 (4-9-68 to Drilling at End of Month)

Overburden	0'-100'
Monzonite porph. and granite	100'-459.0'

S-95 (4-11-68 to 4-12-68)

Overburden	0'-175'
Rotary drilling BR	175'-190'

S-96 (4-12-68 to 4-18-68)

Overburden	0'-1060'
Rotary drilling BR	1060'-1134'

S-97 (4-12-68 to 4-13-68)

Overburden	0'-294'
Rotary drilling in BR	294'-304'

S-98 (4-18-68 to 4-26-68)

Overburden	0'-1350'±
Rotary drilling BR	1350'-1394'
Granite-Completely ox'ed, w/indications of only v. wk mineralization	1394'-1395'

S-99 (4-26-68 to Drilling at End of Month)

Overburden	0'-914'

Original Assays

S-89

1202.2'-1254.8'	52.6' @	0.54%	Total Cu
		0.48%	Ox Cu
1266.4'-1288.3'	21.9' @	1.57%	Total Cu
		0.10	Ox Cu
1352.7'-1357.7'	5.0' @	7.18%	Total Cu
		1.68%	Ox Cu
1418.3'-1491.0'	72.7' @	1.13%	Total Cu
		0.49%	Ox Cu

S-90

259.4'-288.4'	29.0' @	1.53%	Total Cu
		1.47%	Ox Cu
328.0'-338.2'	10.2' @	1.39%	Total Cu
		1.39%	Ox Cu
409.7'-513.7'	104.0' @	1.03%	Total Cu
		0.32%	Ox Cu
542.0'-571.0'	29.0' @	0.53%	Total Cu
		0.02	Ox Cu

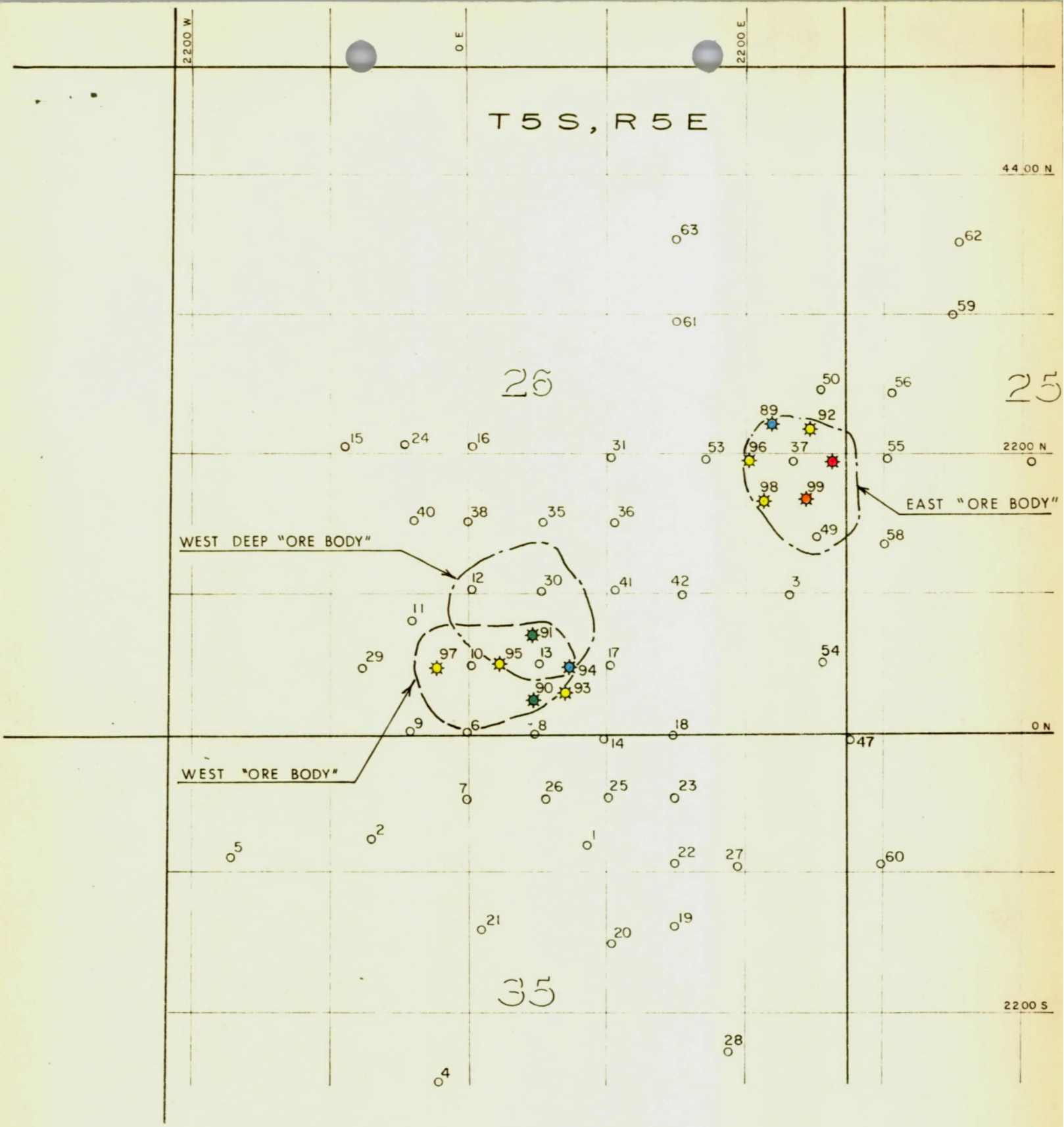
All assay reports for S-90 have been received.

A map showing the states of drilling at the end of the month is attached.

N. P. Whaley

N.P. Whaley

NPW:ir
Attachment
cc: JR Wojcik
SE Zelenkov



EXPLANATION

- O 37 Old, completed drill hole
- Proposed site (not yet drilled)
- 90 Rotary drilling in progress
- 90 Rotary drilling completed
- 90 Diamond drilling in progress
- 90 New, completed drill hole

STATUS OF DRILLING
MONTH OF APRIL
SACATON PROJECT
Pinal County, Arizona

SCALE: 1" = 1000'

April, 1968

J. H. C.

MAY 7 1968

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

May 6, 1968

TO: R. J. Lacy

FROM: W. G. Farley

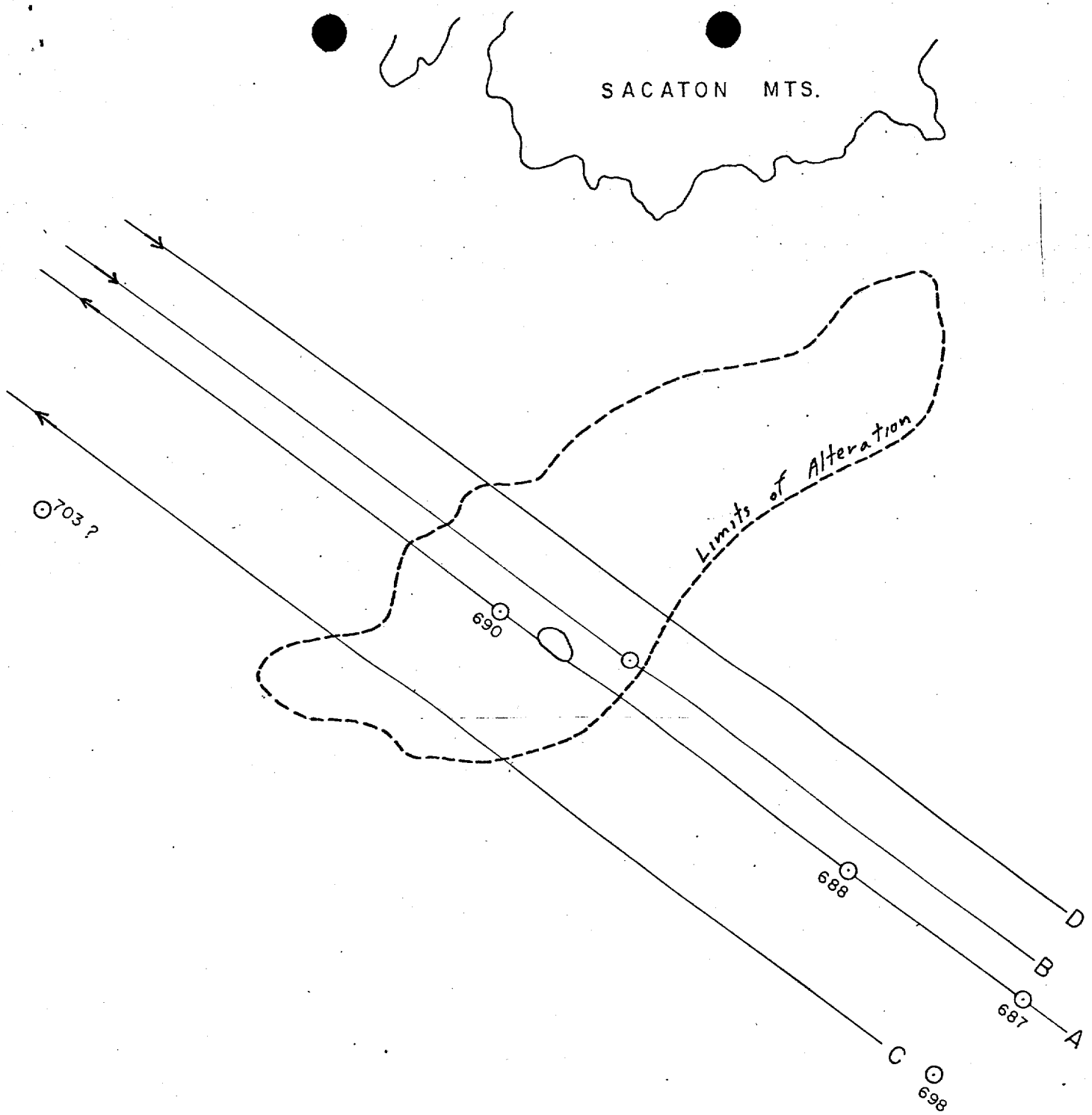
INPUT E.M. TEST SURVEY
SACATON ORE DEPOSIT
PINAL COUNTY, ARIZONA

On May 19, 1967, Mr. W. E. Saegart made arrangements with Mr. Q. G. Whishaw of the DeNiza Mining Corporation to fly a test input E.M. survey over the Sacaton ore deposit. Mr. Whishaw was given a map showing the outline of alteration-mineralization and information on the depth to sulfides. This test survey was flown by Canadian Aero Mineral (date unknown) and a copy of the data submitted to Asarco on May 1, 1968 by Mr. John Heidt who was until recently employed by the DeNiza Mining Corporation. The attached data sheets show the location of four input E.M. lines across the Sacaton alteration zone and the data obtained on those lines. Simultaneously magnetics, radioactivity, and altitude were also recorded. On profile A and C, I have indicated the limits of alteration for correlation purposes. On profile B and D control was not adequate to plot the location of the alteration zone. The input E.M. data was recorded on six channels. The #1 channel has the shortest time delay and the smallest depth penetration with depth penetration increasing progressively with the larger channel numbers. The zero references for all readings (input E.M., magnetics, altitude and radioactivity) are at the top of the graph sheets. On the input E.M. a downward deflection means a more conductive medium. The test lines over the Sacaton alteration zone were flown at an altitude of about 400 feet. The input E.M. receiving bird was probably about 200 feet above the surface. On line A a slight conductive response was indicated on channel 2, 3, and 4 at the edge of the alteration zone. This line was flown directly over the altered outcrop where sulfides are 150 feet deep and over the center of the Asarco I.P. anomaly where sulfides are 300 feet deep. No anomalous input E.M. response was obtained over the outcrop or the Asarco I.P. anomaly. The wild input E.M. fluctuations on the left side of the graphs are due to bird movement when the aircraft leveled off to begin a traverse. Nothing of significance was indicated on the magnetic or radioactive traces. The Sacaton ore deposit would have been missed with this exploration system.

Wayne G. Farley

Wayne G. Farley

WGF:lab
cc: JHCourtright
WESaegart



3 2
10 + 11

0 1 mi

11 12
14 + 13

Aa-16A.3.19B

AMERICAN SMELTING AND REFINING COMPANY
SOUTHWESTERN EXPLORATION DEPARTMENT
P.O. BOX 5795, TUCSON, ARIZONA 85703

J. H. COURTRIGHT
CHIEF GEOLOGIST
L. P. ENTWISTLE
ASSISTANT CHIEF GEOLOGIST
W. E. SAEGART
ASSISTANT CHIEF GEOLOGIST

1150 NORTH 7TH AVENUE
TELEPHONE 602-792-3010

May 19, 1967

Mr. Quentin G. Whishaw
DeNiza Mining Corporation
1024 South Plumer
Tucson, Arizona

Dear Mr. Whishaw:

I am enclosing some information concerning the limits of alteration-mineralization of our Sacaton copper deposit. I am also enclosing descriptive information concerning the depth to top of sulfides in various localities within the limits of the deposit.

Please accept my apology for the time involved in providing you with this information. The best excuse I can offer is that it always takes time to obtain formal approval through channels to release confidential property data.

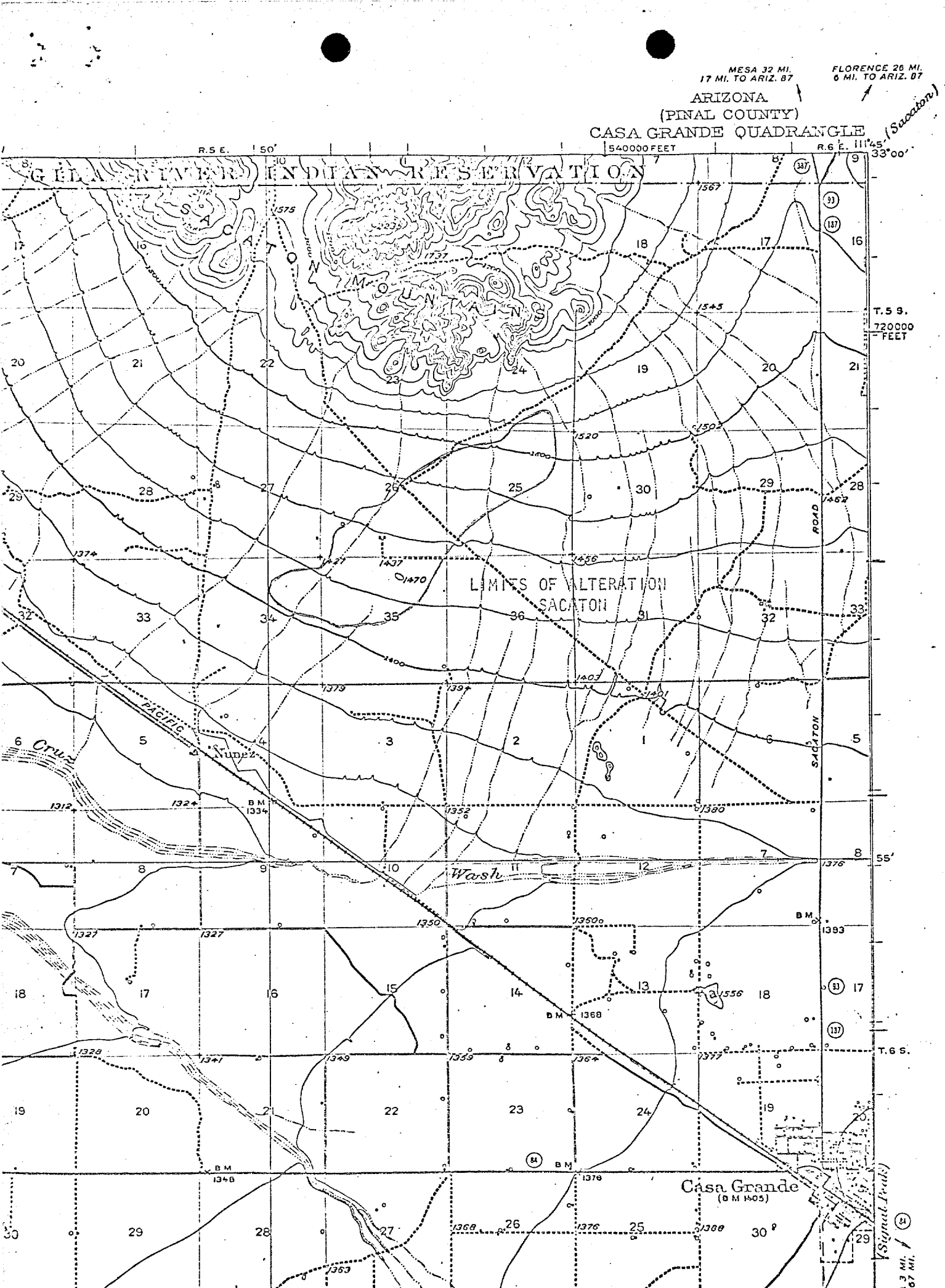
I hope this data will be of some help to you. We naturally would like to have a copy of the INPUT test survey results as soon as they have been evaluated in terms of the spacial distribution of the Sacaton deposit.

Very truly yours,

W. E. Saegart

W. E. SAEGART

WES/pjc
Enclosures
cc: KERichard, w/ encls.
JHCourtright, w/ encls.


MESA 32 MI.
17 MI. TO ARIZ. 87
FLORENCE 26 MI.
6 MI. TO ARIZ. 87
ARIZONA
(PINAL COUNTY)
CASA GRANDE QUADRANGLE
(Sacaton)
R.5 E.
50'
540000 FEET
R.6 E. 111°45'
33°00'
GILA RIVER INDIAN RESERVATION
SACATON MOUNTAINS
T.5 S.
720000 FEET
LIMITS OF ALTERATION
SACATON
SACATON ROAD
PACIFIC
Cruz
Nunez
Wash
B M 1334
B M 1393
B M 1368
B M 1348
B M 1378
Casa Grande
(B M 1905)
(Signal Peak)
T.6 S.
55'

Depth to top of Sulfide Zone
Sacaton Prospect

1. SW 1/4 Sec. 26
   NW 1/4 Sec. 35 . . . .From 400 to 2000', sloping west

2. N 1/2 Sec. 35
   situated under and
   circling altered outcrop . . . . Ave depth 150'

3. E 1/2, SW 1/4 Sec. 26 . . . . From 120 to 300'

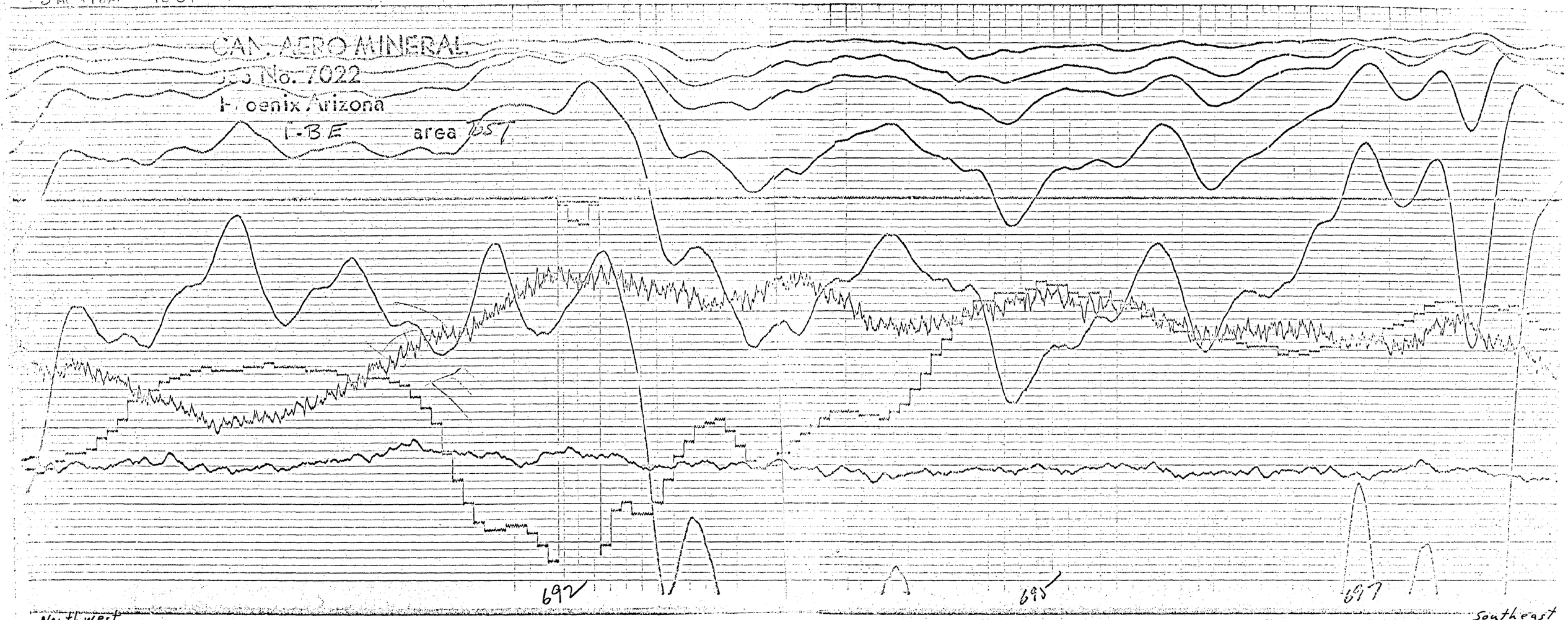
4. SE 1/4 Sec. 26 . . . . From 500 to 1800', sloping south

5. NW 1/4 Sec. 25 . . . . 1700' to 2200'

6. NE 1/4 Sec. 25 . . . . 1200' to 1500'

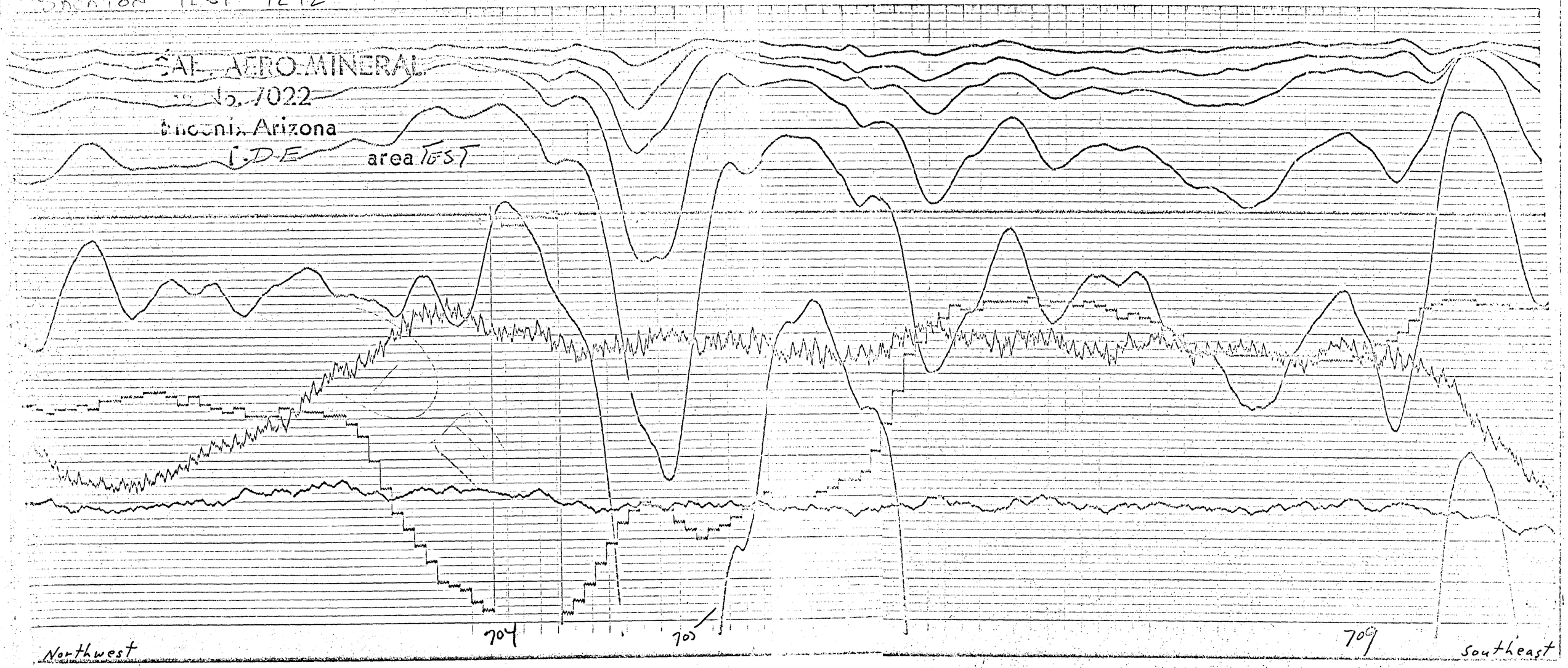
SACATON TEST FL 12 Input E.M.

SPACTON TEST FL 12



SAN AERO MINERAL
No. 7022
Phoenix Arizona
CW area TEST
Southeast
698
700
Limits of alteration
703
Northwest

Spanton Test Fl 12



AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

April 22, 1968

Sacaton
Aa 16A.3.19B

Memorandum to Mr. R. B. Meen:

Referring to the Hardshell project and the statement in the First Quarter Report of the Exploration Department that a very rough open pit estimate indicates 6.5 million tons of 5 oz. silver ore, Mr. Wojcik made this estimate and has the data on which it was based. No report has been made or circulated, however, if you wish to see the data I am sure Mr. Wojcik will show it to you.

JHC:lml

J. H. Courtright

cc: JRWojcik

J. H. C.

MAR 5 1968

Sacaton
aa 16A.3.19B

AMERICAN SMELTING AND REFINING COMPANY
SOUTHWESTERN EXPLORATION DEPARTMENT
P.O. BOX 5795, TUCSON, ARIZONA 85703

J. H. COURTRIGHT
CHIEF GEOLOGIST
L. P. ENTWISTLE
ASSISTANT CHIEF GEOLOGIST
W. E. SAEGART
ASSISTANT CHIEF GEOLOGIST

1150 NORTH 7TH AVENUE
TELEPHONE 602-792-3010

March 5, 1968

Copies sent to:
Metler Bros. Drilling Co.
4001 E. Illinois
Tucson, Ariz. 85714

Boyles Bros. Drilling Co.
10801 N. 21st Ave.
Phoenix, Ariz. 85020

Joy Mfg. Co.
750 E. Evans Blvd.
Tucson, Ariz.

J. O. Barnes Drilling Service
P.O. Box 141
Casa Grande, Arizona

ASARCO plans additional drilling on its Sacaton property located about 7 miles northwest of Casa Grande, Arizona. The program will involve non-core rotary drilling through the alluvium and conglomerate and core drilling in "bedrock". Holes can be grouped in four categories:

1. Rotary drilling to 500', averaging 300'/hole;
2. Rotary drilling to 2000', averaging 1500'/hole;
3. Core drilling to 1000', averaging 500'/hole;
4. Core drilling to 2000', averaging 500'/hole.

Total footage should be between 15,000' and 20,000' in 10 or 15 holes more or less equally divided in the four categories.

Bids for this work should include the following items:

(1) Non-core rotary drilling in a minimum size suitable for NX casing -
  (a) 0 - 500', price/ft.
  (b) 500' - 2000', price/ft.
(2) Coring (intermittent) with rotary drill to verify "bedrock", taking a minimum 2-1/8" dia. core, price/hr. plus actual cost of bit.
(3) Casing or cementing with rotary drill - price/hr.
(4) Standby time for rotary drill -
  (a) ready (with crews), price/hr.
  (b) secured (without crews), price/day.
(5) Diamond core drilling -

(a) NX wireline	0 - 500'	price/ft.
	500 - 1000'	do.
	1000 - 1500'	do.
	1500 - 2000'	do.
	2000 - 2500'	do.
(b) BX wireline if required,		
	0 - 500'	do.
	500 - 1000'	do.
	1000 - 1500'	do.
	1500 - 2000'	do.
	2000 - 2500'	do.

cont'd. . . .

(6) Casing or cementing with core drill - price/hr.
(7) Standby time for core drill -
    (a) ready (with crews), price/hr.
    (b) secured (without crews), price/day.
(8) Reaming -
    (a) with rotary drill, price/ft.
    (b) with core drill, " "
(9) Water truck -
    (a) monthly rental
    (b) mileage charge
(10) Mud and chemicals to be supplied by contractor but may be supplied by ASARCO at the Company's option.
(11) Core boxes will be supplied by ASARCO.

Yours very truly,

JRW:lmi

J. R. Wojcik

the DON Mahoney AGENCY

please copy for { Kud S / [illegible]

J. H. C.

2-26-68 FEB 23 1968

From the desk of BOOTS CLAUNTS

205 W. SECOND ST. - CASA GRANDE ARIZONA 85222 PHONE 836-7483

FEBRUARY 23, 1968

AMERICAN SMELTING AND REFINING CO.
SOUTHWESTERN MINING DEPT.
P.O. BOX 5795
TUCSON, ARIZONA 85703

ATTN: MR. J.H. COURTRIGHT, SUPERVISOR

DEAR MR. COURTRIGHT:

THANKS VERY MUCH FOR LETTING ME KNOW ABOUT YOU PEOPLE RENTING THE TREKELL BUILDING, LOCATED AT 1541 PINAL AVE., CASA GRANDE, ARIZONA.

AFTER TALKING TO YOU I MADE THE NECESSARY CONTACT WITH THE LAND LORD AND IT WAS ALL ARRANGED FOR.

THIS LETTER WILL SERVE AS A VERIFICATION TO YOU THAT THE TERMS AS OUTLINED IN YOUR LETTER OF FEBRUARY 21ST ARE CORRECT AND SATISFACTORY WITH THE TREKELLS.

I HAVE THE KEY HERE AT OUR OFFICE AND ANYTIME FROM NOW ON, YOU MAY FEEL FREE TO PICK IT UP.

MAY I PERSONALLY SAY THAT WE ARE LOOKING FORWARD TO YOUR COMPANY RETURNING TO OUR CITY, AND IF I CAN DO ANYTHING ELSE, PLEASE DO NOT HESITATE TO CALL ON ME.

BEST REGARDS,

Boots

H.B. CLAUNTS

HBC/MB

CC: DON TREKELL

P.S. PLEASE MAKE RENT CHECKS PAYABLE AS FOLLOWS:
TVT ACCOUNT
ALICE TREKELL, AGENT
MAIL CHECKS TO MRS. ALICE TREKELL
P.O. BOX 38
CASA GRANDE, ARIZ. 85222

New York, N. Y., January 16, 1968

Ga 16A.3.19B
J.H.C.

JAN 18 1968

Mr. C. P. Pollock

At the meeting of the Advisory Committee held on December 23, 1967, there was approved Seaton Prospect application for property appropriation - New York No. 1624, Plant No. Seaton 2 - in the amount of $200,000 for an additional 15,000 feet of rotary and 9,000 feet of core drilling in 13 holes.

Harold Howe

CHNelson
JPHarrison
HLGoodenough
RJDiSanto
TASneddon
RERees
ETJohnson
JHCourtright

Sacaton

J.H.C.
JAN 15 1968

FILE MEMORANDUM:

Items for inclusion in contract proposal

(1) Mobilization, Lump sum

(2) Core drilling:

Feet		
0 - 500	NXWL,	BXWL, price per ft.
500 - 1000	" ,	" , " " "
1000 - 1500	" ,	" , " " "
1500 - 2000	" ,	" , " " "
2000 - 2500	" ,	" , " " "

(3) Non-core (rotary) drilling @ approx. 4-3/4" diameter:

Feet	
0 - 1000	price per ft.
1000 - 2000	" " "

(4) Spot core drilling with rotary drill in minimum of NX (2-1/8") core, price per hour or foot.

(5) Reaming BX to NX, price per ft.

(6) Setting & pulling casing, price per hour.

(7) Cementing & drilling cement, price per hour.

(8) Standby with crews on the job, price per hour.

(9) Standby for drill rig without crew, price per day.

(10) Drilling mud and additives, cement, etc. will be paid for by the Company at cost delivered to jobsite.

(11) Casing lost or left in place at Company's direction (if not furnished by Company), price per ft.

(12) Water haulage, monthly rental plus mileage.

Range 1: Rotary drilling to maximum depth of 500' averaging about 300' per hole.
Core drilling in rotary drilled holes to maximum depth of about 800' and averaging about 500' per hole.

Range 2: Rotary drilling to maximum depth of 2000' and averaging about 1200' per hole. Core drilling in rotary drilled holes to maximum of 2000' and averaging about 550' per hole.

lmi

JRWojcik
1-16-68

Contractors interested in Sacaton drilling:

Boyles Bros. Drilling Co.
Joe Roberts, Mgr.
10801 North 21st Ave.
Phoenix, Arizona 85020

Sprague & Henwood, Inc.
2151 North Redwood Rd.
Salt Lake City, Utah
Vince Nourse, Mgr.

Joy Mfg. Co.
750 E. Evans Blvd.
Tucson, Ariz.
Art Ecklund or Jack Lloyd

Metler Bros. Drilling Co.
4001 E. Illinois
Tucson, Ariz.
Dick Metler

McPherson Drilling Co.
c/o Wendell Knight
836-7955 Casa Grande, Ariz.

E. J. Longyear Co.
308 E. Pima
Phoenix, Ariz.
J. R. Miller, Mgr.

Whatley Drlg. Co.
1512 W. Prince Rd.
Tucson, Ariz.
Leon Whatley

J. O. Barnes
P.O. Box ----
Casa Grande, Ariz.

T-4.1.1

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

January 10, 1968

J. R. W
JAN 15 1968

MR. JRW, WES
READ AND RETURN
PREPARE ANSWERS HANDLE
FILE INITIALS

J. H. C
JAN 11 1968

AIR MAIL

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

W.E.S.
FEB 14 1968

SACATON PROSPECT
Application for Property Appropriation

Dear Sir:

In accordance with Mr. Howe's memorandum of January 5, 1968, to you, we are forwarding herewith original and three copies of Sacaton Prospect Application for Property Appropriation No. 2 in the amount of $200,000 to cover the cost of 24,000 feet of rotary and core development drilling as described in Mr. Courtright's estimate of December 19, 1967. A closer spacing of holes is required in order to firm up ore reserve estimates and to permit layout and design of mine workings.

Very truly yours,

ORIGINAL SIGNED BY
K. A. von den Steinen
K. A. von den Steinen
Chief Accountant

KvdS/cj
Encls.
cc: CENelson, w/attachs.
HLGoodenough, no attachs.
BJDiSanto, w/attachs.
TASnedden, " "
RBMeen, " "
JHCourtright, w/attachs.

FORM 302 (REVISED 1964)

N.Y. Approp. No. .....
Plant No. Sacaton 2

APPLICATION FOR PROPERTY APPROPRIATION

January 10, 1968

SACATON PROSPECT — PLANT or UNIT

DESCRIPTION:

Additional 15,000 feet of rotary and 9,000 feet of core drilling in 18 holes, all in accordance with Mr. J. H. Courtright's estimate of December 19, 1967.

If work contemplates replacement or improvement of structures or equipment now in place, insert: -1. Original cost $ ..... 2. Date erected or installed .....

Total estimated cost (FORM 302A ATTACHED) $ 200,000
Estimated annual net saving $ .....
Estimated completion date DEC (MONTH) 1968 (YEAR)

ADVANTAGES TO BE DERIVED:

Existing holes which were completed during the exploration stage of the project are spaced 550 to 700 feet apart. In order to firm up ore reserve estimates and to permit layout and design of mine workings for development of the ore bodies, additional information based on closer spacing of holes is required.

Reviewed by ..... (ACCT. MGR. OR CHIEF ACCNT)

Approved by ..... (COMPTROLLER)

Account Chargeable to ..... (TO BE FILLED IN BY COMPTROLLER)

Recommended by /s/ J. H. Courtright
Supervisor XXXXXX

Approved by /s/ C. P. Pollock (VICE PRESIDENT)

Approved by Advisory Committee

.....19...

Approved by Board of Directors

.....19.....

..... (SECRETARY)

COST ESTIMATE

FORM 302A

JOB Rotary and core development drilling PLANT SACATON PROSPECT

JOB NO. AUTH. NO. DRAWING NOS.

MADE BY J. H. Courtright DATE Dec. 19, 1967 CHECKED BY K. v. d. Steinen DATE Jan. 10, 1968

OUP NO.	CLASSIFIED MATERIAL	QUANTITIES	EST'D. LIFE	EST'D. DATE OF COMPL.	UNIT PRICES		ESTIMATED COST		TOTAL ESTIMATED COST
					MATERIAL	LABOR	MATERIAL	LABOR	
	West (shallow) ore zone								
	Rotary drilling	3,000 ft. @ $4.50/ft.							13,500.
	Core drilling	5,000 ft. @ $12.00/ft.							60,000.
	East (deep) ore zone								
	Rotary drilling	12,000 ft. @ $5.50/ft.							66,000.
	Core drilling	4,000 ft. @ $15.00/ft.							60,000.
	Total	24,000 ft.							199,500.

JHC file

File: "Sacaton", also "Nuclear Blasting for Underground Leaching"

January 9, 1968

Mr. M. A. Lekas
U.S. Atomic Energy Commission
2111 Bancroft Way
Berkeley, California

Dear Mr. Lekas:

Referring to our telephone conversation of today, I have checked the information sent on May 20, 1966, to Mr. Spenst M. Hansen, Lawrence Radiation Laboratory, and find that the areal plan map did not include the town of Casa Grande, Arizona. Accordingly, a U.S.G.S. topographic map showing the location of the Sacaton copper deposit and Casa Grande is enclosed herewith. It is understood that this information will be regarded as confidential.

We will be looking forward to discussing this project with you here in Tucson.

Yours very truly,

J. H. Courtright
Chief Geologist

JHC:lmi
encl.

Sacaton

1/8/68
2:10 p.m.
J.H.C.

JAN 9 - 1968

+
ASARCO TUC
ASARCO NY CLG

J H COURTRIGHT

WE ARE WILLING TO ALLOW STUDY OF SACATON DATA IN TUCSON OFFICE BY NUCLEAR EXPLOSION LEACHING EXPERTS ON CONFIDENTIAL BASIS BUT PRESUMPTION IS THAT THE DEEP ORE WILL BE NEEDED FOR CONVENTIONAL MILL
POLLOCK

JAN 8 1968

Called LeKas 1-9-68 —
He will advise 2 weeks in advance of visit to Tucson

+
ASARCO TUC

T

J. H. C

JAN 8 - 1968

New York, N. Y., January 5, 1968

Mr. C. P. Pollock

It has been decided, for accounting purposes, that the $200,000 authorized under Mining Authorization No. 117-67 at the meeting of the Advisory Committee held on December 28, 1967, for additional drilling at the Sacaton copper project, Pinal County, Arizona, should be charged instead to capital expenditures. We are therefore cancelling Mining Authorization No. 117-67.

Please submit Application Form 302 for this expenditure.

Harold Howe

FGHamrick
CHNelson
JPHarrison
HLGoodenough
TASnedden
RBKeen
JECourtright

J. H. C.

JAN 3 - 1968

New York, N. Y., December 28, 1967

Ga 16A. 3. 1913

Mr. C. P. Pollock

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

Mining Authorization No. 117-67
Sacaton Project
Pinal County, Arizona

It was reported that $1,662,881 has been expended for exploration work at the Sacaton Project - a possible copper prospect, in Pinal County, Arizona.

It was reported that Company geologists recommend further exploration to consist of a minimum of 24,000 feet of combined rotary and core drilling in 18 holes at a total expense of $200,000.

There was approved, subject to ratification by the Board of Directors, an expenditure of $200,000 for additional drilling at the Sacaton copper project, Pinal County, Arizona.

A. J. Gillespie, Jr.

FGHamrick
CENelson
HLGoodenough-2
TASnedden
RBMeen
JHCourtright

J. H. C.
DEC 29 1967

ASARCO NY CLG

J H COURTRIGHT
ADVISORY COMMITTEE APPROVED YOUR REQUEST FOR $200,000 FOR SACATON COLLINS

12/28/67

~~CORRECTION ON FIRST TELEX SECOND LINE FOURTH TEXT PLS READ AS PLEASE TNX~~

W.E.S.
DEC 28 1967

ASARCO TUC

Copy for Kudd
12-28-67
Jm

Aa 16A. 3. 1913

"Socaton Prospect"
JHC file
"Nuclear Blasting for Underground Leaching"

December 20, 1967

Mr. Gary H. Higgins
K-Division Leader
Lawrence Radiation Laboratory
P.O. Box 808
Livermore, California 94551

Dear Mr. Higgins:

This will acknowledge your letter of November 9 in reply to my letter of November 7 regarding the possibility of conducting studies to determine the feasibility of preparing a copper deposit for leaching by the use of nuclear explosives.

The delay in acknowledging your letter is due to the fact I was awaiting a reply from the San Francisco Operations Office since you stated that the questions asked in my letter of November 7 should be posed to Mr. John Philip of that office. To date I have not heard from him.

At present we are planning further drilling to more closely evaluate the aforementioned copper deposit with the objective of developing plans for ore extraction by conventional means. However, we are still interested in exploring the possibilities of leaching in-place.

Yours very truly,

J. H. Courtright
Chief Geologist

JHC:lml
cc: John J. Collins, w/encls.
John Philip
Glenn Werth
Milo Nordyke

UNIVERSITY OF CALIFORNIA

J. H. C.

NOV 17 1967

LAWRENCE RADIATION LABORATORY
P. O. BOX 808 L-41
LIVERMORE, CALIFORNIA 94551

W.E.S.
NOV 17 1967

November 9, 1967

JRW 11/20/67

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

Mr. J. H. Courtright, Chief Geologist
American Smelting and Refining Company
Southwestern Exploration Department
P. O. Box 5795
Tucson, Arizona 85703

Dear Mr. Courtright:

Thank you for your inquiry of November 7, 1967, concerning our interest in development of a copper deposit for nuclear explosive fracturing and leaching. As you know from the announcement concerning the Kennecott deposit near Safford, we are actively engaged in study of this application of nuclear explosives. We would be quite interested in evaluating a second deposit and would like to meet with you to discuss the details.

It is my understanding that the nature of our discussions could be kept on an "Official Use Only" basis, so there would be no publicity, if you should desire. It is further my understanding that there would be no obligation on the part of either party during preliminary evaluations. These questions should be posed to the San Francisco Operations Office (c/o Mr. John Philip, U. S. Atomic Energy Commission, San Francisco Operations Office, 2111 Bancroft Way, Berkeley, California 94704), as well. I am sending Mr. Philip copies of your request and my response.

Further development of the ASARCO project concept will be carried out in this laboratory by Mr. Milo D. Nordyke, in the event we decide to proceed further with the study. I look forward to a mutually profitable and technologically interesting association and thank you for your inquiry.

Sincerely,

Gary H. Higgins

Gary H. Higgins
K-Division Leader

GHH:ca

cc: Mr. John Philip, SAN, w/encl
Dr. Glenn Werth, w/encl.
Mr. Milo Nordyke, w/encl.

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

J. H. C.
DEC 14 1967

December 13, 1967

TO: J. H. Courtright

FROM: J. R. Wojcik

Sacaton
Request for Additional Drilling

In 1964 at your request I made a preliminary estimate of possible "ore" reserves at the Sacaton property and an estimate of the return that might be realized on a minimum capital investment. The "ore" considered recoverable amounted to 8.6 million tons at 1.40% Cu, minable by open pit and 13.3 million tons at 1.18% Cu, minable by block caving. Messrs. Herde and Williams have recently calculated a return of 11.5% discounted to present value on a capital investment of some $21,000,000. However, they used as "ore" reserves the figures I had determined as possible ore. In view of the fact that an attractive return can be calculated on this possible ore, I feel that additional drilling, amounting to about 24,000', is warranted to move these reserves into the measured category. Proposed locations of some of these holes are shown on the attached plan.

I estimate the cost of this drilling to be about as follows:

West (shallow) "~~ore" body~~ ore zone		
Rotary drilling	- 3000' @ $ 4.50/ft.	$ 13,500
Core drilling	- 5000' @ 12.00/ft.	60,000
East (deep) ~~"ore" body~~ ore zone		
Rotary drilling	- 12000' @ $ 5.50/ft.	66,000
Core drilling	- 4000' @ 15.00/ft.	60,000
	24000'	$199,500

These costs ~~should~~ include ~~all overhead expenses, such as~~ site preparation, supervision, geology and assaying.

Since the successful financial outcome requires substantiation of both bodies, testing of one could be eliminated should the other not prove out.

JRW:lmi

J R Wojcik
J. R. Wojcik

J.H.C.
DEC 11 1967

W.E.S.
DEC 20 1967

J.R.W.
DEC 21 1967

Air Mail

December 7, 1967

Mr. C.E. Williams
Mining Department
Tucson Office

Sacatone

Dear Mr. Williams:

In view of the renewed interest in Sacatone, I wonder if you will have occasion to run an analysis similar to your Waterloo work on the precision in the grade of ore, utilizing the original drilling results within the boundaries of the ore body as now measured. Since there are several radically different classes of ore at Sacatone (oxide, chalcocite, primary), also separate mining areas, I suggest that these distinctions be observed in the groupings of samples for the statistical analysis.

Sincerely,

John J. Collins

CC:CENelson
TASnedden
RBMeen
JHCourtright

MR. WES
READ AND RETURN
PREPARE ANSWERS HANDLE
FILE INITIALS

December 4, 1967

AIR MAIL

W.E.S. DEC 7 1967

J. H. C. DEC 6- 1967

Mr. T. A. Snedden, Gen. Mgr.
Asarco U. S. Mining Dept.
Tucson.

SACATON PROSPECT - OUTCOME ESTIMATE

Dear Mr. Snedden:

Referring to our telephone conversation, I wish to confirm that the Sacaton feasibility study attached to your letter of November 2nd is sufficiently attractive to justify the expense of the drilling needed to support the reserves shown by Mr. Courtright's report of February 5, 1964.

Mr. Pollock has advised Mr. Courtright of the decision to proceed with the drilling program. Therefore, the Mining Department should collaborate with the Exploration Department in laying out a drilling program which will prove an assured ore reserve and give the information necessary to develop the most practical methods for mining the orebodies. A Mining Authorization should then be requested to cover the cost of the program.

In addition to the drilling program, it should be determined how much additional land will be needed for the various surface facilities, rights of way for pipe lines, etc. Perhaps options should be taken to purchase some of the more critical areas prior to, or shortly after, drilling commences.

It is my understanding that water for milling operations may be developed in three areas. However, the entire Casa Grande area is designated as a "critical ground water region", and no new wells can be drilled without direct negotiations with the State. Therefore, a preliminary investigation should be made to determine the position of the State on this subject. Also, it should be determined what land may be available in the aquifer areas.

Very truly yours,
Original Signed
C. E. NELSON

cc: EMcLTittmann
CPPollock
RBMeen,A/M
JHCourtright,A/M

J.H.C.

DEC 6- 1967

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

December 4, 1967

TO: Mr. J. H. Courtright

FROM: J. R. Wojcik

SACATON ESTIMATE

No. 2 shaft could be drilled at substantial savings.

Additional tonnage is available to shrink stoping or Swedish sublevel method where thickness is less than 150' if capital is not recovered from this tonnage (stripped cost).

Perched chalcocite zones would be dump leach "ore" tonnage not estimated.

von den Steinen won't be happy with the 40% indirect cost if you will recall his comments at the time of calculation of the 1964 outcome.

Desvaux's estimate for mining equipment was based on 2500 tpd from open pit and 3500 tpd from underground. Subsequently, the mining plan as calculated required contracting the mining to eliminate this capital expenditure. Our $12 million capital plus $1.5 million for equipment and $4.2 million for underground investment is $17.7 million compared to mining department's $21 million.

I would think that drilling costs could be held to the 1964 estimate or even a little below.

JRWojcik

JRW:lmi

J. R. Wojcik

J.H.C
DEC 6- 1967

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

December 4, 1967

TO: Mr. J. H. Courtright

FROM: J. R. Wojcik

SACATON PROSPECT
Outcome Estimate

The Outcome Estimate of the Sacaton Prospect by Messrs. Herde and Williams dated October 30, 1967, indicates a discounted return of 11.5% on the capital investment assuming the "ore" reserve as postulated in 1964 can be substantiated. In order to substantiate the reserves, additional drilling is necessary as proposed in my report of February 5, 1964. Costs of the drilling should be the same as estimated in 1964 or slightly less, which were:

Shallow rotary drilling	≅ $4.50/ft.
Deeper rotary drilling	≅ 5.50/ft.
Shallow core drilling	≅ 12.00/ft.
Deeper core drilling	≅ 15.00/ft.

These are total costs and include site preparation, road maintenance, office space, supervision and assaying. The total footage required to measure the Sacaton deposit can be determined at the time a request is made for a Mining Authorization.

JRWojcik

JRW:lmi

J. R. Wojcik

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

November 16, 1967

TO: Mr. J. H. Courtright

FROM: J. R. Wojcik

Santa Rosa Project
Casa Grande, Arizona

During the exploration of the Sacaton "ore" deposit, reconnaissance disclosed anomalous molybdenum values in ground water samples obtained from an area about 15 miles southwest of the Sacaton project. An induced polarization survey outlined an area of +9 Mv/v response as shown on the attached map.

Drilling begun in March 1967 failed to find a sulphide source for the I.P. response nor any source for the molybdenum.

The anomaly proved to be parallel to and on the down thrown side of a major basin and range type fault. Thickness of gravels and conglomerate varies from about 400' in hole SR-8 to almost 1800' in hole SR-4. Pre-mineral bedrock is granite, monzonite porphyry, or andesite porphyry. The rocks are weakly altered in the vicinity of holes SR-1 and SR-6 but the alteration noted in SR-6 may be associated with ground water circulation in the fault zone. Hole SR-6 also contained some copper values up to about 700 ppm but again the copper may have been deposited from ground water circulating along the fault. An area of mineralization may lie in the deeper portion of the basin but sufficient evidence is not available at this time to locate it.

Eight holes were drilled totaling 9407' at a direct cost of $4.42/ft. Sampling, supervision, and assaying added another $0.91/ft. for an overall cost of $5.33/ft. The entire sequence, except for 43', was drilled with a large non-coring type rotary as at Sacaton and Santa Cruz. Forty-three feet of coring was accomplished with the rotary drill at an average cost of about $31/ft.

The information derived from the drill holes suggests that the anomalous I.P. response was from water-saturated clays shallow enough to be detected by the ASARCO equipment. The source of the molybdenum in the ground water was not located and could represent a future exploration target.

JRWojcik
J. R. Wojcik

JRW:lmi
encls.: Asarco Geologic-Assay Logs
Nos. SR-1 through SR-8
Map--Sacaton-Santa Cruz Area, Pinal Co., Ariz.

Final Depth 1091.0
Collar Elevation
Coordinates
Inclination

ASARCO

GEOLOGIC – ASSAY LOG

Property SANTA ROSA

HOLE NO. SR-1
Sheet No. 1 of 1
Date Completed 4-1-67
Logged By JRW

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration		Rock Type	Remarks
132.0	132.0	4 3/4"RB													Qal	
990.0	858.0	RB													QTg	Conglomerate
031.5	41.5	RB											Wk	Arg	Tmp	Altered, leached, capping
036.25	4.75	2 1/8"		<50 %				FeOx					Wk	Arg	Tmp	Dark gray monzonite porphyry, tr hem on fracs, No Cu stain
060.0	23.75	RB											Wk	Arg	Tmp	
			(1060-1087)		.025											
082.4	22.4	RB											Wk	Arg	pCgr	
091.0	8.6	2 1/8"		<50									Wk	Arg	pCgr	Coarse grained granite, crushed, sheared and gougy

Final Depth
Collar Elevation
Coordinates
Inclination

ASARCO

GEOLOGIC – ASSAY LOG

Property SANTA ROSA

HOLE NO. SR-2
Sheet No. 1 Of 1
Date Completed 4-5-67
Logged By JRW

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay - % Cu			Mineralization					Alteration		Rock Type	Remarks
					Total	Non-S	Average	Oxides	Pyrite	Cpy	Cc	Other				
245.0	245.0	4-3/4" RB													Qal	
670.0	425.0	RB													QTg	conglomerate
693.0	23.0	RB													pCgr	
706.0	13.0	2-1/8"											None		pCgr	

Final Depth 1480.0
Collar Elevation
Coordinates
Inclination

ASARCO

GEOLOGIC – ASSAY LOG

Property SANTA ROSA

HOLE NO. SR-3
Sheet No. 1 of 1
Date Completed 4-11-67
Logged By JRW

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu			Mineralization					Alteration		Rock Type	Remarks
					Total	Non-S	Average	Oxides	Pyrite	Cpy	Cc	Other				
265.0	265.0	4-3/4"	RB												Qal	
435.0	1170.0	RB													QTg	Fine grained, clayey, pebble conglomerate
450.0	15.0	RB													Ld	Medium grained diorite
453.0	3.0	2-1/8		67											Ld	Diorite similar to Laramide intrusive in Sacaton Mtns.
480.0	27.0	RB													Ld	

Final Depth 1807.0
Collar Elevation
Coordinates
Inclination

ASARCO

GEOLOGIC – ASSAY LOG

Property SANTA ROSA

HOLE NO. SR-4
Sheet No. 1 of 1
Date Completed 4-18-67
Logged By JRW

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay - % Cu			Mineralization					Alteration		Rock Type	Remarks
					Total	Non-S	Average	Oxides	Pyrite	Cpy	Cc	Other				
296.0	296.0	4-3/4"	RB												Qal	
1610.0	1314.0	RB													QTg	Conglomerate
1780.0	170.0	RB													QTg-Flt	? Yellow-Orange to Red stained quartz and red clay
1800.0	20.0	RB											-NONE-		pCgr	
1807.0	3.0	2-1/8"		67											pCgr	

Final Depth 687.0
Collar Elevation
Coordinates
Inclination

ASARCO

GEOLOGIC – ASSAY LOG

Property SANTA ROSA

HOLE NO. SR-5
Sheet No. 1 of 1
Date Completed 4-20-67
Logged By JRW

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay - % Cu			Mineralization					Alteration		Rock Type	Remarks
					Total	Non-S	Average	Oxides	Pyrite	Cpy	Cc	Other				
211.0	211.0	4-3/4"	RB												Qal	
673.0	462.0	RB													QTg	Fine grained, clayey, pebble conglomerate
685.0	12.0	RB													pCqtzt	
687.0	2.0	2-1/8"		100											pCqtzt	Vy. fine grained, light gray quartzite or argillite. Possibly pC Dripping Springs

Final Depth 1352.0
Collar Elevation
Coordinates
Inclination

ASARCO

GEOLOGIC – ASSAY LOG

Property SANTA ROSA

HOLE NO. SR-6
Sheet No. 1 of 1
Date Completed 4-26-67
Logged By JRW

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu			Mineralization					Alteration		Rock Type	Remarks
					Total	Non-S	Average	Oxides	Pyrite	Cpy	Cc	Other				
110.0	110.0	4-3/4"RB													Qal	
900.0	790.0	RB													QTg	Fine grained, clayey, pebble conglomerate
					sludge											
120.0	220.0	RB			.025										An Por	
280.0	160.0	RB													Flt. ?	Red clay, no coarse fraction, rapid
340.0	60.0	RB			.045											drilling
															Flt.?	ditto
349.0	9.0	RB													An Por	
352.0	3.0	2-1/8"		67									Wk Arg		An Por	Dark coarse grained andesite porphyry

Final Depth 1673.0
Collar Elevation
Coordinates
Inclination

ASARCO

GEOLOGIC – ASSAY LOG

Property SANTA ROSA

HOLE NO. SR-7
Sheet No. 1 of 1
Date Completed 5-2-67
Logged By JRW

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay - % Cu			Mineralization					Alteration		Rock Type	Remarks
					Total	Non-S	Average	Oxides	Pyrite	Cpy	Cc	Other				
255.0	255.0	4-3/4"RB													Qal	
1040.0	785.0	RB													QTg	Fine, clayey pebble conglomerate
1440.0	400.0	RB													Flt ?	Red clay, rapid drilling, no coarse fraction in sample.
1591.0	151.0	RB													QTg	Mostly andesite and granite pebbles
1620.0	29.0	RB													QTg	Some red clay with rapid drilling
1669.0	49.0	RB											None		pCgr	Coarse grained biotite granite
1673.0	4.0	2-1/8"		100									None		pCgr	ditto

Final Depth 615.0
Collar Elevation
Coordinates
Inclination

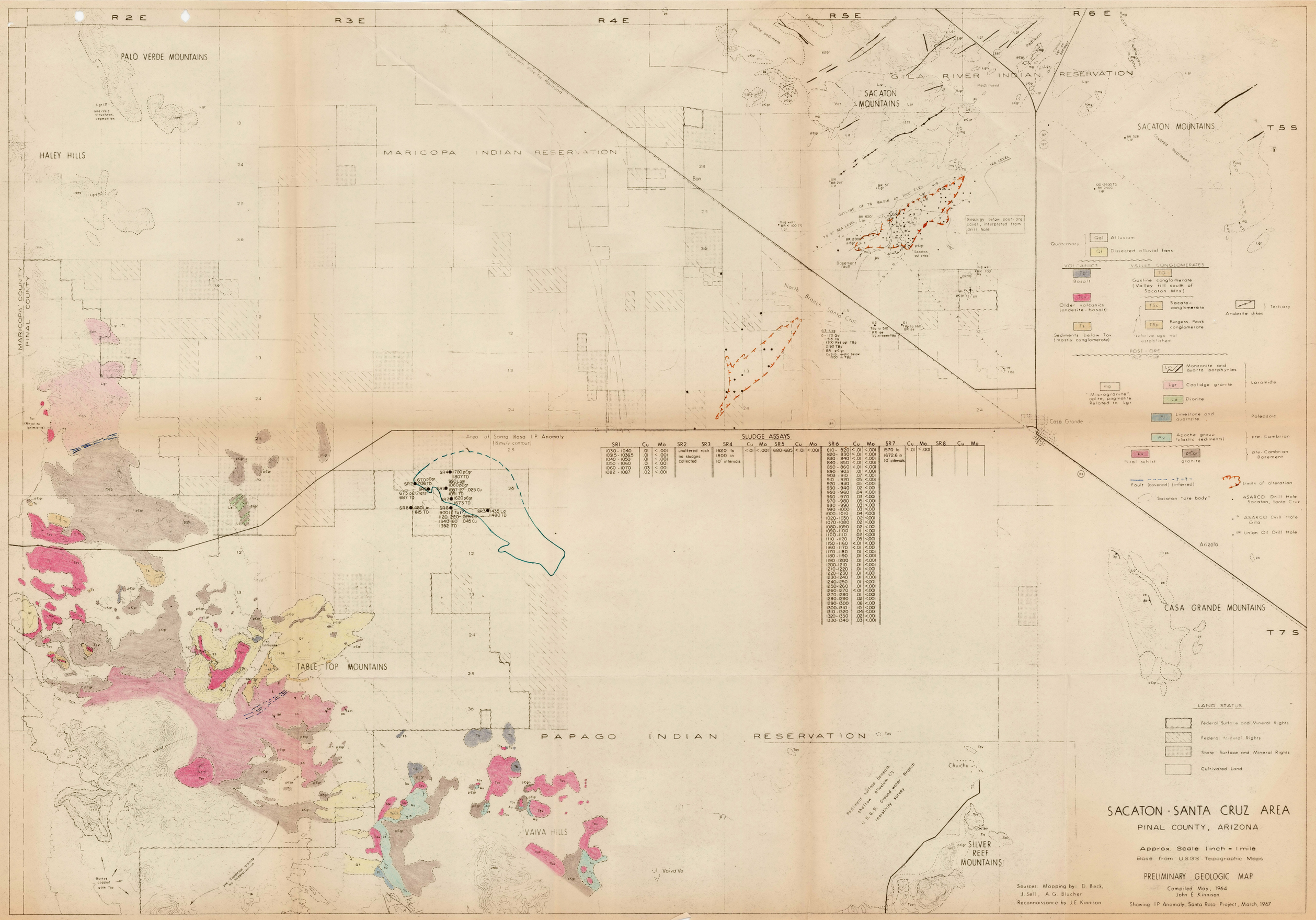
ASARCO

GEOLOGIC – ASSAY LOG

Property SANTA ROSA

HOLE NO. SR-8
Sheet No. 1 of 1
Date Completed 5-5-67
Logged By JRW

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu			Mineralization					Alteration		Rock Type	Remarks
					Total	Non-S	Average	Oxides	Pyrite	Cpy	Cc	Other				
125.0	125.0	4-3/4" RB													Qal	Alluvium
435.0	310.0	RB													QTg	Coarse boulder conglomerate, gneiss & schist boulders
480.0	45.0	RB													QTg	Coarse boulder conglomerate, monzonite boulders
615.0	135.0	RB											None		Lmz	Light buff to pink, fine grained quartz monzonite porphyry


R 2 E
R 3 E
R 4 E
R 5 E
R 6 E
T 5 S
T 7 S
PALO VERDE MOUNTAINS
HALEY HILLS
MARICOPA INDIAN RESERVATION
GILA RIVER INDIAN RESERVATION
SACATON MOUNTAINS
SACATON MOUNTAINS
CASA GRANDE MOUNTAINS
TABLE TOP MOUNTAINS
VAIVA HILLS
PAPAGO INDIAN RESERVATION
SILVER REEF MOUNTAINS
MARICOPA COUNTY
PINAL COUNTY
Southern Pacific Railroad
North Branch Santa Cruz
Casa Grande
Arizola
Chuichu
Vaiva Vo
Pediment
Granite pediment
Basement fault
Sacaton out crop
Geology below post-ore cover, interpreted from drill hole
Area of Santa Rosa I.P. Anomaly (8 mv/v contour)
SLUDGE ASSAYS
SR1 Cu Mo
1030 - 1040 .01 < .001
1035 - 1036.5 .01 < .001
1040 - 1050 .01 < .001
1050 - 1060 .01 < .001
1060 - 1070 .03 < .001
1082 - 1087 .02 < .001
SR2 unaltered rock no sludges collected
SR3
SR4 1620 to 1800 in 10' intervals Cu < .01 Mo < .001
SR5 680-685 Cu < .01 Mo < .001
SR6 Cu Mo
810 - 820 < .01 < .001
820 - 830 < .01 < .001
830 - 840 < .01 < .001
840 - 850 < .01 < .001
850 - 860 < .01 < .001
890 - 900 .01 < .001
903 - 910 .07 < .001
910 - 920 .05 < .001
920 - 930 .05 < .001
930 - 940 .02 < .001
950 - 960 .04 < .001
960 - 970 .03 < .001
970 - 980 .05 < .001
980 - 990 .03 < .001
990 - 1000 .03 < .001
1000 - 1010 .04 < .001
1020 - 1030 .02 < .001
1070 - 1080 .02 < .001
1080 - 1090 .02 < .001
1090 - 1100 .01 < .001
1100 - 1110 .02 < .001
1110 - 1120 .05 < .001
1150 - 1160 < .01 < .001
1160 - 1170 < .01 < .001
1170 - 1180 .01 < .001
1180 - 1190 .01 < .001
1190 - 1200 .01 < .001
1200 - 1210 .01 < .001
1210 - 1220 .01 < .001
1220 - 1230 .01 < .001
1230 - 1240 .01 < .001
1240 - 1250 .01 < .001
1250 - 1260 .01 < .001
1260 - 1270 < .01 < .001
1270 - 1280 .01 < .001
1280 - 1290 .02 < .001
1290 - 1300 .06 < .001
1300 - 1310 .10 < .001
1310 - 1320 .04 < .001
1320 - 1330 .02 < .001
1330 - 1340 .03 < .001
SR7 Cu Mo
1570 to 1672.6 in 10' intervals < .01 < .001
SR8 Cu Mo
Quaternary
Qal Alluvium
Qt Dissected alluvial fans
VOLCANICS
Tb Basalt
Tov Older volcanics (andesite - basalt)
Ts Sediments below Tov (mostly conglomerate)
VALLEY CONGLOMERATES
TG Gasline conglomerate (Valley fill south of Sacaton Mts)
TSc Sacaton conglomerate
TBp Burgess Peak conglomerate
relative age not established
Tertiary
Andesite dikes
POST - ORE
PRE - ORE
Lpr Monzonite and quartz porphyries
Lgr Coolidge granite
Ld Diorite
Laramide
mg "Microgranite", aplite, pegmatite Related to Lgr
Pl Limestone and quartzite
Paleozoic
Au Apache group (clastic sediments)
pre-Cambrian
Ps Pinal schist
pCgr granite
pre-Cambrian Basement
Fault (covered) (inferred)
Sacaton "ore body"
Limits of alteration
ASARCO Drill Hole Sacaton, Santa Cruz
ASARCO Drill Hole Gila
UN Union Oil Drill Hole
LAND STATUS
Federal Surface and Mineral Rights
Federal Mineral Rights
State Surface and Mineral Rights
Cultivated Land
Pediment surface beneath shallow alluvium (?) U.S.G.S. Ground water Branch resistivity survey
Sources: Mapping by: D. Beck, J. Sell, A.G. Blucher
Reconnaissance by J.E. Kinnison
SACATON - SANTA CRUZ AREA
PINAL COUNTY, ARIZONA
Approx. Scale 1 inch = 1 mile
Base from USGS Topographic Maps
PRELIMINARY GEOLOGIC MAP
Compiled May, 1964
John E. Kinnison
Showing I.P. Anomaly, Santa Rosa Project, March, 1967

Route to W.E. Saegart

"SACATON PROSPECT"
JHC File

November 7, 1967

W.E.S.
NOV 7 1967

Mr. Gary H. Higgins
Division Leader, K Division
Lawrence Radiation Laboratory
P.O. Box 808
Livermore, California

Dear Sir:

Reference is made to your letter of July 21, 1966, addressed to Mr. John J. Collins, regarding a copper prospect which was submitted for evaluation as a possible nuclear explosive copper leach development site. Your letter arrived here after Mr. Collins had left for a very extended tour of Australia and I don't believe that he wrote a reply.

After receiving the report by Mr. S. M. Hansen, I attempted unsuccessfully to persuade the New York office that we should submit all data on the copper deposit, including its identity and location for evaluation by your Department. I have now been advised to reopen the matter and determine if you people are still interested in making an evaluation of this copper deposit should you be provided with all the necessary data.

Would this involve any obligation on ASARCO's part, and would it be possible to avoid publicity, at least during the time prior to the actual conduct of any experimental work?

Incidentally, Mr. John J. Collins was recently appointed to the position of Chief Geologist in New York, replacing Mr. Kenyon E. Richard.

Yours very truly,

J. H. Courtright
Chief Geologist

JHC:lml