

CONTACT INFORMATION
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James Doyle Sell Mining Collection

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TAB

Superior EAST 1970

J 1) S

AMERICAN SMELTING AND REFINING COMPANY Tucson Arizona

September 28, 1970

TO: W. E. Saegart

FROM: Don Hedrick

SUBJECT: Progress Report, September, 1970

Superior East Project, Pinal Co., Az.

During the month of September, the road work on the Kay claims was continued. Drilling and blasting was done to arrive at location for validating the Kay claims. This work was completed on September 21 at which time the compressor and jack hammer was returned to Tucson. The D-7 Cat was used to move equipment to each location for drilling with an air-track and a 600 c.f.m. compressor.

Equipment for validating the Superior East claims was moved onto location by A. A. McDaniel Well and Machine Company September 1, and drilling began on the Dacite claims. Twenty-four holes, aggregating 1,780', were drilled. Air-track validation drilling was completed September 25.

Harvey Smith, mining engineer, began drilling the Kay claims with a portable drill on August 24 . A total of 38 claims were drilled consisting of a 10 hole on each, Kay 93-110 and Kay 44-63. This work was completed September 28. Paper work and posts of each claim will be done by Mr. Smith also. Maps and locations will be submitted by Mr. Smith later on.

Jack Aneas Construction Company of Globe, Arizona was finished with road work and moving equipment to drill sites September 12. Because of heavy rains, some of the work had to be done again. Roads were washed out. This was done by A. A. McDaniel Well and Machine Company.

The claims validated by air-track drilling were recorded at the County seat on September 25. Posts and papering of claims have been put on the drill sites.

Attached to this report is a list of drill holes done by the air-track, the dates on which they were drilled, total depth of feet of each hole, and the claims in which they validate. Following later, when the work is completed, a list of drill holes and the dates of validation done by Harvey Smith will be added. Maps will be included.

Don Hedrick

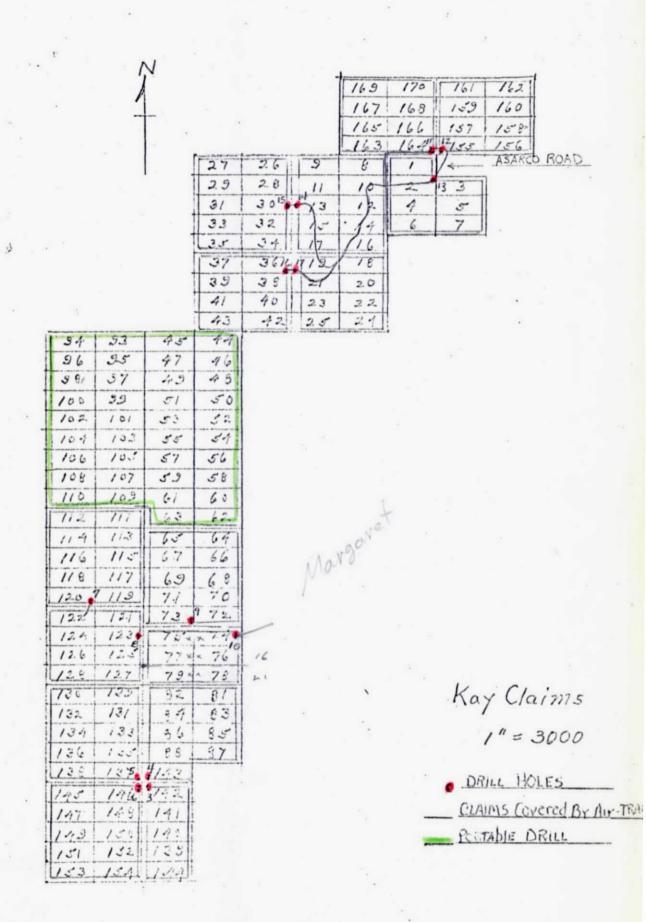
DH:mw

Drill Hole Validations of Dacite and Kay Claims Superior East Project

Hole #	Location	Depth	Claims Validated	Date Drilled
1	SW Corner Dacite #5	50'	Dacite 1 - 5	Sept. 1
2	NW Corner	50'	Dacite 6 - 10	Sept. 2
3	Dacite #6 NW Corner Kay 142	501	Kay 139-142 & 144	Sept. 4
4	SW Corner Kay 143	90'	Kay 143 & 81-88	Sept. 4
5	SE Corner Kay 137	1001	Kay 129-138	Sept. 4
6	NE Corner Kay 146	100'	Kay 145-154	Sept. 8
7	SE Corner Kay 120	1001	Kay 111-120	Sept. 11
8	W Center Kay 123	801	Kay 121-128	Sept. 11
9	SE Corner Kay 73	100	Kay 64-73	Sept. 12
10	NE Corner Kay 74	60 '	Kay 74-79	Sept. 12
11	SE Corner Kay 164	80 1	Kay 163-170	Sept. 15
12	SW Corner Kay 155	801	Kay 155-162	Sept. 16
13	NE Corner Kay 2	70'	Кау 1-7	Sept. 16
14	W Center Kay 13	100'	Kay 8-17	Sept. 18
15	E. Center Kay 30	100¹	Kay 26-35	Sept. 18
16	SE Corner Kay 36	801	Kay 36-43	Sept. 18
17	SW Corner Kay 21	801	Kay 18-25	Sept. 18

Hole #	Location	Depth	Claims Validated	Date Drilled
18	NW Corner Dacite 25	100'	Dacite 25-29 & 31-35	Sept. 22
19	SE Corner Dacite 19	20¹	Dacite 19 & 13	Sept. 22
20	NE Corner Dacite 20	100'	Dacite 14-18 & 20-24	Sept. 22
21	SW Corner Dacite 43	201	Dacite 43 & 49	Sept. 25
22	NW Corner Dacite 44	100'	Dacite 44-48 & 50-54	Sept. 25
23	NE Corner Dacite 38	60'	Dacite 38-42 & 36	Sept. 25
24	SW Corner Dacite 37	101	Dacite 37	Sept. 25

Dated: September 28, 1970



37 24 21 43 38 23 22 44

To be re-Staked

Dacite Claims

October 27, 1970

TO: S. I. Bowditch
H. L. Crittendon
A. Dalla Vista
S. R. Davis
W. G. Farley
D. Friel
B. E. French
H. Hedrick
B. E. Kilpatrick
J. R. King
R. H. Luning
J. D. Sell
R. Shannon
G. J. Stathis

FROM: W. E. Saegart

N. P. Whaley R. Van Blaricom

Re: Monthly reporting

Since there have been a number of changes in the personnel assignments covering current projects, I want to remind each of you that your monthly report and cost summaries are to be delivered to my office by October 30.

Current project responsibilities are as follows:

Silver Bell East	R. H. Luning
Superior East	J. D. Sell
GEM	G. J. Stathis
Red Hills	R. Van Blaricom
Poston Butte	A. Dalla Vista
Hachita Valley	W. G. Farley
Rochester	W. L. Kurtz

ORIGINAL SIGNED BY W. E. SAEGART

W. E. Saegart

WES:mw cc: W. L. Kurtz

AMERICAN SMELTING AND REFINING COMPANY Tucson Arizona

November 1, 1970

RECEIVED NOV 2 1970 S W U. S. EXPL. DIV

TO: W. E. Saegart

FROM: J. D. Sell

Re: Progress Report - October
Superior East
Pinal County, Arizona

The Superior East project work of claim staking and validation was carried out by Harvey Smith under the supervision of D. Hedrick (ASARCO). The work has been completed and reports submitted.

Geologic and incidental work in the project area is now being conducted under the title of Pioneer General Reconnaissance.

Early in the month, Ramon Shannon and myself replaced claim notices on three claims (Dacite 11, 12 and 30), dated October 8, 1970, as these claims were not validated by drilling. Validation and/or repapering will be necessary for these claims.

Doug Friel and I have been working this month on the continued reconnaissance. Doug is mapping and sampling the extent of the oxide copper mineralization on the northeast side in the schist just as it goes under the dacite cover. This phase will require a few more days and he will then collect some data on the Manitou Hill area to the northeast. Later he will continue his reconnaissance along the entire eastern edge of the dacite.

My primary phase has been the study of the Whitetail Conglomerate areas with the collection of samples (both matrix material and altered/mineralized clast material). Five areas have been checked to date.

Continued good-will relationships with Miami, Inspiration, and Magma are being maintained, as well as continued checking of progress of drilling on the plateau. The Continental drill hole (Whatley) has been terminated at 2402' in what I believe to be "early volcanics." Casing has been set and capped so it is believed that Continental will put a diamond drill on the hole. I have not been able to catch up with John Roscoe but heard from the rancher (Webb) that he was back.

We are also maintaining our PR work with the ranchers and landholders of the area. Mr. Webb felt we did a nice job on putting up gates along his fence lines but thought they were "too tight" and hence people would tend to leave them down. He suggested putting "bar cheaters" on to help refasten the gates. I concur.

November 2, 1970

The ICC hole south of Hutton Peak (drilling by Barnes) is presently at 1410' in Whitetail Conglomerate. The hole is in trouble and they were to convert to a polymer-gel mud this weekend. Permission has been granted by ICC and Barnes for allowing Howard Crittendon to observe drilling techniques on the hole.

I have also been talking with HLC and John Hale of Elenburg Exploration on drilling problems and techniques for completing holes on the plateau. Elenburg appear interested in doing a turn-key job.

Cauces WSEO

JDS:mw cc: W. L. Kurtz

AMERICAN SMELTING AND REFINING COMPANY Tucson Arizona

November 30, 1970

RECEIVED

DEC 1 1970 S. W. U. S. EXPL. DIV.

TO: W. E. Saegart

FROM: J. D. Sell

Re: Progress Report, November 1970

Superior East - Pioneer General Reconnaissance

Pinal-Gila Counties, Arizona

Geologic work was carried on by D. Friel by continuing the study of the premineral rocks, alteration and mineralization on the northeast side. Doug is nearing completion of this phase and will submit a report on results before moving southward into the Hutton Peak area.

- G. Barnett initiated his study of features within the dacite mass itself. The major effort was a study of the pumice flattening-ratio work reported by D. W. Peterson, and Barnett has not been able to completely reproduce the results. Barnett will continue with this phase plus a fracture-fault photo study.
- J. King has spent several days in general reconnaissance for familiarity prior to working the northwest area of intrusive rock units. He hopes to resume work this week.
- R. Shannon has completed several projects including the moving out of the east end line of the dacite claims to their full 1500 foot lengths. Originally the posts were placed at only 1000 feet by H. Smith. He has also satisfied the rancher, M. Webb, on the gate closures.

Some 99 "Carrie" claims were staked by ASARCO to the north of the Kay claims of ASARCO by putting in the center line only and throwing the location notices to both sides. The work was performed by the above members of the project under the supervision of R. Crist who is submitting the claim outline and information.

Mr. Hugh Olmstead, chief Geologist of ICC, sent a letter and claim maps of their claims in the same general area. It appears that some 30 "Carrie" claims and "Kay" claims were overstaked onto ICC valid claims. A reply will be sent to H. Olmstead and the conflicting claims resolved.

The ICC (Barnes) drill hole south of Hutton Peak continues to be in trouble and on November 23rd, Inspiration terminated the drilling and Barnes is in the process of removing the rig. H. Crittendon has had several good sessions

with Tom Brock, drilling foreman on the job. The hole was terminated at 1710 feet in reported conglomerate. Drill cuttings show a very high percentage of schist fragments and it may be that the hole is barren schist but that the overlying conglomerate continues to cave and cause trouble.

-2-

James D. Sell

JDS:mw cc: W. L. Kurtz

9205

AMERICAN SMELTING AND REFINING COMPANY Tucson Arizona

December 29, 1970

TO: W. E. Saegart

FROM: J. D. Sell

Re: Progress Report, December 1970
Superior East-Pioneer General Reconnaissance
Pinal-Gila Counties, Arizona

Integration and acquisition of data continues in the project area. D. Friel has essentially concluded his work in the northeast side and a preliminary report is being prepared. Additional samples in the altered areas and mapping and sampling of several tunnels has been accomplished with R. Shannon. Some United Verde (ca 1930) drill hole data has been secured from N. P. Peterson and contact has been made with Mrs. Eder of Globe who has claims in the area. D. Lowell also has some data which he will trade us for locations of known drill holes on the Plateau. Contact, by R. Crist, has been made with the owners of the Carlota area. D. Friel is continuing his reconnaissance to the southeast.

- J. King is preparing his report on the northwest Stone House area and tentatively feels that the intrusive is indeed post-Dacite in age, which then places the alteration-mineralization even younger. Contact has been made with J. Fuller of Tucson who has some drill data in the area. J. King will move down into the Silver King area for continued study.
- R. Shannon is continuing to aid all parties and specifically has worked with ICC in establishing the field boundaries of the Ghost-Eder claim group, which ASARCO has overstaked into. Relationships are cordial between ICC and ASARCO.

Location drilling on three Dacite claims and six Kay claims was started late in the month. R. Shannon is specifically in charge with H. Crittendon aiding in the drill problem and D. Hedrick and A. Benavidez as helpers. The crew will then progress to putting up the proper corners and doing the location work on the Carrie claims recently staked on the north.

G. Barnett finished collecting some twenty stations in the flattening-pumice study in the Dacite. Computer aid suggests that the collected data does not show the sharp division as D. Peterson showed in his study. Magma (Ben Green and Rus Webster) found a similar problem when they were doing a shaft location study for their Number 9 shaft site. G. Barnett has spent most of the month doing a stero-photo study of the dacite fracture problem. He will continue the study on the Plateau and later to the major pre-mineral patterns adjacent to the Plateau.

My specific work continues to be the general collection of information and the Whitetail problem. Several additional sites have been collected but to date only the Silver King-type diorite porphyry (and similar dikes at Magma) has been found. No acid porphyry, Magma breccia or good replacement mineralization has been noted, except locally at the Belmont area where mineralized Naco limestone of apparent immediate derivations was noted in the covering Whitetail.

Work on the southwest side indicates that Banner Mining Company has staked abundant claims (ACE group) during 1970 in the premineral rocks and have moved into the Belmont area staking tight against the Belmont claims (on lease to Magma). Banner had also applied for three state sections to the east up on the Plateau but we have not checked to see if they were accepted or not, nor have we checked to see if their staked claims are up onto the Plateau.

A tour was taken by W. E. Saegart and various members of the project crews into the properties of Magma, Inspiration, and Ranchers in the Superior-Globe area. Valuable information has been gained and reported by W. E. Saegart. Additional tours are planned with Miami Copper.

James D. Sell

James W Se 20

JDS:mw cc: W. L. Kurtz

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	Grand]	Total - \$1,831

Accounting figure - 2,542.92

Misc.

RECEIVED

J. W. STILL

Consulting Mining Engineer
5213 N. ORACLE RD. 602 887-5341

TUCSON, ARIZONA 85704

DEC 29 1970 S. W. U. S. EXPL. DIV.

December 28, 1970

Mr. William E. Saegart American Smelting & Refining Co., 1150 North 7th Ave., Tucson, Arizona

The following billing covers work done for your company during the month of December - this work being covered in the two letter reports to you dated 12/14 & 12/16/70.

Professional Services:

J.W. Still, 3 days @ \$300/day..... \$900.00

Expenses:

LD Phone calls..... 5.10

Total

\$905,10

Yours very truly,

J.W.Still

W & Saugar A chq Supurin East MA 0010-02

TAB

197/

AMERICAN SMELTING AND REFINING COMPANY Tucson Arizona

February 1, 1971

TO: W. E. Saegart

FROM: J. D. Sell

Re: Progress Report - January, 1971
Superior East-Pioneer General Recon.
Pinal-Gila Counties, Arizona

The month was mainly devoted to cleaning up the study areas by D. Friel and J. King. Final reports from them will be completed this week. No immediate exploration targets have been delineated by them. The final report by G. Barnett is also in the final stages.

Further data has been gathered from D. Lowell on the drilling at the Eder or 64 area of oxide mineralization. Also, the Hanna drill hole east of Castle Dome has been secured from them.

Completion of claim work, monuments and paper on the Carrie group is underway and approximately a third of the group is in final status. Upon completion, in the middle of the month, the drilling for location work will commence.

Bowditch, Crist and myself visited with the principals of Home-Stake Production which have an option on the Carlota group. A memo on the proceedings has been submitted. We anticipate further information upon their planned resumption of drilling.

The Magma Shaft No. 9 has now entered the Whitetail conglomerate at 1875 feet below the collar and no water was encountered. The Magma tunnel borer cut Whitetail from 4266 feet to 4835 feet and is now in Dacite with approximately 575 feet to connection with the shaft.

James Dell J. D. Sell

JDS:mw

cc: W. L. Kurtz

verbal: Ru Welister March 4, 1971

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	SOUTHWESTERN EXPLORATION DE	The state of the s	
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GRAND TOTAL - \$2,204.00

AMERICAN SMELTING AND REFINING CO. Tucson Arizona

March 2, 1971

TO: W. E. Saegart

FROM: J. D. Sell

RE: Progress Report - February, 1971
Superior East-Pioneer, General Reconnaissance
Pinal-Gila Counties, Arizona

The Rock House-Reevis Trail report was submitted by J. R. King during the month. This conclusion was that the alteration-mineralization zone was the result of solfataric activity associated with the emplacement of the porphyry which intrudes the dacite and may be a source area for the volcanics. King has now moved into the Silver King area to map and sample the alteration zone associated with the diorite of pre-Whitetail age.

The report by D. T. Friel is in the final stages of preparation covering the Powers Gulch-Cactus area. Tentative conclusions suggest the Powers-Gulch alteration-mineralization breccia area is similar to that of the Cactus-Carlota area and is also underlain by a flat-fault. The source of the moved block and mineralization is postulated to be to the southwest and drill hole recommendations to test the idea are proposed. Friel is now south of Pinal Ranch covering more of the Dacite contact area.

G. S. Barnett has completed the preliminary draft of his report on the Dacite proper and the structural features surrounding the area. His conclusions suggest that careful study of the pumice ratios will be an aid in dacite depth determinations. Also, the structural work suggests a pre-dacite structural high extending from Silver King to essentially Castle Dome and any work north of that zone would encounter thick pre-dacite volcanic units.

The claim validation on the 94 Carrie claims is progressing. Forty-nine claims were validated using compressor-jack hammer combination towed by a pickup. Portable drills are now being used for the remaining claims and several weeks will probably be needed to complete same.

Magma has recently (December, 1970) extended claims south of the Sun (1 - 50) group to fill in the open land in Sections 7 and 18 in T 2 S, R 13 E. The land is between their Belmont lease and the State Lease lands.

J. D. Sell

JDS:van Enc.

cc: WLKurtz

	SOUTHWESTERN EXPLORATION DE		February	, 197
Superior East MA 0010-02	Project, <u>Pinal-Gila</u> County	• <u>Arizona</u> State		
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GRAND TOTAL \$2,096.00

AMERICAN SMELTING & REFINING COMPANY Tucson Arizona

March 31, 1971

TO: W. E. Saegart

FROM: J. D. Sell

Superior East Project Monthly Report, March, 1971

Only two days of my time was spent in the field; one with F. Graybeal on the Cactus-Carlota breccia problem and the other with R. Crist and the Forest Service District Ranger, Mr. William H. Moehn.

Attached are the individual reports by Graybeal, King, Friel, and Barnett on their phases of work.

Continuing work by H. Crittendon has completed the location validation drilling on all the Carrie Claims. A block of twenty Gin Claims were papered north of Magma and west of our Kay Claims. Corners and location work is needed.

The drilling of four holes has been authorized and Boyles Brothers will be the contractor with the first rig (a CP-50 diamond drill) on the property at the Continental M-1 drill hole in the first week of April. The Failing 2500 rotary for drilling A-1 is ready to move and will be placed next week upon completion of the drill site and the securing of a Boyles drill foreman from New Mexico.

Junes D. Sell J. D. Sell

JDS:van

Month MARCH , 1971 MONTHLY COST SUMMARY Project, ___ PINAL-GILA ARIZONA SUPERIOR EAST MA: 0010 CONTRACTORS! CHARGES Invoiced during month covering current month's work Statement Amt. Contractor Estimated balance of contractors' charges covering work through end of current month Contractor Estimated Cost ASARCO EXPENSES Salaries No. Days Allocated to Name Project During Month (show as ratio to total working days in month, i.e. 24/26) 15/27 825.00 J. D. SELL Wages No. of Overtime No. of Straight Name. Time Hours Durtime Hours During Month ing Month Traveling and Living Expenses - Salaried ASARCO Personnel Estimated or Actual Name Traveling Expenses Incurred During Mo. 11.50

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Description	Amount
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Claim Staking Rental Payments (i.e. State prospection permits)	19
Option Payments Property Purchases	
Royaltics - Lease Payments	

AMERICAN SMELTING AND REFINING COMPANY Tucson Arizona

March 30, 1971

TO: J. D. Sell

FROM: J. R. King

Re: MONTHLY PROGRESS REPORT

MARCH 1971

The number of days spent working during the month of March which pertain to either the Superior East Project or the Pioneer General Reconnaissance, amounts to sixteen days. Another ten work days are chargeable to general exploration.

On the 25th of March, validation drilling of the Carrie Claim blocks was completed. The northeast corner of Carrie 18, the northwest corner of Garrie 17 and the northwest corner of Ghost 127 were butcher papered. In field checking parts of the Carrie claims, it was found that possibly 25% of the corners and end centers are not legal structures.

After receiving approval (March 9) the Gin claim group were staked on the 11th and 12th of March. Corners and end-center monuments were not built at that time.

Petrographic examination of samples from Keff McGee's OF-1A drill hole and Continental's M-1 drill hole established that the rock encountered at the bottom of the holes is not pre-mineral diabase (as reported by Ken McGee and Continental) but post-mineral andesite with definite flowage textures.

Initial steps were taken with Jim Lukansk (Phelps Dodge, Exploration) for obtaining information on the Copper Springs Area (Santa Anna Terminal).

Detailed mapping of the alteration east of the Silver King Mine was not completed this month due to priority work in other areas.

John R. King

JRK:Cv

AMERICAN SMELTING AND REFINING COMPANY Tucson Arizona

March 29, 1971

TO: J. D. Sell

FROM: D. T. Friel

Re: SUPERIOR EAST PROJECT

MONTHLY PROGRESS REPORT

FOR MARCH 1971

in February, reconnaissance south of U.S. Highway 60-70 was initiated along the eastern edge of the dacite plateau. To date the American Mine, Snyder Group and Lorraine areas have been mapped and sampled. An area of weak to moderate hydrothermal alteration has been encountered in the Pinal schist south of the Snyder Group stretching approximately 1500 feet southward along the dacite contact and 2000 feet to the east. This alteration is not pervasive, however, and not thought to be of importance. Further reconnaissance to the south along the eastern dacite contact is planned.

A distribution of time spent on the project for the month of March is as follows:

Time Distribution	Number of Days
Finalizing report on the Powers Gulch- Cactus area	5
Reconnaissance south down the eastern dacite contact	3
Tours - Mission, Sierrita-Esperanza, Four	
Metals Breccia Pipe, Lavender Pit, Morenci, Ray and Poston Butte	4
Drafting Maps	2
General office	2
Monthly and quarterly report	1
Reconnaissance showing Fred Graybeal Cactus area	1
Drilling	2
Staking Gin claims	2
Butcher papering corners for aerial photos	1
Total	23 day

A copy of an assay report from American Analytical and Research Laboratories covering samples taken from the American Mine and Snyder Group is attached.

D. T. Friel

DTF:sh

45.00

CHARGES \$

AMERICAN ANALYTICAL and RESEARCH LABORATORIES

ASSAYERS - CHEMISTS - METALLURGISTS

TUCSON, ARIZONA, 85713

American Smelting & Refining Company DATE March 10,1971

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AM-4			560	42	15	2		
SG-1 5			500	160	175			
5G-2 8			740	85	39			
SG-3			119	17	14			
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AMERICAN ANALYTICAL and RESEARCH LABORATORIES

ASSAYERS - CHEMISTS - METALLURGISTS

TUCSON, ARIZONA 85713

SAMPLE SUBMITTED BY American Smelting & Refining Company

DATE March 10,1971

SAMPLE MARKED	GOLD OZ / TON	SILVER OZ /TON	PER CENT	PERCENT LEAD	PERCENT ZINC	PERCENT	PPM PERCENT OX Cu	Percent
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AMERICAN SMELTING AND REFINING COMPANY Tucson Arizona

March 29, 1971

TO: J. D. Sell

FROM: F. T. Graybeal

Re SUPERIOR PROJECT

MONTHLY REPORT, MARCH 1971

Seven days were spent developing an interpretation of the Cactus breccia. At present, seven possible origins of the breccia are being considered. Mapping has shown that most of the brecciation and faulting in the breccia is pre-dacite. Numerous structures have been recognized in the breccia and are being evaluated statistically. In addition, a new area of possible mineralized schist breccia was found south of the Carlota mine.

A.T. Graybeal
F. T. Graybeal

FTG:sh

cc: WESaegart

March 31, 1971

TO: J. D. Sell

FROM: G. S. Barnett

Re: QUARTERLY REPORT

JANUARY - MARCH, 1971

I have been conducting an analysis of the structure for the main dacite mass as well as for the Globe-Miami to Superior Region. As an outgrowth of this study, a regional map with a structural and geological history interpretation for the region is also being prepared.

I have submitted to you proof drafts of the "Pumice Ratios Study" and a report on "Tertiary Basalt" for the Superior East Project. An examination and report pertaining thereto, of cuttings for the Continental Materials M-I drill hole have been completed.

I am in the process of finalizing my report and maps for the Superior East Project. These reports and their status areas follows:

Maps - Known Structure and Photo-Interpreted Lineaments, Superior Project, Pinal and Gila Counties, Arizona. 1:24,000 scale: drafting room, nearly complete. Report is 80% complete.

Regional Geologic map: All work sheets accumulated (at various scales). Needs drafting. Report 40% complete.

Haunted Canyon: Map completed. Report needed Map Major Elements and structural blocks. Major elements have been defined, report 85% complete.

Final Color Resolution map will be prepared when received from drafting room.

So, upon satisfactory completion of these projects, I intend to finish the map for the area west of the Oxide Pit, Silver Bell. I will also submit recommendations concerning the report "Storage and Retrieval of Geologic Data for ASARCO Exploration". I also plan to conduct geological reconnaissance mapping in the Pantano area. To date in this area, I have seen abundant propylitic alteration and some pyritization. Possibilities for a vertically zoned or hidden target are excellent for the area.

Leonge S. Barriett
G. S. Barnett

GSB:sh

cc: WESaegart

May 3, 1971

TO: W. E. Saegart

FROM: J. D. Sell

Re: SUPERIOR EAST PROJECT

MONTHLY REPORT, APRIL 1971

The drilling has started on three sites of the project. A Failings 2500 started a new hole at site A-l on April 10, and terminated its work on April 27 at a depth of 1317 feet. The base of the dacite vitrophyry was penetrated at 1304 and air circulation lost at that point. The few cuttings coming up suggest that the bottom of the hole is in quartz "sand". The hole has been cased and capped to await the core rig. The Failings is now set up east of Oak Flat at site A-4 and will kick off this coming week. The CP-50 core rig re-entered the Continental hole M-1 and started coring April 21. At a depth of 2428 the andesitic basalt was bottomed and Whitetail Conglomerate is being cored below the basalt and the rig was still in Whitetail at 2663. The hole has been designated as M-1A by ASARCO. Minor native copper is found in the conglomerate.

Crittendon, Cummings and myself toured the new tunnel of Magma Copper where they have also found native copper in the Whitetail. We also inspected the dump material from the 2300 level of Magma's No. 9 Shaft where they are in Whitetail. The dump also has native copper fragments and one large clast of porphyry. Magma verbally reported no porphyry clasts in the tunnel or shaft conglomerates.

- J. R. King has completed his sampling and mapping of the Silver King area and the report is pending. D. T. Friel has completed and submitted his continued study southward along the east boundary of the dacite. No targets were found. G. S. Barnett has submitted his summary report on the dacite studies and is presently following up with detailed submittals of the individual study problems undertaken. F. T. Graybeal has completed the restudy of the Cactus-Carlota area and the report is in the final stages. He also logged two holes of the renewed drilling by Home Stake. Home Stake closed down the drilling while on the third hole (out of a planned dozen or so) and moved all the core from the drillsite and Miami to an unknown location.
- R. B. Cummings is doing a fine job handling the day to day problems on the project and will submit the monthly progress on the drilling activities.

Chile II

JDS:sh

May 3, 1971

TO: J. D. SELL

FROM: R.B. CUMMINGS

Monthly Report Superior East Project April, 1971

During the month of April, 1971, the following progress was made on the Superior East Project:

Drilling sites A-I and A-4 were constructed; Existing drill holes DCA-2 and OF-IA, were logged by Schlumberger Well Services; Hole A-I was drilled to a depth of 1317 feet and Hole MI-A was deepened from 2400 feet to 2663 feet.

Schlumberger's Logs showed that:

Hole OF-1A was opened to 1860 feet; Hole DCA-2 was opened to 1291 feet; and Hole DCA-3 was opened to 680 feet. A Formation Density Log and an Induction Log were run on Holes OF-1A and DCA-2.

Hole A-I was started April 9th, with a Failing 2500. An Ingersoll-Rand down the hole hammer was utilized with a 9-7/8" rock bit to a depth of 132 feet. From 132 feet to 811 feet, the hole was drilled with a 9-7/8" rock bit only. Circulation was lost at 811 feet. The hole was then cased with a 7" l.D. casing. From this point, the hole was drilled to a final depth of 1317 feet with a 6-1/4" rock bit. Water was encountered from 867 feet. The hole was terminated because of caving. Casing (4" l.D.) was installed to a depth of 1306 feet.

Most of the Hole A-I is in orange dacite. At approximately 1100 feet the color of the dacite gradually changes from orange to brown. The vitrophyre was encountered at about 1250 feet. A light colored tuff unit was encountered at 1305 feet. Cullings from the bottom of the hole (1317 feet) consisted mostly of buff colored, fine grained, sub-rounded to sub-angular quartz grains. It is thought that this material may represent a crushed zone in schist or a sandy layer in the Whitetail conglomerate.

A CP-50 core rig is being used on Hole M-1A. Work started on April 11th. 2400 feet of 3-1/2" 1.D. casing was pulled and 2400 feet of 4" 1.D. casing was installed. Drilling started at a depth of 2400 feet on April 21st. The hole is being drilled with an NC Wire Line Core Barrel. As of April 30th, M-1A had been deepened to a depth of 2663 feet.

The estimated expenditures for the Superior East Project for April, 1971, is \$70,000.00.

and 2641 feet to 2663 feet. This unit has a red matrix with abundant coarse

grained muscovite. Fragments are mostly a light colored granodiorite (Schultze granite) with some fragments as above. Fragments reach 6 inches in diameter. In most cases, fragments show no alteration. Tiny specks of native copper were found through the Whitetail, in the matrix, along fractures

K.B. Cummings Van

RBC:van

cc: WESaegart

and in the fragments.

MONTHLY COST SUMMARY

SUPERI	OR EAST (MA-O	010-)	Project,	Pinal	- Gila	County,	Arizona
					Taller Anna ann an Aire		
CON CTORS!	CHARGES						
						*	

Invoiced during month covering current month's work

Contractor	Statement Amt.
I. R. Compressor Service	\$ 3,200.00 €
Munroe Foster	1,505.00
Schlumberger Well Services	4,527.48
Hagen Construction	625.00
	/ U XL /
	rges covering work through end of current month
Contractor 1. R. Compressor Service Boyles Brothers Drilling	Estimated Cost, 3,200,00 41,300,00
Contractor 1. R. Compressor Service	rges covering work through end of current month Estimated Cost 3,200.00
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ASARCO EXPENSES

Salaries

Name

	Project During Month (show as ratio to total working days in month, i.e., 24/26		
Crittendon	25/25	1265.00	
Cummings	22/25	948 .0 0	
Sell	16/23	1038.00	
Shannon	22/22	630.00	

No. Days Allocated to

3,881.00

Name	No. of Straight Time Hours During	No. of Overtime Hours During	
Amado	Month	Month	
Benavides	120	_25	
Encizo	176	$20\frac{1}{2}$	
Fox	$\frac{107\frac{1}{2}}{127}$		
HITT	136½ 136½	25	
Powell	110	27	
Tewksbury		2 2	
Vallez	$\frac{25\frac{1}{2}}{106\frac{1}{2}}$		
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		Traveling Expenses	
		Incurred During Mo.	
Shannon		900.00	
Sell		270.00	
Cummings .		500.00	
Crittendon		350.00	
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sportation - Compan	y Vehicles		
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į.	to Project Durin	g Month	
Sc 2961	2,200	345.00 160.00	
WT 13840 Nev. PC 7468	1,320 1,900	90.00	
HC 9781	2,400	290.00	
Crittendon	2,000	200.00	
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	And the state of t		
son Office Supervis	ion - To be prepared	by Asst. Chief Geologist	
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		Charge or Est.	
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PROPERTY EXPENSES, INCLUDING LEGAL - To be completed by Propert, Lanager

ltem			Expense	The State
Claim Staking				
Rental Payments (i.e. Sta	te prospecting	permits		
Option Payments				
Property Purchases				
Royalties - Lease Payments	5			
Expenses (i.e. legal)				
			- 	

0.00

OFFICE AND DRILLING RELATED EXPENSES

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Office Rental	75.00
Field Trailer Rental	62.40
Housing Trailer Rental	350,00
Arizona Public Service Co., (Office)	8.69
Arizona Public Service Co., (Trailer)	0.00
Arizona Water Co., Miami, (Office)	5.78
Arizona Water Co., Miami, (Trailer)	0.00
Arizona Water Co., Superior, (Drilling)	0.00
Mountain States Telephone, (Office)	53.00
Mountain States Telephone, (Trailer)	0.00

554.87

TOTAL 69,580.00

AMERICAN SMELTING & REFINERY COMPANY Tucson Arizona

May 4, 1971

Memorandum to: Mr. J. D. Sell

From:

F. T. Graybeal

SUPERIOR PROJECT MONTHLY REPORT, April 1971

The past month was spent mapping and developing an interpretation of the Cactus - Carlota area. The report has been completed and is now being assembled.

F. T. Graybeal

FTG/jmc

June 1, 1971

TO: W. E. Saegart

FROM: J. D. Sell

SUPERIOR EAST PROJECT MONTHLY REPORT MAY, 1971

Attached is a copy of R. B. Cummings' report on the direct drilling cost estimates and simplified drill logs of the holes M-1A and A-4.

Holes M-IA at the end of the month was at 3773 feet and still in White-tail Conglomerate. The hole has now cored 1345 feet of Whitetail with an impressive amount of visible native copper both in the matrix and individual fragments. More altered porphyry fragments are appearing in the lower portion of the holes. Included in the Whitetail figure given above is a slide block of shattered quartz monzonite which was found between 2920 and 3107 feet. The rock is fine grained and fresh though it somewhat resembles the Cactus breccia in texture. Photographing the core prior to splitting for assay has been started, but the failure of the rewind mechanism ruined the first attempt. Re-photographing will commence early next week and upon return of the film the core will be prepared for assay.

Hole A-4 was spudded-in early in the month and encountered 1975 feet of dacite and 102 feet of andesitic basalt before the contractor was terminated. The new contractor (Shelton Drilling) should be set-up next week for the next phase of drilling.

Also attached is the drilling summary report prepared by H. L. Crittendon. A drilling progress map showing old holes and their termination depth with rock type, plus the new penetrations by ASARCO and the Magma shaft with the rock type information is given.

- J. R. King is continuing a sampling program for trace element content of biotites in the Schultze granite, (See memo of L. D. James, May 19, 1971) and has also taken a sample from the quartz monzonite slide block found in drill holes M-IA. King's report on the Silver King area was received and distributed during the month. The alteration area was found not to go under the post-mineral cover and thus is limited in size and metal content.
- F. T. Graybeal's report on the structural analysis of the Cactus-Carlota slide block has been completed and is in final stages of being distributed. Although no unique solution is possible, it is his opinion that the block moved from the west an unknown distance. Upon resumption of coring drill hole A-1, which is now cased at 1317, at the base of the dacite, it is hoped that further helpful information will be available.
- R. D. Falconer's memo on the magnetic interpretation over the plateau area was also distributed during the month, but no real interpretation given.

M. P. Barnes' report on the "Probability of Discovery of a Porphyry Copper Deposit" on the East Superior Project was also received during the month. The revised technique and new data parameters returned a somewhat lower probability than his previous report.

The twenty GIN claims covering the Crown King area have been validated by drilling.

Mr. J. W. Cooksley, Jr., a consulting mining geophysist has started some reflection seismic work to validate our State Lease land in sections 4 and 5 (T 2 S, R 13 E). He will also put spreads over DCA-1 and I-1 for formational control, as well as reinterpreting M-1A with the new control points.

James D. Sell

JDS:sh

EXPLANATION

Previous drill hole ASARCO drill hole

Magma's #9 shaft

DCA-I (hole designation)
40II Tw
Rock type
Bottom hole depth

POST-MINERAL ROCK UNIT

Td - Dacite Tev-Early volcanics Tw-Whitetail

PRE-MINERAL ROCK UNIT

gr - Granite db~Diabase sc - Schist

DRILLING PROGRESS MAP for the month of May, 1971

SUPERIOR EAST
GILA & PINAL COUNTY, ARIZONA
SCALE: I'= I mile J.D.S. 2463

May 28, 1971

TO: J. D. Sell

FROM: R. B. Cummings

MONTHLY REPORT SUPERIOR EAST PROJECT MAY, 1971

During the period May 1 through May 25, 1971 drilling proceeded with some minor delays. Rotary drilling was iniated on hole A-4 on May 1, 1971. The total depth of A-4 as of May 25 was 2077 feet. Hole M-1A was deepened by coring from 2663' to 3551'. A total of 2007 feet were rotary drilled and 888' were cored.

A generalized log of A-4 is attached.

Direct drilling costs through May 25 on A-4 are estimated as follows:

Boyles Brothers - hourly charges	
and water truck	\$16,000.00
Casing and transportation	2,500.00
I.R. Compression Services and fuel	8,500.00
Mission Hammers	1,200.00
Materials, including bits	2,500.00
Samplers	1,500.00
Total	\$32,200.00

This figure represents \$15.50/foot over 2077 feet.

A generalized log of Hole M-1A from 2400 feet (point at which ASARCO started coring) is also attached.

Direct drilling costs from May 1 through May 25 for Hole M-IA are estimated as follows:

Drilling - footage charges	\$14,147.80
Casing time	2,010.00
Water Truck	850.00
Lost circulation materials	3,610.00
Samplers (6 days	450.00

Total

This figure represents \$23.73/ foot.

Robert B. Cummings

\$21,067.80

RBC:sh

cc: WESaegart

Final depth Elevation Coordinates Inclination

ASARCO GEOLOGIC ASSAY LOG

Project .

SUPERIOR EAST

HOLE NO.

A-4

Sheet No.

,

Date Completed Logged by

R.B. Cummings

7	··		·					F10	7]601									<u>LX</u>	gged by N.D. Cummings
From	То	Interval	Size	Spec	Recovery	Assay — Total	% Cu Oxides	Oxides	Mir Py	Cpy	1	Others	Ser	Sil	Alteration Kaol	į.	Others	Rock	Remarks
0	570			-	/6	10101	Oxides	Oxides	<u> </u>	Сру	u	Omers	361	311	Ruoi	1001	Officers		Gray Dacite
570	1030		-					1	-	 					<u> </u>		 		Orange Dacite
								1		 						İ			Brown Dacite
							 												
1776	1970									<u> </u>				ļ					Vitrophyre Brown Dacite
1970	1975			1			†												Vitrophyre
1975	2077	<u> </u>							_										Andesitic Basalt
			-							 									Andestere Basare
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Final depth Elevation Coordinates Inclination

ASARCO SEOLOGIC ASSAY LOG

M-1A Sheet No. Date Completed R. B. Cummings

		Project SUPERIOR EAST M-/A To Interval Size Spec Recovery Assay - % Cu Mineralization Alteration										ote Completed R. B. Cummings							
From	То	Interval	Size	Spec	Recovery %	Total	Oxides	Oxides					Ser					Rock	Remarks
2400	2428																		Andesitic Basalt
2428	2920																		Whitetail Conglomerate
·																			mudstone, gritty shale
																			limy shale and arkose
																			with several thin lim
																			stone beds and Z thin
																			(12' & 25') conglomer
																			ate beds. Traces of e
																			otic native copper
																-			mineralization.
2920	3107.	5															-	-	Quartz Monzonite -
																			slightly porphyritic,
																			brecciated; sheared
	-																		near base. Slide bloc
107.5	3551																		Whitetail Conglomerat
																			poorly sorted conglon
																			ate with schist (60%
																			diabase (20%) and gr
																			itic intrusive (15%)
																			and quartzite (5%)
																			fragments. Weak but p
									•										vasive exotic native
													_						copper mineralization
															-				
				T															

June 30, 1971

TO: W. E. Saegart

FROM: J. D. Sell

Monthly Report - June Superior East Project Pinal County, Arizona

Attached is the monthly drilling report by R. B. Cummings. The depths of the holes as of this morning are: M-lA 5213 feet in limestone-shale with minor specularite and pyrite, and A-4 3041 feet in Whitetail conglomerate. At this date the approximate unexpended authorization for the project is \$90,000., which is sufficient for one additional month of drilling, plus project clean-up. The results to date are not as conclusive as originally hoped for in that the penetrations to pre-mineral rock have not been secured. This is due ONLY to the slowness of drilling and depth and not to the drilling technicalities. It is anticipated that an additional authorization will be requested.

Relogging of M-lA suggests that the Whitetail base is at 4898 feet in the last gritty conglomerate material, with the interval from 4898 - 5108 feet being a very monotonous mudstone with limey characteristics and minor sandy zones (Supai ?). No native copper was noted in the mudstone interval but sparce to trace amounts were noted in the gritty conglomerate horizons. The dense white to grey limestone found below 5108 feet contains a few densely fossiliferous zones and shale zones and some chert zones which occillate with the limestones; this is characteristic of the Naco limestone. Further comparison with known sections will be made.

A core was taken in A-4 between 2708 - 2737 feet and the Whitetail exhibited some native copper as was indicated from the rotary cuttings prior to the core run. Since then (at around 2950 feet), large finger-nail flakes of native copper has been found in the cuttings. Another core will be taken on the next bit change.

As shown in R. B. Cumming's report and his memo on the split core intervals, the cored interval of M-lA from 3370 to 3520 feet has been split and assayed. The fifteen ten-foot intervals averaged 0.154% copper and the duplicates had a low value of 0.075% to a high of 0.348% copper. Additional samples are being prepared and check assays will be made. Photographing of the core is nearly complete and the slides to date have shown the core features very well for a permanent visual record.

Other work expended on the project includes the seismic work by J. R. Cooksley, Jr., primarily on Sections 4 and 5 State Leases. Compilation and integration of the information has not been made as he anticipates securing good one-way velocity measurements from down hole soundings in drill hole M-lA upon its completion (now anticipated at 5500 feet).

Fred Graybeal's excellent analysis of the Cactus breccia displacement has been submitted and distributed.

By following up the earlier suggestion on probing the Miami-Superior hole DCA-1, permission was secured from Inspiration Copper
Company (present claim holder of the drill site) and with one of
their geologists, the hole was found to be blocked at 613 feet.
H. L. Crittendon proposes that a cable-tool rig be secured and the
hole further tested to see if the blocked area can be opened. He
is proceeding in contacting available contractors for this phase.

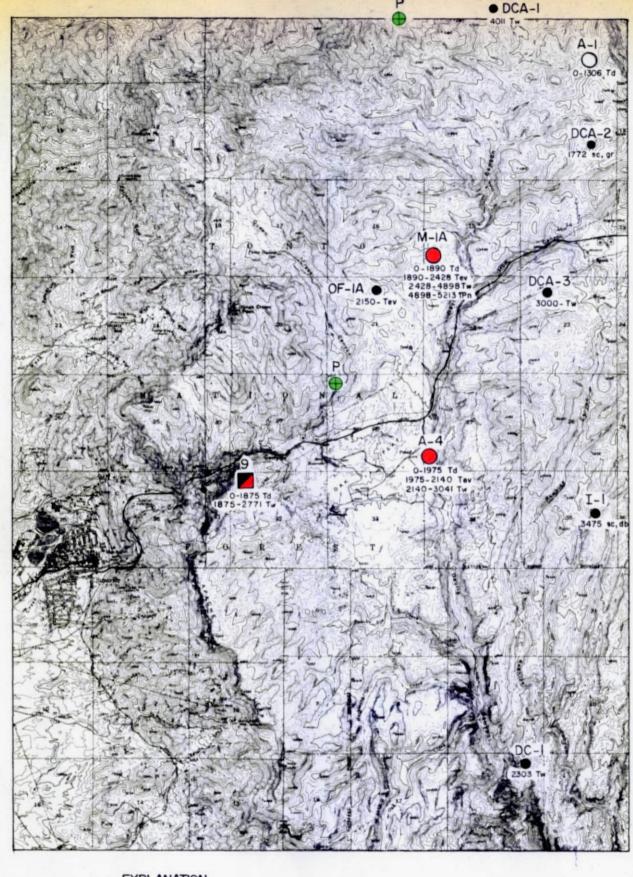
As additional security in protecting a possible find in the proposed root area of Graybeal's, it is proposed that some forty additional claims be staked in the northwest side in the vicinity and south of the Tony Ranch area.

Verbal information indicates that Magma's No. 9 shaft is below 2771 feet, and thru uphole diamond drill information, they anticipate pre-mineral rock at 2960 feet in the shaft. No comment was made on the type of rock unit expected. Word also is out that a diamond drill hole on the 3000 foot level shaft station was drilled to the south and hit mineralization at 170 feet when shortly thereafter, they lost the hole. They are planning another hole to secure more information on the occurrance. Magma has leased and optioned all the Belmont - Grand Pacific land south of Superior for \$800,000. due in 1975.

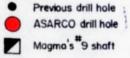
Janes W. Lell J. D. Sell

JDS:van
Att.

cc: WLKurtz



EXPLANATION



DCA-1 (hole designation) 4011 Tw

Rock type
Bottom hole depth Proposed drill site

POST-MINERAL ROCK UNIT

Td - Dacite Tev-Early volcanics Tw-Whitetail

PRE-MINERAL ROCK UNIT gr - Granite db - Diabase

sc - Schist TPn-Naco limestone

DRILLING PROGRESS MAP for the month of June 197/ SUPERIOR EAST

GILA & PINAL COUNTY, ARIZONA SCALE: I'= I mile J.D.S.

2463

June 29, 1971

TO: J. D. Sell

FROM: R. B. Cummings

Monthly Report SUPERIOR EAST PROJECT June, 1971

During the period May 25 through June 25, coring continued without delays on Hole M-1A. Hole A-4 was re-entered by Shelton Drilling Company and drilling was initiated on June 14. Drilling progress was hampered by unforeseen equipment repairs. Hole M-1A was deepened from 3551 feet to 5092 feet (a total of 1541 feet) and Hole A-4 was deepened from 2082 feet to 2879 feet (a total of 797 feet).

A generalized log of Hole A-4 is attached (Attachment 1).

Direct drilling costs from May 25 through June 25, on A-4 are estimated as follows:

Drilling - footage charge	\$14,346.		
Hourly charges - including	g coring		736.
Core bit			2,500.
Site preparation			1,000.
			\$18.582.

A generalized geologic log of Hole M-1A is attached (Attachment 2). Assay results on some of the better native copper mineralization in the Whitetail conglomerate have been received. Fifteen 10' samples were assayed (3370 feet to 3520 feet). They averaged 0.154% Cu. Results are shown on Attachment 3.

An estimate of direct drilling costs on Hole M-1A for the period May 25 through June 25, are as follows:

Drilling - footage charges (1541') \$34,566.

Water Truck 1,400.

Lost circulation materials 1,500.

\$37,466.

R. B. Cummings

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RBC:van



GEOLOGIC LOG

ATTACHMENT	1	
FILE NO.		+
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DIAMOND DRILL HOLE No. A-4

AMERICAN SMELTING & REFINING CO.

TOTAL DEPTH OF HOLE

PROPERTY Superior East Project

LOG BY R B Cummings

	TOTAL D	EPTH OF HOLE		PROPERTY_Super	<u> </u>			LOG BY K B CUMMINGS
DE	PTH	Rock	MIN	ERALIZATION		ALTERA-	HEAVY MINERALS	Drugge
FROM	то	CLASSIFICATION	9%\ 9 5	灵外火灾火火灾	xxxxx	TION	HEAVY MINERALS IN CONCENTRATES	REMARKS
0	570							Gray dacite.
5570	1030						•	Orange dacite.
1030	1772							Brown dacite.
1772	1776							Vitrophyre.
1776	1970							Brown dacite.
1970	1975							Vitrophyre.
1975	2145							Andesitic basalt.
2145	2330							Whitetail conglomerate - limy.mudstone,
2,439								conglomerate, and limestone.
2330	2708		Minor amounts of nat					Whitetail conglomerate - as above
			mineral concentrate.			1		
	2717	Core	Sparce exotic native					Whitetail - brown mudstone
2717	2737	run	11 11 11	11	ļ			Whitetail - conglomerate with QMP, schist
								& diabase fragments. QMP is altered and
								contains oxidized copper minerals.
2737	2862		Minor native copper	in concentrate				Whitetail - limey mudstone, conglomerate,
								and limestone.
2862	2885		Strong native copper	in concentrate and				Whitetail - as above.
			in larger fractions			ļ		
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GEOLOGIC LOG

ATTACHMENT	2	•
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FILE NO		

DIAMOND DRILL HOLE NO. M-1A

AMERICAN SMELTING & REFINING CO.

TOTAL DEPTH OF HOLE PROPERTY Superior East Project

Log BY R B Cummings

DE	PTH	Rock	MIN	ERALIZATION		ALTERA-	HEAVY MINERALS	
FROM	то	CLASSIFICATION	?≯ ₩₹	ŞUL KKU K	፠፠፠	TION	HEAVY MINERALS IN CONCENTRATES	REMARKS
	2428							Andestic basalt.
2428	2920		Traces of exotic na	tive copper				Whitetail conglomerate - mudstone shale
								and arkose with minor thin limestone beds
								and conglomerate beds.
2920	3107.5							Quartz monzonite porphyry - slightly por-
								phyritic, brecciated, sheared near base.
								Slide block.
3107.	53856		Weak but pervasive	exotic native copper	•			Whitetail conglomerate - poorly sorted
							·	conglomerate with schist (60%), diabase
								(20%) granitic intrusive (15%) and quart-
								zite (5%)
3856	4898		Weak but pervasive	exotic native copper	•			Whitetail conglomerate - as above, but
			-					fragments are diabase (55%) QMP (20%) and
	1						·	limestone and quartzite (25%).
4898						* -		Whitetail - gray to red limy mudstone.
5041	5092							Whitetail - gritty conglomerate with 95%
								light gray limestone fragments.
-								
			<u> </u>					
			NA				· · · · · · · · · · · · · · · · · · ·	
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Final depth Elevation Coordinates Inclination

ASARCO GEOLOGIC ASSAY LOG

ATTACHMENT 3 HOLE NO.

Sheet No.

Coordinate Inclination							020					r E			_	M-1	A	Da	ite Completed agged by R. B. Cummings
From	То	Interval	Size	Spec	Recovery %	Assay — Total	% Cu	Oxides		neralizat Cpy		Others	Ser		Alteration	on	Others	Rock	Remarks
3370	3380				/0	0.305		OAIGES	''	Ору	"	Offices	361	3	ixao:	1001	Omera		
3380	3390					0.348						<u> </u>							
3390	3400					0.152													
3400	3410			<u> </u>		0.130				 		1							
3410	3420					0.100							-			ļ			
	3430					0.082										<u> </u>			
	344 0				1	0.092													
	3450					0.110						<u> </u>	.,						
3450	3460					0.090				l l		<u> </u>		 					
3460	3470	<u> </u>	 			0.075		ļ 			<u> </u>								
	3480			-	 	0.130				 		<u> </u>				 			
3480	3490					0.222											<u> </u>		
	3500					0.220													
	3510					0.140													
	3520					0.122													
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June 21, 1971

TO: J. D. Sell

FROM: R. B. Cummings

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SUPERIOR EAST PROJECT HOLE M-1A

On June 12, 1971, fifteen samples from Hole M-1A were delivered to Met-Con Research in Tucson, for sample preparation. These samples are ten foot core splits of Whitetail conglomerate which contain varying amounts of exotic native copper. The samples are to be prepared in such a manner as to eliminate possible errors caused by the presence of native copper.

The sample numbers and corresponding depths are as follows:

SAMPLE NUMBER	DEPTH
M-1A - 1	3370 - 3380
M-1A - 2	3380 - 3390
M-1A - 3	3390 - 3400
M÷1A - 4	3400 - 3410
M-1A - 5	3410 - 3420
M-1A - 6	3420 - 3430
M-1A - 7	3430 - 3440
M-1A - 8	3440 - 3450
M-1A - 9	3450 - 3460
M-1A - 10	3460 - 3470
M-1A - 11	3470 - 3480
M-1A - 12	3480 - 3490
M-1A - 13	3490 - 3500
M-1A - 14	3500 - 3510
M-1A - 15	3510 - 3520

June 21, 1971 J. D. Sell - 2 -After preparation the samples are to be assayed by American Analytical Laboratories and the results will be reconstructed by Met-Con Research. RBC:van

MONTHLY COST SUMMARY

SUPERIOR EAST (MA-001	0-) Project, Pinal - Gila	County, Arizona	
ONTRACTORS! CHARGES			
Invoiced during month o	overing current month's work		
Contractor		Statement Amt.	
Contractor Boyles Bros. Drill Shelton Drilling C Rusty Moore Sperry-Sun Cooksley	ing o.	Estimated Cost 36,500.00 21,550.00 1,000.00 2,300.00	
SARCO EXPENSES Salaries			\$62,350.
Name Cummings Sell Crittendon	No. Days Allocated to Project During Month (show as ratio to total working days in month, i.e., 24/26 25/25 5/22 15/22		
Shannon	22/22		

LI~	nnc	
Wel	aes	

Name Name	No. of Straight Time Hours During	•	
	Month	Month	
Encizo Fox	<u> 119</u> 	<u>23-1/2</u> <u>9-1/</u> 2	
Hill	132-1/2		
Harmon	25-1/2		
Benavidez	176	16	
	· · · · · · · · · · · · · · · · · · ·		
	**************************************	Committee discourse	
	Total Control of the		
			\$1,616.00
Traveling and Living	Eveneras - Calamind	ACARCO Reserved	
Traversite and Ervsins	expenses - sataried	MSAKUU Personnei	
<u>Name</u>		Estimated or Actual	
		Traveling Expenses	
		Incurred During Mo.	
Sell		30.00	
Cummings Crittendon		45.00 326.52	
Shannon		250.00	
D Di 11 - 411		**************************************	0/50 00
Per Diem Living Allowa	ances - Hourly ASARC	0 Personnel	\$652.00
			\$652.00
Per Diem Living Allowa	Applicable N for which Pe	o. of Days	\$652.00
Name	Applicable N for which Pe able During	o. of Days r Diem Pay-	\$652.00
	Applicable N for which Pe	o. of Days r Diem Pay-	\$652.00
Name	Applicable N for which Pe able During	o. of Days r Diem Pay-	\$652.00
Name	Applicable N for which Pe able During	o. of Days r Diem Pay-	
Name Benevidez	Applicable N for which Pe able During 24	o. of Days r Diem Pay- Month	\$288.00
Name Benevidez Supplies - Itemize ind	Applicable N for which Pe able During 24	o. of Days r Diem Pay-	\$288.00
Name Benevidez Supplies - Itemize ind	Applicable N for which Pe able During 24	o. of Days r Diem Pay- Month	\$288.00
Name Benevidez Supplies - Itemize ind Item Kiva Container	Applicable N for which Pe able During 24 lividual purchases o	o. of Days r Diem Pay- Month f \$25.00 or more - Group sma Cost 157.59	\$288.00
Name Benevidez Supplies - Itemize ind Item Kiva Container Gils Compressor	Applicable N for which Pe able During 24 lividual purchases o	o. of Days r Diem Pay- Month f \$25.00 or more - Group sma Cost 157.59 30.00	\$288.00
Name Benevidez Supplies - Itemize ind Item Kiva Container Gils Compressor Schwarz Lumber	Applicable N for which Pe able During 24 lividual purchases o	o. of Days r Diem Pay- Month f \$25.00 or more - Group sma Cost 157.59 30.00 83.67	\$288.00
Benevidez Supplies - Itemize ind Item Kiva Container Gils Compressor Schwarz Lumber Western Auto	Applicable N for which Pe able During 24 lividual purchases o	o. of Days r Diem Pay- Month f \$25.00 or more - Group sma Cost 157.59 30.00 83.67 4.02	\$288.00
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Benevidez Supplies - Itemize ind Item Kiva Container Gils Compressor Schwarz Lumber Western Auto Gila Laundry Mine Supply Har	Applicable N for which Pe able During 24	o. of Days r Diem Pay- Month f \$25.00 or more - Group sma Cost 157.59 30.00 83.67 4.02 10.75 3.47	\$288.00
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<u>Item</u>	Expense	
Claim Staking Rental Payments (i.e. State prospecting permi Option Payments Property Purchases Royalties - Lease Payments Expenses (i.e. legal)	ts	
ICE AID DRILLING RELATED EXPENSES		
<u>Item</u>		
Office Rental	75.00	
Field Trailer Rental	62.40	
Housing Trailer Rental	175.00	
Arizona Public Service Co., (Office)	21.08	
Arizona Public Service Co., (Trailer)		
Arizona Water Co., Miami, (Office)	13.06	
Arizona Water Co., Miami, (Trailer)		
Arizona Water Co., Superior, (Drilling)	70.00	
Mountain States Telephone, (Office)	135.72	
Mountain States Telephone, (Trailer)		
		\$552.

PROPERTY EXPENSES, INCLUDING LEGAL - To be completed by Property Manager

OFF

TOTAL \$69,800.00

Valal from RB Cerminings on Jun 30, 1971.

His figures have only \$74,000 renespendal especiations freeds.

August 2, 1971

TO: W. L. Kurtz

FROM: J. D. Sell

MONTHLY REPORT - JULY 1971 SUPERIOR EAST PROJECT PINAL-GILA COUNTIES, ARIZONA

Attached is the monthly report by R. B. Cummings. The depths as of this morning were: A-1 at 1757 feet and in schist breccia, some pyrite, and zones of fresh schist; A-4, as reported, is cased at 3593 and waiting for the core rig; A-5 has been spudded in and is presently at 85 feet in dacite.

I had anticipated, in A-1, some oxide copper in the fresh schist under the well leached and altered schist praphyry breccia but to date little has been noted. A three foot zone of pyrite was cut between 1742-1745. The lower portion of the hole apparently shows oxidized breccia and fresh schist in alternate bands or zones. It is probably the lower part of the brecciated slide block but no basal fault has been recognized to this point. If fresh schist continues without any exotic copper values the hole will be terminated shortly.

Hole A-4 contains some native copper and the assay values are reported by Cummings. The values are from rotary cuttings and are substantially lower than the values from the coring of M-1A, i.e. 0.07 versus 0.15% copper. The two core runs were of short intervals and the last one had very poor recovery.

The rotary rig has been moved to hole A-5 and is at 85 feet in dacite.

Magma's shaft No. 9 was not visited this month but verbally it was said that a diamond drill up-hole in the shaft position hit Whitetail at the 2960 level. The drill hole collared in the breccia reported in the original reports on the project.

Additional claims are being staked (Eve group) west of DCA-1 and the proposed northern drill hole. Location papers are out on twenty-six of the fourty claims, and the work is continuing in the very rough country, for coverage in the Graybeal proposed root zone area.

The Salt Lake City geophysical department established EM probes in drill hole M-lA but were unsuccessful in placing them at the anticipated depths.

James D. Sell

JDS:sh

August 2, 1971

TO: J. D. Sell

FROM: R. B. Cummings

MONTHLY REPORT SUPERIOR EAST PROJECT JULY, 1971

During the period June 26 through July 25, drilling on the subject area proceeded with some delay. Hole M-lA was deepened by coring from 5092' to a terminal depth of 5322' (a total of 230'). Hole A-l was deepened by coring from 1309' to 1495' (a total of 186'). Hole A-4 was deepened from 2879' to 3593' by rotary drilling. Rotary drilling was hampered by equipment repair and slow penetration rate.

Direct drilling costs on M-1A, A-1, and A-4 for June 26 through July 25 are estimated as follows:

Hole M-lA

Coring - footage charges (230') Pulling Casing - hourly charges	\$6,877.00 300.00
Casing 480' @ \$4.00/foot	1,920.00
Water Truck Lost Circulation Materials	465.00 235.00
	\$9,797.00

Hole A-1

Coring - footage charges (186')	\$1,109.00
Move & Set Up - hourly charges	3,045.00
Water Truck	935.00
Lost Circulation Materials	1,164.00
	\$6.253.00

Hole A-4

Rotary drilling - footage charges	(587')
	\$9,903.00
Coring - hourly charges	736.00
Casing - 3600' @ \$1.40/foot	5,040.00
	\$15,679.00

-2-August 2, 1971 J. D. Sell Attachment 1 is a generalized geologic log of Hole M-1A. A pre-mineral penetration was made but it is not certain if this occurred at 4898' or 5108'. Note that identification of the interval 4898'-5108' is in question. Samples of this material are being examined for microfossils. Assays were received on the interval 3850'-4040'. This interval averaged 0.097% Cu. The highest 10' assay was 0.16% Cu. Hole A-1 penetrated pre-mineral rock (Cactus Breccia) at 1374'. Attachment 2 is a generalized geologic log of Hole A-1. Rotary drilling was terminated on hole A-4 at a depth of 3593' in Whitetail conglomerate. Attachment 3 is a generalized geologic log of Hole A-4. Assays have been received on the interval from 2212'-3108'. A weighted average of the whole interval (896') runs 0.074% Cu while the interval from 2212'-2785' (573') averages 0.050% Cu and from 2785'-3108' (323') averages 0.117% Cu. R. B. Cummings RBC:sh

Final depth
Elevation
Coordinates
Inclination

ASARCO (S) GEOLOGIC ASSAY LOG

HOLE NO.

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M-1A

Sheet No.]
Date Completed
Logged by

Coordinat Inclinatio								Pro	oject _	Supe	rior	Eas	t		- M	1-1A			ate Completed . ogged by
From	То	Interval	Size	Spec	Recovery	Assay —	% Cu		Mir	neralizat	ion			1	Alteration	on		Rock	Remarks
					%	Total	Oxides	Oxides	Ру	Сру	Cc	Others	Ser	Sil	Kaol	Tour	Others		
4898	5041		<u> </u>					ļ	<u> </u>	ļ						<u> </u>			Cret. sediments?
										ļ						-		_	Grey to red limey
		·						<u> </u>									-		mudstone.
5041	5108	<u></u>																	Cret. sediments?
				İ													<u> </u>		Gritty conglomerate.
																	1		95% of the fragments
																			are light grey lime-
																			stone.
5108	5322									1									Penn. Naco limestone
	-						1											•	Light colored crys
							1												stalline limestone
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Final depth Elevation Coordinotes Inclination

ASARCO • GEOLOGIC ASSAY LOG

HOLE NO. Sheet No.

Date Completed Logged by

A-1

Project Superior East A-1

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					%	Total	Oxides	Oxides	Ру	Сру	Cc	Others	Ser	Sil	Kaol	Tour	Others		
<u> </u>	1334					<u> </u>													Brown dacite.
	1374																		Buff to white dacite
1374	1495					Trac	es of	oxi	dize	d Cu	min	eral	•						Cactus Breccia.
																			Matrix-reddish
																			finely ground mater-
																			ial. Fragments sub-
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																			90% schist +10% QM?,
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Final depth Elevation Coordinates Inclination

ASARCO GEOLOGIC ASSAY LOG

Project Superior East

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					%	Total		Oxides				Others	Ser	Sil	Kaol	Tour	Others		
2862	2920							Stro	ng n	ativ	e co	pper		******					Whitetail - as above
				<u> </u>				in c	nce	<u>ntra</u>	te a	nd i	<u>. </u>						
								Large	er f	ract	ions	•							
2920	3092							Mino	r na	<u>tive</u>	cop	per							Whitetail conglomer-
																			ate with schist
	T																		fragments pre-
																			dominating.
3092	3119	Core	run					"		11		11							Whitetail (10% re-
																			covery) as above.
3119	3593			T				- 11		11		•							Whitetail - as above
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SOUTHWESTERN EXPLORATION DEPT. Month JULY , 1971 MONTHLY COST SUMMARY SUPERIOR EAST (MA-0010-) Project, Pinal - Gila County, Arizona CONTRACTORS! CHARGES invoiced during month covering current month's work Contractor Statement Amt. Carley Moore \$6,713.50 \$6,713.50 Estimated balance of contractors! charges covering work through end of current month Contractor Estimated Cost Shelton Drilling Co. \$12,404.00 Boyles Bros. Drilling 17,460.00 Carley Moore 150.00 \$30,014.00

ASARCO EXPENSES

Salaries

Name	No. Days Allocated to
	Project During Month (show as ratio to total
	working days in month,
	i.e., 24/26
Sell	5/21
Shannon	12/23
Crittendon	12/21
Cummings	20/23
	the state of the s

\$2,400.00

ASARCO EXPENSES (Continued)

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	No. of Straight Time Hours During Month	No. of Overtime Hours During Month	
Benavidez	41		
Encizo	62-1/2	2-1/2	
<u>Hill</u>		- 1.46, 1.3 . 1.49 (1.16)	
Harmon Powell		2-1/2	
	220		\$680.00
veling and Living	Expenses - Salaried	ASARCO Personnel	
Name		Estimated or Actual	
		Traveling Expenses	
Sell		Incurred During Mo.	
Cummings		80.00 75.00	
Shannon		150.00	
Crittendon		300.00	
Diem Living Allow	vances - Hourly ASARCO) Personnel	\$605.00
Diem Living Allow	Applicable No for which Per able During N	o. of Days Diem Pay-	\$605.00
	Applicable No for which Per	o. of Days Diem Pay-	\$605.00
Name Benavidez	Applicable No for which Per able During N 5	o. of Days Diem Pay- Month	¢40.00
Name Benavidez Olies - Itemize in	Applicable No for which Per able During N 5	o. of Days Diem Pay- Month \$25.00 or more - Group smal	¢40.00
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Name Benavidez Olies - Itemize in Item Smith Pipe & Steel	Applicable No for which Per able During No 5	o. of Days Diem Pay- Month \$25.00 or more - Group smal Cost \$5,274.82	¢40.00
Name Benavidez Olies - Itemize in Item Omith Pipe & Steel	Applicable No for which Perable During No 5	0. of Days Diem Pay- Month \$25.00 or more - Group smal Cost \$5,274.82 8.42	¢40.00
Benavidez Olies - Itemize in Item Smith Pipe & Steel PABSCO Swede's Cabinet Sh	Applicable No for which Perable During No 5	Cost \$5,274.82 8.42 44.10	¢40.00
Benavidez Olies - Itemize in Item Omith Pipe & Steel PABSCO Swede's Cabinet Sh	Applicable No for which Perable During No 5	Cost \$5,274.82 8.42 44.10	¢40.00
Benavidez Olies - Itemize in Smith Pipe & Steel PABSCO Swede's Cabinet Sh Western Auto Schwarz Lumber	Applicable No for which Perable During No 5	25.00 or more - Group small Cost \$5,274.82 8.42 44.10 3.57 41.20	¢40.00
Benavidez Olies - Itemize in Item Smith Pipe & Steel PABSCO Swede's Cabinet Sh Vestern Auto Schwarz Lumber Central Drug	Applicable No for which Perable During No 5	Cost \$5,274.82 8.42 44.10 3.57 41.20 19.32	¢40.00
Benavidez Olies - Itemize in Smith Pipe & Steel PABSCO Swede's Cabinet Sh Western Auto Schwarz Lumber	Applicable No for which Perable During No 5	Cost \$5,274.82 8,42 44.10 3.57 41.20 19.32 157.59	¢40.00
Benavidez Dies - Itemize in Item Smith Pipe & Steel PABSCO Swede's Cabinet Sh Vestern Auto Schwarz Lumber Central Drug Kiva Can	Applicable No for which Perable During No 5	Cost \$5,274.82 8,42 44.10 3.57 41.20 19.32 157.59 19.08	¢40.00
Benavidez Dlies - Itemize in Item Emith Pipe & Steel PABSCO Swede's Cabinet Sh Western Auto Schwarz Lumber Gentral Drug Kiva Can Lily Co.	Applicable No for which Perable During No 5	Cost \$5,274.82 8,42 44.10 3.57 41.20 19.32 157.59	¢40.00
Benavidez Dlies - Itemize in Item Emith Pipe & Steel PABSCO Swede's Cabinet Sh Western Auto Schwarz Lumber Gentral Drug Kiva Can Lily Co.	Applicable No for which Perable During No 5	Cost \$5,274.82 8,42 44.10 3.57 41.20 19.32 157.59 19.08	¢40.00
Benavidez Dlies - Itemize in Item Chith Pipe & Steel PABSCO Swede's Cabinet Sh Western Auto Schwarz Lumber Central Drug Kiva Can Lily Co.	Applicable No for which Perable During No 5	Cost \$5,274.82 8,42 44.10 3.57 41.20 19.32 157.59 19.08	¢40.00
Benavidez Dlies - Itemize in Item Chith Pipe & Steel PABSCO Swede's Cabinet Sh Western Auto Schwarz Lumber Central Drug Kiva Can Lily Co.	Applicable No for which Perable During No 5	Cost \$5,274.82 8,42 44.10 3.57 41.20 19.32 157.59 19.08	¢40.00

Vehicle License	Expense Chargable Cur	rent Month	\$ <u>558.00</u>	
Vehicle License	Transportation - Company	Vehicles_		\$558.0
to Project During Month XC 6962			argable	
XC 6962	venicle License	to Project Durin	ng Month	
## ## ## ## ## ## ## ## ## ## ## ## ##	XC 6962			
SC 1859	нс 9781		<u> </u>	
SC 2961 HC 9783 B00 B0. FC 250 B0. S620 Tucson Office Supervision - To be prepared by Asst. Chief Geologist Name Days Charge or Est. Expense for Assaying American Analytical Met Con Lab Freight Carrier Charge Charge S220 S220 S220	PC 7468		— 155.	
HC 9783 250 50. Tucson Office Supervision - To be prepared by Asst. Chief Geologist Name Days R EXPENSES Assaying Assayor Charge or Est. Expense for Assaying Performed During Month 120.00 100.00 Freight Carrier Charge Misc.				
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R EXPENSES Assaying Assayor Charge or Est. Expense for Assaying Performed During Month 120.00 100.00 Freight Carrier Charge S220	Tucson Office Supervision	- To be prepared	by Asst. Chief Geologist	
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\$220 Freight Carrier Charge	American Analytical		120.00	
Carrier Charge	Met Con Lab		100.00	
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				-

PROPERTY EXPENSES, INCLUDING LEGAL - To be completed by Property Manager

Item Claim Staking Rental Payments (i.e. State prospecting perm Option Payments Property Purchases	Expense Its	
Royalties - Lease Payments Expenses (i.e. legal)	145.00	\$145.00
OFFICE AND DRILLING RELATED EXPENSES		
<u> Item</u>		
Office Rental	75,00	
Field Trailer Rental	62.40	
Housing Trailer Rental	175.00	
Arizona Public Service Co., (Office)	28.18	
Arizona Public Service Co., (Trailer)		
Arizona Water Co., Miami, (Office)	14.19	
Arizona Water Co., Miami, (Trailer)		
Arizona Water Co., Superior, (Drilling)	60.00	
Mountain States Telephone, (Office)	121.57	
Mountain States Telephone, (Trailer)		

\$536.34

TOTAL \$48,135.59

AMERICAN SMELTING AND REFINING COMPANY Tucson Arizona

September 1, 1971

TO: W. L. Kurtz

FROM: J. D. Sell

MONTHLY REPORT - AUGUST 1971 SUPERIOR EAST PROJECT PINAL - GILA COUNTIES, ARIZONA

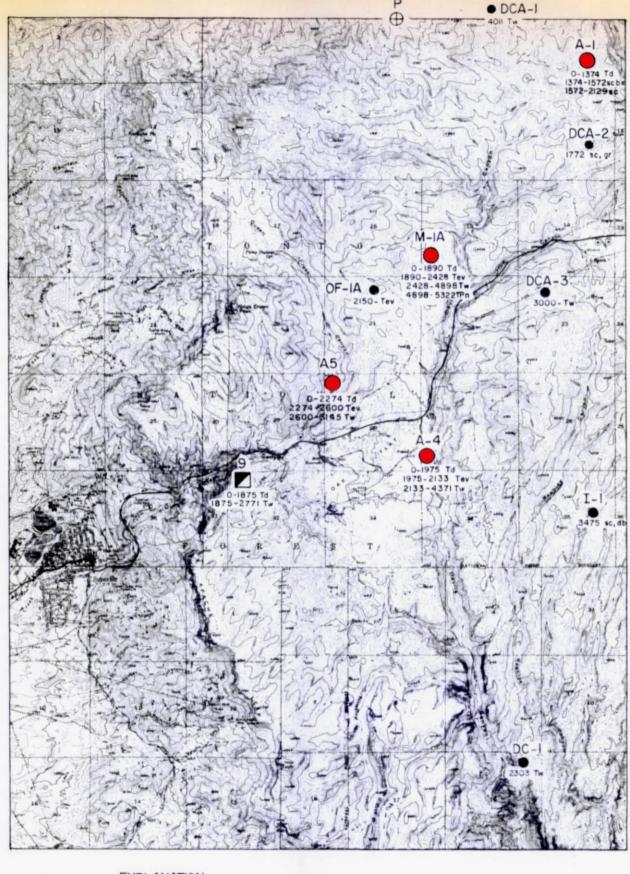
Attached is the monthly report by R. B. Cummings. As of this morning, the core rig at A-4 is at 4371 feet coring in Whitetail Conglomerate. Cooksley tentatively places a velocity contact between 4500 and 4800 feet in the vicinity of the hole. Drill hole A-5 has been rotaried to 3145 feet and 4" casing has been set and cemented. DCA-1, the Inspiration controlled hole, has been successfully probed to the bottom at 4011 feet (4015 cable driller). The water level is at 800 feet with the old mud level at 3500 feet. It is now awaiting ICC signature for placing of 4" casing. A-1 was bottomed in weakly altered schist with minor quartz-pyrite at 2129 feet. DCA-3 was probed by the cable tool and "metal" was found at 485 feet. With the success of cleaning out DCA-1 it would be worth while to consider reentering DCA-3 and determining the character of the metal -- perhaps by use of a down-the-hole camera -- milling it out and continue cleaning by cable tool means.

Forest Service photos have been secured and will be used by J. R. King in studying the outcrops around the Bohme-Hanna area between Inspiration and Castle Dome.

The fault problem ideas from the information in A-1 will be covered in a separate memo. Rocks for thin-section study secured from core and outcrop of Whitetail Conglomerate and Cactus Breccia have been secured and prepared and will be studied.

James D. Sell

JDS:sg Attach.



EXPLANATION

Previous drill hole ASARCO drill hole

Magma's #9 shaft

DCA-1 (hole designation)
4011 Tw
Rock type
Bottom hole depth

Proposed drill site

Tw-Whitetail

Td - Dacite

POST-MINERAL ROCK UNIT

Tev-Early volcanics

PRE-MINERAL ROCK UNIT gr - Granite db-Diabase sc - Schist TPn-Naco limestone

DRILLING PROGRESS MAP for the month of August SUPERIOR EAST GILA & PINAL COUNTY, ARIZONA SCALE: I'= I mile J.D.S.

2463

AMERICAN SMELTING AND REFINING COMPANY Tucson Arizona

August 30, 1971

TO: J. D. Sell

FROM: R. B. Cummings

MONTHLY REPORT SUPERIOR EAST PROJECT August, 1971

During the period July 26 through August 25, drilling continued without delay. Hole A-1 was cored from 1495' to a terminal depth of 2129' (a total of 634'). Hole A-4 was reentered and cored from 3593' to 4060' (a total of 467'). Rotary drilling was initiated in hole A-5 and a total of 2930' was drilled.

Direct drilling costs on A-1, A-4, and A-5 for July 26 through August 25 are estimated as follows:

Hole A-1

Coring - footage charges (634')	\$8,936.60
Moving - hourly charges	150.00
Water Truck	765.00
Lost Circulation Materials	2,355.05
	\$12,206.65

Hole A-4

Coring - Footage charges (467')	\$ 9,151.10
Move and Set Up - hourly charges	2,400.00
Water Truck	635.00
Lost Circulation Materials	942.60
	\$13,128.70

Hole A-5

Rotary Drilling .	- footage (2930')	charges	\$35,127.00
Mobilization	,		1,000.00
Coring - hourly	charges		920.00
			\$37,047.00

Attachment 1 is a generalized log of Hole A-1. The base of the Cactus Breccia was found at 1572'. A strong fault zone was found from 1572' to 1585'. Below this point (to the terminal depth of 2129') the cored rock was schist, brecciated schist and schist breccia. The schist is weakly altered and

See Attachment 3 for a generalized log.

R. B. Cummings

RBC:sg attach.

PROPERTY Superior East

MINING DISTRICT Pioneer

COUNTY, STATE Pinal County, Arizona

DRILL HOLE A-1
FINAL DEPTH 2129

NE¼ SW¼ SE¼, Sec. 2, T 1 S, R 13 E

PAGE 1 Of 2

DATE 4/9/71 - 8/12/71

Los ByR.B.Cummings

DEF	•тн				
FROM	то	ROCK	MINERALIZATION	ALTERATION	REMARKS
0	1100	Td			Dacite - orange
1100	1250	Tđ		The state of the s	Dacite - brown
1250	1297	Td			Vitrophyre
1297	1309	Tđ			Light colored tuff
1309	1332	Tđ	Note: core drilling initi	ated at 1309'	Dacite - Brown
1332	1374	Td		**************************************	Tuff- buff colored
1374	1527	pCpi-b>	Traces of oxidized Cu		Cactus Breccia, Matrix - reddish
			minerals near top		to brownish finely ground rock
					material. Fragments - sub-rounded
					to sub-angular; mostly schist with
					0-5% QM.; mostly fresh, some strong
					alteration
1527	1566	Tw?			Whitetail(?)coarse grained water
					lain lithic tuff. Bedding 250to 400
					axis of core.
1566	1572	p€pi-bx			Cactus Breccia as 1374-1532
1572	1585	fault			Fault zone in strongly sheared schi
					(shearing vertical to 40° from
					horizontal).
1585	1775	p€pi	Traces of py. 0-1% FeOx-	Secondary SiO2 on	Pinal Schist. Qtz-sericite and qtz-
		·	py on fractures	fractures	sericite-chlorite schist. Well
			Wk. qtz. veining		fractured and brecciated.

PROPESUPERIOR East

MINING DISTRICT Pioneer

County, State Pinal County, Arizona

DRILL HOLE A-1
FINAL DEPTH 2129

PAGE 2 of 2

DATE _____

Log By R.B.Cummings

DEPTH DEPTH				TIMAL DEFINITION	Log By R.B.Cummings
FROM	TH	ROCK	MINERALIZATION	ALTERATION	REMARKS
1775	2129	p€pi	Sulfide zone 1/2% to 3%	Secondary SiO2 and some	Pinal Schist as 1585-1775'.
			py. and trace cpy on	Sericite	
			fractures - some pre-		
			ference for horizontal		
			control.	•	
END OF	HOLE				

PROPERTY Superior East
MINING DISTRICT Pioneer
COUNTY, STATE Pinal County, Arizona

DRILL HOLE <u>A-4</u>

FINAL DEPTH______ SW\(\frac{1}{4}\) SW\(\frac{1}{4}\) SW\(\frac{1}{4}\) SEC. 27

PAGE 1 of

DATE 5/1/71
Log ByR.B.Cummings

						IS, R	13 E
	PTH	ROCK					
FROM	то	ROCK	MINERALIZATION		ALTERATION		REMARKS
0	570	Td		1. 			Dacite - gray
570	1030	Td					Dacite - orange
1030	1772	Td					Dacite- brown
1772	1776	Td				-	Vitrophyre
1776	1970	Tđ				•	Dacite - brown
1970	1975	Tđ					Vitrophyre
1975	2133	Tev					Andesitic basalt
2133	2330	Tw					Whitetail - limy mudstone con-
							glomerate, and limestone.
2330	2920	Tw	Minor exotic native	coppe	r 2703'-2737'-core	run	Whitetail - as above
2920	4060	Tw	Minor exotic native	coppe	r 3092'-3119'-core	run	Whitetail conglomerate with brown
		·			coring initiated @	3593'	gritty matrix. Fragments are
							approximately 80% schist, 15%
							diabase, and 5% QM and quartzite.
							Minor fine grained silty or muddy
							zone - horizontal
1.		:					

PROPERTY Superior East

Mining District Pioneer

County, STATE Pinal County, Arizona

DRILL HOLE _____ SE¼ SE¼ NW¾ Sec. 28

FINAL DEPTH_____ T 1 S, R 13 E

PAGE 1 of

DATE 7/29/71
Log By R.B. Cummings

DEPTH					
FROM	TO	ROCK	MINERALIZATION	ALTERATION	REMARKS
0	625	Tđ			Dacite - gray
625	185 7	Td	1335'-1358' - Core run		Dacite - orange
1857	2099	Td			Dacite - brown
1099	2159	Td			Dacite - brown with vitrophyre
2159	2274	Тđ		<u> </u>	Tuff - fine grained, gray to cream
2274	2600	Tev			Black andesitic basalt with some
					imterbedded light green crystal tuf
2600	2930	Tw	Traces of exotic native		Whitetail - gritty mudstone with
			copper.		some limestone
1					

AMERICAN SMELTING AND REFINING COMPANY Tucson Arizona

October 4, 1971

TO: W. L. KURTZ

FROM: J. D. SELL

MONTHLY REPORT - SEPTEMBER, 1971 SUPERIOR EAST PROJECT PINAL - GILA COUNTIES, ARIZONA

Attached is the monthly report by R. B. Cummings. At the end of the month the core drill on A-4 was at 5523 and in a nearly monolithologic schist conglomerate with minor diabase and altered intrusive clasts. This extreme thick section of Whitetail Conglomerate far exceeds our expectations although it was known that the site location is along the axis of the Superior Syncline expressed by the Paleozoic units exposed at Superior. Preliminary interpretation of the seismic suggested we were in a graben area.

Previously drill hole DCA-1, which was cleared out last month, has been cased and capped and is now awaiting a core rig for continuing below the 4011 depth. Checking of claim dates has apparently determined that Continental Copper's claim over the drill site preceded ICC's claim, and therefore the hole is on ASARCO controlled ground.

The old drill hole DCA-3 was probed using a down-the-hole camera (Les Price, Arizona Underground Survey, Eloy, Arizona) and it was determined that the churn drill "metal" obstruction at 485 was not there - probably it was a crooked hole and the long churndrill probe was binding at that point - whereas, the Schlumberger obstruction at 680 feet was found to be a mud bank on one side of the hole (at another kink in the hole). The apparent strong deviations in the hole and its small size has lead to the conclusion that to further pursue the idea of cleaning and placing NX casing (versus NC in DCA-1) is not to our advantage. Crittendon is securing bids on down-the-hole hammer drilling with sufficient air to do the job. To date, our testing of drilling techniques by air has not been satisfactory as the previous contractors were not set-up, or willing, to pursue the job in the proper manner.

Crittendon has also heard that Superior Oil is bringing in a large capacity (\$15,000.00 mobilization charge) rig from Texas to drill a hole "out of Superior on the dacite". As I see it, only three possibilities exist:

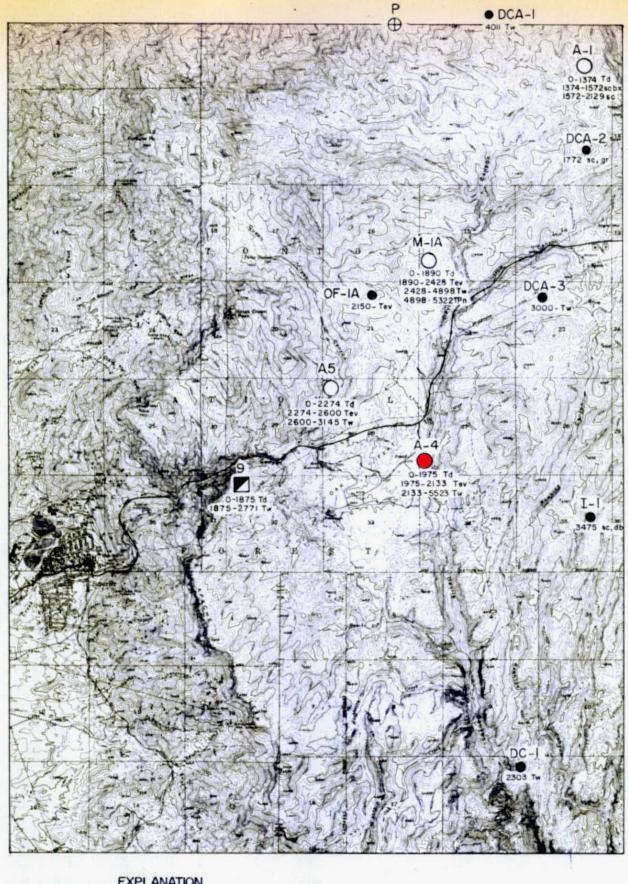
1) State land to the south, 2) Oak Flat, and 3) Joint venture with Magma. The road work is to be started this week by Rusty Moore.

King and Rees are continuing to study around the Bohme-Hanna ground.

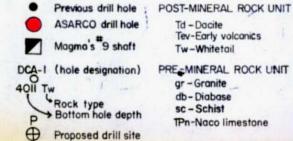
Cooksley now has the acustical probe for one-way velocity measurements and will probe A-4 this week.

Caudi DSell James. D. Sell

JDS:sg attach.



EXPLANATION



DRILLING PROGRESS MAP for the month of _Sept. /97/ SUPERIOR EAST GILA & PINAL COUNTY, ARIZONA SCALE: " = I mile J.D.S. 2463

AMERICAN SMELTING AND REFINING COMPANY Tucson Arizona

October 4, 1971

TO: J. D. Sell

FROM: R. B. Cummings

MONTHLY REPORT SUPERIOR EAST PROJECT SEPTEMBER, 1971

During the period August 26 through September 25 drilling progressed well. Hole A-4 was deepened from 4060' to 5342. Hole A-5 was deepened from 2930' to a final rotary depth of 3145'. Casing (4") was set at that depth. Hole DCA-1 was cleaned out with a churn drill and cased with 4" casing to a depth of 3978'. An attempt was made to clean out DCA-3 in a like manner but was not successful. A down-the-hole camera survey revealed a mud bridge at 677'.

Direct drilling costs on A-4 and A-5 are estimated as follows:

Hole A-4

Coring - footage charges (1282) Water Truck Materials	\$32,179.80 1,400.00 1,100.25
TOTAL	\$34,680.05
Hole A-5	
Rotary Drilling - Footage charges (215) Casing, etc.	\$ 3,585.00 5,140.00
TOTAL	\$ 8,725.00

Hole A-5 was cased in Whitetail conglomerate. See Attachment 2 for a generalized geologic log. Hole A-4 is still in Whitetail conglomerate. A lithic tuft unit was found from 5083 to 5102. Exotic cuprite was found disseminated in the tuft and along fractures in the conglomerate below the tuft to a depth of 5336. Attachment 1 is a geologic log of A-4.

R. B. Cummings

RBC:sg attach.

PROPERTY Superior East
MINING DISTRICT Pioneer

DRILL HOLE A-4
FINAL DEPTH

SW1/4 SW1/4 SW1/4 Sec.2

DATE 5/1/71 -Log By R. B. Cummings

PAGE 1 of 2

County, State Pinal County, Arizona

Cou	INTY, STATE	Final CO	unty, Arizona	TIS, R	13 E Log By N. B. Cullantings
DE:	РТН ТО	ROCK	MINERALIZATION	ALTERATION	REMARKS
0	570	Td			Dacite - gray
570	1030	Td			Dacite - orange
1030	1772	Td			Dacite - brown
1772	1776	Td			Vitrophyre
1776	1970	Td			Dacite - brown
1970	1975	Td			Vitrophyre
1975	2133	Tev			Andesitic basalt
2133	2330	Tw			Whitetail - limy mudstone conglomerate
		N., 1			and limestone.
2330	2920	Tw	Minor exotic native copper. 2	703'-2737'-core run	Whitetail - as above
2920	4161	Tw	Minor exotic native copper. 3	92'-3119'-core run	Whitetail conglomerate with brown gritty
			coring initiated at 35931		matrix. Fragments are approximately 80%
					schist, 15% diabase, and 5% QM and
					quartzite. Minor fine grained silty or m
					muddy zones - horizontal.
4161	5083	Tw	Minor exotic native copper		Whitetail - conglomerat as above but
					fragments are 45% diabase, 35% schist,
					20% limestone and quartzite and traces of
					QM. Bedding - 15°.
5083	5102	Tw	Wk. exotic cuprite on fracture	e S	Whitetail - fine grained lithic tuft.
			and in disseminated blebs.		
			Cu estimated at 0.2% - 0.3%.		

PROPERTY Superior East Project
Mining District

DRILL HOLE ____

FINAL DEPTH_____

PAGE 2 of 2

Col	UNTY, STATE			FINAL DEPTH	Log By
DE	PTH				
FROM	то	ROCK	MINERALIZATION	ALTERATION	REMARKS
5102	5336	Tw	Minor to wk. amounts of ex-		Whitetain conglomerate with reddish brown
			otic cuprite, native copper,		matrix. Fragments are 45% schist, 35%
			and malachite. Mostly on		diabase, 20% limestone and quartzite, and
			fractures and fragment bounda	ries.	traces of QM.
5336	5342	Tw			Whitetail conglomerate with light brownish-
					red matrix. Fragments are 85% schist,
					and 15% diabase, quartzite, limestone,
					and QM.



PROPERTY Superior East Project

MINING DISTRICT Pioneer

County, STATE Pinal County, Arizona

DRILL HOLE A-5

FINAL DEPTH _____ SE1/4 SE1/4 NW1/4 Sec.28

T 1 S, R 13 E

PAGE 1

DATE 7/29/71
Log By R. B. Cummings

DEPTH					
FROM	ТО	ROCK	MINERALIZATION	ALTERATION	REMARKS
0	625	Td			Dacite - gray
625	1857	Td	1335'-1358' - Core run		Dacite - orange
1857	2099	Td			Dacite - brown
20 99	2159	Td			Dacite - brown with vitrophyre
2159	2274	Td			Tuff - fine grained, gray to cream
2274	2600	Tev			Black andesitic basalt with some inter-
					bedded light green crystal tuff
2600	2999	Tw	Traces of exotic native copper		Whitetail - gritty mudstone with some
					limestone
2999	3145	Tw	Traces of exotic native copper		Whitetail conglomerate with mainly
					schist fragments and minor gritty mud-
	· .				s tone.
		· .			
	· .				

AMERICAN SMELTING AND REFINING COMPANY Tucson Arizona

November 8, 1971

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report - October 1971 Superior East Project Pinal-Gila Counties, Arizona

Attached is the monthly report by R. B. Cummings. At the end of the month, the core drill on A-4 was at 6588 feet in heavily faulted, sheared, and brecciated biotite quartz monzonite of probable Tertiary age. The intrusive rock is porphyritic, contains numerous inclusions of schist, and has substantial orthoclase alteration patches and veining. Pyrite is disseminated, but chalcopyrite and molybdenite are found principally along some orthoclase and quartz veinlets.

As reported in R. B. Cumming's log, a block of limestone and limestone breccia was cut from 6339 to 6448 with Whitetail Conglomerate from 6448 to 6484. At 6484, replaced limestone (probably Mississippian in age) and limestone breccia were cut to a depth of 6571. The replaced limestone contains massive oxidized hematite-limonite in variable amounts and contains appreciable native copper to a depth of 6539. The base of the limestone section is sheared and a "cemented" fault gauge was cut from 6571 to 6575. An open fault and breccia zone was then penetrated to 6588 at the end of the month. The rock, an intrusive biotite quartz monzonite, becomes less sheared away from the fault contact.

The entire units cut are being sampled for assay purposes and selected units prepared for thin-section identification. The intrusive rock will also be age dated, as it has several characteristics suggesting a possible Precambrian age.

Some assays are available and show:

2212-2785 = 573 feet at 0.05% copper 2785-3138 = 353 feet at 0.12% copper 3138-3593 = 455 feet at 0.06% copper 3593-5070 = assays not available 5070-5080 = 10 feet at 0.03% copper 5080-5350 = 270 feet at 0.89% copper 5350-5680 = 330 feet of approximately 0.08% 5680-5810 = 130 feet at 0.86% copper 5810-5970 = 160 feet at 0.16% copper 5970- = assays not available

The sampled interval from 5080-5810 = 730 feet of 0.53% copper.

All of the above assays are principally native copper in the Whitetail Conglomerate. Coring started at 3593 and the assays represent samples of split core. Above 3593 the assays are on splits of the rotary cuttings.

Cummings has completed Drill Hole Summaries and Costs on M-1A (total), A-1 (total), A-4 (rotary portion), and A-5 (rotary portion). Summaries on Daily Drill Data-Unit Contacts have also been completed for the cored portions of holes M-IA, A-I, and A-4. Memorandums on the remaining portions of the respective holes are in progress, as are Drill Hole Assay Result Logs.

In compliance with the agreement between ASARCO and Continental Copper, a Quarterly Report was submitted for the work ending October 1 covering Continental's ground.

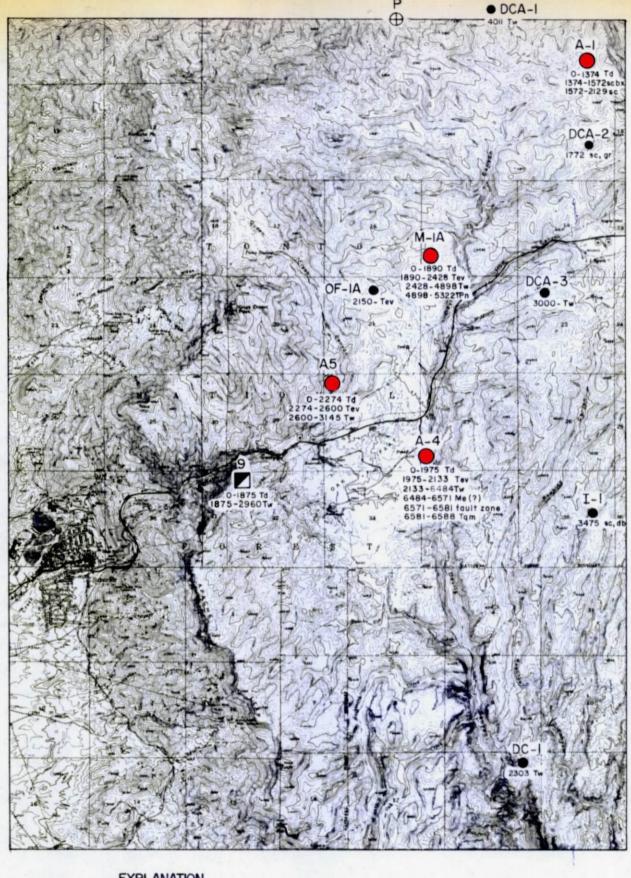
A bore hole survey of drill hole A-4 was run by H. L. Crittendon and the results distributed. Three readings were taken (to 5760) and the fourth point projected to 6500. At this depth the hole is estimated to have drifted only 396 feet, S4°40'W from the collar.

Mr. J. Cooksley was unable to test the down-the-hole velocity equipment during the month, but the work was accomplished early in November.

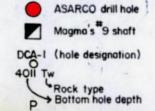
Clyde Rees continues to work in the Miami area and has found several interesting facets previously unknown. One is several areas of Manitou Hill type intrusive east of the suspected Needle Mountain fault and another is tourmaline near the newly reported Barney ore-body area. Integration of information continues. James W Self

James D. Sell

JDS: lad Attach.



EXPLANATION



Proposed drill site

Previous drill hole

POST-MINERAL ROCK UNIT

Td - Dacite Tev-Early volcanics Tw-Whitetail

PRE-MINERAL ROCK UNIT

gr - Granite Me-Escabrosa Limestone db-Diabase Tbx-breccia Tam-Quartz Monzonite sc - Schist

TPn-Naco limestone

DRILLING PROGRESS MAP for the month of Oct. 1971 SUPERIOR EAST GILA & PINAL COUNTY, ARIZONA SCALE: 1'= 1 mile J.D.S. J.D.S. 2463

AMERICAN SMELTING AND REFINING COMPANY Tucson Arizona

November 1, 1971

TO: J. D. Sell

FROM: R. B. Cummings

MONTHLY REPORT

SUPERIOR EAST PROJECT

OCTOBER, 1971

Core drilling progressed very well on hole A-4 during the month (September 26 through October 25). A-4 was deepened from 5342' to 6461' (a total of 1119'). Direct drilling costs are estimated as follows:

Hole A-4

Coring -	footage charges	1119'	\$35,563.10
Water Tr	ıcks		1,400.00
Materials	3		1,185.50
Hourly cl	narges - survey		90.00
		TOTAL	\$37,238.60
		IUIAL	337,230.00

The hole penetrated limestone breccia at 6339'. (See attachment 1 for a geologic log of A-4.) The limestone is thought to be Mississippian Escabrosa limestone. The limestone is mineralized with exotic native copper, cuprite, chrysocolla, and tenorite. Traces of Fe0x \rightarrow py are seen. The hole goes back into Whitetail at 6447.5. Weak shearing is present in the base of the Escabrosa and the top of the Whitetail. The limestone intersection is interpreted to be a slide block.

Several assays have been received from the zone of strong cuprite. They are as follows:

Sample No.	<u>Depth</u>	<u>Interval</u>	<u>% Cu</u>	% Cu0x
A-4-C4	5070-5080	101	0.03	0.01
A-4-C5	5080-5090	10'	1.36	1.01
A-4-C6	5090-5100	101	1.24	0.93
A-4-C7	5195-5215	20'	1.38	0.90

Samples have been split and are being prepared for assay from the rest of the hole below the lithic tuff unit.

R. B. Cummings

RBC:sg attach.

PROPERT	y Super	or East	 	-
		Pioneer		

County, STATE Pinal County, Arizona

DRILL HOLE A-4

PAGE 1 of 3 DATE 5/1/71 -

FINAL DEPTH_

SW1/4 SW1/4 SW1/4 Sec.27 T 1 S, R 13 E

Log By R. B. Cummings

DE	PTH			1 1 3,	K 13 L	
FROM TO		ROCK	CK MINERALIZATION ALTERATION	ALTERATION	REMARKS	
0	570	Td			Dacite - gray	
570	1030	Td			Dacite - orange	
1030	1772	Td			Dacite - brown	
1772	1776	Td			Vitrophyre	
1776	1970	Td			Dacite - brown	
1970	1975	Td			Vitrophyre	
1975	2133	Tev			Andesitic basalt	
2133	2330	Tw			Whitetail - limy mudstone conglomerate	
					and limestone.	
2330	2920	Tw	Minor exotic native copper. 2703'-	2737'-core run	Whitetail - as above	
2920	4161	Tw	Minor exotic native copper. 3092'-	3119'-core run	Whitetail conglomerate with brown gritty	
· · · · ·			coring initiated at 35931		matrix. Fragments are approximately 80%	
e i					schist, 15% diabase, and 5% QM and	
					quartzite. Minor fine grained silty or n	
-					muddy zones - horizontal.	
4161	5083	Tw	Minor exotic native copper		Whitetail - conglomerat as above but	
					fragments are 45% diabase, 35% schist,	
					20% limestone and quartzite and traces of	
					QM. Bedding - 15°.	
5083	5102	Tw	Wk. exotic cuprite on fractures		Whitetail - fine grained lithic tuft.	
			and in disseminated blebs.			
·			Cu estimated at 0.2% - 0.3%.			

AMERICAN SMELTING & REFINING CO.

GEOLOGIC LOG

A-4

Superior East Project MINING DISTRICT DRILL HOLE ____ FINAL DEPTH____ COUNTY, STATE

PAGE 2 of 3 DATE ____

Log By____

ROCK MINERALIZATION ALTERATION FROM TO REMARKS 5102 5336 Tw Minor to wk. amounts of ex-Whitetain conglomerate with reddish brown otic cuprite, native copper, matrix. Fragments are 45% schist, 35% diabase. 20% limestone and quartzite, and and malachite. Mostly on fractures and fragment boundaries. traces of OM. 5336 Tw 5644 Whitetail conglomerate with light brownish red matrix. Fragments are 85% schist, and 15% diabase, quartzite, limestone, and QM. 5644 6068 Tw Sparce native copper and cuprite Whitetail. Schist conglomerate (as 5336in Schist Cg. Wk to strong native 5644) interbedded with typical type concopper in some areas of the glomerate (dark brn. gritty matrix and typical Cq. Better areas as fragments - 45% diabase, 35% schist, 20% follows: 5687-5707, 5717-36, limestone, quartzite and mudstone, and 5740-83, 5800-13, 6019-41. traces of OM. 6068 6339 Tw Trace to strong native copper Whitetail. Typical type conglomerate as from 6068-6190. Sparce native above. Sediments and QM fragments total copper from 6190-6339. 30-40%. Escalussa? Limestone Breccia. Gray, fine to medium 6339 6386 Trace to strong native copper Me? (exotic) on fractures. Sparce grained limestone gragments up to 2". Fe0x \rightarrow py. Spaces between fragments filled with greenish and reddish talcy gouge. Slickensides common.

PROPERTY	Superior	East	roject	
				100
MINING DISTE	PICT			

DRILL HOLE A-4

PAGE 3 of 3

DATE _____
Log By____

COUNTY, STATE

FINAL DEPTH____

DEPTH						
FROM	то	ROCK	MINERALIZATION	ALTERATION	REMARKS	
6386	6396		Very strong native copper, and		Gouge Zone. High angle (60°-80°) fractur	
			cuprite with chrysocolla and		with reddish talcy gouge, silicified lime	
-			tenorite - all exotic.		stone, and limestone fragments.	
6396	6422	Me?	Very strong chrysocolla with		Limestone Breccia. Gray medium grained	
			some cuprite and tenorite to		limestone gragments up to 6". Matrix is	
			6407.5. Sparce Fe0x → py.		chrysocolla to 6407.5 and reddish gouge	
					to 6422.	
6422	6423				Fault gouge. Hemetitic. 70°	
6423	6437	Me?	Sparce native copper.		Escaluosa? Limestone Breccia. Similar to above.	
					Matrix is ground limestone with hemetitic	
					stain.	
6437	6438				Fault gouge. Hemetitic. 70°.	
6438	6447.5	Me?	Moderate amounts of native		Escoliosa? Limestone Breccia. Fragments are angular	
			copper in matrix.		gray, very fine grained limestone (?).	
					Matrix is reddish brn. gritty material.	
					Weak shearing (0-45°) near base.	
6447.5	6461	Tw	Moderate native copper.		Conglomerate. Reddish brn. to brown	
					gritty matrix. Fragments 60% limestone,	
					30% qtz. porphyry, and 10% diabase and	
					schist(?). Some shearing (30°-60°) at	
					6447.5 to 6452.	

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

December 7, 1971

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report - November 1971 Superior East Project Pinal-Gila Counties, Arizona

Attached is R. B. Cummings' monthly report on the project area. As written, the drill hole A-4 has been bottomed at 6664' in a biotite quartz monzonite. Samples of the rock and other units in the hole have been sent off for thin-section examination. The results of this phase are not yet reported. Also, a sample of the monzonite from A-4 and the granite from M-1A has been submitted for age-date determination. Microprobe examination of cupritenative copper samples has been requested from the New Jersey research group.

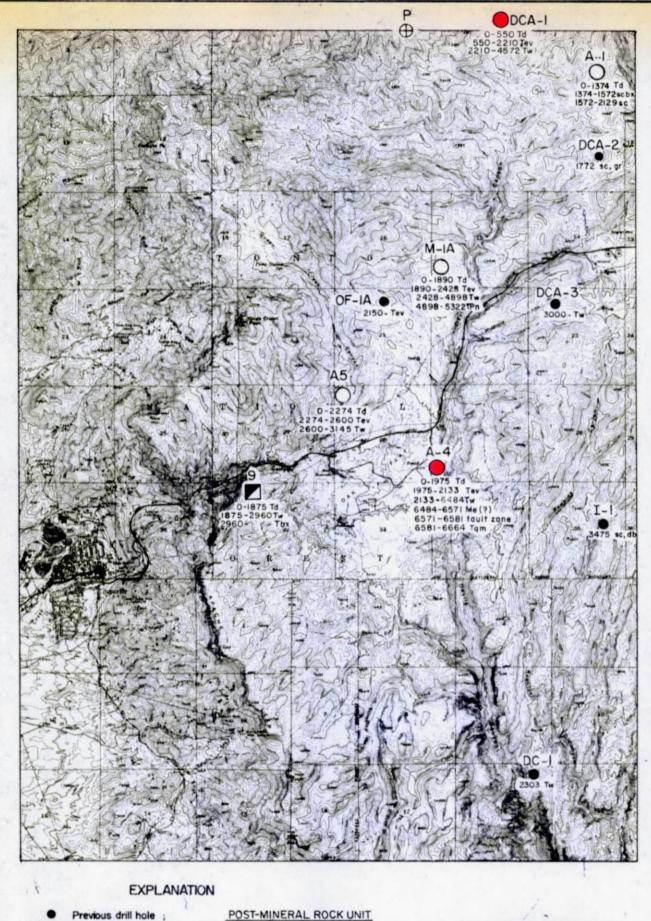
Drill hole DCA-IA was at 4572' on December 1 and drilling was progressing well.

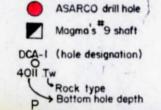
C. Rees' work is continuing in the Miami block and additional sampling work has been laid out for control.

James D. Sell

JDS: lad

Attachs.





Proposed drill site

POST-MINERAL ROCK UNIT

Td - Dacite Tev-Early volcanics Tw-Whitetail

Me-Escabrosa limestone

PRE-MINERAL ROCK UNIT

p€db-Diabase Tbx-Breccia Tam-Quartz Monzonite p€sc-Schist Tgr-Granite TPn-Naco limestone

DRILLING PROGRESS MAP for the month of Nov. 1971

SUPERIOR EAST GILA & PINAL COUNTY, ARIZONA SCALE: |'= | mile J.D.S. J.D.S. 2463

AMERICAN SMELTING AND REFINING COMPANY Tucson Arizona

December 2, 1971

TO: J. D. Sell

FROM: R. B. Cummings

MONTHLY REPORT SUPERIOR EAST PROJECT NOVEMBER, 1971

During the month (October 26 through November 25) coring proceeded slowly on drill hole A-4. A final depth of 6664' was reached on November 4, 1971. Delays included a broken wire line, stuck rods, geophysical surveys and adverse drilling conditions. The rig was moved to DCA-1A and coring started on November 17 at a depth of 4002'. Drilling has proceeded smoothly since that time to a depth of 4307' on November 25.

Direct drilling costs on holes A-4 and DCA-1A are estimated as follows:

Hole A-4

Coring - footag Materials	e charges - 2031	\$7901.70 472.70
	- siesmic survey	390.00 600.00
	Total	\$9,364.40

Hole DCA-1A

Coring - footag Materials		3051	\$ 6,588.00 1,053.81
Hourly charges Water truck	- setpup	Total	2,760.00 900.00
		Total	\$11.301.81

See Attachment 1 for a generalized log of hole A-4. In all, two seperate limestone slide blocks were penetrated. Beneath the lower block is a flat fault. Beneath the flat fault is schist intruded by biotite quartz monzonite (to a depth of 6610.5') and biotite quartz monzonite to a depth of 6664'. The schist and intrusive contains traces (locally strongly developed) of pyrite, chalcopyrite, and molybdenite. Veinlets of quartz and secondary K-spar and blebs of secondary K-spar occur in the quartz monzonite.

All assays have been completed on A-4 and a seperate report is in preparation.

See attachment 2 for a generalized log of hole DCA-IA. All rock cut so far has been whitetail conglomerate with a predominance of diabase fragments. No copper has been seen.

on lotte on weir be fault tentent trobach The estimated unexpended balance for Mining Authorization No. 0010-04 after all November accounts are paid is \$230,433.70.

RBC:sg attach.

R. B. Cummings

Oct office in the - 3 to 0. 36

PAGE 1 of 4

AMERICAN SMELTING & REFINING CO. GEOLOGIC LOG

PROPERTY Superior East MINING DISTRICT Pioneer

DRILL HOLE A-4

DATE 5/1/71 - 11/10/71

Cor	UNTY, STATE	. Pinal Co		SW1/4 SW1/4 Sec.27 R 13 F Log By R. B. Cummings
DE	PTH			R 13 E Log By No Be Culturings
FROM	то	ROCK	MINERALIZATION . ALTERATION .	REMARKS
0	570	Td		Dacite - gray
570	1030	Td		Dacite - orange
1030	1772	Td		Dacite - brown
1772	1776	Td		Vitrophyre
1776	1970	Td		Dacite - brown
1970	1975	Td		Vitrophyre
1975	2133	Tev		Andesitic basalt
2133	2330	Tw		Whitetail - limy mudstone conglomerate
				and limestone.
2330	2920	Tw	Minor exotic native copper. 2703'-2737'-core run	Whitetail - as above
2920	4161	Tw	Minor exotic native copper. 30921-31191-core run	Whitetail conglomerate with brown gritty
			coring initiated at 3593'	matrix. Fragments are approximately 80%
	<u> </u>			schist, 15% diabase, and 5% QM and
	 			quartzite. Minor fine grained silty or m
	<u> </u>			muddy zones - horizontal.
4161	5083	Tw	Minor exotic native copper	Whitetail - conglomerat as above but
				fragments are 45% diabase, 35% schist,
				20% limestone and quartzite and traces of
				QM. Bedding - 15°.
5083	5102	Tw	Wk. exotic cuprite on fractures	Whitetail - fine grained lithic tuft.
			and in disseminated blebs.	
			Cu estimated at 0.2% - 0.3%.	
		<u> </u>		
1.1				

PROPERTY Superior East Project
MINING DISTRICT COUNTY, STATE

DRILL HOLE A-4
FINAL DEPTH 6664'

PAGE 2 of 4 DATE _______ Log By______

DE F	PTH 07	ROCK	MINERALIZATION . ALTERATION .	REMARKS
102	5336	Tw	Minor to wk. amounts of ex-	Whitetain conglomerate with reddish brown
			otic cuprite, native copper,	matrix. Fragments are 45% schist, 35%
			and malachite. Mostly on	diabase, 20% limestone and quartzite, and
			fractures and fragment boundaries.	traces of QM.
336	5644	Tw		Whitetail conglomerate with light brownish
				red matrix. Fragments are 85% schist,
				and 15% diabase, quartzite, limestone,
				and QM.
644	6068	Tw	Sparce native copper and cuprite	Whitetail. Schist conglomerate (as 5336-
			in Schist Cg. Wk to strong native	5644) interbedded with typical type con-
			copper in some areas of the	glomerate (dark brn. gritty matrix and
			typical Cg. Better areas as	fragments - 45% diabase, 35% schist, 20%
			follows: 5687-5707, 5717-36,	limestone, quartzite and mudstone, and
			5740-83, 5800-13, 6019-41.	traces of OM.
068	6339	Tw	Trace to strong native copper	Whitetail. Typical type conglomerate as
			from 6068-6190. Sparce native	above. Sediments and QM fragments total
			copper from 6190-6339.	30-40%.
339	6386	Me?	Trace to strong native copper	Limestone Breccia. Gray, fine to medium
			(exotic) on fractures. Sparce	grained limestone gragments up to 2".
			Fe0x → py.	Spaces between fragments filled with
				greenish and reddish talcy gouge.
				Slickensides common.

PROPERTY Superior Fast Project
Mining District

DRILL HOLE A-4
FINAL DEPTH 6664

PAGE 3 of 4

DATE _____

DE	PTH	1	T		
FROM	то	ROCK	MINERALIZATION	ALTERATION	REMARKS
5386	6396		Very strong native copper, and		Gouge Zone. High angle (60°-80°) fracturi
			cuprite with chrysocolla and		with reddish talcy gouge, silicified lime-
			tenorite - all exotic.		stone, and limestone fragments.
396	6422	Me?	Very strong chrysocolla with		Limestone Breccia. Gray medium grained
<u></u>			some cuprite and tenorite to		limestone gragments up to 6". Matrix is
			6407.5. Sparce Fe0x → py.		chrysocolla to 6407.5 and reddish gouge
					to 6422.
5422	6423				Fault gouge. Hemetitic, 70°
5423	6437	Me?	Sparce native copper.		Limestone Breccia. Similar to above.
					Matrix is ground limestone with hemetitic
					stain.
6437	6438				Fault gouge. Hemetitic. 70°.
5438	6447.5	Me?	Moderate amounts of native		Limestone Breccia. Fragments are angular,
		,	copper in matrix.		gray, very fine grained limestone (?).
					Matrix is reddish brn. gritty material.
					Weak shearing (0-45°) near base.
5447.5	6484	Tw	Moderate native copper.		Conglomerate. Reddish brn. to brown
					gritty matrix. Fragments 60% limestone,
					30% qtz. porphyry, and 10% diabase and
					schist(?). Some shearing (30°-60°) at
					6447.5 to 6452.
5484	6539	Me?	Strong native coppermalong		Escabrosa Limestone? Completely replaced
			fractures.		by specularite and red earthy hematite.

PROPERTY Superior East Project
Mining District

FINAL DEPTH 6664

PAGE 4 of 4

DATE _____

COUNTY, STATE				FINAL DEPTH 6664'	
DE FROM	PTH TO	ROCK	MINERALIZATION	ALTERATION	REMARKS
6539	6563	Me?	Sparce native copper	Very fine grained incipient	Escabrosa Limestone? Well fractured &
				silicification	brecciated. Bedding 20°.
6563	6566	Fault	Nil		Brecciated rock as above with shearing and hemetitic to chloritic gouge.
					Dip - 30°.
6566	6571	Me?	Nil		Escabrosa Limestone. Replaced as 6484-
					6539.
6571	6575	Fault	Sparce native copper.		Cemented gritty fault gouge with minor
			Strong chalcocite.		silicified fragments. Cataclastic
					lineation - 30°.
6575	6580	Tqm	Nil		Biotite quartz monzonite. Sheared and
					faulted. Strong chloritic material.
					Shearing 20-40°.
6580	6610.5	P€pi &	Trace - moderate cpy.	Minor quartz veinlets	Fine grained quartz-biotite schist in-
		Tqm	Traces py. and mo.	and secondary k-spar.	truded by thin dikes of biotite quartz
					monzonite.
6610.5	6664	Tqm	Traces of cpy., py., & mo.	Minor quartz veinlets and	Medium grained biotite quartz monzonite.
				secondary k-spar.	
END OF	HOLE				
			NOTE: All dips are in refere	nce to a plane at right angles	to the
			axis of the core.		
			•		

PROPERTY Superior East Project

MINING DISTRICT Pioneer

County, State Pinal County, Arizona

AMERICAN SMELT S & REFINING CO.

GEOLOGIC LOG

DRILL HOLE DCA-1A

NE 1/4, NW 1/4 NE 1/4 FINAL DEPTH___ Sec. 3, T 1 S, R 13 E

PAGE 1 of 1 DATE 11/20/71 -

Log By R.B.Cummings

PROM FROM	PTH TO	ROCK	MINERALIZATION	ALTERATION	REMARKS
002	4307	Tw	Minor vuggy veinlets and veins		Whitetail conglomerate with greenish
		1	of calcite and heulandite.		gritty matrix. Fragments are approximately
		1 1	No native copper.		65% diabase, 20% quartzite, and 15% lime-
					stone.
			•		

AMERICAN SMELTING AND REFINING COMPANY Tucson Arizona

December 27, 1971

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report - December 1971 Superior East Project° Pinal-Gila Counties, Arizona

R. B. Cummings' monthly report will follow his return from vacation.

Only drill hole DCA-IA is in operation this month and, as of December 23rd, it was at a depth of 5222 feet, for a cumulative 915 feet since the November report. As shown on the attached progress drilling map, the hole penetrated Pennsylvanian limestone units from 4669-4998 and Mississippian limestone units from 4998 to the present depth. Several zones of typical alteration replacement limestone have been cut, but to date none contained any mineralization. Drilling progress has been slow in the fractured limestone and with recent logistic troubles due to road conditions.

Petrographic study of units in A-4 has confirmed the monzonite affinity and indicates that the secondary K-spar reported earlier is not K-spar. The alteration in the bottom of A-4 is weak argillic similar to other fringe-zone alteration halos.

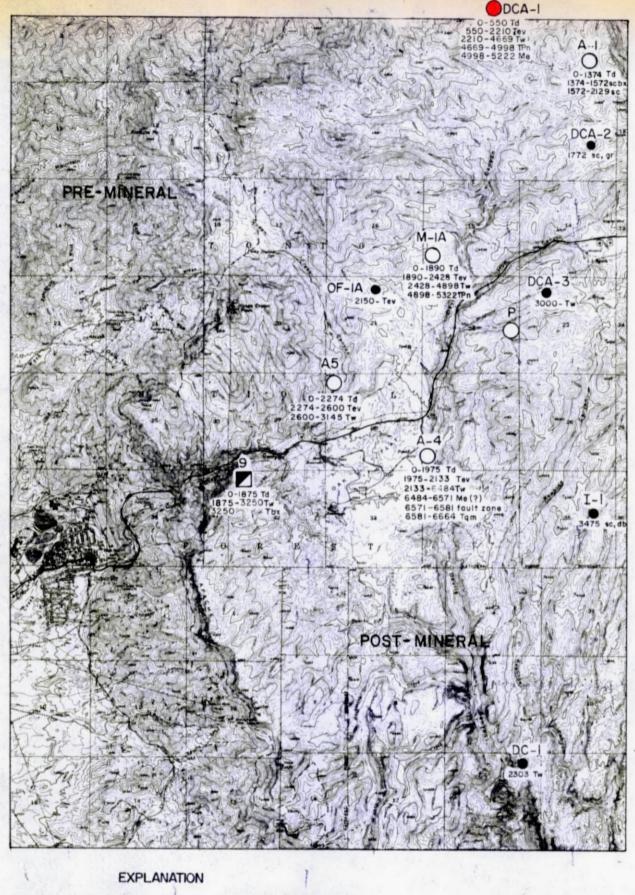
The microprobe examination report has been received and distributed. No unusual findings were reported.

The seismic exploration results on work conducted by J. W. Cooksley have been received, but not distributed. It appears that by using a velocity analysis curve a close pick of units can be made when coupled with the correct time-unit data.

The Brown-Coffey rig is being assembled and should be drilling early in January at the prepared site in section 22.

James D. Sell

JDS:lad Attach.



Previous drill hole ASARCO drill hole Magma's #9 shaft

DCA-I (hole designation) 40II Tw

Rock type
Bottom hole depth Proposed drill site

Tbx-Breccia Tam-Quartz Monzonite Tgr-Granite

Td - Dacite Tev-Early volcanics

Tw-Whitetail

TPn-Naco limestone Me-Escabrosa limestone

POST-MINERAL ROCK UNIT

PRE-MINERAL ROCK UNIT

p€db - Diabase

p€sc-Schist

DRILLING PROGRESS MAP for the month of Dec. 1971 SUPERIOR EAST

GILA & PINAL COUNTY, ARIZONA SCALE: I'= I mile J.D.S.

AMERICAN SMELTING AND REFINING COMPANY Tucson Arizona

January 13, 1972

TO: J. D. Sell

FROM: R. B. Cummings

MONTHLY REPORT SUPERIOR EAST PROJECT DECEMBER, 1971

During the month (November 25 through December 25), coring continued on hole DCA-IA. Progress was hampered by bad weather and lost circulation zones. The hole was deepened from 4307' to 5222' as of December 25th. Work was initiated on the drill site for hole A-2.

Direct drilling costs on hole DCA-IA are estimated as follows:

Hole DCA-1A

Coring Footage charges	915'	\$23,276.60
Materials		3,096.44
Water Truck		2,000.00

Total \$28,373.04

See Attachment I for a generalized log of hole DCA-IA. The bottom of the Whitetail conglomerate was found at 4669'. The underlying pre-mineral rock is unmineralized Pennsylvanian Naco limestone. The top of the Mississippian Escabrosa limestone was found at 4998'. At 5222' the hole was still in Escabrosa.

R. B. Cummings lad

RBC:lad Attach.

AMERICAN SMELTING & REFINING CO.

GEOLOGIC LOG

PROPERTY Superior East Project
Mining District Pioneer

DRILL HOLE DCA-1A

PAGE 1 of 2 DATE 11/20/71 -

County, STATE Pinal County, Arizona

FINAL DEPTH____

NE 1/4, NW 1/4 NE 1/4

Log By R.B.Cummings

County, State Pinal County, Arizona			ounty, Arizona ri	Sec. 3. T 1 S, R 13 E Log By W.D. Cullinitings	
DEPTH		ROCK	MINERALIZATION	ALTERATION	REMARKS
FROM	ТО	RUCK	#INERALIZATION ALIERATION	ALIENATION	REMARKS
4002	4560	Tw	Minor vuggy veinlets and veins	· · · · · · · · · · · · · · · · · · ·	Whitetail conglomerate with greenish
igenosis.			of calcite and heulandite.		gritty matrix. Fragments are approximately
			No native copper.		65% diabase, 20% quartzite, and 15% lime-
					stone. Some brownish color to matrix in
			·		basal 250'. Bedding - 20° to 30°.
4560	4669	Tw	As above		Whitetail conglomerate with brown to gray
					muddy matrix. Fragments are approx. 95%
					limestone, <5% quartzite, and trace diabase.
					Bedding = 35° to 60°.
4669	4842	i Pn	Sparce to moderate calcite		Naco Limestone. Gray to gray-brown limestor
	,		veining with traces of		with numerous red to gray shale layers and
			heulandite.		beds up to 5' thick. Slump Bx. textures
					common. Isolated fusilinid-rich horizons. Minor chert. Bedding - 30° to 45°.
4842	4976	₽n			Naco limestone. Alternating shale and
					limestone beds (Shale up to 25' and 1s.
					up to 49'). Ls. as above. Shale - brn. to
					reddish brn; slightly limy. Some steep
					faults. Bedding up to 50°.
4976	4987	P n			Naco limestone. Shale, reddish brn. & dirty
4987	4998	(P n			Naco limestone. Chert Breccia. Orange
					to gray chert with brn. shaley matrix.
4998	5003	Me	Some calcite veining around	,	Escabrosa limestone. Brn. muddy ls.
			mud seams.		with thin mud seams.

PROPERTY Superior East Project

MINING DISTRICT Pioneer

COUNTY, STATE Pinal County, Arizona

DRILL HOLE DCA-1A
FINAL DEPTH_____

NE 1/4, NW 1/4, NE 1/4 Sec. 3, T1S, R13E PAGE 2 of 2

DATE 11/20/71
Log ByR.B.Cummings

FROM TO ROCK MINERALIZATION ALTERATION 5003 5222 Me Locally strong calcite Very fine grained silicitica- Esca veining. tion replacing certain dolo- and mitic horizons. Good solution Both breccia textures. Replaced beds at 5026-30, 5033-36, 5060-66, 5098-5102, 5202-10.	
veining. tion replacing certain dolo- and mitic horizons. Good solution Both breccia textures. Replaced beds at 5026-30, 5033-36,	REMARKS
mitic horizons. Good solution Both breccia textures. Replaced beds at 5026-30, 5033-36,	abrosa limestone. Light gray limestone dark gray dolomitic limestone.
breccia textures. Replaced beds at 5026-30, 5033-36,	
beds at 5026-30, 5033-36,	h slump brecciated.
beds at 5026-30, 5033-36,	
5060-66, 5098-5102, 5202-10.	
	·
	·

TAB

1972

AMERICAN SMELTING AND REFINING COMPANY Tucson Arizona

February 1, 1972

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report - January 1972 Superior East Project Pinal-Gila Counties, Arizona

R. B. Cummings' report is attached. As noted, DCA-IA entered Devonian Martin limestone at 5452 feet and coring has progressed to 5619 feet in Devonian. At that point, on January 12, caving hole conditions prevented further work. After consultations it was decided to clean out the hole in segments, cement the interval, drill out the cement and clean another interval, and repeat. This has been done several times and the cement is set to a depth of 5000 feet. The last cement is being drilled (Jan. 31) and it is hoped the hole will then be usable to the full depth of hole after cleaning.

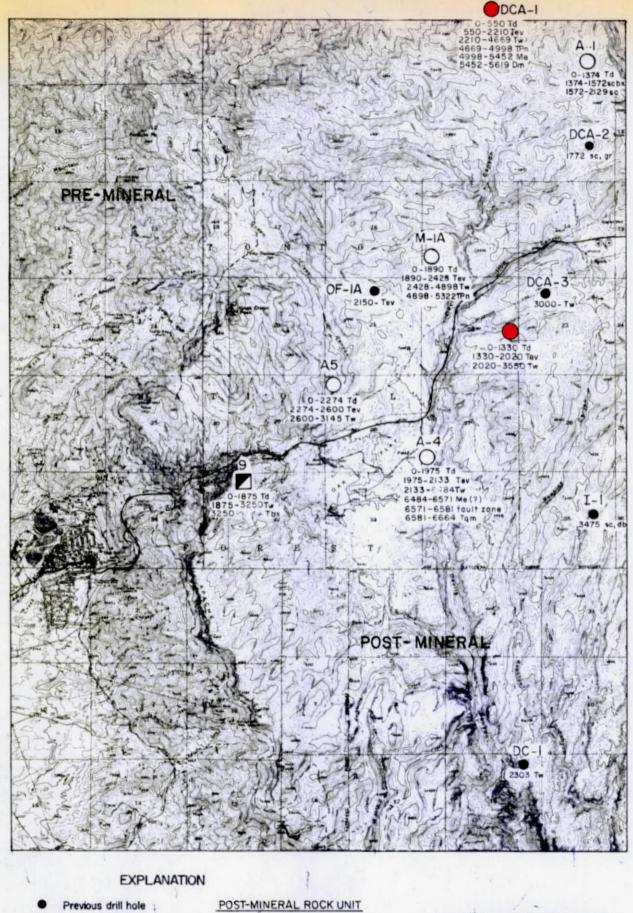
A-2 site, occupied by a Mayhew 3000, is air drilling and is at 3550 feet as of the end of the month. Dacite, early volcanics, and Whitetail conglomerate have been encountered. The Whitetail contains noticeable native copper in the upper part with increasing cuprite content to the present depth. Several cores have been cut in the Whitetail, but the recovery has been very poor.

Some fossil identification by E. Nieves on core from DCA-1A confirms the limestone at 4716 feet is Pennsylvanian, as is the limestone at 4889 feet. The other sample, at 5201 feet, was indeterminate in age (our work suggests Mississippian).

C. Rees has completed and distributed his report on the Bohme-Coryell ground. Samples have been taken as per his suggestion on additional work. Integration of these samples is not complete.

Samples of Whitetail, one each from DCA-1, M-1A, and A-4, have been submitted for permeability-porosity tests.

W. L. Kurtz February 1, 1972 · - 2 · -K-Ar age dates have been received from Geochron Labs. The quartz monzonite slide block in M-1A is dated at 59.9 ± 2.2 m.y. The quartz monzonite porphyry at the bottom of A-4 has a date of 62.6 ± 2.3 m.y. Both dates are Laramide and equivalent to the Schultze granite and its porphyry equivalents in the Miami district. Junes D Sell James D. Sell JDS: lad Attachs.



ASARCO drill hole Magma's #9 shaft

DCA-1 (hole designation)
40II Tw
Rock type
Bottom hole depth

Proposed drill site

Td - Dacite Tev-Early volcanics Tw-Whitetail

PRE-MINERAL ROCK UNIT

Tbx-Breccia Dm-Martin Ims Tqm-Quartz Monzonite p€db Diabase Tgr-Granite p€sc Schist TPn-Naco limestone Me-Escabrosa limestone

DRILLING PROGRESS MAP for the month of January 1972 SUPERIOR EAST GILA & PINAL COUNTY, ARIZONA SCALE: I's I mile J.D.S.

AMERICAN SMELTING AND REFINING COMPANY Tucson Arizona

February 4, 1972

TO: J. D. Sell

FROM: R. B. Cummings

MONTHLY REPORT SUPERIOR EAST PROJECT JANUARY 1972

During the month (December 25 through January 25) hole DCA-IA was deepened by coring from 5222' to 5619' (397'). Progress was hampered by mechanical failures and adverse drilling conditions. Rotary drilling was initiated on hole A-2 on January 13, 1972. By January 25th the hole had reached a depth of 2004'.

Direct drilling costs for holes DCA-IA and A-2 are estimated as follows:

Hole DCA-1A

Coring - Footage	charges (397')	\$11,870.30
Materials		3,301.55
Hourly charges -	149 hours	4,470.00
Water Truck		2,500.00
TOTAL		\$22,141.85

Hole A-2

Footage charges	(20041)	\$17,040.00
Hourly charges		5,987.50
1900年,1900年		
TOTAL		\$23,027.50

See Attachment 1 for a generalized log of hole DCA-1A. Two more unmineralized replacement beds were cut in the Escabrosa limestone. The top of the Devonian Martin Limestone was penetrated at 5452'. A replacement bed was cut in the Devonian at 5595'-5615'. Attachment 2 is a generalized log of hole A-2. The base of the dacite was penetrated at 1330'. From that point to the depth as of January 25th (2004'), the hole has been in the andesitic basalts of the earlier volcanics.

K.B. Cummings

RBC:sg attach.

PROPERTY Superior East Project

Mining District Pioneer

County, State Pinal County, Arizona

DRILL HOLE DCA-1A

NE 1/4, NW1/4, NE 1/ Sec. 3. T 1 S. R 13 PAGE 1 of 3 pages

DATE 11/20/71
Log ByR. B. Cummings

DE	РТН		T T		1 S, R 13 E Log Byk. B. Cummings	
FROM	то	ROCK	MINERALIZATION	ALTERATION	REMARKS	
4002	4560	Tw	Minor vuggy veinlets and veins		Whitetail conglomerate with greenish	
			of calcite and heulandite.		gritty matrix. Fragments are approximatel	
			No native copper.		65% diabase, 20% quartzite, and 15% limesstone. Some brownish color to matrix in	
					basal 250'. Bedding - 20° to 30°.	
4560	4669	TW	As above		Whitetail conglomerate with brown to gray	
					muddy matrix. Fragments are approx. 95%	
					limestone, < 5% quartzite, and trace dia-	
					base.	
4669	4842	₽n	Sparce to moderate calcite		Naco Limestone. Gray to gray-brown lime-	
			veining with traces of		stone with numerous red to gray shale lay-	
			heulandite.		ers and beds up to 5' thick. Slump Bx.	
					textures common. Isolated fusilinid-rich	
					horizons. Minor chert. Bedding 30-45°.	
4842	4976	₽n			Naco limestone. Alternating shale and	
					limestone beds (shale up to 25' and 1s.	
					up to 49'). Ls. as above. Shale - brn. t	
					reddish brn; slightly limy. Some steep	
					faults. Bedding up to 50°.	
4976	4987	P n			Naco limestone. Shale, reddish brn & dirt	
4987	4998	₽n			Naco limestone. Chert breccia. Orange	
					to gray shert with brn. shaley matrix.	
4998	5003	Me	Some calcite veining around		Escabrosa limestone. Brn. muddy 1s.	
			mud seams.		with thin mud seams.	

PROPERT	y Super	<u>ior East</u>	Proje	ect	
MINING	DISTRICT_	Pioneer			
		inal Coun		rizona	F - 1

DRILL HOLE DCA-1A
FINAL DEPTH

PAGE 2 of 3 pages
DATE _____

DEF	TH	2224			
FROM.	то	ROCK	MINERALIZATION	ALTERATION	REMARKS
5003	5246	Me	Locally strong calcite	Very fine grained silicitica-	Escabrosa limestone. Light gray limestone
			Veining-	tion replacing certain dolo-	and dark gray dolomitic limestone.
				mitic horizons. Good solution	Both slump brecciated.
	3			breccia testures. Replaced	
				beds at 5026-30, 5033-36,	
				5060-66, 5098-5102, 5202-10,	
		1 The 1 The 1		and 5528-32.	
5246	5247.5	Me			Escabrosa limestone. Gray to black chert
					bed.
5247.5	5284	Me	Weak calcite veining.		Escabrosa limestone. Light gray, fine-
					grained, fossiliferous limestone, composed
					almost completely of ostracods.
5284	5369	Me	Weak calcite veining. Trace		Escabrosa limestone. Light gray and fine
			Fe0x → py.		grained. Slump brecciated.
5369	5388	Me	Weak calcite veining.		Escabrosa limestone. Limestone-Chert Brec
					Light colored is. and gray, red, and
					orange chert fragments. Green clay seams.
5388	5452	Ме	Weak calcite veining.	Very fine grained silicifi-	Escabrosa limestone. Gray Dolomitic
				cation and solution breccia	limestone. Fine to medium grained. Minor
				as above. Weakly developed	muddy seams. Some slump brecciation.
				at 5388-5401 and well devel-	
Degard.				oped at 5401-10.	

PROPERTY Superior East ProjectMining District Pioneer

County, STATE Pinal County, Arizona

DRILL HOLE DCA-1A
FINAL DEPTH

PAGE 3 of 3 pages

n c	PTH	T			Log By
FROM	TO	ROCK	MINERALIZATION	ALTERATION	REMARKS
5452	5480	Dm	Mil to trace calcite veinlets		Martin Limestone. Lt. green to maroon
					limy shale and reddish brn. fossiliferous
					limestone. Interbedded and faulted.
		* 12.			Bedding (shale) - 30°.
5480	5567	Dm	Weak calcite veining.		Martin Limestone. Gray limestone, muddy
					limestone, dolomitic limestone and minor
					shale. Some slump brecciation. Bedding
					20-35°.
5567	5572	Dm	Trace calcite veining.	Weak replacement textures	Martin Limestone. Buff to pink sandstone
				5568-70.	Fine grained, calcareous cement.
5572	5595	Dm	Moderate calcite veining.		Martin Limestone. Gray, muddy, fosil-
					iferous limestone. Slump brecciated.
5595	5619	Dm	Weak calcite veining.	Replaced beds (as above	Martin Limestone. Brn. dolomitic lime-
				5401-10) at 5595-5615.	stone and greenish shaley dolomitic
					limestone.

PROPERTY Superior East Project

MINING DISTRICT Pioneer

County, STATE Pinal County, Arizona

DRILL HOLE A-2

NW 1/4, NE 1/4, SE 1/4 Sec. 22, T 1 S, R 13 E PAGE 1 of 1 pages

DATE 1/20/72
Log By R. B. Cummings

				Sec. 22,	T 1 S, R 13 E. Log By R. B. Cummings
FROM DEI	PTH	ROCK	MINERALIZATION	ALTERATION	
PROM	70			PEI ERATION	REMARKS
0	720	Td			Dacite - gray
720	1120	Td			Dacite - orange
1120	1225	Td			Dacite - brown
1125	1231	Td			Dacite - vitrophyre
1231	1302	Td			Dacite - brown
1302	1330	Td			Dacite - tuff
1330	2004	Tev			Andesitic basalt. Dark gray to reddish
				1	brown. Very fine grained.

AMERICAN SMELTING AND REFINING COMPANY Tucson Arizona

March 1, 1972

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report Superior East Project February 1972

Attached is Mr. Cummings' monthly report and the synopsis logs of drill holes DCA-1A and A-2. As noted, drill hole DCA-1A was terminated at 5813 in quartzite of Precambrian age. Although numerous replacement zones were cut (including the thick section in the middle of the Mississippian unit which contains the bulk of Magma Copper Company's new replacement reserves), none were mineralized but contained only the silica addition and replacement of the original limestone-dolomite host.

Drill hole A-2 was rotaried down to 4076 with three spot cores taken, the last being from 4075 to 4076. All core recovery was literally nil, but the few pieces from the last core confirmed the presence of an altered and mineralized quartz monzonite porphyry. The hole was cleaned and cased with 4" casing by the rotary rig. Upon reentering with the Longyear 44 core rig, it was determined that the casing had been set on fill and was not on bottom. The core rig cleaned the lower portion and cored two feet (to 4078) with good recovery before high torque conditions necessitated cementing the hole.

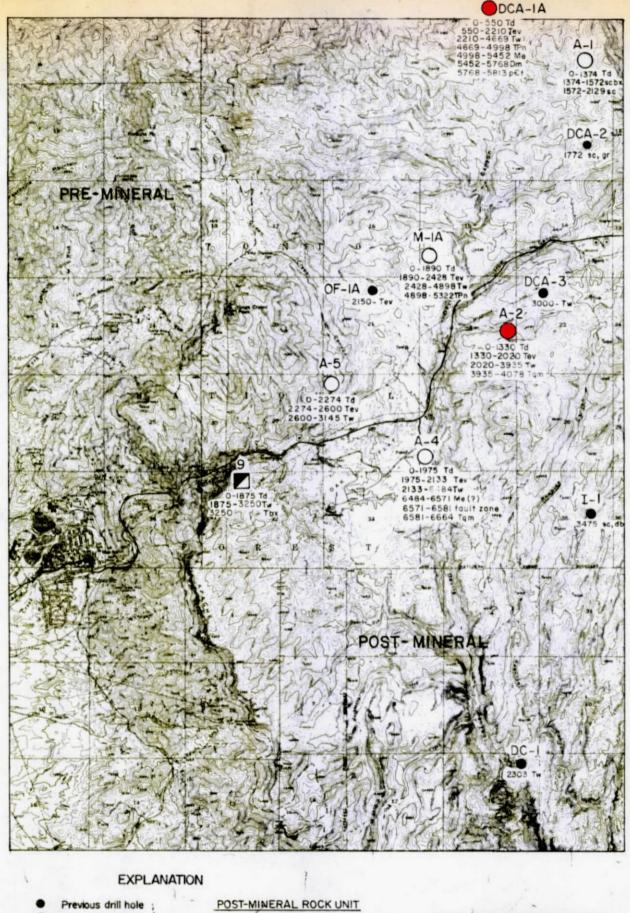
As of this morning, the core rig has cleaned to 4073, has remixed mud, repaired the rig, and is now ready to continue coring. New bedrock core is anticipated by tonight.

Mr. Cummings is on loan to the Northwest District for the summer and will be leaving at the end of March. He will submit a Summary of the Drilling Activities prior to his departure.

The Superior East drilling map, updated, is attached.

James D. Sell

JDS:lad Attach.



ASARCO drill hole

Magma's #9 shaft

DCA-1 (hole designation)

DCA-1 (hole designation)
40II Tw
Rock type
Bottom hole depth

Proposed drill site

Td - Dacite Tev-Early volcanics Tw-Whitetail

PRE-MINERAL ROCK UNIT

Tbx-Breccia
Tqm-Quartz Monzonite
Tgr-Granite
TPn-Naco limestone
Me-Escabrosa limestone

Dm-Martin Ims p€t-Troy qtz p€db-Diabase p€sc-Schist DRILLING PROGRESS MAP
for the month of Feb. 1972
SUPERIOR EAST
GILA & PINAL COUNTY, ARIZONA
SCALE: 1"= 1 mile J.D.S.

2463

AMERICAN SMELTING AND REFINING COMPANY Tucson Arizona

February 28, 1972

TO: J. D. Sell

FROM: R. B. Cummings

MONTHLY REPORT SUPERIOR EAST PROJECT FEBRUARY 1972

During the month (January 26 through February 25) hole DCA-1A was deepened from 5619' to a terminal depth of 5813' (194'). Hole A-2 was deepened by rotary drilling from 2004' to 4076' (2072'). Casing (4'') was set, but the bottom of the hole was not reached. On February 21 Longyear Drilling Company re-entered hole A-2. The bottom of the casing was found at 4043'. The hole was deepened by coring from 4076' to 4078'. At that point a cement job was necessary to stabilize 6-1/4'' uncased portion of the rotary hole from 4043' to 4076'.

Direct drilling costs for holes DCA-1A and A-2 for the period January 26 through February 25 are estimated as follows:

Hole DCA-1A Footage charges (194') Hourly charges - 72 hours Materials Water trucks	\$ 5,700.60 2,370.00 1,400.00 2,000.00 \$11,470.60
Hole A-2 - Rotary Footage charges (2076') Hourly charges 4" Casing	\$26,680.00 8,570.00 6,500.00 \$41,750.00
Hole A-2 - Coring Mobilization Footage charges (2') Hourly charges Materials Water truck	\$ 495.00 35.00 1,848.00 500.00 100.00 \$ 2,978.00

See Attachment 1 for a generalized log of DCA-1A. Numerous unmineralized replacement beds were cut in the Devonian Martin Limestone. The base of the Martin was penetrated at 5768'. The quartzitic rock found from 5768' to 5813' has been tentatively identified as Precambrian Troy quartzite. See Attachment 2 for a generalized log of A-2. The base of early volcanics was penetrated at 2020'. Whitetail conglomerate was cut from 2020' to 3935'. Premineral Laramide (?) quartz monzonite was cut from 3935' to 4078'.

R. B. Cummings Plad

RBC:lad Attachs.

PROPERTY Superior East Project MINING DISTRICT Pioneer

DRILL HOLE DCA-1A

NE 1/4, NW1/4, NE 1/4

PAGE 1 of 4 pages DATE 11/20/71 -Log By R. B. Cummings

FINAL DEPTH_____ Sec. 3, T 1 S, R 13 E County, STATE Pinal County, Arizona DEPTH ROCK MINERALIZATION ALTERATION REMARKS TO FROM 4002 4560 Tw Minor vuggy veinlets and veins Whitetail conglomerate with greenish of calcite and heulandite. gritty matrix. Fragments are approximately No native copper. 65% diabase, 20% quartzite, and 15% limestone. Some brownish color to matrix in basal 250'. Bedding - 20° to 30°. 4669 4560 TW As above Whitetail conglomerate with brown to gray muddy matrix. Fragments are approx. 95% limestone, < 5% quartzite, and trace diabase. 4669 Naco Limestone. 'Gray to gray-brown lime-4842 ıΡn Sparce to moderate calcite veining with traces of stone with numerous red to gray shale layheulandite. ers and beds up to 5' thick. Slump Bx. textures common. Isolated fusilinid-rich horizons. Minor chert. Bedding 30-45°. 4842 4976 Naco limestone. Alternating shale and ₽'n limestone beds (shale up to 25' and is. up to 49'). Ls. as above. Shale - brn. to reddish brn; slightly limy. Some steep faults. Bedding up to 50°. 4976 4987 Pn. Naco limestone. Shale, reddish brn & dirty. 4987 4998 Pπ Naco limestone. Chert breccia. Orange to gray chert with brn. shaley matrix. 4998 5003 Me Some calcite veining around Escabrosa limestone. Brn. muddy 1s. mud seams. with thin mud seams.

PROPERTY_Supe	<u>rior East</u>	Project
MINING DISTRICT_	Pioneer	
COUNTY, STATE P		

DRILL HOLE DCA-1A

FINAL DEPTH____

PAGE 2 of 4 pages

DATE _____

	TIT, STATE.		<u> </u>		LOG BY
.DEP	TH TO	ROCK	MINERALIZATION	ALTERATION	REMARKS
5003	5246	Me	Locally strong calcite	Very fine grained silicitica-	Escabrosa limestone. Light gray limestone
					and dark gray dolomitic limestone.
			Veining.	mitic horizons. Good solution	
				breccia textures. Replaced	DOCTI STUMP BYCCCTALEU.
				beds at 5026-30, 5033-36,	
				5060-66, 5098-5102, 5202-10,	
				and 5528-32.	
5246	5247.5	Me			Escabrosa limestone. Gray to black chert
					bed.
5247.5	5284	Mē	Weak calcite veining.		Escabrosa limestone. Light gray, fine-
					grained, fossiliferous limestone, composed
					almost completely of ostracods.
5284	5369	Me	Weak calcite veining. Trace		Escabrosa limestone. Light gray and fine
			Fe0x → py.		grained. Slump brecciated.
5369	5388	Me	Weak calcite veining.		Escabrosa limestone. Limestone-Chert Breco
					Light colored ls. and gray, red, and
					orange chert fragments. Green clay seams.
5388	5452	Ме	Weak calcite veining.	Very fine grained silicifi-	Escabrosa limestone. Gray Dolomitic
				cation and solution breccia	limestone. Fine to medium grained. Minor
				as above. Weakly developed	muddy seams. Some slump brecciation.
				at 5388-5401 and well devel-	
				oped at 5401-10.	

PROPERTY Superior East Project

MINING DISTRICT Pioneer

COUNTY, STATE Pinal County, Arizona

DRILL HOLE DCA-1A

FINAL DEPTH____

PAGE 3 of 4 pages
DATE _____

Cou	ATY, STATE.		country; Arrzona	FINAL DEPIN	Log By
	PTH	ROCK	MINERALIZATION	ALTERATION	REMARKS
FROM	ТО		The state of the s		nements
5452	5480	Dm	Nil to trace calcite veinlets		Martin Limestone. Lt. green to maroon
<u></u>	1				limy shale and reddish brn. fossiliferous
					limestone. Interbedded and faulted.
<u> </u>	1	1			Bedding (shale) - 30°.
5480	5567	Dm	Weak calcite veining.		Martin Limestone. Gray limestone, muddy
					limestone, dolomitic limestone and minor
					shale. Some slump brecciation. Bedding
					20-35°.
5567	5572	Dm	Trace calcite veining.	Weak replacement textures	Martin Limestone. Buff to pink sandstone
<u>'</u>				5568-70.	Fine grained, calcareous cement.
5572	5595	Dm	Moderate calcite veining.		Martin Limestone. Gray, muddy, fosil-
					iferous limestone. Slump brecciated.
5595	5636	Dm	Weak calcite veining.	Replaced beds (as above	Martin Limestone. Brn. dolomitic lime-
<u>, </u>	1			5401-10) at 5595-5614.	stone and greenish shaly dolomitic
<u> </u>				and 5619-5631.	limestone. Minor thin sandy beds.
5636	5643	Dm	Weak calcite veining	Weakly replaced.	Martin Limestone. Buff colored fine-grained
1					limy sandstone. Bedding 30°.
5643	5719	Dm	Moderate to strong calcite	Wk to strong replacement as	Martin Limestone. Brn to gray fine-grained
				above. Some red hematite on	dolomite limestone. Cemented fault breccia
	1			fractures. Minor bleaching	(30°-55°) from 5670.5-5673.
	1			with traces of Fe0x→py	
				5650-5664.	
5719	5723	Dm	Trace calcite veining.	Weak replacement.	Martin Limestone. Limy Sandstone.
					Gray, medium to fine-grained.
	(· 图图表,其中的基础。	

PROPERT	Superior Ea	st Project
MINING	DISTRICT P	Oneer
County		unty, Arizona

DRILL HOLE DCA-1A

FINAL DEPTH____

PAGE 4 of 4 pages

DEF		ROCK	MINERALIZATION	ALTERATION	REMARKS
FROM	ТО				
5723	5757.5	Dm	Trace to weak calcite veining	Minor replacement. Some	Martin Limestone. Gray dolomitic limeston
				hematite on fractures.	to brn. sandy dolomitic limestone. Sand
					grains well rounded and frosted. Sandy
					nature increases toward base. Bedding
					35°-40°. Fault Bx at 5753-55 (70° to 90°)
					and 5757.5 (one inch thick - 65°).
757.5	5768	Dm	Trace calcite veining		Martin Limestone (basal unit). Inter-bedo
					pebble cg. and argillaceous sandstone.
ellega (Pebbles - qtz. and qtzite., up to 1-1/4",
					well rounded to angular.
					Fault Bx @ 5759 (1" thick - 70°).
5768	5781	p€t?	Sparse calcite veining.	Wk. replacement textures.	Troy Quartzite(?). Quartzite, pure to
					argillaceous, fine-grained with some pebb
					layers, brn. to light gray. Brecciated
					5778-81. Bedding 40°.
5781	5813	p€t?		Some weak replacement texture	Troy Quartzite. Interbedded argillaceous
					sandstone, pebbly qtzite, qtzite, and san
					mudstone. Gray to reddish brn. Some cro
					bedding. Some chert pebble layers.
	4				Bedding 30°-45°.
			END OF HOLE		

PROPERTY Superior East Project

Mining District Pioneer

County, STATE Pinal County, Arizona

DRILL HOLE A-2

NW 1/4, NE 1/4, SE 1/4

PAGE 1 of 2 pages

DATE 1/20/72
Log By R. B. Cummings

	JAIT, STATE		<u> </u>	Sec. 22,	T 1 S, R 13 E. Log By N. D. Cullini 11195
DEP FROM	PTH TO	ROCK	MINERALIZATION	ALTERATION	REMARKS
0	720	Td			Dacite - gray
720	1120	Td			Dacite - orange
1120	1225	Td			Dacite - brown
1125	1231	Td			Dacite - vitrophyre
1231	1302	Td			Dacite - brown
1302	1330	Td			Dacite - tuff
1330	2020	Tev			Andesitic basalt. Dark gray to reddish
					brown. Very fine grained.
2020	2425	Tw	Traces of native copper with		Whitetail. Greenish to brownish gritty
			schist.		mudstone with minor schist conglomerate.
2425	2 810	Tw	Traces of native copper with		Whitetail. Conglomerate with light green
Cored f	rom		schist.		to brn. gritty matrix and mainly schist
2559 to					fragments with minor diabase and qtzite.
2810	3459	Tw	Traces of native copper. Trac	des	Whitetail. Conglomerate with brn. gritty
			of cuprite, malachite and		matrix. Fragments are schist and weakly
			azurite from approximately		altered qtz. monzonite with some diabase.
			3339-3459		
3459	3540	Tw?	Traces of native copper, cupri	ite,	Whitetail(?) Conglomerate? No matrix in
Cored f	rom		malachite and azurite.		cuttings. Fragments mostly fine-grained
3540 to	3550		- <u> </u>		qtz. monzonite - wkly alterated.
	f				Note: This interval may be a qtz.
					monzonite slide block.
3540	3935	Tw	Traces of cuprite, native		Whitetail. Conglomerate with red to red-brn
			copper, malachite and azurite.		gritty matrix. Fragments as 2810'-3459'.

PROPERTY Superior East Project
Mining District Pioneer

DRILL HOLE A-2

DATE _____

County, STATE Pinal County, Arizona

FINAL DEPTH____

Log By_____

PAGE 2 of 2 pages

COUNTY, STATE					LOG DY
DEF FROM	тн то	ROCK	MINERALIZATION	ALTERATION	REMARKS
3935	4078	QM	Traces of chalcocite (?)	Wk. argillic alteration (of	Laramide (?) Qtz. monzonite. Medium-
Note:	Cored f	rom	Wk-strong chalcocite (?) on	plagioclase) to strong qtz.	grained slightly porphyritic with minor
	4075-40		fractures and disseminated	veining and strong qtz-	biotite.
			from 4075-78. Low total	sericite and coarse-grained	
			sulfide.	muscovite.	
; i.					

AMERICAN SMELTING AND REFINING COMPANY Tucson Arizona

April 3, 1972

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report Superior East Project March 1972

Attached is R. B. Cummings' monthly report and synopsis of the drill log for A-2, the only hole in progress during the month. As noted, the coring commenced at 4076 in leached capping, within a Tertiary quartz monzonite (65%) intermixed with Precambrian Pinal schist (35%). Limonites had been leached, but small specks of chalcocite had been left behind in some of the more silicious and protected areas. Assays of the leached material average less than 0.05% copper, although higher assays were received where visible chalcocite remained. Between 4288 and 4295 a strong, flat, fault structure was found with intense slickensides and gouge. Below the fault minor leaching extended to 4342, with sulfides appearing at 4314.

Sulfides of pyrite, bornite, and chalcocite are found in schist (71%) and intermixed quartz monzonite (29%), which is moderately to strongly silica flooded, with argillic and quartz-sericite alteration. The assay from 4310 to 4480, which includes all sulfide mineralization, averages 0.36% copper. The subsequent three assays on ten-foot intervals, ending at 4510, ran 2.40, 0.42, and 1.01% copper. Composites for gold-silver are presently being run, and the sulfide assays will be checked by a separate assayer.

Present interpretation suggests that we have cored through a leached chalcocite blanket, passed through a fault of probable minor displacement, and are now in the unleached chalcocite blanket area. The intense silica also suggests we are near the outer edge of the mineral-alteration system.

The identity of chalcocite from a piece of core recovered by Longyear coring at a depth of 4076-4078 feet was confirmed by a polished section analyzed by the South Plainfield laboratory.

As of this date all efforts to free the drill string and/or recover the last eight feet of core (to 4521') have been unsuccessful. Longyear is continuing to recover the hole.

permit for the construction has been forwarded to the Forest Service and work will commence upon receipt of the permit.

Estimated unexpended balance for the Superior East authorization is

James D. Sell

James D Sell

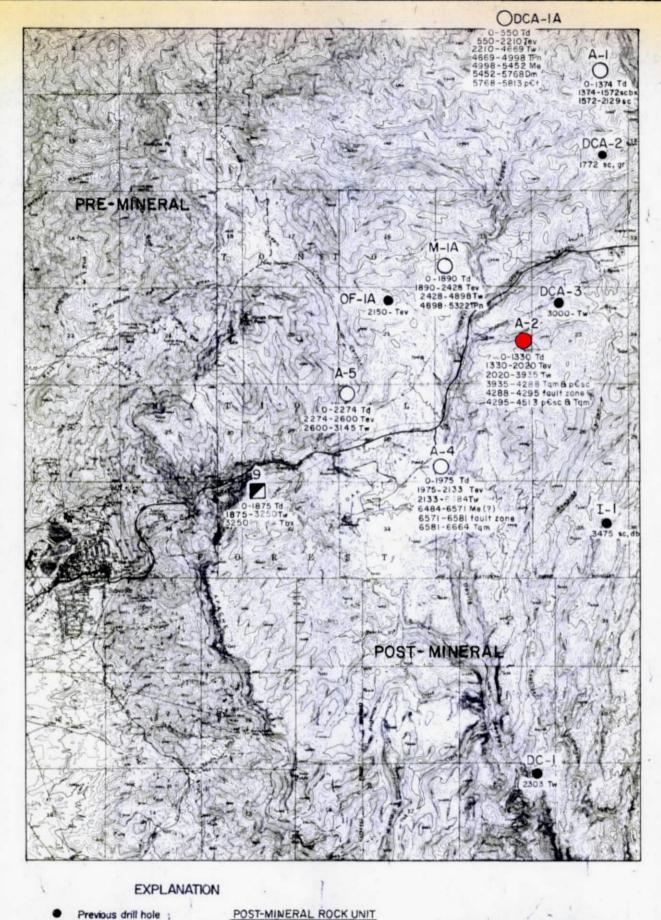
JDS: lad Attach.

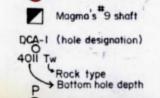
\$55,500.00.

Jim:

Bill wanted me to give you the estimated unexpended balance of the authorizations for Superior East -- it's \$75,500.

Lois -- 3/10/72





ASARCO drill hole

Proposed drill site

POST-MINERAL ROCK UNIT

Td - Dacite Tev-Early volcanics Tw-Whitetail

PRE-MINERAL ROCK UNIT

Tbx-Breccia Dm-Martin Ims Tam-Quartz Monzonite p€t-Troy qtz p€db-Diabase Tgr-Granite TPn-Naco limestone p€sc-Schist Me-Escabrosa limestone

DRILLING PROGRESS MAP for the month of March 1972 SUPERIOR EAST GILA 8 PINAL COUNTY, ARIZONA SCALE: I'= I mile J.D.S.

2463

AMERICAN SMELTING AND REFINING COMPANY Tucson Arizona

March 28, 1972

TO: J. D. Sell

FROM: R. B. Cummings

MONTHLY REPORT SUPERIOR EAST PROJECT MARCH, 1972

During the month (February 26 through March 25) the uncased portion of hole A-2 was finally stabilized with a second cement job. Coring was continued on March 4, 1972. Up to March 18, the hole was deepened from 4078' to 4521' (a total of 443'). At that point the rods became stuck and all work to the end of the month has been related to solving this problem.

Direct drilling costs for hole A-2 for the period February 26 through March 25 are estimated as follows:

Hole A-2

Footage charges	(4431)	=	\$ 8,580.25
Hourly charges			2,718.00
Materials			905.00
Water truck			540.00

\$12,743.25

See Attachment I for a generalized geologic log of hole A-2. Tertiary quartz monzonite and Pinal schist were found to a depth of 4288'. To this point both rocks are altered, mineralized, oxidized, leached and intensely brecciated. A flat fault was penetrated from 4288-95'. Below this point to 4513 (at the time of this writing, the interval 4513-4521' is in the hole) the rock is schist with minor Tqm dikes. This rock is unoxidized below 4314, altered, and mineralized with py, cc replacing py, and bor.

Assays have been received to 4510° . To 4340° only several samples assayed over 0.20% Cu. From 4340 to 4480° (140°) the average Cu content was 0.40% Cu. The interval 4480-4510 (30°) averaged 1.28% Cu. The high average of the last interval is due mainly to a 2.40% Cu assay from $4480-90^{\circ}$. A complete sample list is in preparation.

RBC:sg attach.

R. B. Cummings

PROPERTY Superior East Project

Mining District Pioneer

County, State Pinal County, Arizona

DRILL HOLE A-2

NW 1/4, NE 1/4, SE 1/4

PAGE 1 of 3 pages

DATE 1/20/72 -

Co	UNTY, STATE	Fillal C	ounty, Arizona	Sec. 22,	T 1 S, R 13 E. Los By R. B. Cummings
	DEPTH ROCK		MINERALIZATION		
FROM	ТО	-	PINERALIZATION	ALTERATION	REMARKS
0	720	Td			Dacite - gray
720	1120	Td			Dacite - orange
1120	1225	Td			Dacite - brown
1125	1231	Td			Dacite - vitrophyre
1231	1302	Td			Dacite - brown
1302	1330	Td			Dacite - tuff
1330	2020	Tev			Andesitic basalt. Dark gray to reddish
					brown. Very fine grained.
2020	2425	Tw	Traces of native copper with		Whitetail. Greenish to brownish gritty
			schist.		mudstone with minor schist conglomerate.
2425	2810	Tw	Traces of native copper with		Whitetail. Conglomerate with light green
Cored	from	141	schist		to brn. gritty matrix and mainly schist
2559 to	2574				fragments with minor diabase and qtzite.
2810	3459	Tw	Traces of native copper. Trace		Whitetail. Conglomerate with brn. gritty
			of cuprite, malachite and		matrix. Fragments are schist and weakly
			azurite from approximately		altered qtz. monzonite with some diabase.
			3339-3459		
3459	3540	Tw?	Traces of native copper, cupril	te, and the second second	Whitetail(?) Conglomerate? No matrix in
Cored f	rom		malachite and azurite.		cuttings. Fragments mostly fine-grained
3540 to	3550				qtz. monzonite - wkly alterated.
					Note: This interval may be a qtz.
					monzonite slide block.
3540	3920	Tw	Traces of cuprite, native		Whitetail. Conglomerate with red to red-brn
			copper, malachite and azurite.		gritty matrix. Fragments as 2810'-3459'.

AMERICAN SMELTING & REFINING CO.

PROPERTY Superior East Project	GEOLOGIC LOG
MINING DISTRICT	DRILL HOLE A-2
COUNTY, STATE	FINAL DEPTH

2 of 3

DE	PTH				LOG DY
FROM	ТО	ROCK	MINERALIZATION	ALTERATION	REMARKS
3920	4208	Tqm	Traces of py and cc. dissemin-	Strong. Varies from wk ar	Tertiary Qtz. monzonite. Medium-grained
Note:	Coring		ated and on fractures. Str.	gillic to strong qtz-seri-	and slightly porphyritic with minor
star	ted at 407	5'	cc in local qtz-sericite pods	cite and silicification.	biotite. Numerous small inclusion of
			as 4081-82.5 & 4021-26. Total	Str. gtz veining.	of biotite schist. Large inclusions
4			Fe0x → sulf. varies from		4110-20, 4158-66 and 4182-88. Fracturing
			< 1% to 2-4%. Substantial		very strong - brecciated (post mineral).
			portion of FeOx probably		Lower contact - Fault zone?. Flat gouge
	ļ		after cc.		bx in schist 4203-08.
4208	4288	p€pi ε	Sparce py and cc. as above.	Wk-str in schist - chloriti-	Biotite schist with dikes (?) of Tam.
		Tqm	Fe0x → sulf. (some of which		Tgm @ 4226-32, 4236-43 and 4248-75.
			is probably cc). varies from	str qtz-sericite. Mod-str	Total section is strongly brecciated.
			<1/2% to 2-4%. Best from	in Tqm as above. Strong qtz	Tqm has a sheared, granulated look.
			4262-88. Traces of specular-	veining in both.	
			ite.		
4288	4295	p€pi Flat Faul	1-2% Fe0x — sulfide.	Wk chloritization to strong argillization.	Flat Fault. Rock is schist as above.
				argilitzacion.	Strong brecciation. Strong light
					colored gouge. Gouge Bx.
NOTE:	This faul	t zone ma	rks a major change. Above the	zone the dominant rock type	s Tqm, the rock is strongly brecciated and
					ock is un-brecciated and only weakly
	oxidized.				
. Ass					

PROPERTY_	Superi	or ta	st Pro	oject	1.0
				1	
MINING DI	STRICT				<u> </u>

DRILL HOLE A-2
FINAL DEPTH

PAGE 3 of 3

DATE _____
LOG BY_____

COUNTY, STATE				FINAL DEPTH	Log By		
	PTH	ROCK			1		
FROM	TO	- NOCK	MINERALIZATION	ALTERATION	REMARKS		
4295	4321	Tqm	Traces of cc. replacing py	Wk to str argillization with	Tqm. As. 3920-4208 from 4295-4314. From		
1.84			on fractures and in dissemin-	local str qtz-sericite.	4314-21 - Fine grained salmon colored		
			ations. 1% FeOx—sulfides	Minor qtz veining.	qm with 2% biotite.		
			from 4295-4314. (Only traces				
			of oxidation below 4314).				
	ļ		Traces of specularite.				
4321	4471	р€рі	1/2-2% py on fractures with	Str. silicification. Schist	Biotite schist. Schistosity 45-90° Tam		
			qtz veinlets and disseminated	has probably been recrys-	dikes 4393-94, 4410-17 & 4432-33 - also		
			Wk cc. replacing py. Wk bor.	tallized along schistosity	some smaller.		
			as very fine grained dis-	with remobilization of bio-			
			seminated.	tite. Some argillization			
				along schistosity. Minor qtz			
				sericite with qtz veining.			
				Mod-str. irregular qtz			
				veinlets.			
4471	4513	p€pi	1-2% py, cc., and bor. Local	Str argillization on frac-	Schist as above. Tqm dike(?) 4509-?.		
			str development of cc-4484-89	tures. Local areas of str	Crushed gouge-bx zones with rounded		
			and 4500-4510. Str. bor. 4505.	qtz-sericite. Str. silici-	fragments @ 4481.5-83.5, 4484.5-85.0,		
				fication and qtz veining	4487-88, 4498-4500 (w/qtz veinlets) and		
				(irregular) Tqm-str. argil-	4505-09 (w/qtz veinlets). Fault Bx -		
				lization and local str qtz-	well healed at 4504-70°.		
				sericite.			

AMERICAN SMELTING AND REFINING COMPANY Tucson Arizona

May 2, 1972

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report Superior East Project April, 1972

Attached is the Superior East progress map and the drill log for A-2W, the hole wedged off of the abandoned hole A-2.

As reported last month, Longyear lost a string of rods and core barrel (with eight feet of core). Numerous attempts to recover the string failed and Longyear resorted to placing a wedge in the hole and deflecting into the wall. This was successful and coring on the new hole, A-2W, commenced at a depth of 4230 feet on April 19. At the end of the month, they were at 4526 feet. A progress of 296 feet for the month.

The drill hole was surveyed by Crittendon and the following deviations recorded: at 1500 ft., $4^{\circ}20'$; at 3000 ft., $7^{\circ}0'$; at 4200 ft., $7^{\circ}30'$, and at 4400 ft., $9^{\circ}30'$. The declination at the bottom is S21°E.

Hole A-2W started in leached capping and has essentially penetrated the same units as A-2 at comparable depths. The mineralization and alteration is comparable although less silica flooding appears present.

The sample pulps from the sulfide zone of A-2 were rerun by Hawley and Hawley with confirming results as previously reported.

The road work for State Lease Sections 4 and 5 is progressing well and has been extended over a quarter mile from the starting point.

I have talked with Mrs. Webb, the grazing lease holder on the Plateau, and she confirms that the ranch is in escrow to a Mr. Dees, a Tucson lawyer. Final payment is due May 15, 1972. It is unknown if Mr. Dees is acting in his own behalf or for others.

The Salt Lake Geophysical Division conducted tests on the probes in DCA-1A and A-4. Results were disappointing.

Discussion with Mr. Weber, of Moss-Weber Water Drilling and Service Company, has taken place in regard to converting A-2 into a water source area. It is believed that a near water source would be to advantage when drilling out offset wells in the area.

Mr. Cummings' report is in progress.

W. L. Kurtz -2-May 2, 1972 Few direct charges on hole A-2 were applicable during the month of hole troubles and recoring the last footage. Estimated unexpended balance for the Superior East authorization is

James D. Sell

JDS:sg attachs.

\$45,500.

PROPERTY Superior East Project

MINING DISTRICT Pioneer

County, STATE Pinal County, Arizona

DRILL HOLE A-2
FINAL DEPTH 4521

NW 1/4 NE 1/4 SE 1/4 Sec. 22, T 1 S, R 13 E.

PAGE 1 of 3 pages

DATE 1/20/72 - 3/18/72

Log By R. B. Cummings

DF	EPTH	1			1 1 3, K 1) E. 200 J.
FROM	то	ROCK	MINERALIZATION	ALTERATION	REMARKS
0	720	Td			Dacite - gray
720	1120	Td			Dacite - orange
1120	1225	Td			Dacite - brown
1125	1231	Td			Dacite - vitrophyre
1231	1302	Td			Dacite - brown
1302	1330	Td			Dacite - tuff
1330	2020	Tev			Andesitic basalt. Dark gray to reddish
					brown. Very fine grained.
2020	2425	Tw	Traces of native copper with		Whitetail. Greenish to brownish gritty
			schist.		mudstone with minor schist conglomerate.
2425	2810	Tw	Traces of native copper with		Whitetail. Conglomerate with light green
Cored f	from		schist		to brn. gritty matrix and mainly schist
2559 to					fragments with minor diabase and qtzite.
2810	3459	Tw	Traces of native copper. Trac	es	Whitetail. Conglomerate with brn. gritty
			of cuprite, malachite and	Property of the other to be follow	matrix. Fragments are schist and weakly
			azurite from approximately	11年代 12年代 12年代 12年代	altered qtz. monzonite with some diabase.
			3339-3459		
3459	3540	Tw?	Traces of native copper, cupri	te,	Whitetail(?) Conglomerate? No matrix in
Cored f	rom		malachite and azurite.	Light of the things to perfect	cuttings. Fragments mostly fine-grained
3540 to	3550				qtz. monzonite - wkly alterated.
					Note: This interval may be a qtz.
	1				monzonité slide block.
3540	3920	Tw	Traces of cuprite, native		Whitetail. Conglomerate with red to red-broad
			copper, malachite and azurite.		gritty matrix. Fragments as 2810'-3459'.

PROPERT	y Superior	East Proj	ect	<u> </u>	0202	00.0			PAGE.	2 0
1.59										
MINING	DISTRICT			_	DRILL	HOLE	A-2		DATE.	
			er College			1000				
COUNTY.	STATE		edia di Silata di I		FINAL	DEPTH_			1.00	D.

Co	DUNTY, STATE		<u> </u>	FINAL DEPTH	Log By		
FROM	ЕРТН	ROCK	MINERALIZATION	ALTERATION	REMARKS		
3920	4208	Tqm	Traces of py and cc. dissemin-	Strong. Varies from wk ar-	Tertiary Qtz. monzonite. Medium-grained		
Note:	Coring		ated and on fractures. Str.	gillic to strong gtz-seri-	and slightly porphyritic with minor		
star	ted at 40	751	cc in local qtz-sericite pods	cite and silicification.	biotite. Numerous small inclusion of		
			as 4081-82.5 & 4021-26. Total Fe0x → sulf. varies from	Str. qtz veining.	of biotite schist. Large inclusions 4110-20, 4158-66 and 4182-88. Fracturing		
			<pre>1% to 2-4%. Substantial portion of Fe0x probably</pre>		very strong - brecciated (post mineral). Lower contact - Fault zone?. Flat gouge		
			after cc.		bx in schist 4203-08.		
4208	4288	p€pi ε Tqm	Sparce py and cc. as above. Fe0x → sulf. (some of which		Biotite schist with dikes (?) of Tqm. Tqm @ 4226-32, 4236-43 and 4248-75.		
			is probably cc). varies from	str qtz-sericite. Mod-str	Total section is strongly brecciated.		
			<1/2% to 2-4%. Best from	in Tqm as above. Strong qtz	Tqm has a sheared, granulated look.		
			4262-88. Traces of specular-	veining in both.			
4288	4295	p€pi Flat Fau	1-2% FeOx — sulfide.	Wk chloritization to strong argillization.	Flat Fault. Rock is schist as above. Strong brecciation. Strong light		
					colored gouge. Gouge Bx.		
NOTE:	1		1		s Tqm, the rock is strongly brecciated and		
	oxidized.	1	ed. Below this zone the domina	nt rock type is schist, the ro	ock is un-brecciated and only weakly		
*							

AMERICAN SMELTING & REFINING CO.

PROPERT	Superior	East Pr	oject		GEOL	-0010	LUG		PAGE	3 of 3
	The say it is given									
MINING	DISTRICT				DRILL	HOLE	\- 2		DATE -	
COUNTY	STATE			공기를 들고 그 그리다.	FINAL	DEPTH	<u> </u>		Loc B	•

DEPTH							
FROM	то	ROCK	MINERALIZATION	ALTERATION	The state of the s		
4295	4321	Tqm	Traces of cc. replacing py	Wk to str argillization with	Tqm. As 3920-4208 from 4295-4314. From		
			on fractures and in dissemin-	local str qtz-sericite.	4314-21 - Fine grained salmon colored		
			ations. 1% Fe0x—sulfides	Minor qtz veining.	qm with 2% biotite.		
			from 4295-4314. (Only traces				
			of oxidation below 4314).				
			Traces of specularite.				
4321	4471	p€pi	1/2-2% py on fractures with	Str. silicification. Schist	Biotite schist. Schistosity 45-90° Tam		
			qtz veinlets and disseminated	has probably been recrys-	dikes 4393-94, 4410-17 & 4432-33 - also		
			Wk cc. replacing py. Wk bor.	tallized along schistosity	some smaller.		
			as very fine grained dis-	with remobilization of bio-			
			seminated.	tite. Some argillization			
				along schistosity. Minor qtz			
				sericite with qtz veining.			
				Mod-str. irregular qtz			
				veinlets.			
4471	4513	p€pi	1-2% py, cc., and bor. Local	Str argillization on frac-	Schist as above. Tqm dike(?) 4509-?.		
			str development of cc-4484-89	tures. Local areas of str	Crushed gouge-bx zones with rounded		
			and 4500-4510. Str. bor. 4505.	qtz-sericite. Str. silici-	fragments @ 4481.5-83.5, 4484.5-85.0,		
				fication and qtz veining	4487-88, 4498-4500 (w/qtz veinlets) and		
				(irregular) Tqm-str. argil-	4505-09 (w/qtz veinlets). Fault Bx -		
				lization and local str qtz-	well healed at 4504-70°.		
				sericite.			
4513	4521	7	Core barrel and several hund	red feet of rods were lost in	the hole. Recovery attempts were		
			unsuccessful. The hole was	deflected at 4230 with a wedge	. See log of A-2W for hole continuation		

PROPERTY Superior East Project
Mining District Pioneer

County, STATE Pinal County, Arizona

DRILL HOLE A-2W (Wedge)
FINAL DEPTH NW1/4 NE1/4 SE1/4

PAGE 1 of 2 DATE 4/19/72 -LOG ByJ.D.Sell

Sec. 22, T 1 S, R 13 F ROCK MINERALIZATION ALTERATION REMARKS FROM TO NOTE: Drill hole A-2W is wedged off df the original drill hole A-2. 4230 4238 Limonite, 1-4% after sulfides. Silica and atz-sericite in Monzonite dike @ 4233-4236. All rock i a3a Minor leached chalcocite qtz. schist & monzonite. Argillic | broken somewhat sheared & crushed. lin monzonite. veins. 4238 4276 Oxidized, leached, 1-3% after Argillic with some gtz. gtz- Increased shearing at base. Tam sulfides. Minor leached challsericite veinlets. cocite. Veinlets & disseminated. 4276 4289 Oxidized, leached, 2-4% after Otz-sericite and silica inpCpi Crushed and brecciated. sulfides. jection and veinlets. Probable base of faulted section. 4289 4320 Tqm Oxidized, leached, 1-2% after Argillic with weak qtz-seri- Base of intense oxidation @ 4317. sulfides. Minor qtz veining. cite, some silicification. 4320 4357 Qtz & pyrite, minor chalco- Argillic in monzonite. 3 iqJq Minor oxidation in monzonite @ 4330-Tam Silica in monzonite & schist. 4337. cite. Filter-press quartz & veining Qtz & minor qtz-sericite as |Tqm @ 4396-4397, aplitic @ 4408-4410. <u>4357</u> 4488 with py, cp, cc & bornite, & stockwork, veining. Few gouge seams. disseminated. 4488 4512 Tam Py, cp, cc, bornite in shear Argillic w/ qtz-sericite & Entire zone cataclastic texture with veinlets & disseminated. qtz veinlets & flooding. numerous slips, shears, & gouge zones.

AMERICAN SMELTING & REFINING CO.

PROPERTY_	Superior Ea	st Project		GEOLOGIC	LUG	D. C.	2 of 2
					014	PAGE -	
MINING DIS	STRICT			DRILL HOLE A	<u>'-2w</u>	DATE -	
COUNTY ST	FATE			FINAL DEPTH			

DEPTH									
FROM	ТО	ROCK	MINERALIZATION	ALTERATION	REMARKS TO THE TENTRE OF THE STATE OF THE ST				
4512	4521	рСрі	Filter press qtz & complete	Qtz & minor qtz-sericite.	Stockwork qtz.				
			silica overflooding @ 4516-						
			4519. Py, minor cp, cc.						
4521	4526	Tgm		Argillic, minor qtz-sericite.	No qtz veining; highly fractured,				
			films.	[[교리 출발하기 등에 가는 그리고 말으라는 다	steep angled gouge.				



Magma's #9 shaft

DCA-1 (hole designation)
4011 Tw
Rock type
Bottom hole depth

Proposed drill site

Tev-Early volcanics Tw-Whitetail

PRE-MINERAL ROCK UNIT

Tbx-Breccia Tam-Quartz Monzonite Tgr-Granite TPn-Naco limestone p€sc-Schist Me-Escabrosa limestone

Dm-Martin Ims p€t-Troy qtz p€db-Diabase for the month of April 1972 SUPERIOR EAST GILA & PINAL COUNTY, ARIZONA SCALE: I'= I mile J.D.S. J.D.S.

2463

May 26, 1972

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report Superior East Project May 1972

Attached is the Superior East progress map and the drill log continuation for A-2W, the only hole in progress during the month.

Hole A-2W was deepened during the month from 4526 feet to a terminal depth of 4940 feet; a progress of 414 feet for the month. Hole A-2W continued in Pinal Schist cut by dikes and masses of quartz monzonite. The schist contains variable alteration and mineralization, as does the quartz monzonite. The chalcocite zone from the base of leaching at 4320 feet to 4528 feet averaged 0.37% copper, while the sulfide zone from 4528-4610 averaged 0.31% copper. A heavy gouge-fault zone occurs at 4613-4622 feet. The alteration decreases below the fault at 4622, but quartz and quartz-sericite veinlets are present, along with pyrite, chalcopyrite, and specularite with some molybdenite. The assays from 4610-4790 averaged 0.13% copper, while the remainder of the hole to 4940 feet averaged 0.42% copper. Stuck rods caused a termination of the hole at 4940 feet and 818 feet of rods and core barrel were lost.

Approximately 1-1/4 miles of road have been constructed into State lease section 5.

Mrs. Webb states that she has sold the ranch to Mr. Dees.

Century Geophysics conducted a temperature survey on drill hole A-2W. The surface temperature was 63°F and incrementally rose to 126°F at depth of 4070 feet, where it retrograded to 50°F at 4090 feet, then to 38°F at 4200 feet, where it stabilized and incrementally increased again to 42°F at 4900 feet, the last reading. The instrument was checked and four runs were made thru the retrograde zone. It is believed that the survey is real, but interpretation as to the cause is open. Interestingly, Longyear determined that the first free point in the stuck rods is at 4115 feet.

May 26, 1972 W. L. Kurtz - 2 -Map and section revisions have been made for incorporation into Mr. Cummings' report, which is in the final typing. Estimated unexpended balance for Superior East authorization is \$11,300. James D. Sell JDS: lad Encs.

AMERICAN SMELTING & REFINING CO. GEOLOGIC LOG

PROPERTY Superior East Project MINING DISTRICT Pioneer

4488

4512

Tam

DRILL HOLE A-2W (Wedge)

FINAL DEPTH 4940 NW1/4 NE1/4 SE1/4

PAGE 1 of 3 DATE 4/19/72 - 5/17/72

Entire zone cataclastic texture with

numerous slips, shears, & gouge zones.

County, STATE Pinal County, Arizona Log By J.D. Sell Sec. 22. T 1 S. R 13 E DEPTH ROCK MINERALIZATION ALTERATION REMARKS FROM ΤÓ Drill hole A-2W is wedged off df the original drill hole A-2. 4230 Limonite, 1-4% after sulfides. Silica and qtz-sericite in Monzonite dike @ 4233-4236. All rock 4238 iα⊋α Minor leached chalcocite qtz. schist & monzonite. Argillic broken somewhat sheared & crushed. lin monzonite. veins. 4238 4276 Oxidized, leached, 1-3% after Argillic with some qtz, qtz- |Increased shearing at base. Tam sulfides. Minor leached challsericite veinlets. cocite. Veinlets & disseminated. 4276 Oxidized, leached, 2-4% after Otz-sericite and silica in- Crushed and brecciated. 4289 p€pi sulfides. jection and veinlets. Probable base of faulted section. 4289 Oxidized, leached, 1-2% after Argillic with weak qtz-seri- Base of intense oxidation @ 4317. 4320 Tam sulfides. Minor atz veining. cite, some silicification. 4320 Qtz & pyrite, minor chalco-4357 p€pi & Argillic in monzonite. Minor oxidation in monzonite @ 4330-Silica in monzonite & schist. 4337. Tam cite. 4357 Filter-press quartz & veining Qtz & minor qtz-sericite as Tqm @ 4396-4397, aplitic @ 4408-4410. 4488 with py, cp, cc & bornite, & stockwork, veining. Few gouge seams. disseminated.

atz veinlets & flooding.

Py. cp. cc. bornite in shear Argillic w/ qtz-sericite &

veinlets & disseminated.

AMERICAN SMELTING & REFINING CO. GEOLOGIC LOG

PROF	Superior	East Project					
					게임 기가 되는 것 같다.	이 사람님 경제 성입하다	
Mini	NG DISTRICT		<u> </u>	ď	RILL HOLE A-2W		
1986 B. 1886							
Com	TY. STATE			F:	INAL DEPTH		

PAGE ______3

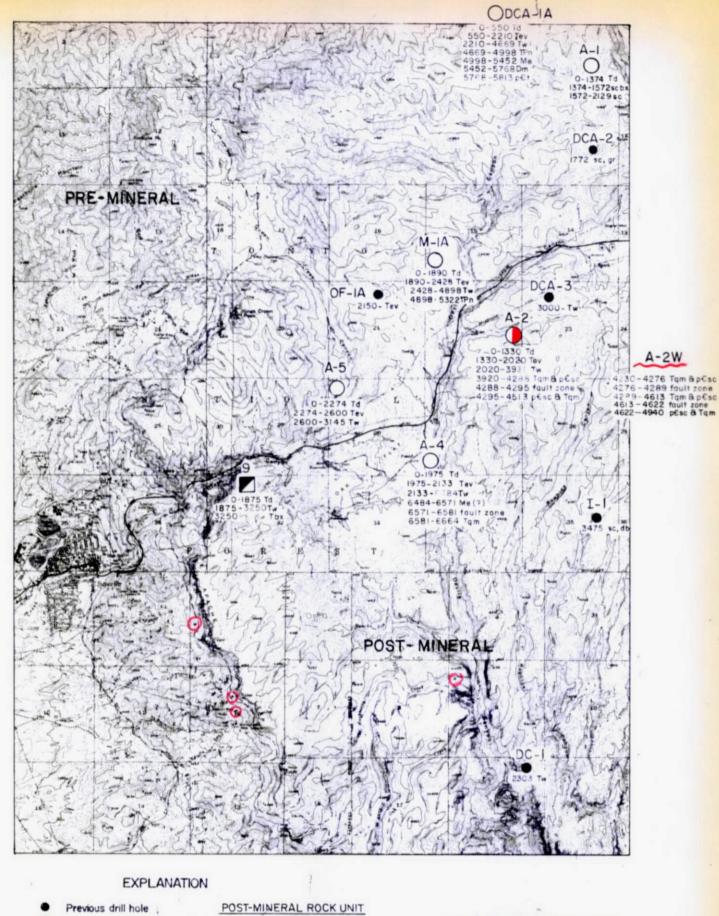
DATE ______

TH TO	ROCK			
TO	RUCK	MINERALIZATION	ALTERATION	REMARKS
• •				The state of the s
4521	p€pi	Filter press qtz & complete	Otz & minor qtz-sericite.	Stockwork qtz.
		silica overflooding @ 4516-		
		4519. Py, minor cp, cc.		
4528	Tqm	Minor diss. py, less cp, cc	Argillic, minor qtz-sericite.	No qtz veining; highly fractured,
		films.		steep angled gouge.
4542	Tqm	Smoky qtz veinlets w/py, cp,	Increased qtz and qtz sericit	
		moly. Some dissemination,		
		2-4% sulf.		
4578	Tqm and	Smoky qtz veinlets & masses	Qtz veinlets and pervasive	Crushed and shear zones @ 4550-4553; 4555
	р€рі	w/py, cp, moly; also dissem.	incipient qtz-sericite.	4561-4562; 4564; and 4565-4566.
		2-3% sulfides		
4613	р€рі	Dissem. & veinlet py, cp,	Qtz veining & flooding with	Gouge & shear zone at 4582-4598. Mineral
		minor moly & specularite, 1-2% sulf.	incipient qtz-sericite	decreasing below zone.
4622	Fault	Heavy gouge and crushed p£pi	with atz seams & dissem, veinl	ets of py & cn
4639	р€рі			Upper eight feet badly broken and gougy.
		py; very minor cp. <1% sulf.		
4646	Tqm	Intersecting qtz veinlets &	Very weak argillic w/inter-	Included schist bands one foot wide at
		dissem. w/py. minor co		
4658	р€рі			
4678				te 1% total sulfides; minor inclusions
		w/py, rare cp.	veinlets & qtz. veinlets	of schist.
A				
	4528 4542 4578 4613 4622 4639 4646	4528 Tqm 4542 Tqm 4578 Tqm and pepi 4613 pepi 4622 Fault 4639 pepi 4646 Tqm	silica overflooding @ 4516- 4519. Py, minor cp, cc. 4528 Tqm Minor diss. py, less cp, cc films. 4542 Tqm Smoky qtz veinlets w/py, cp, moly. Some dissemination, 2-4% sulf. 4578 Tqm and Smoky qtz veinlets & masses pπ w/py, cp, moly; also dissem. 2-3% sulfides 4613 pπ Dissem. & veinlet py, cp, minor moly & specularite, 1-2% sulf. 4622 Fault Heavy gouge and crushed pπ 4639 pπ Minor dissem. & veinlets of py; very minor cp. <1% sulf. 4646 Tqm Intersecting qtz veinlets & dissem. w/py, minor cp. 4658 pπ Minor (<1%) py & cp. 4678 Tqm Minor diss. py & qtz veins	silica overflooding @ 4516- 4519. Py, minor cp, cc. 4528

AMERICAN SMELTING & REFINING CO. GEOLOGIC LOG

PROPERTY Superior East Project		OFOGIO FOO	PAGE 3 of 3
Mining District	n de la companya de la companya de la companya de la companya de la companya de la companya de la companya de La companya de la co	LL HOLE A-2W	DATE
		AL DEPTH	
COUNTY, STATE			Log By

DE	тн	7							
FROM	70	ROCK	MINERALIZATION	ALTERATION	REMARKS				
4678	4748	р€рі	Minor pyrite throughout; with	Barren qtz veinlets, except	Essentially fresh qtz-biotite schist				
			discrete qtz-py-cp, moly,		with dikelets of Tam @ 4690-4692, 4713,				
			specularite veins @ 4692-4693	, qtz-sericite are associated	. 4718. Fault vein @ 4746.				
			4707-4708, 4722, 4729-4736,						
			@ 45-60° to core.						
+748	4830	р€рі &	Barren qtz veinlets; increas-	Schist fresh at top, increas-	Increasing crushed and shear zones with				
		minor	ing with py, cp, specularite	ing incipient qtz-sericite &	gouge development toward base.				
		Tqm	towards bottom (1% sulfides)	veinlets towards base. Tqm					
			in qtz-sericite veinlets.	weak argillic.					
4830	4834	Fault	Minor py, cp, specularite		Steep angled zone, +60° to core.				
1834	4848	р€рі	Minor py, cp, specularite	Otz veinlets, weak qtz-serici	e Few gouge zones.				
1848	4940	Tqm	Increasing py, cp, specularit	eModerate argillic alt. in Tqm	Tqm increases to base, last 34 feet				
		(73%)	qtz veining and silica	increasing qtz veins & qtz-	is Tqm. Entire zone cut by numerous				
		8	overflooding from top to	sericite alt. throughout.	slips, shears, & gouge zones, at +60°				
		р€рі	bottom. Up to 3% sulfides in	Silica overflooding towards	to core.				
		(27%)	zones.	base. Biotites partly					
		•		chloritized.					
•			图表层 的复数现代基础 医红斑						
rill p	ipe stuc	seven f	eet off of bottom. Pipe cut a	t 4115 feet and recovered.					
318 fee	t of NQ(X) rods,	connectors, and core barrel l	øst.					



ASARCO drill hole

Magma's **9 shaft

DCA-1 (hole designation)

4011 Tw

Rock type

Bottom hole depth

Proposed drill site

Td - Dacite Tev-Early volcanics Tw-Whitetail

PRE-MINERAL ROCK UNIT

Tbx-Breccia Dm-Martin Ims
Tqm-Quartz Monzonite p€t-Troy qtz
Tgr-Granite p€db-Diabase
TPn-Naco limestone p€sc-Schist
Me-Escabrosa limestone

for the month of MAY 1972

SUPERIOR EAST
GILA 8 PINAL COUNTY, ARIZONA
SCALE: I'= I mile
J.D.S.
2463

June 26, 1972

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report Superior East Project June 1972

Work during the month has been the drafting of maps and reports finalizing the project activities. The drilling progress attachment submitted last month completed the drilling activities under the present authorization.

Mr. R. B. Cummings' report <u>Drill Hole Geology 1971 and 1972</u>, <u>Superior East Project</u> covers the geology as now interpreted from the drilling. The report was distributed during the month, with a cover letter containing the geology log of the wedged hole A-2W and assays.

As reported last month, Century Geophysical ran a temperature probe in A-2 and reported a strong reversal in the gradient. Mr. Paul Laird of Century Geophysical reported by phone that their laboratory measurements had found a reproduceable defect in their temperature probe. A separate memo on the subject has been submitted. Mr. Laird affirms that the temperature survey from start to 125°F is valid, but above that temperature the probe circuits kick out and give incorrect readings. In hole A-2 (A-2W), assuming the temperature gradient to 125°F is correct, we can project the temperature at 5000 feet to be between 136° and 142°F. Century is not submitting an invoice for the survey or subsequent testing. They have apparently corrected the malfunction and would be interested in doing further work.

During the week of June 5, the SLC geophysical group placed electrodes in drill hole A-2 (A-2W). The surface EM measurements indicated a response restricted to within 800 feet of the hole (report dated June 13).

Mr. Paul Bryant, equipment contractor, has cleaned and filled drill sites DCA-1A and A-2. Both sites were then seeded by Mr. Benavidez of this office and a letter sent to the Forest Service at Globe.

Mr. H. L. Crittendon is completing a drilling cost-technique report on the Superior East Project.

The unexpended authorization is estimated at \$9,000.00. Rental on the Claypool office and facilities continue.

James D. Sell
James D. Sell

JDS: lad

July 31, 1972

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report Superior East Project July 1972

Only minor office work, report writing, drafting, etc. was done on the project for the month. Rental on the Claypool office and facilities continue with expected use in the joint venture with Hanna and further work on Superior East.

The unexpended authorization continues to be estimated at \$9,000.00.

James D. Sell

JDS: lad

wollow9 7 8 20 27

September 1, 1972

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report Superior East Project Pinal County, Arizona August 1972

Minor clean-up work has been accomplished in the Claypool office, as well as office work in Tucson.

A summation of the drilling progress and results along with discussion of the three types of target areas discovered has been drafted. The report, with recommendations for further work will be distributed shortly.

Aerial photographs covering the Project and surrounding area from Ray to Globe has been sent to Mr. Staargaard. Further evaluation of his study will be conducted in Tucson and the Project area.

J. D. Sell

JDS: lad

Accounting Office Balance - 14 Sept = #8129.77

263

7766.77

October 3, 1972

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report Superior East Project September 1972

My summation report (dated August 31, 1972) on the drilling activities, findings, interpretation, and recommendations has been distributed.

The final four cost summaries for holes DCA-IA (coring), A-2 (rotary and coring), and A-2W (coring) have been distributed. A <u>Cost Summary</u> report for the entire project authorizations (as of September 1, 1972) has also been compiled and distributed. The report indicates, by Accounting Dept. figures, that the direct drilling costs over the entire project amount to \$26.80 per foot drilled, while the total project costs amounted to \$35.38 per foot drilled. This total figure includes the early sums spent in claim staking, validation, geologic studies, etc. Mr. Crittendon is preparing a summary of the direct drilling costs applicable only to the drilling itself.

Mr. Staargaard visited the area during the month and offered some verbal comments on aspects of the project.

Claypool rental facilities and expenses were charged against the project for the month. These charges will be transferred to the Bohme Project next month (October) and thereafter until termination of the Bohme Project.

Two claims were posted with a location notice (the Tom and Cat claims) over the general area of the Stew #1 and #2 which may be invalid. Further research is necessary as they may have until December 31 to record the work done. No sign of the Stew Claims nor of work done was noted.

Mr. Bob Crist informs us that Mr. Clary has picked up the Robert Craig acreage between the other two pieces of ground owned by Clary. Negotiations are in progress on the homestead area now in probate with the death of Mr. Craig's mother. Both of these pieces of ground (and especially the homestead) are key parcels in the land trading for any purpose such as the BLM or Forest Service.

The estimated unexpended balance is \$7,866.00.

J. D. Sell

JDS: lad

October 16, 1972

TO: W. L. Kurtz

FROM: J. D. Sell

Reports and Memos Superior East 1971-1972

A number of reports and memos have been written by various individuals covering facets of the Superior East project during the 1971-1972 drilling program. Most of the items have been covered in the Monthly Progress reports.

The attached table is an attempt to show the reports and drill hole coverage by author and date.

J. D. Sell

JDS:lad Attach.

SUPERIOR EAST: 1971-1972

Report or Memo	A-1		A-2 Dr	111 Hc	A-2W	· —	A-4	A-5	1	DCA-1A		M-1A
Daily Summary-Unit Contact (Rotary) Daily Summary-Unit Contact (Diamond) Drilling Progress Coring Rates Cost Summary Explanation	RBC 11/22/71 RBC 10/27/71 HLC 5/25/71 JDS 11/8/71 RBC 10/ 1/71	JD\$	3/27/72 5/18/72 	JDS	NA 5/23/72 	RBC HLC	11/22/71 10/27/71 5/25/71 11/ 8/71	RBC 11/15/71 NA 	RBC	NA 3/ 7/72 	HLC	NA 10/27/71 5/25/71 11/ 8/71
Cost Summary (Rotary) Cost Summary (Diamond) Cost Summary, Initial Cost Summary, Direct Drilling Cost Summary, Project Assay Data Graphic Log - Assay Results Geology Log Drill Hole Geology 1971-1972 1971-1972 Summation Report	RBC 10/ 1/71 RBC 10/ 1/71 RBC 10/ 1/71 HLC 6/16/71 HLC In Prepa JDS 9/28/72 RBC 11/11/71 JDS 10/ 5/71 RBC 5/-1/72 RBC 5/30/72 JDS 8/31/72	JDS JDS ration	9/26/72 9/26/72 	JDS	NA 9/26/72 	RBC	10/27/71 1/13/72 6/16/71	RBC 10/27/71 NA 	JDS	NA 9/26/72 	RBC HLC	NA 10/27/71 6/16/71
		RBC JDS RBC	3/24/72 7/ 8/72 5/ 1/72	JDS JDS	5/20/72 7/ 8/72 6/ 1/72		11/ 9/71 12/ 2/71 5/ 1/72	NA JDS 5/25/72 RBC 5/ 1/72	RBC JDS RBC	4/ 4/72 3/31/72 5/ 1/72	RBC JDS RBC	1/13/72 7/ 8/71 5/ 1/72
Inclination Survey Temperature Survey		HLC JDS	5/30/72 6/30/72	HLC JDS	5/30/72 6/30/72		11/ 2/71 11/ 9/71		HLC JDS	3/16/72 1/28/72	SS	6/15/71
Porosity-Permeability Age-dates Microprobe		∫WLK	 3/ 9/72			GL {JDS GL	2/ 4/72 2/ 7/72 2/ 7/72 1/20/72 11/11/71		Cr Cr	2/ 4/72 2/ 7/72 	CINC CI CIDS CI	2/ 4/72 2/ 7/72 1/20/72 6/23/71
Copper in Biotite Fossil Identification		ĮVΚ	3/22/72 			{vĸ	12/10/71		EJN	1/12/72	FDI	7/13/71 7/14/71
Origin of Native Copper Petrographic Examination	 GJS 1/19/72		- 			JK FTG	2/24/72 5/31/72	- ;-		'	C	
3. Spirio and macron	GJS 1/19/72					GJS	1/20/72		GJS	11/30/71	(G12 (G12	1/19/72 1/20/72

CL - Core Laboratories

EJN - Emanuel J. Nieves

FTG - Fred T. Graybeal

GJS - George J. Stathis GL - Geochron Laboratories

HLC - Howard L. Crittendon

JDS - James D. Sell

JK - Jan Krason

JJC - John J. Collins

LDJ - Lloyd D. James

RBC - Robert B. Cummings

SS - Sperry-Sun VK - Val Kudryk

WLK - William L. Kurtz

NA - Not Applicable

October 31, 1972

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report Superior East Project October 1972

No new work has been done on the project area.

K. Coryell and Magma have now pushed a road down the west side of the area (on Magma ground) to reach State Lease Section 8. Word is that Coryell will move a rig on and drill a hole to completion.

Joy Drilling is still on location above the Belmont workings for Magma.

A new road above Cross Canyon is being pushed by Magma, apparently for a drill site station. This is just south of the Anaconda drill holes.

The estimated unexpended balance remains at \$7,866.00.

James D. Sell A

JDS:lab

November 28, 1972

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report Superior East Project November 1972

No new road or drill work has been done on the project area under our expenditure.

The joint-venture road of K. Coryell and Magma was completed south in section 32 and into the Rancho Rio Creek drainage in section 6. It then cut across the SWI/4 of section 5 and into the Hackberry Creek drainage in section 8, which it followed eastward into the NWI/4 of section 9.

Lohman Drilling (Salt Lake City) has moved a Gardner-Denver 1500 onto the site and commenced mud-drilling a 5-1/8 inch rotary hole. The hole is designated as KC-1 (Attachment A). The rig has been visited twice. The dacite-Whitetail contact is approximate and the depth presently reported was secured verbally as of the 23rd. Probable ultimate depth is around 2500 feet for the rig, at which time the hole will be cased and a diamond drill moved in. The rotary driller suggested that Coryell had several more holes in the "Globe area" for the rig.

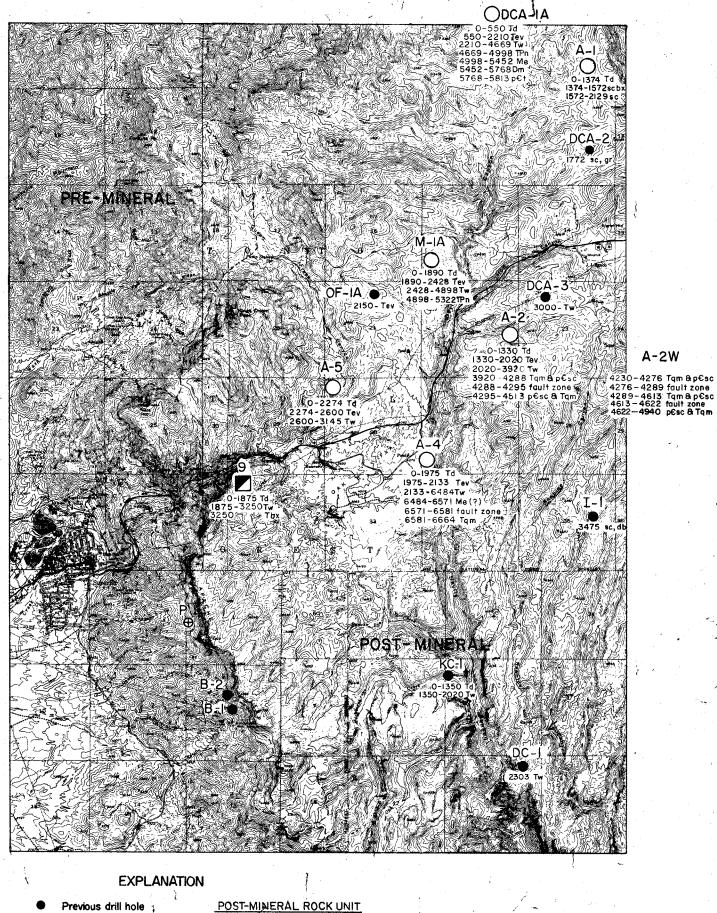
Magma completed two diamond drill holes (B-1 & B-2) in the Belmont area. Both holes started in the Pennsylvanian Naco Limestone and were verbally reported to have been completed into the quartzite below the Devonian Martin Limestone. No core chips were found on the sites, nor was any pyrite or other sulfides (or oxides) noted in the mud ditches. Drill results were reported as "discouraging". Magma has completed the drill site above Cross Canyon (marked as "P" on the map), but as of the 25th a drill had not been moved onto the site. The hole will be collared in Pennsylvanian Naco Limestone.

Examination for section and quarter corners around section 33 (Oak Flat) has been completed and flagged for future use.

The estimated unexpended balance remains at \$7,866.00.

James D. Sell

JDS:lab Attach.



ASARCO drill hole Magma's #9 shaft

DCA-1 (hole designation) 40II Tw Rock type

Bottom hole depth

Proposed drill site

Td - Dacite Tev-Early volcanics Tw-Whitetail

PRE-MINERAL ROCK UNIT

Tbx-Breccia Tam-Quartz Monzonite Tgr-Granite TPn-Naco limestone

Dm-Martin Ims p€t-Troy qtz p€db-Diabase p€sc-Schist Me-Escabrosa limestone

DRILLING PROGRESS MAP for the month of NOU. 1972 SUPERIOR EAST

GILA & PINAL COUNTY, ARIZONA SCALE: " I mile J.D.S. J.D.S. 2463

December 26, 1972

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report Superior East Project December 1972

The contract for rebuilding and opening the road eastward from A-2 has been made with P. Bryant Contracting. The road will be placed up out of the drainage and will be for drilling on the Inspiration ground as well as reopening the road to the south.

Loman Drilling completed the rotary portion of KC-1 on the State Lease ground of Kirby Coryell and cased to 2370 feet. It has been verbally reported that the base of the dacite was at 1010 feet, followed by 900 feet of mudstone in the Whitetail.

Joy Drilling moved a diamond rig onto KC-1 and is reported to be around 2500 feet in poor ground.

Joy is also diamond drilling on CC-1 in Cross Canyon for Magma Copper. No report is available on the hole.

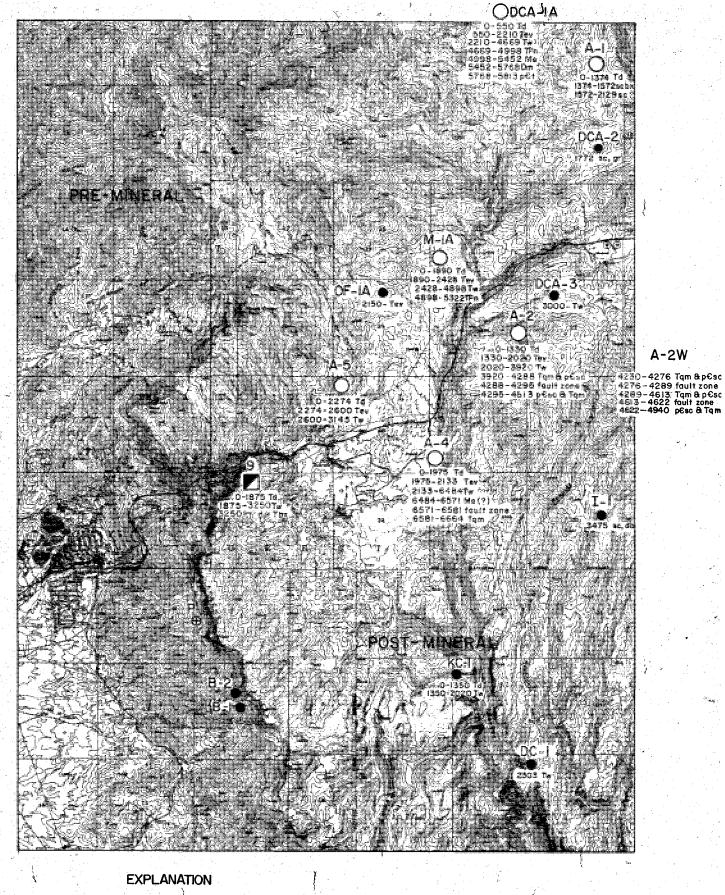
It has also been reported that Conoco Oil has joint ventured the ground of Norandex to the south and has a drill rig on the site. No field check has been made to date.

Some butcher paper has been placed on available corners of the Oak Flat area.

The estimated unexpended balance is \$6,500.

Gauces W.Sell James D. Sell

JDS: lab



Previous drill hole

ASARCO drill hole

Magma's 9 shaft

DCA-I (hole designation) 40II Tw

Rock type

Bottom hole depth

Proposed drill site

POST-MINERAL ROCK UNIT

Td - Dacite
Tev-Early volcanics
Tw-Whitetail

PRE-MINERAL ROCK UNIT

Tbx-Breccia Dm-Martin Ims
Tqm-Quartz Monzonite p€t-Troy qtz
Tgr-Granite p€db-Diabase
TPn-Naco limestone p€sc-Schist
Me-Escabrosa limestone

DRILLING PROGRESS MAP for the month of NOV. 1972 SUPERIOR LAST

GILA & PINAL COUNTY, ARIZONA SCALE: | z | mile J.D.S. 2463

TAB

1973

February 1, 1973

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report Superior East Project January 1973

Road building east from drill site A-2 has progressed some 300 feet during the month. W. L. Kurtz late last week found new location notices by W. Dees on the Margaret claims.

Discussion on future drilling on the project area has been made and tentative plans have been formulated with a test to the east of A-2 (actually on the Rawhide area when the joint venture proposal is signed) and another south of A-4 on the project proper.

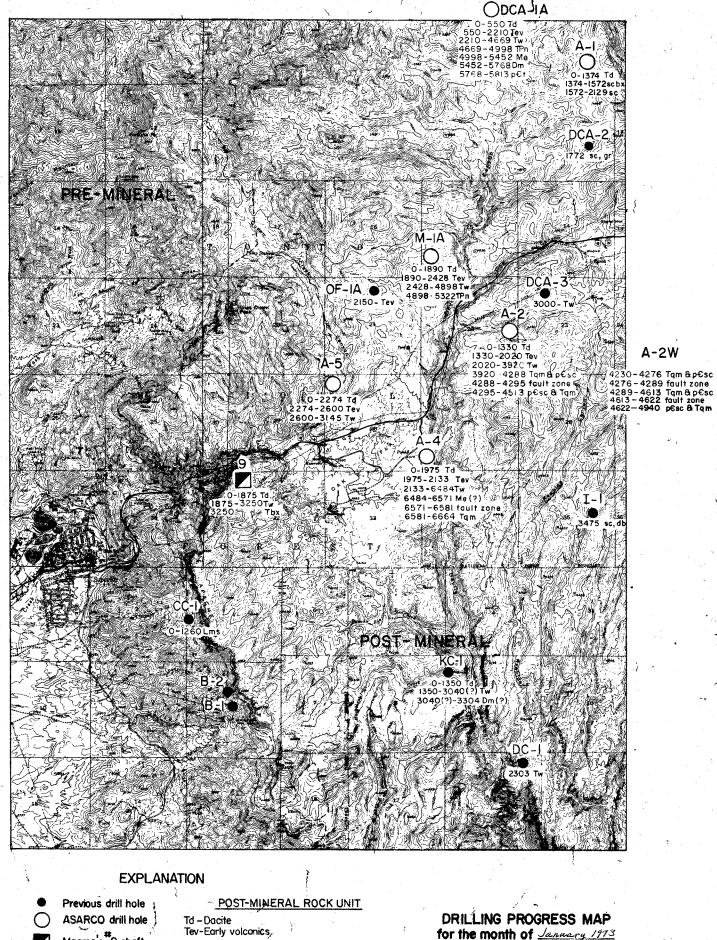
The hole on the State Lease land of Coryell, hole KC-1, was terminated at a depth of 3304 feet (driller's shift report). Cuttings and core chips at the site suggest a brown fine-grained limestone (dolomitic) unit was the last encountered. This is presently interpreted as being the Devonian Martin Limestone. Verbal report by the foreman suggested some three hundred feet of limestone had been cut. NX casing was set at 2966 feet and Whitetail Conglomerate was reported at 3039 feet. Thus the formational change is estimated at 3040(?) feet. If the reported unit and footage are correct, then a fault of considerable magnitude exists between KC-1 and A-4. An alternate possibility (probability?) is that the unit is a slide block. The driller reported going into "shaley" zones between limestone units, and these may be fine-grained mudstone units of the Whitetail Conglomerate.

The Magma drill hole CC-1 is a skid rig drilling a 60° angle hole and is reported at 1260 feet in limestone. Apparently drilling problems (lost circulation?) is plaguing the drilling. The hole was collared near the Whitetail-Pennsylvanian Limestone contact.

The Conoco Oil drill rig on Norandex claims was moved off this week. The vertical hole is in the SW quarter of section 21, T2S, R13E, approximately three-quarters of a mile south of the south boundary of Attachment A (the section south of Section 16). The hole was collared near the Whitetail-Pennsylvanian Limestone contact. No information is known on the findings.

The estimated unexpended balance is \$5,200.

James D. Sell /6-



ASARCO drill hole Magma's #9 shaft

DCA-I (hole designation)
40II Tw

Rock type

Bottom hole depth Proposed drill site

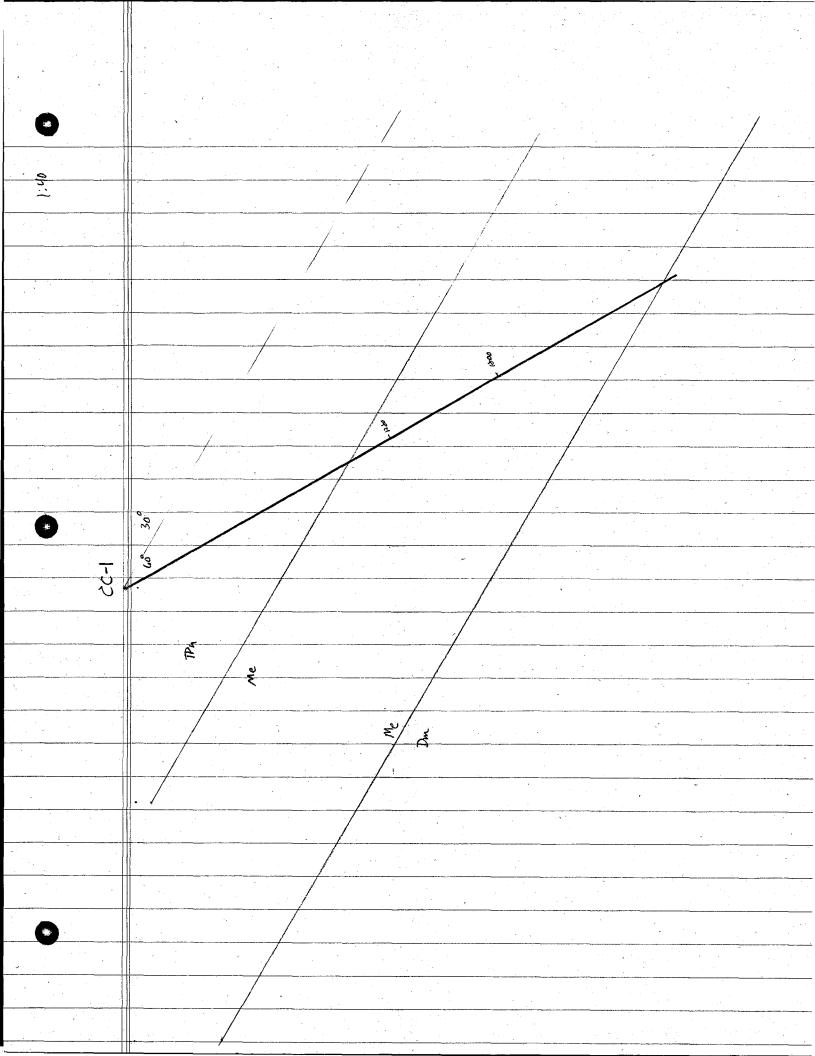
PRE-MINERAL ROCK UNIT

Tw-Whitetail

Tbx-Breccia Dm-Mortin Ims Tam-Quartz Monzonite p€t-Troy qtz Tgr-Granite p€db-Diabase TPn-Naco limestone p€sc-Schist Me-Escabrosa limestone

DRILLING PROGRESS MAP for the month of January 1973 SUPERIOR EAST GILA & PINAL COUNTY, ARIZONA SCALE: | 'z | mile J.D.S.

J. D. S. 2463



February 28, 1973

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report Superior East Project February 1973

Road building east from drill site A-2 has progressed an additional 500 feet during the month. Rain and snow have hampered the progress, but the road is nearly to the first flat. About one week's work will place it eastward into the second flat, or the area proposed for the first test of the Rawhide Project. Before completing the link, Bryant will reopen the road to the south and push a road out onto Section 4 State Lease. Time scheduling for this phase is difficult to estimate.

Magma's hole CC-1 is rumored to be at 1800 feet in mineralized ground. Projection of the units would place the hole in the middle units of the Mississippian Escabrosa Limestone -- the major host unit for the stacked replacement ore reserves presently being mined.

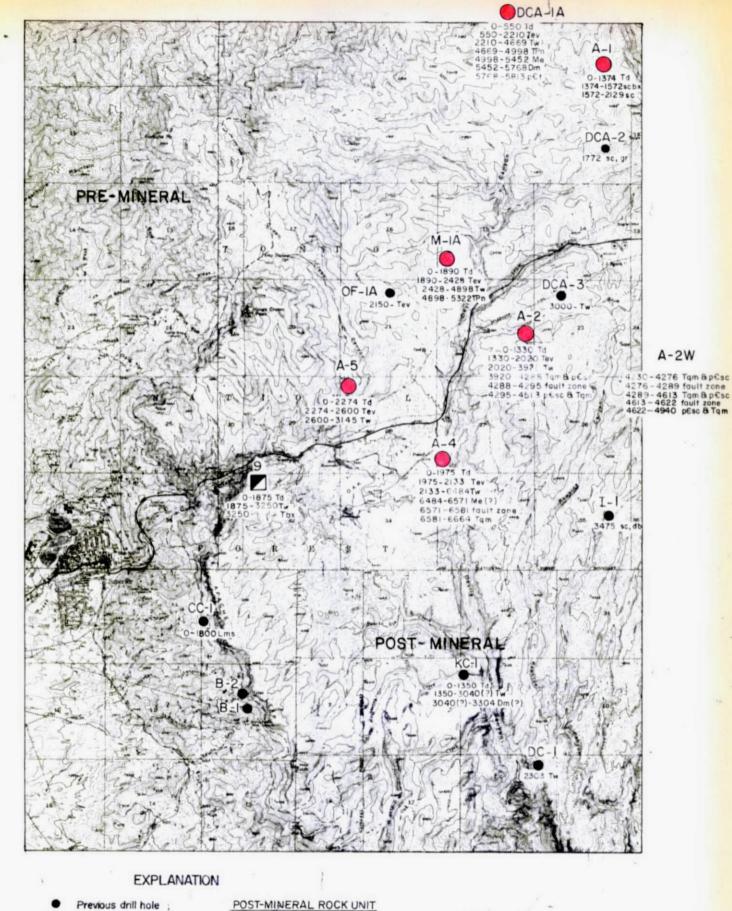
Final plans on improving the road south of Oak Flat for drilling in Section 5 State Lease have not been made. It appears feasible to add fill to the first part, as requested by the Forest Service, and avoid blasting on the early part of the road.

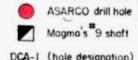
The estimated unexpended balance is \$5,100.

James D. Sell

JDS:1b

Attach.





DCA-I (hole designation) 40II Tw Rock type

Bottom hole depth

Proposed drill site

POST-MINERAL ROCK UNIT

Td - Dacite Tev-Early volcanics, Tw-Whitetail

PRE-MINERAL ROCK UNIT

Tbx-Breccia Tam-Quartz Monzonite Tgr-Granite TPn-Naco limestone Me-Escabrosa limestone

Dm-Martin Ims p€t-Troy qtz p€db-Diabase p€sc-Schist

DRILLING PROGRESS MAP for the month of February, 1973 SUPERIOR EAST GILA & PINAL COUNTY, ARIZONA SCALE: | " = I mile J.D.S. J. D. S. 2463

March 29, 1973

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report Superior East Project Pinal County, Arizona

The road work continued during the month and reached the junction to where we were to go south into Section 4 (State Lease) and east into the Rawhide Project area. The road east was started, but stopped short in a dispute with Mr.Dees. The problem appears to be resolved in that the road will be entirely on ASARCO claims, but all activity is now on the south road which is undisputed.

Verbal permission from the U.S.F.S. and Magma (for fill) has been secured for completing the road south of Oak Flat and into Section 5 (State Lease).

The unexpended balance is estimated at \$109,000.

Sames D. Sell /

James O. Sell

JDS: 1b

May 1, 1973

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report Superior East Project Pinal County, Arizona April 1973

Road work continues to be the main expenditure on the project area. Fill has been secured from Magma and the road through Oak Flat has been prepared and connected with the previous road suitable for drilling purposes. The Section 5 area is ready for drill site preparation.

Eastward from drill site A-2, the road has been pushed in to near the boundary of the Rawhide Project. Disputes with Dees continue. The road southward for Section 4 is in progress, but was hampered by extreme wet weather and mushy ground.

The expenditures for the LD group of claims have been transferred from the Rawhide appropriation to this appropriation. Location of LD No. 21 was completed by drill hole expenditures. LD Nos. 13, 14, 15, & 16 are being requrked by digging of pits under contract to Mr. Harvey McKee.

The unexpended balance is estimated at \$96,000.

James D. Sell

JDS:16

May 30, 1973

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report Superior East Project May 1973

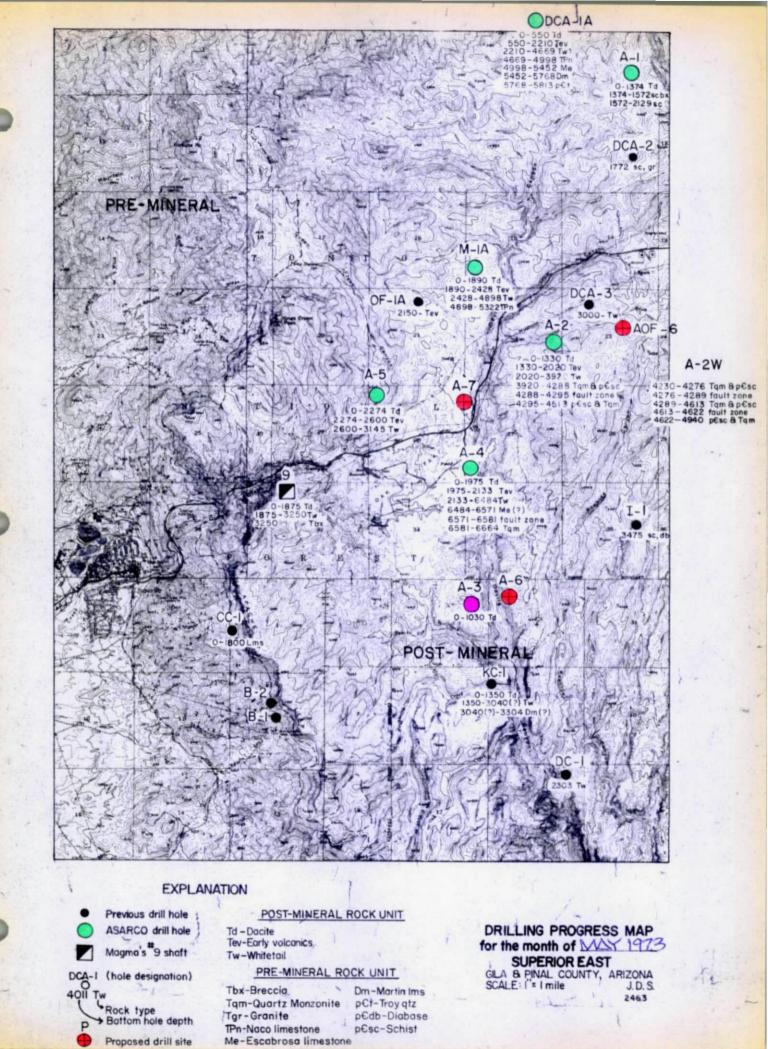
Harness Drilling Company is drilling in State Lease Section 5 south of Oak Flat (Attachment A) and was at a depth of 1030 feet in Dacite. The hole is designated A-3. He will move to State Lease Section 4 and drill A-6. Both holes are designed to fill the work commitment for the leases and will be tightly capped for reentry at a later date. It is expected that the Dacite will stand open for long periods in such drill holes.

Drill site A-7 has been picked for continued work in the project area. Road building will commence soon toward the site. Drill site AOF-6, a joint venture with Inspiration Copper Company, has also been determined for the adjacent Rawhide Project area. Confirmation on the site is expected in the coming month.

The legal problem concerning the American Group appears to be resolved.

Estimated unexpended balance is \$70,000.

James D. Sell/L James D. Sell



June 28, 1973

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report - June 1973 Superior East Project Pinal County, Arizona

Harness Drilling Company completed drill hole A-3 (in State Section 5) with the following units and footage: 0-1430 Td (Dacite)

1430-1445 Tw (Whitetail Congl.)

The hole has been capped and covered for reentry at a later date.

Harness moved to the site of drill hole A-6 in State Section 4 and drilled the following: 0-1358 Td; again the hole was capped and covered for reentry at a later date.

Drill site area for A-7, located north of A-4, has been cleared and is placed at the common corner of four Margaret claims. This is 600 feet north of Magma's Sun Group north line.

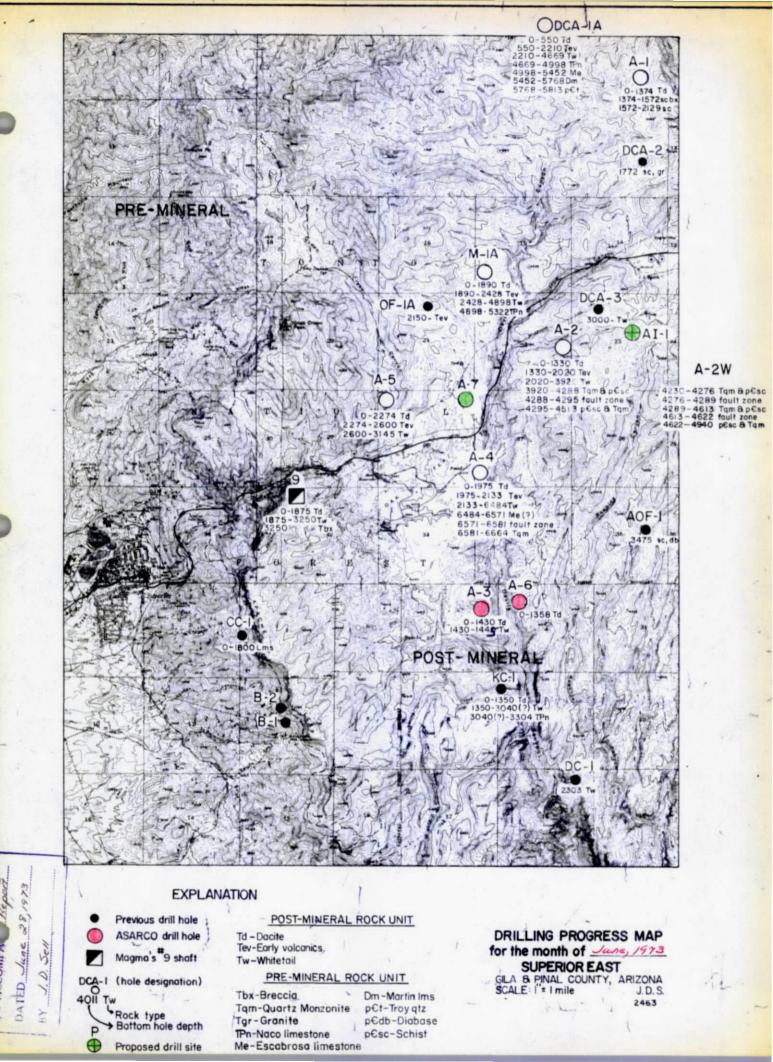
Drill site area for Al-1 (AOF-6 in last month's report), the joint venture hole with Inspiration on the Rawhide Project, has been prepared and will be occupied initially this coming month.

Final maps on surveying of the compromise line and the American Group have been prepared and submitted. The LD area map has been submitted, but minor work needs to be done in the area.

The above sites are shown on Attachment A. Estimated remainder of present authorization is \$46,000.

James D. Sell

James DSell



July 31, 1973

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report - July 1973 Superior East Project Pinal County, Arizona

J. O. Barnes Drilling Company has occupied drill site Al-1 (on the Rawhide Project) adjacent to the Superior East Project boundary. As of the end of the month, a 9" hole had been drilled by air-hammer to a depth of 1287 feet in Dacite. Seven-inch casing is being installed to seal off the water flow and air-hammer drilling will continue to core point.

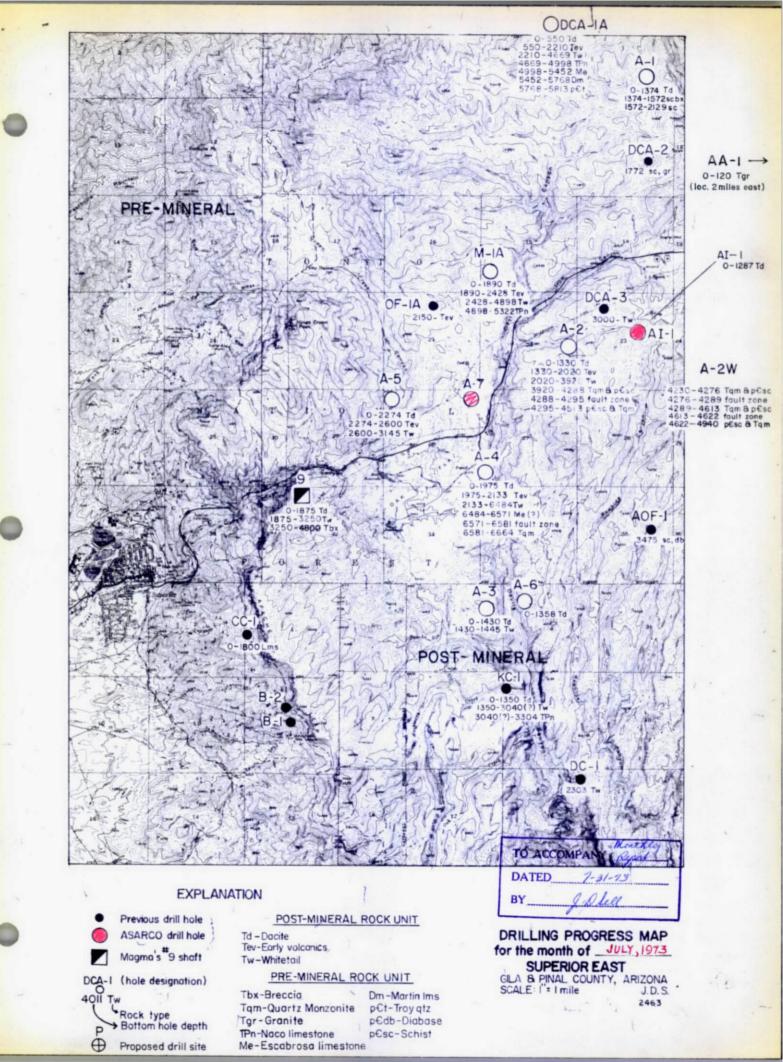
Drill site A-7 is being expanded to accommodate the J. O. Barnes drill rig which will be moved upon completion of the present hole AI-1.

Assessment drilling has been conducted on the American Group (Clark Option) claims. L. R. Cox Drilling Company air-hammered a 5" hole to 120 feet in Tertiary Schultze Granite. The cuttings are being assayed, but no ore zone was apparently cut during the drilling. The hole is capped with a name plate (AA-1) for reentry during the next assessment year. The location of this hole is shown on the Rawhide Project map.

A new map (ASARCO Map No. 2625) of the LD Group and adjacent claims has been submitted by T. L. Gant.

Estimated unexpended balance of authorization is \$37,000.

Sames D. Sell



August 30, 1973

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report - August 1973 Superior East Project Pinal County, Arizona

J. O. Barnes Drilling Company has set 4-inch casing on drill hole Al-l of the adjacent Rawhide Project area. The casing was set at 2768 feet in Whitetail Conglomerate which contains traces to minor amounts of native copper. The hole has been surveyed and will be occupied by a diamond drill in September.

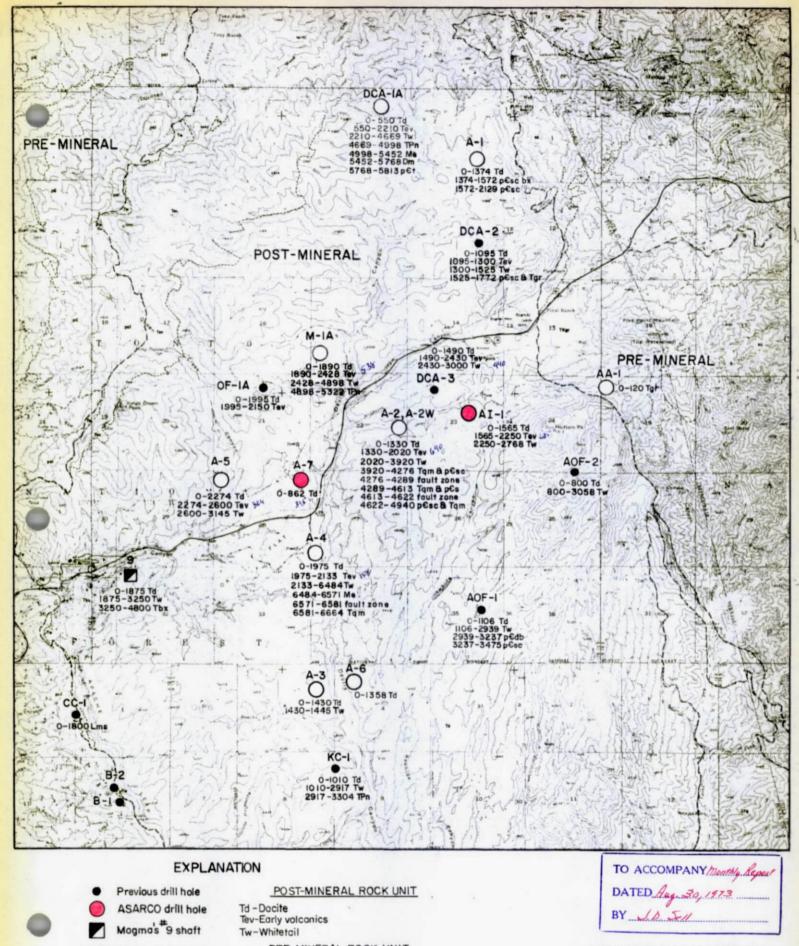
The Barnes rig then moved to site A-7 of the Superior East project and penetrated to 862 feet in Dacite by the end of the period. Good water has been encountered and will be sealed off with 7-inch casing. Rotary drilling will continue to the expenditure of the appropriation.

New factual data has been secured for drill hole KC-1 located in the south part of the area. Footage contacts are changed, but the units encountered remain.

P. Kayser, who has an option on the Lindburg Group north of our LD Group, is presently pushing in a bulldozer road in the direction of their furthest southwest corner. This will be over a half mile northeast of our drill hole AI-1 (Rawhide).

Estimated unexpended balance of authorization is \$21,500.

James D. Sell Me-



DCA-I (hole designation) 40II Tw Rock type Bottom hole depth

Proposed drill site

PRE-MINERAL ROCK UNIT

Tbx-Breccia Dm-Martin Ims Tam-Quartz Monzonite p€t-Troy qtz p€db-Diabase Tgr-Granite TPn-Naco limestone p€sc-Schist Me-Escabrosa limestone

DRILLING PROGRESS MAP for the month of August 1973 SUPERIOREAST GILA & PINAL COUNTY, ARIZONA SCALE: I"= Imile J.D.S.

AMERICAN SMELTING AND REFINING COMPANY TUCSON ARIZONA

October 1, 1973

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report - Sept. 1973 Superior East Project Pinal County, Arizona

The J. O. Barnes Drilling Company continued in drill hole A-7 and has cased the hole with 4-inch pipe to a depth of 3150 feet. Unit contacts are:

Surface-2100 Dacite 2100-2445 Earlier Volcanics 2445-3150 Whitetail Conglomerate

The Whitetail is apparently weakly cemented mudstones and shales, similar to those found in the upper parts of adjacent holes, which created difficult hole stabilization problems.

Very sparse native copper has been recorded and a twenty-two foot sample of a more tuffaceous unit returned geochem values (ppm) of Cu 60, Mo 3, Pb 33, and Zn 99, with 3.08% iron.

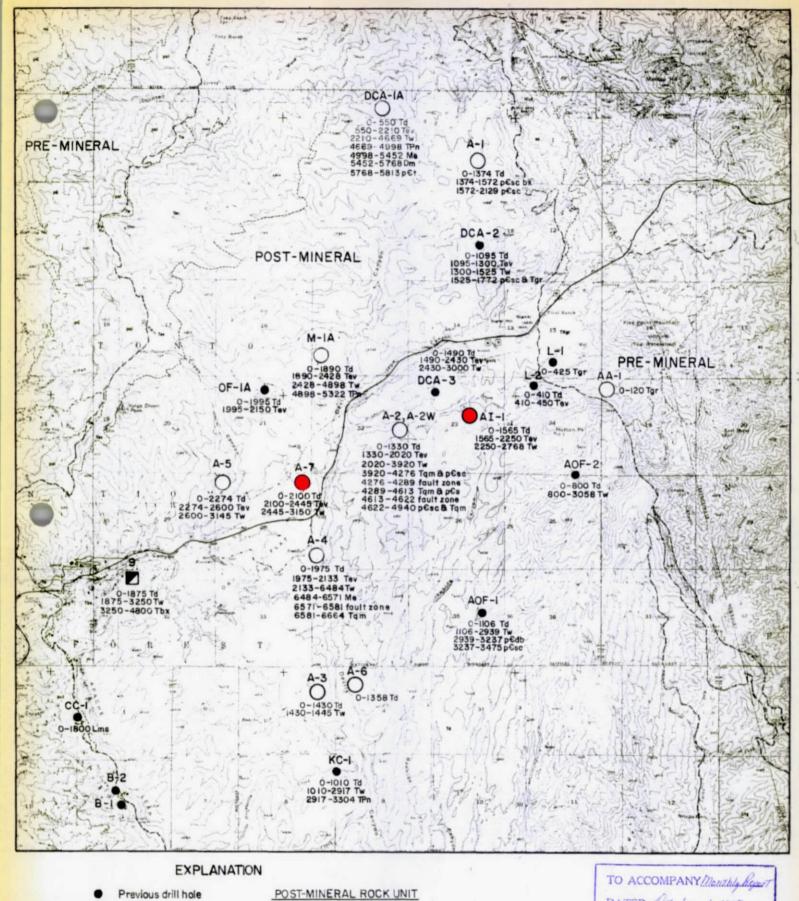
The diamond drill is now moving onto the adjacent Rawhide Project hole Ai-1.

P. Kayser of the Lindburg group to our northeast has rotaried two holes in their ground, one of which (L-2) is within several hundred feet of our LD claims boundary. Hole L-1 was collared in Tertiary Schultze Granite and bottomed at 425 feet in the same material. Sludge cuttings average less than 0.05% copper (500 ppm). The hole L-2 was collared in Dacite with the last few samples ending in Earlier Volcanics at 450 feet. The volcanics have abundant vesicle fillings of a blue-greenish mineral (a ferrous sulfate) which contained 20 ppm copper. R. Franks suggests that Kayser is going to place a "10-wheel" rig on L-2 and "drill it deep".

Inspiration is presently checking out favorable access routes from Sutton Summit (Pinal Ranch) north and west to gain a drilling position northeast of drill hole DCA-2 up on the dacite cover.

ICC previously drilled some twenty churn drill holes in outcropping schist and granite which contains up to 0.3% oxide copper. They apparently will test for the continuation of the mineral under the dacite cover. The new road will cross over ASARCO-controlled claims and will connect onto the ASARCO road system between drill holes DCA-2 and A-1.

- 2 -October 1, 1973 W. L. Kurtz Magma has recently requested bids for building 1-1/2 miles of road for two miles south of #9 shaft. This would place the road termination somewhere between the CC-1 hole and the B-series holes. Estimated balance of the authorization is \$91,500. James D. Sell JDS:1b Attach.



Previous drill hole
 ASARCO drill hole

Mogma's #9 shaft

DCA-I (hole designation) O 40II Tw

Rock type

Bottom hole depth

Proposed drill site

Td - Docite Tev-Early volcanics Tw-Whitetail

PRE-MINERAL ROCK UNIT

Tbx-Breccia Dm-Martin Ims
Tqm-Quartz Monzonite p€t-Troy qtz
Tgr-Granite p€db-Diabase
TPn-Naco limestone p€sc-Schist
Me-Escabrosa limestone

DATED Goteber 1, 1973

BY J. D. Sell

DRILLING PROGRESS MAP
for the month of Superior File
SUPERIOR EAST
GILA & PINAL COUNTY, ARIZONA
SCALE: 1"= I mile
J.D.S.

October 31, 1973

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report - Oct. 1973 Superior East Project Pinal County, Arizona

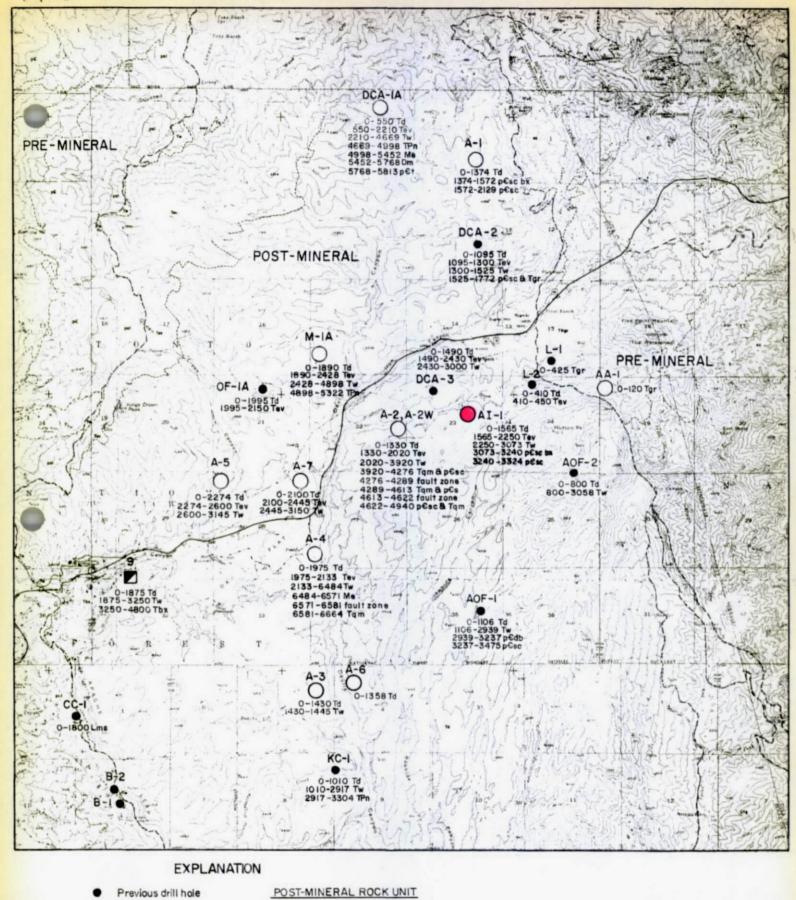
No new drilling is in progress on the project. Boyles' core rig is on the adjacent Rawhide Project hole Al-1. (See the Rawhide report for details on the hole.) Minor pyrite and chalcopyrite values have been found in the unoxidized schist cored to date in Al-1.

Magma has started two roads which are east of the Cross Canyon and Belmont drill holes. Rumor has it that three holes will be drilled. Ben Green (Magma geologist) reports that Boyles Brothers will do the drilling. Boyles will use their "DMX" combination rotary-core rig. Ben has given permission for ASARCO to observe the operations.

A further rumor is that Whatley Drilling has submitted a bid to drill the L-2 hole on the Kayser block.

Estimated unexpended balance is \$87,000.

J. D. Sell



ASARCO drill hole

Magma's #9 shaft

DCA-I (hole designation) 40II Tw Rock type Bottom hole depth

Proposed drill site

Td - Docite Tev-Early volcanics Tw-Whitetail

PRE-MINERAL ROCK UNIT

Tbx-Breccia Dm-Martin Ims Tam-Quartz Monzonite p€t-Troy qtz p€db-Diabase Tgr-Granite TPn-Naco limestone p€sc-Schist Me-Escabrosa limestone

DRILLING PROGRESS MAP for the month of OCTOBER **SUPERIOR EAST** GILA & PINAL COUNTY, ARIZONA SCALE: I"= I mile J.D.S.

December 4, 1973

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report - Nov. 1973 Superior East Project Pinal County, Arizona

No new drilling is in progress on the project. Boyles' core rig is on the adjacent Rawhide Project hole AI-1. (See the Rawhide report for details on the hole.) The hole was terminated at 3967 feet in schist with minor aplite dikes and was cut by quartz (several stages) and quartz-feldspar veinlets. Magnetite occurs disseminated and in veinlets. Minor clayanhydrite(?) veinlets are also found. Total sulfides are low (less than 0.5%), with a high chalcopyrite to pyrite ratio. Values received to date suggest the total run of sulfides will average between 0.10-0.20% copper.

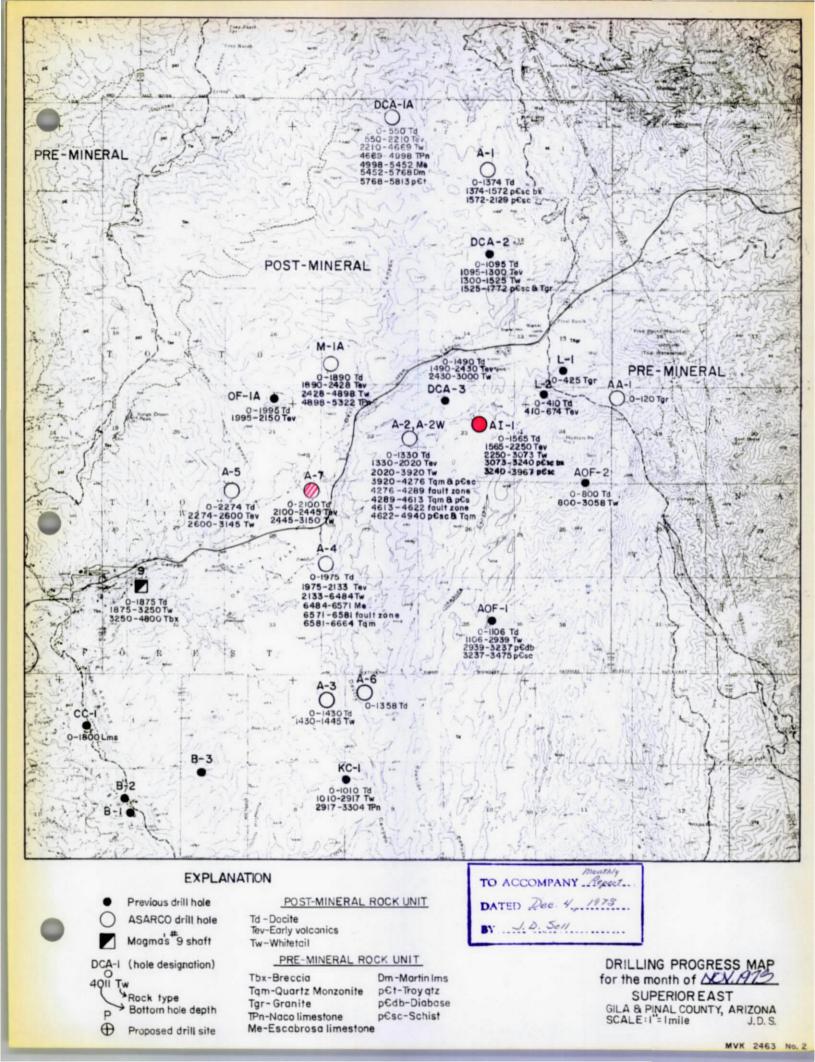
Boyles' core rig is moving to site A-7, which is cased to 3150 feet in Whitetail Conglomerate.

Whatley Drilling Company has set up on the site of L-2 on the adjacent Arizona Mining Company holdings. The hole is some 125 feet north of our claim boundary and a new hole started. Mr. Paul Kayser of AMC has informed us that the hole went through a caved zone between 310-345 and into a black rock. Hole caving conditions terminated the hole at 674 feet. They cemented the hole and upon reentering drilled ten feet of cement before deflecting off into the wall rock, repeated through the cave area and again the hole was terminated by the caving conditions (prior to reaching 674 feet). Mr. Kayser has moved the rig some 200 feet north of our boundary and will drill a new hole with the hopes of casing (8-1/4") off the cave zone and continuing to an ultimate depth of 3000 feet.

Boyles Brothers' DMX rig has set up on Magma's B-3 site and air-hammered down to water ($^{\pm}900$ feet), then converted to mud drilling. At some point ($^{\pm}1200$ feet?) all the mud and water was lost. Lost circulation material (sawdust) was added for nearly a week before circulation was restored. Rumor has it that drilling is going very slowly now. Apparently they cased the hole at $^{\pm}2100$ feet after hitting the limestones at $^{\pm}1900$ feet. The rig will core the hole from the casing point. Magma is building other roads in their block south of the B-3 location. Also, they are building south of our A-6 hole to get onto Coryell's state lease section 9.

Estimated unexpended balance is \$83,800.

James D. Sell



December 18, 1973

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report - Dec. 1973 Superior East Project Pinal County, Arizona

Boyles Brothers has moved to drill hole A-7 and commenced coring on November 29 at a depth of 3150 feet. No time was lost going through the casing shoe and into bedrock, although two feet of fill was below the casing.

The hole is coring well in Whitetail Conglomerate. Average footage per day is running around 70 feet. The top of the conglomerate was intercepted by rotary drilling at 2445 feet and as of day shift of December 14th, the hole was at 4060 feet in Whitetail Conglomerate. It is estimated that the hole will be around 4600 feet by the end of the month.

The Whitetail to date is mainly a weakly cemented, brown, muddy to gritty matrix with predominantly altered Pinal Schist clasts, with minor porphyry, Schultze Granite, quartzite, and diabase. Four samples have been returned and show copper values from 0.03 to 0.09% copper. The samples are ten-foot cuts every hundred feet starting at 3200 feet.

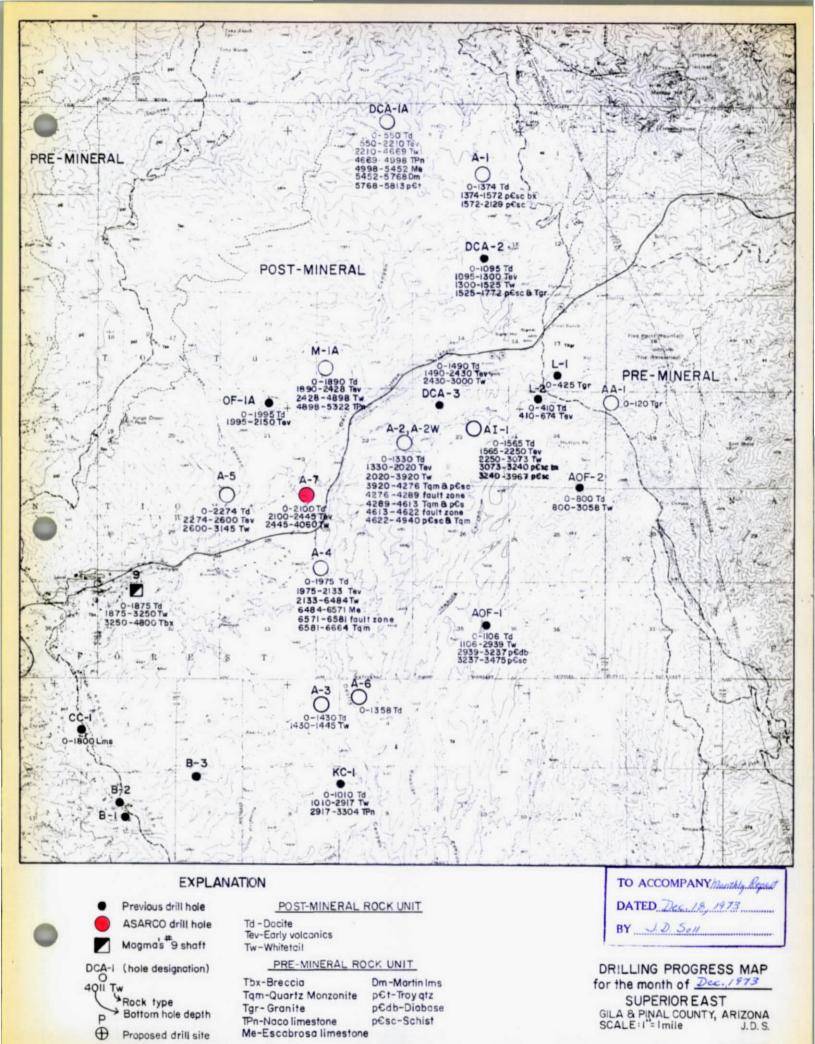
An M-1A, unaltered, Schultze Granite type slide block has been encountered at 3682 feet. Typical Whitetail with a good cemented gritty matrix is found below the slide block.

Copper occurs mainly in the schist fragments and sparingly in the matrix.

Elsewhere, Magma hole B-3 continues coring slowly in limestones. Arizona Mining hole L-2 has intercepted, by rotary, fresh Schultze Granite and they are having hole troubles at 900 feet.

Estimated unexpended balance is \$53,800.

Janus D. Sell
J. D. Sell



TAB

1974

February 4, 1974

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report - Jan. 1974 Superior East Project Pinal County, Arizona

ASARCO drill hole A-7 continues coring in Whitetail Conglomerate. As of the end of the month, the hole had progressed to 5410 feet. As reported last month, spot 10-foot samples cut above a Schultze Granite slide block in Whitetail Conglomerate returned values ranging from 0.03% to 0.21% copper. The slide block had a value of 0.16% copper, while other spot samples below the slide block returned 0.01% to 0.20% copper.

At a depth of 4695 feet, the matrix changed to a dark brown to reddish black with abundant slickensides and a remarkable increase in native copper and cuprite mineralization. This same change of characteristics in drill hole A-4, located some 4000 feet south, occurred at a depth of 5080 feet. In hole A-7, the following depth, footage, assays have been received.

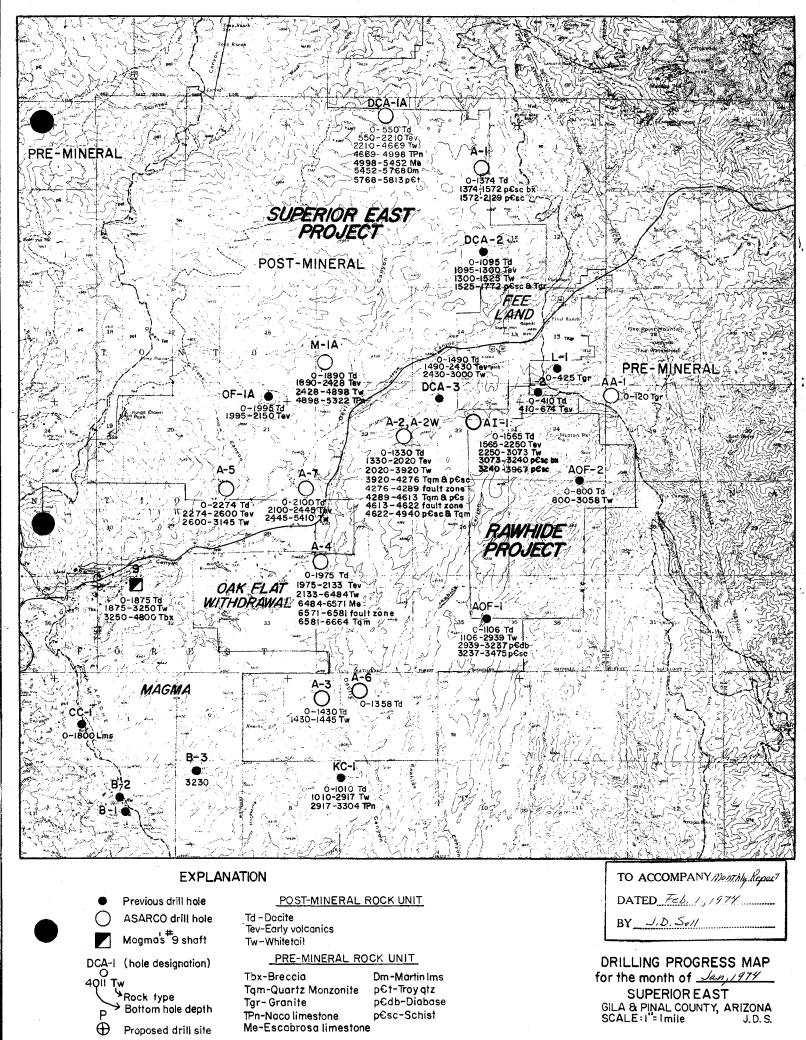
4695-4750 55 ft. @ 1.17% copper 4750-4800 50 ft. @ 0.10% 4800-4910 110 ft. @ 1.46% 4910-4960 50 ft. @ 0.16% 4960-4980 20 ft. @ 0.93% 4980-5020 40 ft. @ 0.28% 5020-5060 40 ft. @ 1.12% 5060-5410 Samples split and being assayed. Visual estimate of the copper content within this interval suggests low values.

The total mineralized footage from 4695 to 5060, or 365 feet, averages 0.86% copper. This compares favorably with the initial 270 feet of mineralized ground in hole A-4 which averaged 0.89% copper and then had 330 feet of relatively barren conglomerate below until the top of the next mineralized interval. Similarly, the extent of cuprite and minor green oxide copper in A-7 of 215 feet is comparable to the 267 feet found in A-4, both being found only in the top intervals of the mineralized section.

The Arizona Mining hole L-2 solved some of the drilling problems and continued rotary drilling to 2300 feet, where 4" ID casing was set. Longyear has moved a large coring rig onto the site. Rotary chips in fresh Schultze Granite at 900 feet geochemed 31 ppm Cu, 770 ppm lead, 59 ppm zinc, and 10 ppm moly. This is slightly higher lead and moly than found in other samples studied in the project and surrounding area.

Estimated unexpended balance is \$24,000.

James D. Sell



March 1, 1974

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report - Feb. 1974 Superior East Project Pinal County, Arizona

Drill hole A-7 terminated during the month at a depth of 6042 feet in units high in the Pennsylvanian Naco Limestone. As reported last month, coring in the Whitetail intercepted a substantial zone of cuprite and native copper. The zone is similar to that found in drill hole A-4. Most of hole A-7 has been split and assayed and the mineralized zone results verified by a second split and assay from the original crushed reject bags.

Comparative assays between American Analytical (AARL) and Southwestern Assayers (SW) are as follows:

Intercept Depth	Footage	Total Copper AARL SW
4695-4750 4750-4800 4800-4910 4910-4960 4960-5070 5070-5120 5120-5170 5170-5360 5360-5490 5490-5610	55 ft. 50 ft. 110 ft. 50 ft. 110 ft. 50 ft. 190 ft. 130 ft.	@ 1.17 1.24 @ 0.10 0.10 @ 1.46 1.51 @ 0.16 0.13 @ 0.70 0.58 @ 0.31 0.32 @ 0.05 0.07 @ 0.06 Not checked @ 0.14 Not checked Scattered assays suggest
		0.05-0.08 range.

Total intercepts suggest the following combinations:

4695-4910, 215 ft. @ 1.07 (American Analytical) or 4695-5070, 375 ft. @ 0.84 (American Analytical) or 4695-5120, 425 ft. @ 0.78 (American Analytical)

As noted, the other mineralized zones failed to materialize in A-7 compared to A-4, although a slight increase is noted in the lower horizon zone around 5400 feet.

An I.P. geophysical probe was implanted to a depth of ± 5000 feet and the hole capped and padlocked.

A directional and temperature survey by Parsons Surveying was also conducted and a report submitted. From 3000 to 6000 feet, the temperature gradient increases 1.53° F. per 100 feet of depth. The two temperatures recorded in the mineralized zone were 149°F at 4500 feet and 156°F at 5000 feet.

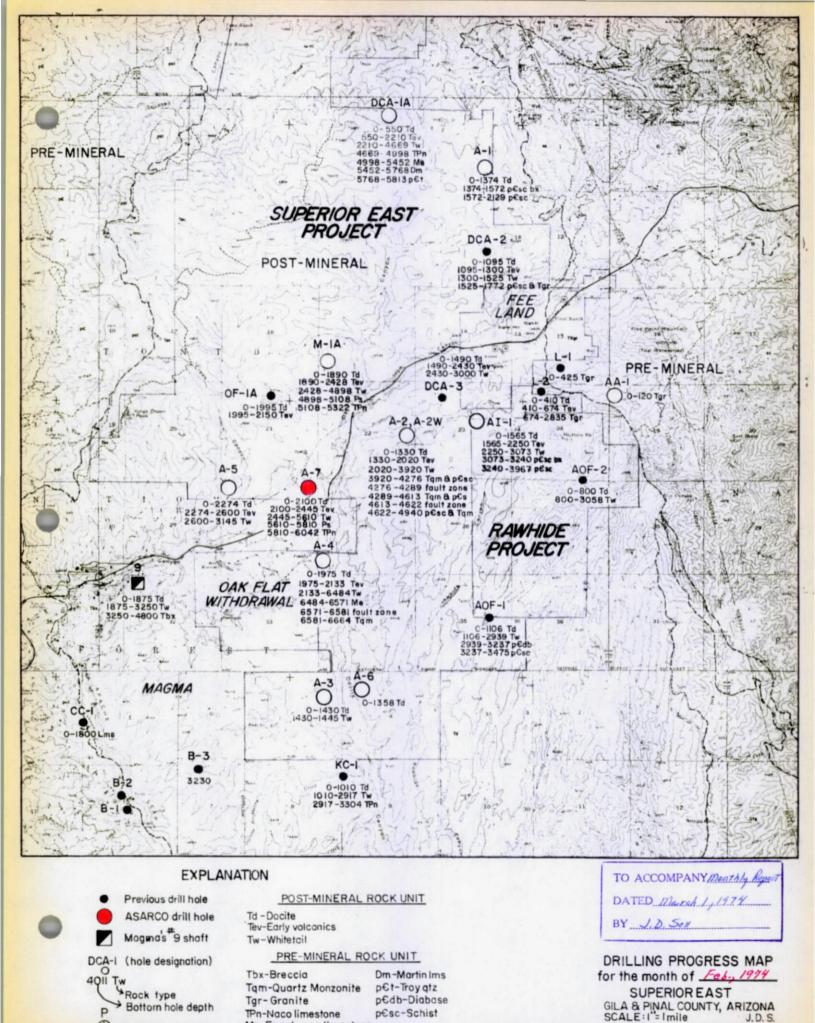
Shelton Drilling successfully moved onto the old hole DCA-3, located north of A-2 and Al-1 sites, and cleared the obstruction and cleaned to around 1950 feet. The hole was left as is and we anticipate having a large rig move on capable of cleaning the hole to its former depth of 3000 feet and set 3-1/2" casing for diamond drilling.

The DMX rig moved south onto Coryell's State Lease sections now under option to Newmont. One hole was rotaried to approximately 1000 feet by spending \$6500.00. The rig then moved far south and onto the old Kerr-McGee hole DC-1 (in Sec. 16) where K-M had abandoned it at 3304 feet in Whitetail Conglomerate. The hole was apparently successfully cleaned and cased as the DMX is reported to be coring.

The Arizona Mining hole L-2 is being cored by Longyear and is at a depth of 2835 feet in unaltered(?) and unmineralized Schultze granite. They call the hole LB#4 (apparently the original hole by Cox was LB#2, the original hole by Whatley LB#3, and the second hole by Whatley LB#4, which is being cored. All are on the same drill site. The first two holes were abandoned around 670 feet due to rig capacity or bad ground).

Estimated deficit is \$8,000.

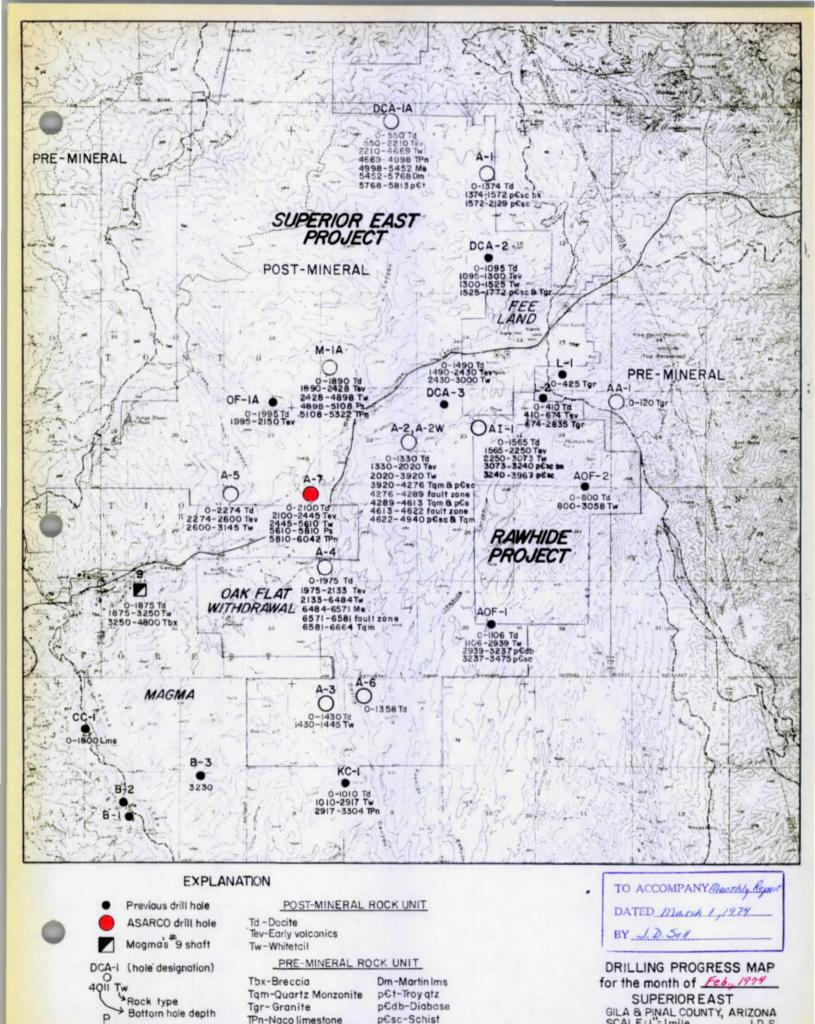
James D. Sell



Me-Escabrosa limestone

Proposed drill site

J.D. S. MVK 2463 No. 2



p€sc-Schist

Bottom hole depth

Proposed drill site

TPn-Naco limestone

Me-Escabrosa limestone

MVK 2463 No. 2

GILA & PINAL COUNTY, ARIZONA SCALE: I"= Imile J.D.S.

March 27, 1974

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report - March 1974 Superior East Project Pinal County, Arizona

No additional field work has been undertaken on the project area. Additional sampling has been undertaken on drill hole A-7 in the lower portions. Assays received to date indicate the following values, which correspond to the lower Whitetail interval cut in drill hole A-4.

Interval	Ft.	% Copper	% Zinc
5360-5490	<u>130</u>	0.14	
(5360-5440)	(80)		0.04
5490-5540	50	0.07	
5540-5610	70	0.18	
(<u>5440-5610</u>)	(170)	•	0.21
5360-5610	250	0.14	0.15

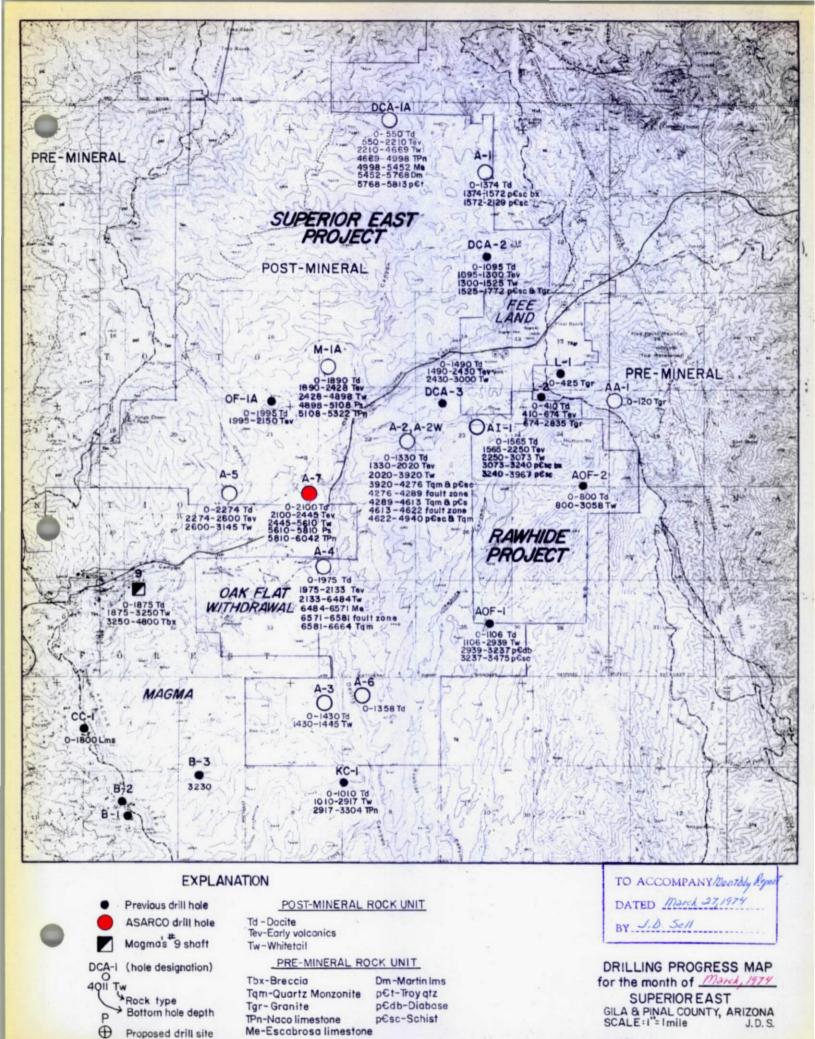
Sampling also reveals that fine native copper and probably some chalcocite are found in the top forty feet of the Supai redbeds. The samples are in the assay lab for determination.

The individual cost summaries for the work performed since September 1972 have been prepared and submitted, along with the cost summary for the entire project since the last report in September 1972.

The Arizona Mining Company hole L-2 is rumored to be at 3300', still in Schultze Granite, and having numerous mechanical problems.

Newmont at the last report period had reentered the old Kerr-McGee DC-1 drill hole on the far south. It is rumored that they had troubles in the hole and may have abandoned the hole prematurely. At present the DMX rig has moved which means that about three weeks of in-hole time was spent at DC-1.

The DMX rig has moved back to B-3 of Magma (which was abandoned at 3230' about six weeks ago). Apparently some sort of probe was placed in the hole as the DMX crew has borrowed a rotary bit to clean the hole in preparation to resume coring. Word was earlier that a core barrel and wire line had been lost in the hole. Core chips suggested the hole was deep in the Apache Group sediments at the 3230 depth.



May 1, 1974

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report - April 1974 Superior East Project Pinal County, Arizona

In drill hole A-7, the assaying in the upper part of the Supai redbeds, immediately below the Whitetail Conglomerate, indicated a copper value of 1.06% in the first ten feet, confirming the visual estimate. The copper values dropped to 0.12%, 0.67%, 0.16%, 0.07%, 0.06%, 0.05%, and 0.05% in each successive ten-foot interval below the first ten feet, which started at a depth of 5610 feet.

Boyles Brothers successfully cleaned out the old drill hole DCA-3 and set casing to a depth of 2993 feet. The hole is now redesignated as DCA-3A and is scheduled for diamond coring as soon as the CP-50 is available from the Bohme Project.

The Arizona Mining Company hole L-2 is now slightly below 3700 feet in Schultze granite. Values are apparently very low geochemically, but visual inspection has not yet been possible.

Newmont, as reported previously, reentered the old Kerr-McGee DC-1 drill hole on the far south (off the attached map) and rotaried to 2800 feet where they set casing. Diamond drilling continued the hole to 3270 feet and is rumored to still be in Whitetail Conglomerate. Inspection of the site and numerous core chips strongly supports the rumor.

The Boyles Brothers DMX drill rig, used by Newmont, moved back to B-3 and apparently cleaned the hole of some geophysical probes and plastic pipe and reinserted new plastic pipe for additional geophysical probes. (See Newmont 1973 Annual Report for pictures and words on their geophysical people on the project).

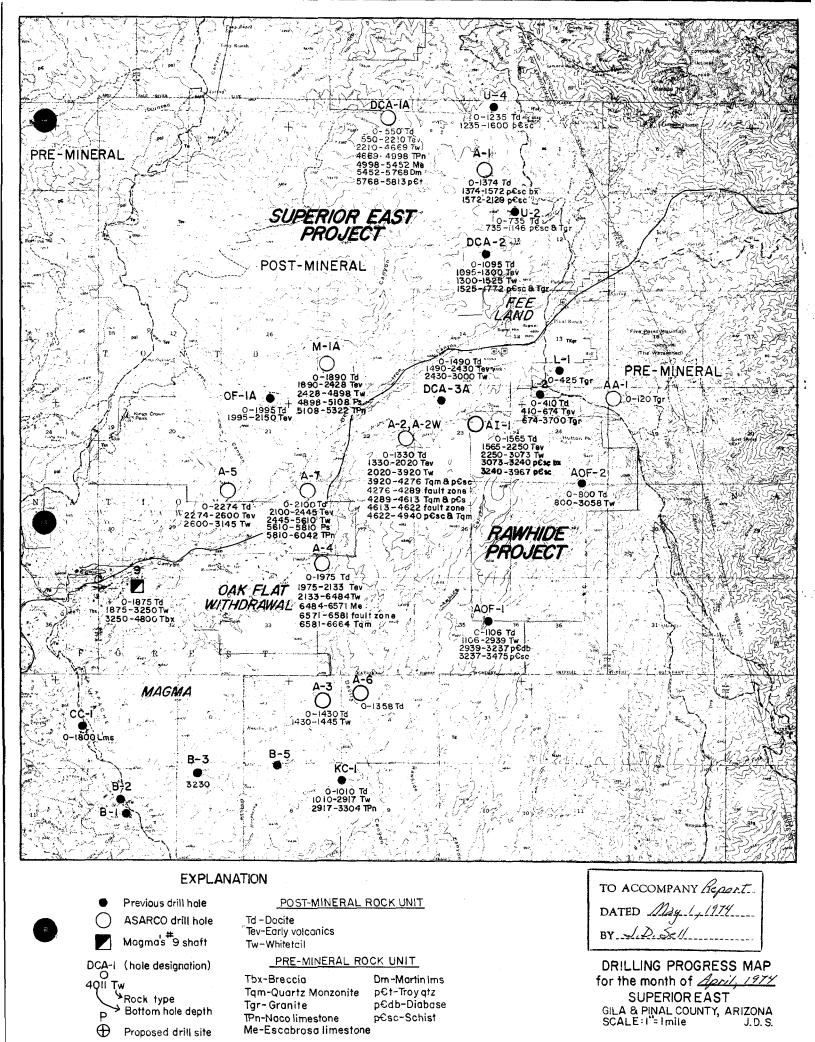
The DMX rig was then borrowed by us long enough to clean out DCA-3 as stated above. Following our clean-out, the DMX moved to hole B-5 for Newmont and commenced the hole. The location is some 350 feet south of our State Lease Section 5. No information is known on the hole at this time.

Inspiration has now completed a road from the Eder area up onto the Dacite Plateau and has constructed some 12 to 20 drill sites scattered north, south, and easterly from our drill hole A-I and between old drill holes U-2 and U-4. A Boyles Brothers rig with down-the-hole hammer has drilled the first hole adjacent to the drill hole U-4 and set casing. The rig moved some 300 feet south to the second location and is now drilling. Rumor is that the air hammer rig will drill and case the holes to 600 feet each up on the dacite area and diamond drilling will commence below. It is assumed that ICC will churn drill the holes located easterly in the schist areas as they did on the program several years ago (see Monthly Report of September 1973).

A contract is now out to deepen our drill hole AA-1 located on the Clark Option ground to the east. The hole is presently at 120 feet in Schultze granite.

Unexpended funds are \$206,600.

J. D. Sell



May 31, 1974

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report - May 1974 Superior East Project Pinal County, Arizona

Copper State Exploration has commenced the assessment work drilling on the State Lease land.

Hole A-3 in Section 5 was deepened from 1445 feet to 1949 feet, staying in Whitetail Conglomerate. The hole drilled very cleanly and, with the experience of other holes, it was decided to fill the hole with heavy mud and leave it uncased.

Hole A-6 in Section 4 was barely occupied by the end of the month and Copper State Exploration had deepened the hole from 1358 feet to 1375 feet with the hole staying in dacite. The hole will be deepened to complete the assessment work during the coming month.

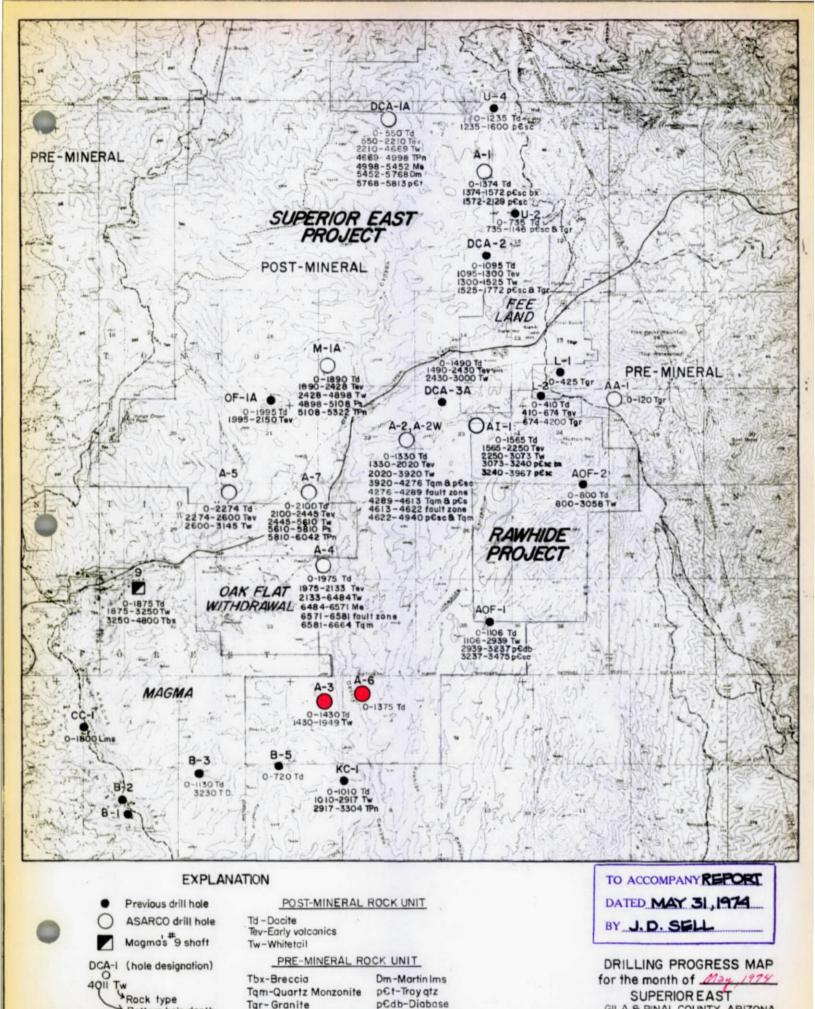
Arizona Mining Company continues coring on their L-2 site and Kayser reported (to R. B. Crist) that they were at 4200 and still in granite. Kayser asked if ASARCO was interested in his area and Crist replied that we would first be interested in evaluating his drill data.

No new information was screened concerning Newmont's hole B-5, other than the depth to the base of the dacite.

No new information on ICC's drilling to the northeast.

Unexpended funds are \$181,000.

James D. Self



p€t-Troy qtz

p€sc-Schist

p€db-Diabase

Tam-Quartz Monzonite

Me-Escabrosa limestone

TPn-Naco limestone

Tgr-Granite

Bottom hole depth

Proposed drill site

SUPERIOREAST GILA & PINAL COUNTY, ARIZONA SCALE: "= I mile J.D.S.

June 25, 1974

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report - June 1974 Superior East Project Pinal County, Arizona

Copper State Exploration completed the lease work on State Section 4, hole A-6, by deepening the hole to 1665 feet. The bottom of the dacite is at 1475 feet and the remainder of the hole is in Whitetail Conglomerate.

Three rotary cuttings assay samples in A-6 averaged 57 ppm Cu, 28 ppm Pb, 113 ppm Zn, and 5 ppm Mo. These values are similar to other Whitetail samples in the upper sections. The hole was filled with heavy mud and capped for later entry.

Cuttings from A-3, five samples, averaged 93 ppm Cu, 57 ppm Pb, 235 ppm Zn, and 4 ppm Mo in the Whitetail interval from 1430-1949 feet.

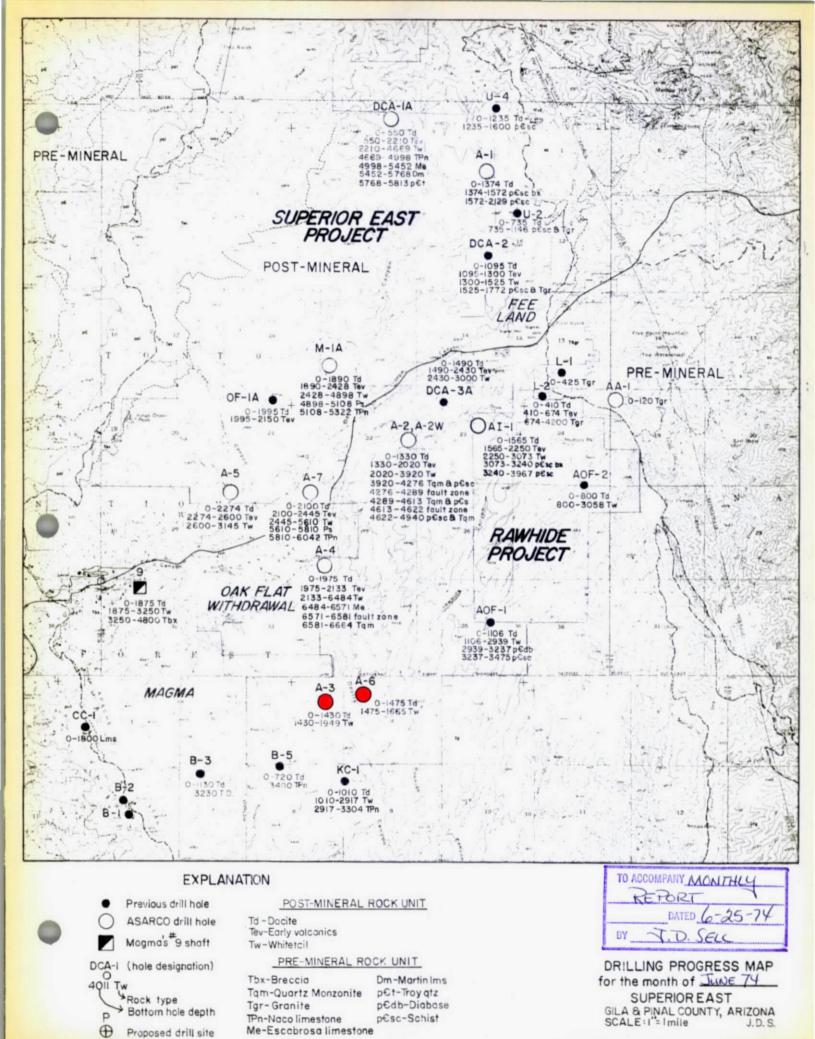
Newmont continues to core hole B-5 located just south of our section 5. They have had cementing problems in the Whitetail which is rumored to be at least to 3200 feet. A half box of core at around 3400 feet appeared to be massive limestone of the Naco type. Shortly after my unofficial visit to the site, the hole was lost some 1400 feet above bottom and it is rumored they will use a dynadrill to establish a deviated hole.

The Newmont geophysical crews have been busy running various probes and seismic over much of the area to the south.

F. T. Graybeal has submitted his report on the thin-section and fluid inclusion study of bedrock samples from drill holes A-2 and AI-1. His concluding remarks were as follows: "The apparent stronger alteration in A-2 may be related to the abundance of granite porphyry, the probable source rock. Nothing can be said about the relative depth of the two holes in the hydrothermal system. The fluid inclusions in the granite porphyry in A-2 are similar to but not as abundant or saline as fluid inclusions examined from a single granite porphyry sample collected from the OxHide deposit. Thus it is possible that the center, or most intense zone of alteration-mineralization has not yet been intersected in the Superior East area, if indeed one was or is still present."

Unexpended funds are \$180,300.

JDS:1b Attach. June Whelf James D. Sell



July 31, 1974

TO: W. L. Kurtz

FROM: J. D. Sell

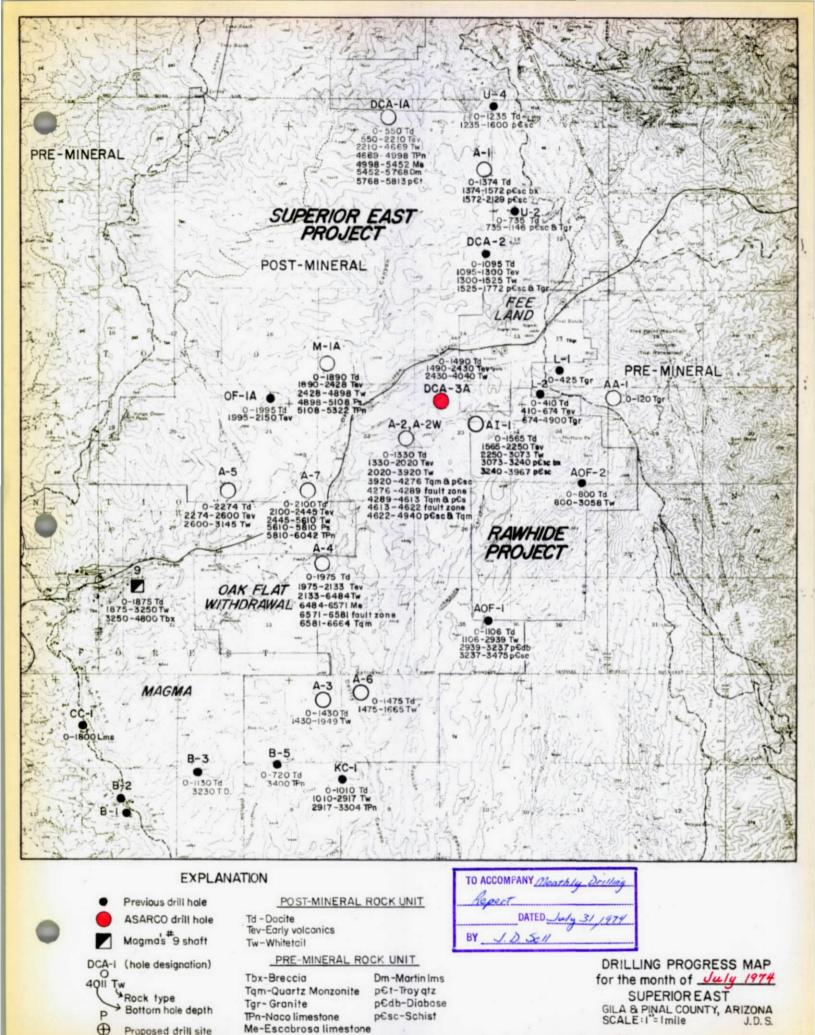
Monthly Report -- July 1974 Superior East Project Pinal County, Arizona

Drill hole DCA-3A, which was cleaned out and set with casing earlier in the year, was occupied with the core drill during the month. The depth to the first core was 2980 feet and was Whitetail Conglomerate. As of the end of the month, the hole continues in Whitetail to the present depth of 4040 feet. Coring for a bedrock intercept continues.

Most of the rock clasts in the Whitetail are Pinal Schist, diabase, and quartz monzonite. All rock units in the clasts have been affected by hydrothermal alteration and numerous clasts show good capping characteristics. Of the total clasts, probably 20% show alteration-leached mineralization features, while the remainder are fresh or nearly so. No assays are presently available and visually only rare to trace native copper has been noted, although a tuff bed was encountered and the Whitetail matrix below is of the dark brown color with some slippage surfaces.

Newmont's drill hole B-5 was terminated after the hole was lost due to caving ground. The decision to deviate by use of the dynadrill was cancelled. Numerous core chips were found and of the several hundred examined, it appears that they may have terminated in black shales and limestones of the Naco sequence. Numerous chips of diabase and quartzite were also noted and many were "recored", suggestive of rubble falling in from the Whitetail. A sample collected from the sludge ditch returned: 228 ppm Cu, 107 ppm Pb, 57 ppm Mo and 1.10% Zn. These values are especially high in moly and zinc, but no identifiable minerals were noted in the chip samples studied.

Apparently the Newmont geophysical crew has returned to the east to digest their findings. I talked to Hugh Steele of the local office and mentioned to him that one of their wire lines was well within the ASARCO State Lease section 5 and suggested we would appreciate the data found. He stated such would be reasonable and he would check the gp lines and data when it was available.



August 29, 1974

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report -- August 1974
Superior East Project
Pinal County, Arizona

Assessment work on the Clark option ground was completed during the month by deepening our drill hole AA-1. The hole was continued from 120 feet to 230 feet in Schultze Granite, with low geochemical values recovered.

Drill hole DCA-3A has been in trouble with holes developed in the casing and broken rock being cored. At 4338 feet the rods became stuck during a wireline core pull and ultimately 128 feet of rods, core barrel, and bit were lost after McCullough found the fill point and cut the drill rods free. The hole was cemented at the cut zone and we are in the process of deviating the hole in continued NX size.

Synopsis of the core portion is:

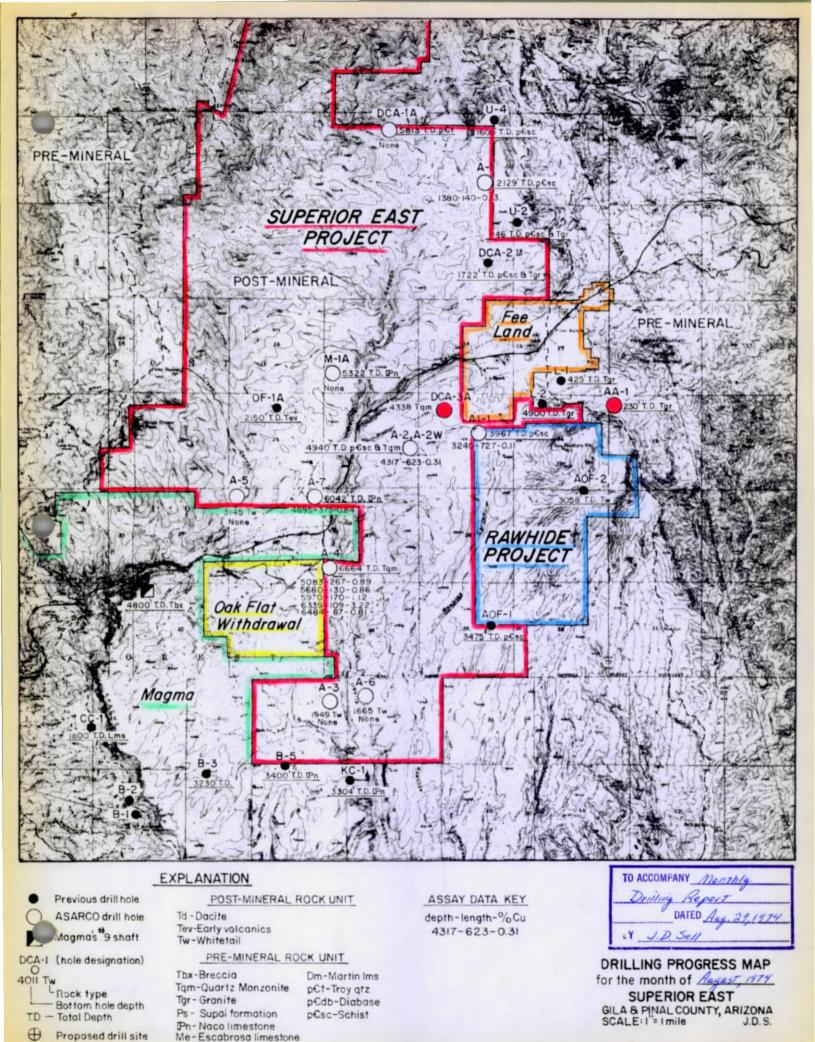
2980-4081 Whitetail Conglomerate 4081-4159 Schist-granite slideblock in Whitetail 4159-4274 Whitetail Conglomerate 4274-4328 Quartz monzonite slideblock 4328-4338 Quartz monzonite (bedrock?)

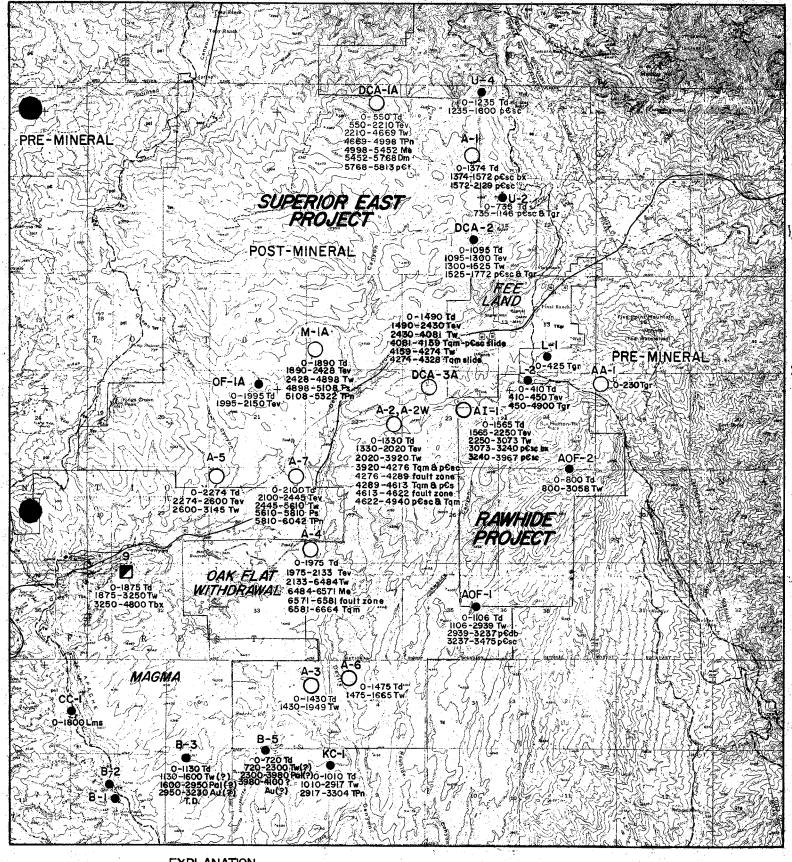
Assays have been returned for the initial Whitetail intercept and values are 427 ppm Cu, 47 ppm Pb, 58 ppm Zn, and 13 ppm Mo. A tuffaceous sandstone was noted and the matrix of the Whitetail became much darker and contains slip surfaces below the marker bed. Geochem values in copper and moly are essentially a third higher than the average reported above.

The two slideblock zones contain quartz-sericite and clay altered products with oxidized iron products and copper limonite to jarositic capping.

Minor copper oxides were noted in the upper block.

The probable bedrock is highly crushed and cataclastic deformed quartz monzonite with increased quartz-sericite and iron oxides along fractures. Pyritic pseudomorphs are also present with total oxidation. Samples within the slideblocks and below have not been returned. The highly deformed nature of the last ten feet of core makes it difficult to determine if the intercept is true bedrock or part of the slideblock. Drilling will continue for a sulfide bedrock intercept.





EXPLANATION

Previous drill hole ASARCO drill hole Magma's 9 shaft DCA-I (hole designation) 4011 Tw Rock type Bottom hole depth Proposed drill site

POST-MINERAL ROCK UNIT

Td - Dacite Tev-Early volcanics Tw-Whitetail

PRE-MINERAL ROCK UNIT

Tbx-Breccia Dm-Martin Ims Tam-Quartz Monzonite p€t-Troy qtz. Tgr-Granite p€db-Diabase TPn-Naco limestone p€sc-Schist Me-Escabrosa limestone

DRILLING PROGRESS MAP for the month of Aug. 1974 **SUPERIOR EAST** GILA & PINAL COUNTY, ARIZONA SCALE: 1"= Imile J.D. S. J.D. S.

September 26, 1974

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report - Sept. 1974 Superior East Project Pinal County, Arizona

Drill hole DCA-3A has been under considerable difficulties of equipment breakdown and wireline latching problems during the month. The engines for both the drill and the pump needed complete replacing.

The new deviated hole was started at 4089 feet using the conventional NX wireline. Logging of the deviated hole started at 4244 feet and continues. As of the end of the month the hole was at a depth of 4410 feet.

As reported last month, a quartz monzonite slide block was intercepted in the original hole and more massive quartz monzonite, having a cataclastic texture, was encountered shortly before the loss of the hole. The deviated hole encountered the slide block material at a slightly deeper depth (4297 feet) and also the cataclastic quartz monzonite. The base of the quartz monzonite was penetrated at 4394 feet and typical Whitetail Conglomerate with Pinal Schist and quartz monzonite clasts has been cored to the present depth of 4410 feet.

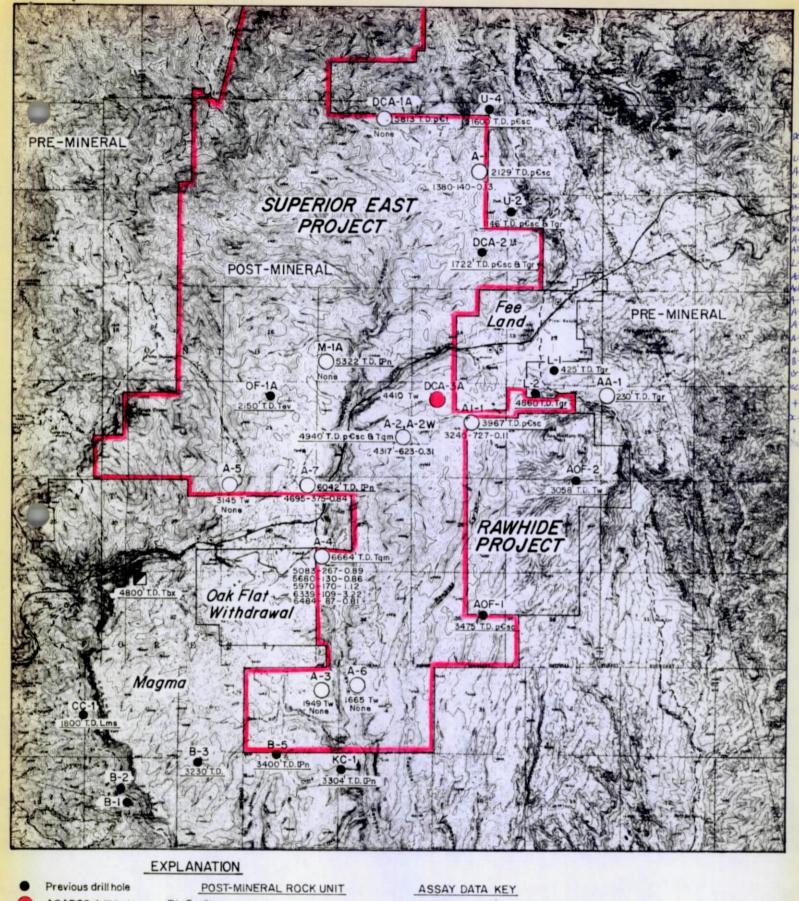
The hole depth of 4410 feet is equivalent to an elevation of +230 feet above sea level. The adjacent hole A-2, which is south and west of DCA-3A, intercepted bedrock at +70 feet subsea. Based on present knowledge, we should be in true bedrock shortly.

The samples collected from the Arizona Mining Company hole L-2 have been returned and all values were in the very low range (File Memo dated Sept. 3rd), with less than 40 ppm Cu. The big Longyear rig moved from L-2 to a site in the Patagonia area for Utah International and is reported to be starting a 10,000-foot test.

No new information as to whether Phelps Dodge has exercised the Lindburg option. Kayser has, however, moved a small Longyear rig over on the northwest claims of the Grayback group (Gibson area) and is presently coring. Reports are that the test is scheduled for 2000 feet, but may be stopped at 1000 feet for this assessment year.

Unexpended balance is estimated at \$136,000.

James D. Sell



Previous drill hole

ASARCO drill hole

Magma's #9 shaft

DCA-I (hole designation)
O
40II Tw

Rock type
Bottom hole depth
D. — Total Depth

Proposed drill site

Td - Dacite
Tev-Early volcanics
Tw-Whitetail

PRE-MINERAL ROCK UNIT

Tbx-Breccia Tqm-Quartz Monzonite Tgr-Granite Ps-Supai formation

Me-Escabrosa limestone

Pn-Naco limestone

Dm-Martin Ims p€t-Troy qtz p€db-Diabase p€sc-Schist depth-length-%Cu 4317-623-0.31

Drilling Report

DATED Sept. 1974

BY J.D. Sell

DRILLING PROGRESS MAP

for the month of September 1974

SUPERIOR EAST

GILA & PINAL COUNTY, ARIZONA SCALE: I'= I mile J.D.S.

October 25, 1974

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report - Oct. 1974 Superior East Project Pinal County, Arizona

Drill hole DCA-3A was completed and terminated at a depth of 5154 feet in Precambrian Pinal Schist. A synopsis of the deviated hole is as follows:

Footage-Depth	% Copper	<u>Unit-Remarks</u>
4244-4297	0.02	Whitetail Conglomerate
4297-4394	0.08	Slideblock of Schultze Granite (oxidized)
4394-4454	0.12	Whitetail Conglomerate
4454-4666		Schultze Granite. Probably a moved block with cataclastic textures (oxidized)
4666-4670		Fault Gouge. Interval shears at 50°-60°, slips and shears above and below at 10°-45°
4670-4806	0.10 ox. 0.09 sulf.	Schultze Granite (oxidized to 4720')
4806-4809		Fault Gouge. Upper contact at 60°-70°
4809-4948	0.01	Pinal Schist, totally crushed
4948-4953		Gouge and Sand. Contacts at 30°-40°
4953-5154	**	Pinal Schist. Massive but fractured

*Note: A chrysocolla zone ran 1.40% and 0.32% copper, while two other

samples with no obvious copper averaged 0.07% copper.

-Note: No sample cut in this interval.

**Note: Sample assays not received by report date.

Geochemical sampling on irregular intervals shows variable values in the blocks as listed above. Minor infilling by assays will be conducted.

An oriented deviation survey was conducted and the hole at 4975 feet in depth was found to be 495 feet south and 42 feet east of the collar. The temperature survey showed 138°F at 4975 feet, with a gradient of 1° per 100 feet in the last 500-foot run.

The Sale Lake City GP department successfully ran down-the-hole measurements from 3000 to 4800 feet and emplanted an antenna probe at 4800 feet for future work.

The road north to DCA-2 has been repaired and a culvert stabilized with a cement pier and cap to support the vehicular drill traffic. The CP-50 machine is presently moving and operations should start soon. The reentered hole is renumbered as ASARCO DCA-2A and the present anticipated work will be to clean the hole and set casing to 1475 feet and wedge off into Whitetail Conglomerate. The hole was originally drilled in 1964-65 and is reported to have cut the following units.

0-1095 Dacite
1095-1300 Earlier Volcanics
1300-1525 Whitetail Conglomerate
1525-1772 Pinal Schist and Schultze Granite (with oxide copper values ranging from 0.016% to 0.095% copper. The bottom sample, partially oxidized, ran 0.18% copper.)

The hole was probed by ASARCO in 1971 and found to be open to a depth of 1295 feet.

Arizona Mining Company requested ASARCO to log their Grayback No. One hole to see if we wished to participate in deepening the hole. Logging shows surface oxidation extended to 125 feet in Pinal Schist. The schist continued to 669 feet and assay intervals ran 0.03% to 0.28% copper. The Schultze Granite was logged from 669 feet to the bottom at 1248 feet. Assay value ran from 0.01% to 0.24% copper. In both units the mineralization is confined to 1/8"-1/4" quartz-pyrite-chalcopyrite veinlets at a steep angle, separated by 1 to 3 feet of barren rock. The veining is similar to that found on the surface.

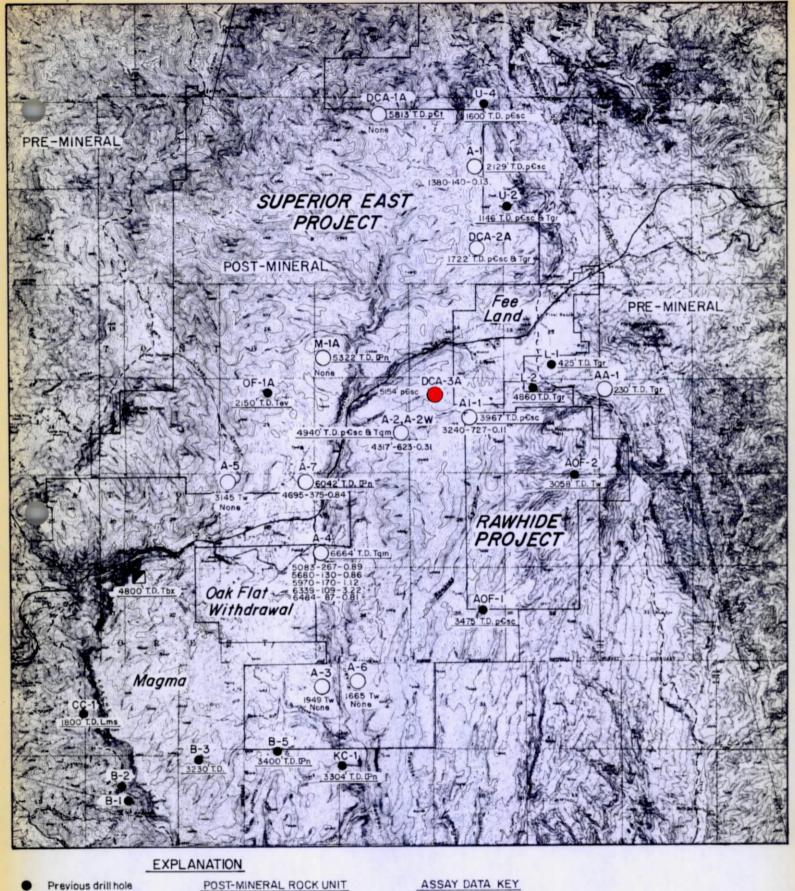
ASARCO declined to deepen the hole, but AMC was going to continue for another "100 to 500 feet."

Discussion was made with Arizona Mining Company for permission to log their 4900-foot hole, Lindburg L-2, but we have not received permission to date.

Dave McLean, a Newmont geophysicist, has approached us on a further discussion whereby they wish to extend their geophysical work over our State Lease Sections 4-5. As reported earlier, they have run lines over our ground without prior permission and to date we have not received the data as requested, but Dave says it is forthcoming.

Unexpended funds are \$96,000.

anes D. Sell J. D. Sell



Previous drill hole ASARCO drill hole Magma's #9 shaft

DCA-I (hole designation) O 4011 Tw

LRock type Bottom hole depth T.D. — Total Depth

Proposed drill site

Td - Dacite Tev-Early volcanics Tw-Whitetail

PRE-MINERAL ROCK UNIT

Tbx-Breccia Tam-Quartz Monzonite Tgr-Granite Ps - Supai formation

Me-Escabrosa limestone

Pn-Naco limestone

Dm-Martin Ims p€t-Troy qtz p€db-Diabase pEsc-Schist

ASSAY DATA KEY

depth-length-%Cu 4317-623-0.31

TO ACCOMPANY MONTHLY DRILLING REPORT DATED CCT 2874 BY T.D. SEU

DRILLING PROGRESS MAP for the month of __OCT 74

SUPERIOR EAST

GILA & PINAL COUNTY, ARIZONA SCALE: I'= I mile J.D.S.

November 26, 1974

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report -- Nov. 1974 Superior East Project Pinal County, Arizona

Drill hole DCA-2A was reentered during the month and a wedge set in the previous hole. The first core was recovered at 1352 feet. Synopsis of the cored hole follows:

1352-1442 Whitetail Cgl. No copper noted.

1442-1452 Rhyolite tuff.

1452-1540 Pinal Schist, oxidized, crushed and broken, moderate Fe-stain.

1540-1613 Schultze Granite, oxidized, crushed and broken, moderate Fe-stain.

1613-1620 Fault zone at +80°.

1620-1676 Schultze Granite, oxidized, argillic alt., weak copper oxide.

1676-1710 Pinal Schist, oxidized, altered, weak copper oxide.

1710-1804 Fault zone (Pinal) @ ±45°, oxidized, moderate

Fe-stain.

1804-1827 Schultze Granite, weak oxidation and Fe-stain (intrusive).

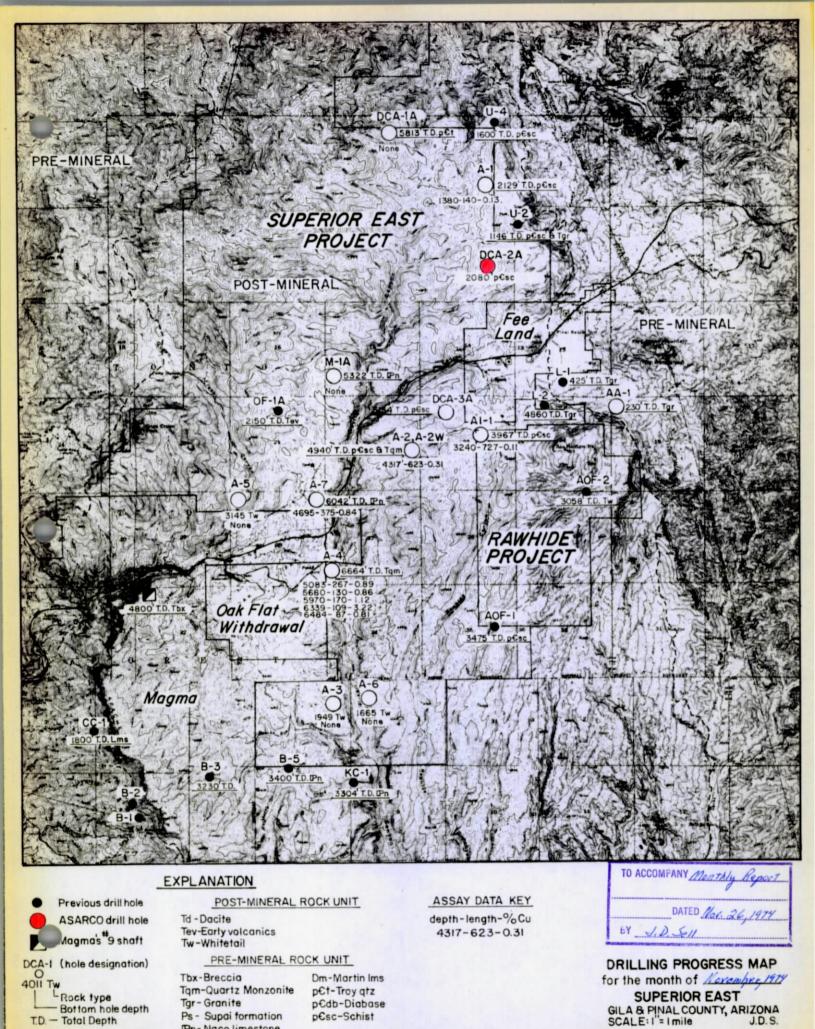
1827-1923 Pinal Schist, weak oxidation and Fe-stain, some copper oxide.

1923-2067 Pinal Schist, less than 0.1% sulfides, disseminated pyrite; with squirts and injections of porphyry, sericite-clay veinlets.

2067-2080 Pinal Schist, crushed with gouge zones.

The rods and core barrel became stuck at 1932 feet during a routine bit change. As of this date, the rods were found to have a free-point at 1600 feet. Consensus is to leave the rods as is and convert to BX drilling for completion of the hole. No geochemical values have been received on the samples submitted.

Newmont has again run a geophysical survey onto the ASARCO ground. One line for gravity measurements ran some 1-1/2 miles northward over our claims. Another cut completely through our section 5 State lease from north to south. The work was performed by an outside contractor. Gordon Wieduwilt has run gravity surveys in the past for Newmont and may be the outside contractor.



Ps - Supai formation

Pn-Naco limestone

Me-Escabrosa limestone

T.D. — Total Depth

Proposed drill site

p€sc-Schist

MVK 2463 No. 3

December 27, 1974

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report - December 1974 Superior East Project Pinal County, Arizona

Drill hole DCA-2A was continued from 2080 to 2422 feet by BX core drilling. The hole was terminated at this depth due to nearby complete lost circulation conditions and the low incidence of favorable alteration-mineralization characteristics with very low total sulfides. Assays are pending in the sulfide zone, but are estimated to be low copper values based on visual inspection.

A report on the Whitetail copper potential was distributed November 8th and the summation of the project, with specific attention to the porphyry copper potential, is in press.

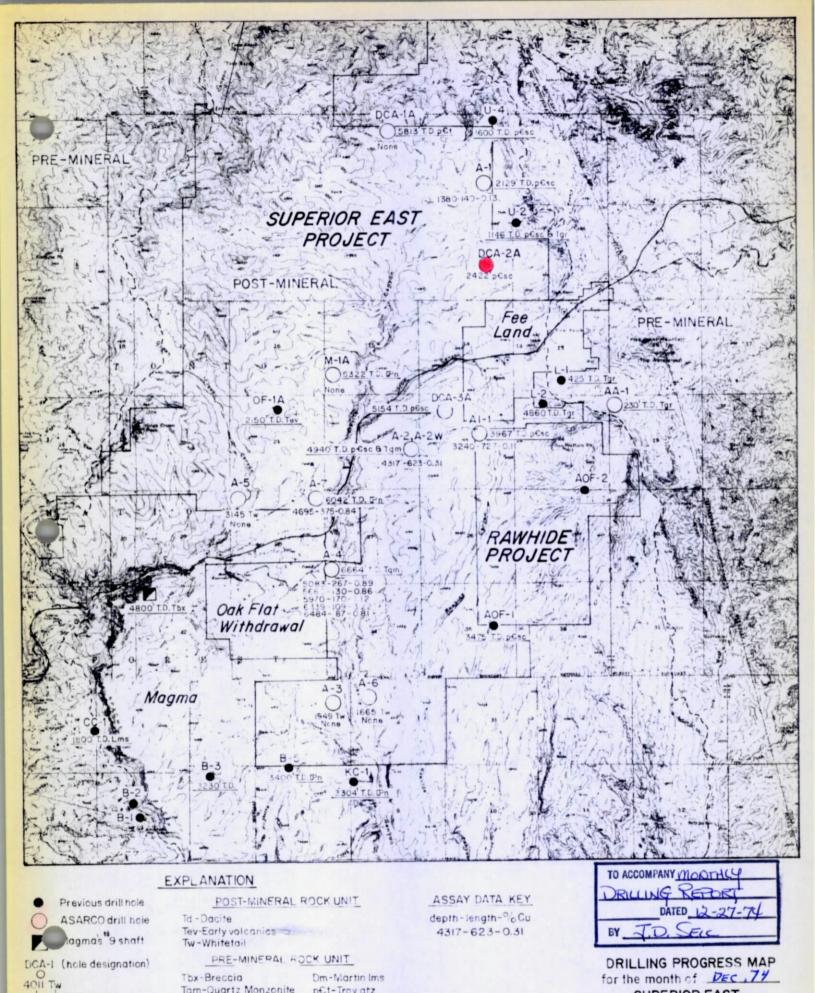
To date no further contact has been made with Newmont concerning the geophysical overruns. Their road contractor, Guzman, is presently cleaning east of Devils Canyon on their State Lease section.

The option for the Clark group of claims around the American Mine has been terminated and the drill-assay information turned over.

Estimated balance of authorization is \$63,500.

James D. Sell/L.

JDS:1b Attach.



Tam-Quartz Monzonite

Ps - Supai formation

Pn-Naco limestone

Me-Escabrosa limestone

Tgr - Granite

Rock type

T.D - Total Depth

Bottom hole depth

Proposed drill site

p€t-Troy qtz

p€sc-Schist

pCdb-Diabase

SUPERIOR EAST GILA & PINAL COUNTY, ARIZONA SCALE: 1"= 1 mile J.D.S.

TAB

1975

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

February 14, 1975

MEMORANDUM FOR GEOLOGISTS

Monthly Reports

Henceforth it will not be necessary to prepare a project drilling progress map every month, but rather quarterly — March, June, September, December. You will still prepare a written monthly report and cost summary.

W.L. Leuts

WLK:1b

cc: VKellogg LBormolini

January 30, 1975

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report -- Jan. 1975 Superior East Project Pinal County, Arizona

Assays have been returned on the sulfide intercept of drill hole DCA-2A. The five samples split from the interval 2000 to 2422 ft. averaged 156 ppm Cu, 41 ppm Pb, 84 ppm Zn, and 5 ppm Mo, confirming the low visual estimate. As reported last month, the hole was terminated at 2422 ft. in Pinal Schist with low pyrite content and weak alteration characteristics.

Drilling has been suspended pending review of drilling contracts and anticipated costs.

Although the contract has not yet been signed, Cooksley is slated to start the seismic work sometime in March.

No map is attached to this report. Estimated balance of authorization is \$56,000.

James D. Sell

February 28, 1975

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report - Feb. 1975 Superior East Project Pinal County, Arizona

The seismic work will be initiated in early March with several east-west lines proposed.

Newmont's gravity data, much of which was run over ASARCO ground, was turned over to us and has been sent to Cal Moss for comment. Values shown by them suggest only gradual changes and McLean suggested they had no interpretation. They were apparently attempting to learn more about the extent of the "breccia" found underground in the area of their No. 9 shaft. As noted in previous memos, the Magma replacement orebodies may have a spatial relationship to this mass.

The cost data for the recently completed phase has been compiled. Also, the summation report. Both are in the final typing phase and will be ready for distribution shortly.

No map is attached to this report. Estimated balance of authorization is \$53,800.

James D. Self

March 25, 1975

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report - March 1975 Superior East Project Pinal County, Arizona

Cooksley Geophysics has completed flagging and drilling the north line (A-5 to AOF-2) and is scheduled to start shooting and recording the line on March 24. The work will be separated into two phases and the first line results computed and interpreted prior to initiation of the second line (A-3 to AOF-1).

Bryant Construction has moved equipment into the area and will start the road and drillsite for hole A-8, located 1800 feet southeasterly from hole A-2. The road is a modification to a previous cat road and the drill site will be about 1700 feet from the existing access road. The access road will also be trimmed up from Devils Canyon, as the past several year's travel and weather have created a number of high center areas and washout zones. It is estimated to take 18-20 days for the work.

Several drill contractors have been contacted for the rotary and core from otherhold drilling of A-8. Tonto Exploration has inspected the previous core and investigated the proposed site. No bids have been received on any drilling proposals to date.

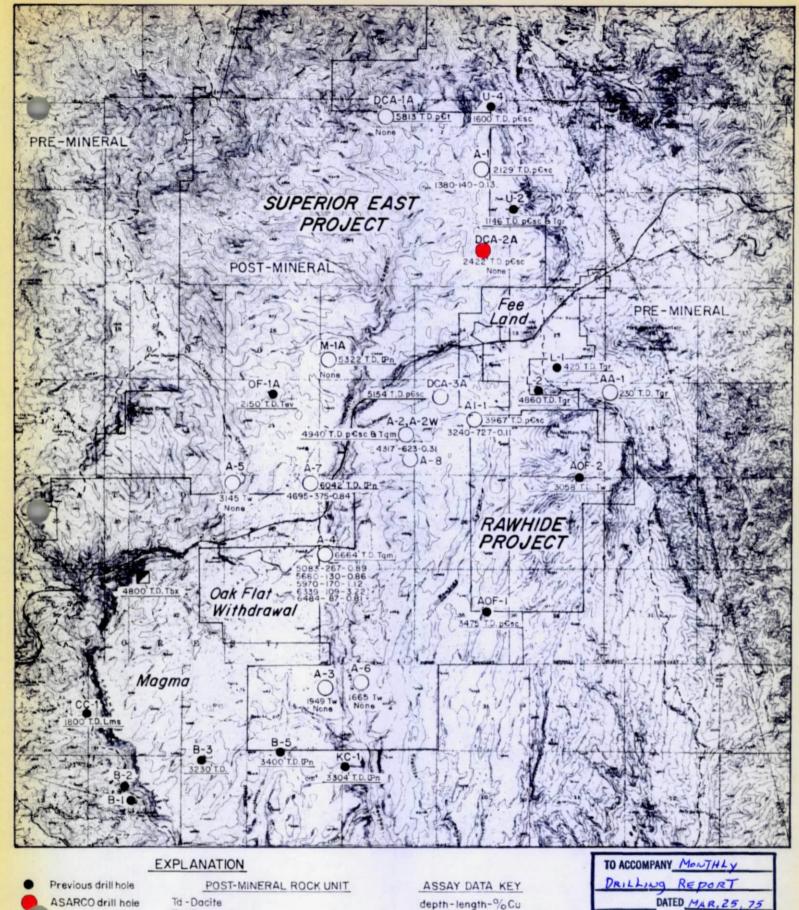
Two Superior East reports have been distributed:

- 1) Cost Summary as of February 1, 1975 (dated Feb. 27, 1975);
- 2) 1974 Summation Report with recommendations for additional exploration (dated March 10, 1975).

Estimated balance of the authorization is \$52,400. Attached is the drilling progress map updated for the past three months.

James D. Sell

JDS:1b Att.



Magma's #9 shaft

DCA-I (hole designation) O 4011 Tw

Rock type

Bottom hole depth
T.D — Total Depth

Proposed drill site

Tev-Early valcanics Tw-Whitetail

PRE-MINERAL ROCK UNIT

Dm-Martin Ims

p€db-Diabase

p€t-Troy qtz

p€sc-Schist

Tbx-Breccia Tam-Quartz Monzonite Tgr - Granite

Ps - Supai formation Pn-Naco limestone Me-Escabrosa limestone 4317-623-0.31

DATED_MAR, 25, 75 BY J. D. SEL

DRILLING PROGRESS MAP

for the month of JAN-MAR, 1975

SUPERIOR EAST

GILA & PINAL COUNTY, ARIZONA SCALE: I'= I mile J.D.S.

April 29, 1975

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report - April 1975 Superior East Project Pinal County, Arizona

Cooksley Geophysics has shot the west half of the north line with apparent good record returns. The shooting and recording were delayed several weeks due to wet ground and high noise level. They will be moving east of Devils Canyon to complete the survey this week.

Bryant Construction has been pulled off the road work south of A-2 while the 1975 drilling work is being clarified.

Longyear has shown interest in bidding on the drilling and a proposal has been received from Tonto Exploration. A contractor decision should be completed this week.

No map is attached to this report.

Estimated balance of the authorization is \$45,000.

James D. Sell

JDS:16

May 28, 1975

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report - May 1975 Superior East Project Pinal County, Arizona

Cooksley Geophysics has completed the shooting of the north line. The field records will be submitted to the data processing company this week, but the turn-around time is unknown. All shot records appear to be good and good interpretive processed records are expected.

No word has been received from Cal Moss on the gravity interpretation they are doing on the Newmont data.

CXM Drilling has cleaned our drill hole A-3 (State Lease Section 5) to the depth of 1945 feet and set 4" black pipe and flush-joint casing to the full depth. Stabilizers were placed at approximated 100-foot centers in the large diameter hole and 16 cubic yards of cement were pumped around the outside of the casing; plug set, pipe stretched and welded to collar.

Tonto Drilling has accepted the contract for diamond coring in holes A-3 and A-5, but the final contract has not been signed as of this date. Tonto is scheduled to be in Tucson this week. Modification of the newly acquired rigs (CP-50's) may take up to 6 weeks.

Several modified drilling programs have been submitted and an additional appropriation secured.

No map is attached. Unexpended funds are \$144,000.

James D. Sell

June 23, 1975

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report - June 1975 Superior East Project Pinal County, Arizona

No new work has been undertaken on the project area during the month. Cooksley is awaiting a return on the first line seismic work. The field records were apparently quite clear and the computer printout sheets are said to be excellent. The computer velocity functions were to be run on the 19th, with the final computer completion scheduled for around July 1.

Tonto Drilling is continuing its modification of the CP-50 and is presently scheduled to move onto the project area prior to July 15. Tonto will move onto A-5 site first, as it has the best access and will afford the best area for breaking in their equipment and crews for the project.

No map is attached. Unexpended funds are \$142,700.

James D. Sell

ASARCO Incorporated Tucson Arizona

July 31, 1975

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report - July 1975 Superior East Project Pinal County, Arizona

No activity.

James D. Sell

ASARCO Incorporated Tucson Arizona

August 27, 1975

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report - August 1975 Superior East Project Pinal County, Arizona

The geophysical results are not yet available, but the progress report states that the velocity filtering technique is being applied to the records and they should be available for interpretation in the not too far distant future. In view of the later report on the first line, it is doubtful that work will be started on the second proposed line which was to pass thru A-3 and A-6. We should be coring A-3 shortly and A-6 is on a State Lease Section which was lost during a drawing and thus the seismic data might be of limited use at this time.

Mr. Whitey Sonnenburg of Tonto has now visited the drill site and area and acquainted himself with the housing, mud engineers, etc. He believes the drill will be in the area around the first of September. I suspect some time will be needed to get on a regular drilling basis.

Mapping and sampling of air-hammer cuttings are now under way on land west of the project area.

Unexpended funds are \$141,200.

James D. Sell/ James D. Sell/

JDS:16

ASARCO Incorporated Tucson Arizona

September 30, 1975

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report - Sept. 1975 Superior East Project Pinal County, Arizona

Tonto Drilling moved their new CP-50, mounted on a long trailer, onto the site of A-3 on September 15th. After setting up and entering the cased hole, they found cement at 1210 feet. After coring for several hundred feet, they converted to a tri-cone bit and are continuing to clean the hole. They expect to reach the bottom of the casing (1950 feet) shortly and will commence drilling new hole at that point.

The Cooksley seismic survey evaluation is hampered by the computer services, but Cal Moss has asked for a "best interpretation" to be submitted early in October. No further seismic work is proposed.

Assay results have now been returned on the last of the air-hammer cuttings on the Bonanza area west of Superior. No values of interest were obtained, but some samples will be cross-checked using a second assay office for comparison.

Unexpended Superior East funds are estimated at \$129,600.

James D. Sell/



October 28, 1975

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report - Oct. 1975 Superior East Project Pinal County, Arizona

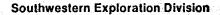
Tonto Drilling successfully cleaned the rotary cased hole A-3 and started coring at 1941 feet with HQ core size, which was continued to 2978 feet. The hole was again cased at that point, and NQ (NX) core continued from 2978 feet to the present depth of 3650 feet.

The cored hole started in Whitetail Conglomerate, which has continued to the present depth. The Whitetail is typical with various clasts, some up to two feet in cored length, set in a fine sandy to gritty matrix, with often long runs of principally sandy-grit and/or mudstone with rare clasts. To date the clasts are predominately Precambrian Pinal Schist and diabase, with variable amounts of Apache Group sediments and Precambrian Troy Quartzite, and rare amounts of Cambrian Bolsa Quartzite and Paleozoic limestones. Only one probable Laramide porphyry (unaltered) clast has been noted.

Massive specularite replaced clasts have been noted which were originally quartzite and diabase. Some clasts of diabase in the lower portions have a 1/8" rind of slick brown-red rinds, but to date no native copper has been found in the rinds. The slick material is similar to that which contains native copper in the holes to the north.

Inspiration finally dug out the skeletonized core from their totally cored hole AOF-1, located two miles northeasterly from A-3. The specimens of Whitetail preserved suggest that abundant pebbles of schist, diabase, Madera diorite, and Apache group persist from the top of the Whitetail to the bottom (1105-2939'), with a few Laramide types. The bedrock samples are relatively unaltered and unmineralized, except for one specimen of diabase (at 3180') in which the feldspars were totally replaced by epidote-chlorite with the mafics unaffected. The ICC log suggests the sample was in the area of a fault zone. The core also had two pieces of core with no depth marked, which were both strongly sheared and gougy schist with a shear plane at 70 degrees to the core axis. As one sample was NX core and the other BX, and both were otherwise similar, the specimens must have been taken around 3148 feet where the core size was changed. The ICC log suggests strong gouge zones at the change.

- 2 -October 28, 1975 W. L. Kurtz The A-3 core has been split at ten feet per one hundred feet, but none has been sent for assay as of this date. The unexpended funds are \$82,000. James D. Sell JDS:16





November 26, 1975

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report - Nov. 1975 Superior East Project Pinal County, Arizona

Tonto Drilling continues to give good penetration rates and excellent core recovery. The addition of the 50-foot rod pull and incorporation of a 20-foot core barrel have been strong factors in the increased rates per shift.

During the month the hole has been deepened from 3650 feet to the present depth of 5663 feet. The rock continues to be Whitetail Conglomerate and continues to be as described in the October report.

The expected change in host rock texture-matrix has not materialized in the conglomerate section. A six-foot lithic tuff bed was intercepted at 3671-3677 feet and a trace of cuprite noted in it. Rare visible native was also noted shortly above the tuff. Native was again found starting around 4020 feet, and native was noted in various runs down to a second tuff layer at 4485-4490. Although no apparent rock type change occurred below the tuff bed, the occurrence of native copper became noticeable in each run and continued to 4780 feet before again becoming spotty in various runs. Assay data to date (to 4660 feet) suggests the values to be less than 0.1% copper in the zones of noticeable copper, and visually no change has occurred to the depth logged.

It is anticipated that drilling will continue for the premineral intercept and to fully view the basin development.

A deviation-temperature survey has been conducted to the present depth, but the readings have not been submitted at this date.

Field checking has been conducted covering a part of the Inspiration-Asarco mutual claim boundary on the north side, and it appears that all is in correct order.

Unexpended funds are \$1,000.

James D. Selly



December 11, 1975

FILE MEMORANDUM.

Newmont Drilling Superior East Area Pinal County, Arizona

On December 10, 1975, I drove over the roads south of Oak Flat and west of Devils Canyon. Three drill rigs are presently in the area.

One Joy rig is in the extreme SE corner of section 6 (T2S, R13E). (Note: The rig is very close to the section line and may in fact be within our State Lease section 5.) The hole had previously been rotaried to some depth by Longyear Drilling Co. Joy started out coring NX in August of 1975, but soon ran into problems due to a crooked hole. They set casing and reduced to BX core. On the day of my visit they had about 1500 feet of BX rods in the tower and had a tap on the casing and were restretching and welding it to the surface pipe. The driller was only "hopeful" that this would solve the problem. Apparently the casing was quite crooked and the BX rods would catch, bind, and twist or break off. After doing so a number of times and the attendant fishing jobs involved, the driller hoped that a new stretch job would help. No clue was noted as to what unit was being cored. I have designated the hole as B-6 and it lies about half way (and north) between Newmont's previous holes B-3 and B-5.

A second rig, a Longyear holemaster rotary, is presently broken down at an unknown depth. Its location is in Hackberry Creek just northeast of the center of section 8. This small rig can probably go to 1000-1200 feet. Some 700-800 feet of rods were on the ground and some in the hole. This hole has been designated as B-7. The hole lies midway and south of Newmont's hole B-5 and the Coryell hole KC-1.

The third rig, a Joy, has been set up on the old Kirby Coryell hole KC-1, which had previously terminated at 3304 feet in Pennsylvanian Naco Limestone. The rig moved on during the week of November 20th and set casing. Last Friday, December 5th, they commenced coring BX, and have averaged between 40-55 feet per day (running 2 shifts per day) since that time. They are presently in Whitetail Conglomerate and apparently penetrated the Naco block shortly (2nd day?) after starting coring. The word is that the hole is scheduled to go to 5400 feet.

File Memorandum December 11, 1975 Newmont has now drilled or is drilling seven holes in an east-west line extending from the dacite cliffs above the Belmont mine (2 holes) to just west of Devils Canyon (KC-1) and just south of a line extending from the south boundary of our State Lease Section 5 (holes B-3 thru B-7). James D. Sell JDS:1b cc: WLKurtz



December 16, 1975

TO: W. L. Kurtz

FROM: J. D. Sell

Quarterly Report October-December 1975 Superior East Project Pinal County, Arizona

Tonto Drilling Company (Vancouver, Canada) initiated coring of hole A-3 in State Lease Section 5 during the early part of the quarter. NQ(HQ) coring commenced at the bottom of the cased rotary hole at 1941 feet and continued to 2978 feet, where the core size was reduced to NX(NQ) and continued to the terminal depth of 6008 feet.

Synopsis of the total hole is as follows:

Surface-1430 Tertiary dacite
1430-5885 Tertiary Whitetail Conglomerate
5885-5930 Precambrian diabase Slide Block
5930-6008 Tertiary Whitetail Conglomerate

Within the Whitetail, a lithic tuff marker horizon was cored at 4485-4490 feet, and persistent native copper was found below this point. Irregular sampling (generally ten feet per fifty feet or one hundred feet) suggests the values from the base of the tuff marker at 4490 feet to the top of the diabase slide block at 5885 feet averaged 0.049% copper with the lower several hundred feet being 0.060%. The diabase slide block returned a value of 0.200% copper as disseminated native copper throughout the block. The underlying Whitetail is represented by only one sample which ran 0.070% copper.

Deviation of the hole was in a consistent southerly direction and at a depth of 5600 feet was 243 feet in a S11°W direction from the collar. (Based on the last three readings, the projected deviation at terminal depth of 6008 feet would be approximately 299 feet at S11-1/2°W.)

The temperature survey indicated a temperature of 153°F. at a depth of 5500 feet. This is an apparent temperature gradient of 1.46 degrees per 100 feet of depth. This value is comparable to that found in the upper part of hole A-2 and in holes DCA-1A and DCA-3A and substantially lower than found in holes A-4, A-7, and at Magma (1.67 to 1.75).

Newmont presently has three drill rigs operating west of Devils Canyon and southerly from A-3 (see map). A Joy rig has reoccupied hole KC-1, has set casing, and is coring BX. The hole had previously been terminated in Naco Limestone extending from 2917 feet to the then terminated depth

of 3304 feet. Newmont's drilling apparently went out of limestone in the first few shifts of drilling (plus or minus 3350 feet) and back into Whitetail Conglomerate, which they were still into at around 3550 feet. The hole is rumored to be scheduled to a depth of 5400 feet.

A Newmont Joy rig is presently at around 1500 feet, coring BX size at hole B-6 after following a Longyear rotary drill. The hole was started in August and has been in continual trouble due to hole deviation and twisted off rods.

A Newmont Longyear rotary has started a hole at B-7 and is broken down at an unknown depth. The rig can probably go to 1000-1200 feet.

The seven-hole line which Newmont now has stretching from above the Belmont Mine area thru KC-l should give them an excellent interpretation of the structure-stratigraphy-mineralization along that band. My inspection of sites B-l, B-2, and B-5 failed to indicate any appreciable alteration-mineralization in the numerous core chips that were found.

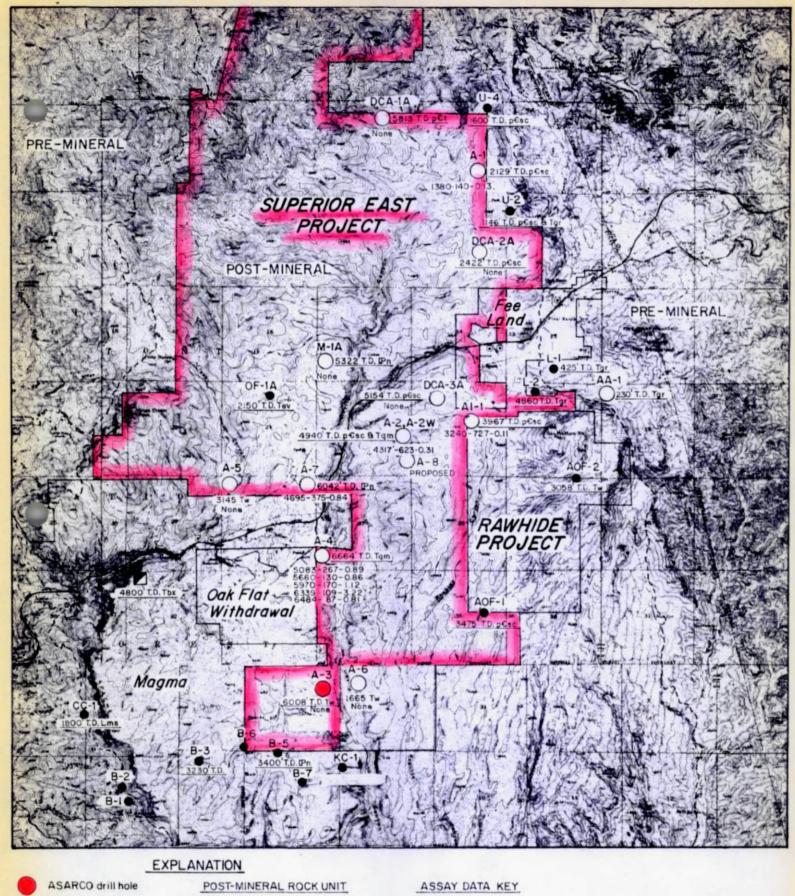
No discussions have taken place with knowledgeable participants, but the drilling would suggest that 1) they have some encouragement, or 2) they are strongly checking out our southern property boundary (most likely based on the linear drill pattern) prior to dropping the State Lease options which are now in the 3rd and 4th years. (The majority of their leases expire on 2/8/77 and 3/2/77.) Although the new State Prospecting Permit law allows grouping of leases, Asarco should still file on the Newmont leases each year as per your instructions of August 21st.

Cooksley has not submitted a final report on the work undertaken nearly a year ago. The last comment was that he was not satisfied with the computer results and intended to do more computer work. However, Cal Moss did receive a drawing of this "best interpretation" in October, which indicated a near symmetrical downdropping of the basin from both edges to a central axial portion. Cooksley's section through hole A-7 was some 1600 feet higher to interpreted bedrock than what was actually found in drilling. It is unknown when a final report will be forthcoming.

A progress drilling map is attached.

James D. Sell

JDS:1b Att.



ASARCO drill hole
Other drill hole
Magma's #9 shaft

DCA-1 (hole designation) O 4011 Tw

Rock type
Bottom hole depth
T.D. — Total Depth

Proposed drill site

Td - Dacite
Tev-Early volcanics
Tw-Whitetail

PRE-MINERAL ROCK UNIT

Tbx-Breccia Tqm-Quartz Monzonite Tgr-Granite Ps-Supai formation

Me-Escabrosa limestone

Pn-Naco limestone

Dm-Martin Ims p€t-Troy qtz p€db-Diabase p€sc-Schist depth-length-%Cu 4317-623-0.31

Dulling Bepart
Dated Dec 16, 1975

BY J.D. Sell

DRILLING PROGRESS MAP

SUPERIOR EAST

GILA & PINAL COUNTY, ARIZONA SCALE: 1 = 1 mile J.D.S.





December 16, 1975

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report - Dec. 1975 Superior East Project Pinal County, Arizona

Tonto Drilling Company's CP-50 rig was terminated in drill hole A-3 at a depth of 6008 feet. During the six days of coring since the November report they deepened the hole from 5663 feet to 6008 feet T.D.

A disseminated native copper block of diabase was cut from 5885 to 5930 feet which ran 0.20% copper, the best of any assays recorded. Whitetail Conglomerate with erratic, low tenor, native copper, similar to that above the diabase slide block, was found below the diabase and persisted to the total depth.

Incomplete assay data suggests the following distribution of values (based on a ten-foot split per hundred feet, except closer intervals in areas of noticeable copper):

Whitetail Conglomerate (rotary)	1430-1949 0.011%
Whitetail Conglomerate (HQ Core)	1949-2980 0.015% 0.014%
Whitetail Conglomerate (NX Core)	2980-3671 0.013%
Lithic tuff marker	3671-3677
Whitetail Conglomerate	3677-4290 0.014%
Whitetail Conglomerate	4290-4485 0.047%
Lithic tuff marker	4485-4490
Whitetail Conglomerate	4490-4780 0.057%
Whitetail Conglomerate	4780-5650 0.044%
Whitetail Conglomerate	5650-5885 0.060%
Diabase Slide Block	5885-5930 0.200%
Whitetail Conglomerate	5930-6008 0.070%
	T.D.

Below the tuff marker at 4485-4490, the amount of native copper was persistent, in that each box of core contained noticeable amounts. The copper was generally in thin, small flakes at the clast boundary with diabase being the usual host clast. Also below the tuff marker was the occurrence of a number of specularite clasts of the Magma type. The specularite occurred as massive pure clasts, or as specularite replacing quartzite and diabase in varying degrees, and specularite veining in schist.

Only in a short zone at 5480 feet was the occurrence of copper found to cover or wrap around a clast. The wrap-around type was very common in the high grade sections in holes A-4 and A-7 to the north.

The matrix in hole A-3 had only a minor amount of the slickensided clast boundary phenomena as noted in holes A-4 and A-7, and the matrix color maintained a medium-chocolate brown with minor green tones in contrast to the reddish to maroon tones to the north.

The cored thickness of conglomerate from the top of the lower tuff marker in hole A-3, to the terminated depth, is 1523 feet which includes the 45-foot slide block of diabase. The thickness of Whitetail from the top of the marker tuff in hole A-4 is 1365 feet to the top of a limestone slide block. The limestone slide block was 109 feet thick and an additional 36 feet of Whitetail was found between the slide block and the Mississippian Limestone-schist-quartz monzonite basement, for a total of 1510 feet of Whitetail-slide block. In hole A-7, a thin tuffaceous unit was noted and from the top of it to the Supai formation basement, a total of 920 feet of Whitetail was cored. Although the apparent thickness of Whitetail now appears to be thickening to the south, the bedrock in hole A-3 undoubtedly was within the drilling capability of the drill rig, but the additional drilling below the original projected and budgeted depth has accrued an overrun on expenditures.

The temperature survey gave a reading of 153°F. at a depth of 5500 feet. The hole deviated 243 feet at S11°W at a depth of 5600 feet.

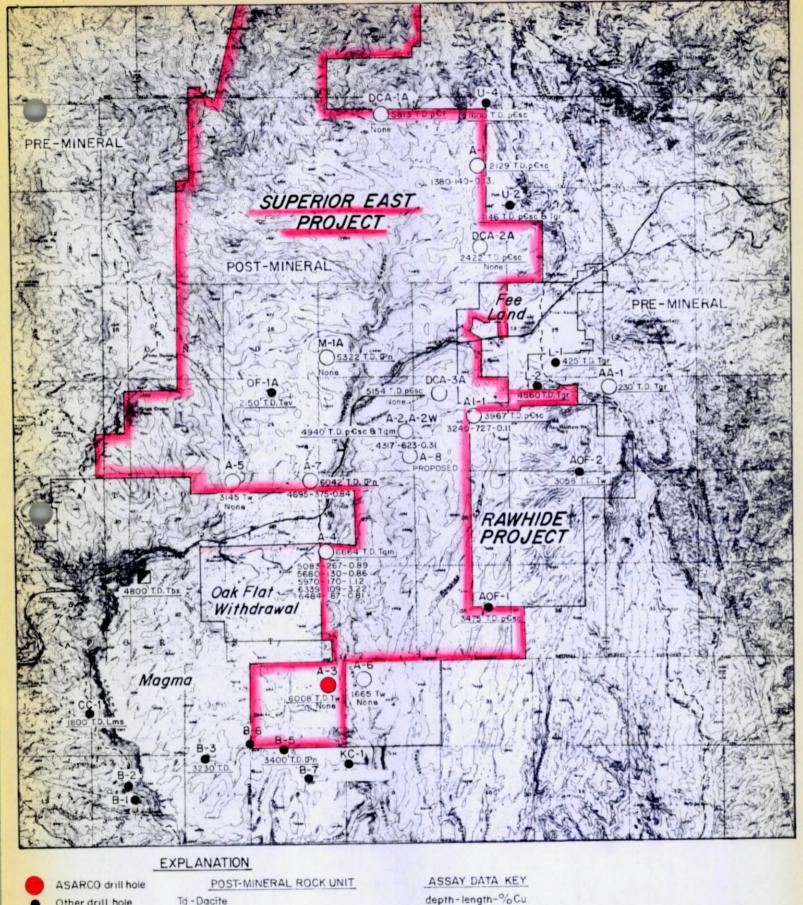
Newmont presently has three rigs running southerly from A-3. They have reoccupied the Coryell hole KC-1 and, shortly after commencing the reentry, the core penetrated the Naco block and went back into Whitetail Conglomerate, where some three hundred feet later they were still in conglomerate. The hole is rumored to be scheduled to 5400 feet. They are coring BX. Two new holes, designated B-6 and B-7, have been started. B-6 has been occupied since August and has been in constant trouble with twisted rods. They have reduced to BX core and are presently around 1500 feet in depth. Hole B-7 is being rotaried at the present time and is probably less than 1000 feet deep. Newmont is also building and repairing roads on the east side of Devils Canyon, and it is expected that they will drill in that area.

The authorized EA expenditures have been exceeded.

The drilling progress map is attached.

James D. Sell

JDS:1b Att.



Other drill hole tagma's #9 shaft

DCA-1 (hole designation) O 4011 Tw

Rock type
Bottom hole depth
T.D. — Total Depth

Proposed drill site

Td - Dacite Tev-Early volcanics Tw-Whitetail

PRE-MINERAL ROCK UNIT

Tbx-Breccia Tam-Quartz Monzonite Tgr-Granite Ps - Supai formation Pn-Naco limestone

Me-Escabrosa limestone

Dm-Martin Ims p€t-Troy qtz p€db-Diabase p€sc-Schist

4317-623-0.31

TO ACCOMPANY MONTH DATED 2 BY 1.D. Sell

DRILLING PROGRESS MAP for the month of Dec. 1975

SUPERIOR EAST GILA & PINAL COUNTY, ARIZONA SCALE: I = I mile J.D.S.

MVK 2463 No. 3

TAB

1976



Southwestern Exploration Division
January 29, 1976

TO: F. T. Graybeal

FROM: J. D. Sell

Monthly Report - Jan. 1976 Superior East Project Pinal County, Arizona

One swing through the project area was made during the month. Newmont now has 4 rigs in the area, having reoccupied the old Kerr-McGee hole DC-1 located in Section 16, T2S, R13E, with a core rig. Newmont had previously used a rotary rig to push the hole to a depth of 3270 feet Rumor at the time suggested they were still in Whitetail, but the driller thought he might have just tapped bedrock. No further information is known on the four holes.

An afternoon was spent talking with an ex-Magma geologist and this thoughts were written up in a memo dated January 21st. His basic belief is that the stepped-up drilling program of Newmont's is to clarify the geology-mineralization potential because large payments are presently in order for 1) an option on mining claims around the Belmont, and 2) the State Lease lands optioned from K. Coryell.

James D. Sell



Southwestern Exploration Division

February 26, 1976

TO: F. T. Graybeal

FROM: J. D. Sell

Monthly Report - Feb. 1976
Superior East Project
Pinal County, Arizona

Newmont has now moved three of their rigs out of the area. One rigremains, but apparently is not doing much work, in the site at B-6 (SE corner of Sec. 6).

T. Benavidez completed gravity readings on 32 stations and tied into the Newmont data. The SLC group worked the data over and made a preliminary interpretation. Verbal communication with Jerry Montgomery suggested that the data was not outlining the basin, but that it was showing something else. He felt that perhaps the granite-schist contact could be traced by gravity. He and I looked the area over and have picked two roads over outcrop which should indicate if a separation is possible. The preliminary work should start in several weeks. The Forest Service, ICC, and Kayser will be notified for permission to conduct this preliminary survey over their land. If the survey is successful, a longer survey will be conducted on the plateau in an attempt of tracing the contact under dacite-conglomerate cover.

Estimated balance of authorization is \$11,500.

James Dell J. D. Sell



Southwestern Exploration Division

March 29, 1976

TO: F. T. Graybeal

FROM: J. D. Sell

Monthly Report - March 1976 Superior East Project Pinal County, Arizona

The geophysical group out of SLC has completed four traverses over the Schultze granite-Pinal Schist contact east of the project area. Although the preliminary tests suggested a low contrast, it has been verbally reported that the field work traverses appear to have some variability. Reduction and interpretation of the data are now in progress.

A preliminary seismic profile has been submitted by J. R. Cooksley and a meeting is scheduled for late March or early April.

Estimated balance of the authorization is \$10,000.

James 1280 Ol J. D. Sell



Southwestern Exploration Division

April 29, 1976

TO: F. T. Graybeal

FROM: J. D. Sell

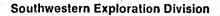
Monthly Report - April 1976 Superior East Project Pinal County, Arizona

Final reports by the geophysical groups (1. the seismic contracted by Cooksley and 2. the gravity by SLC) have not been received. Cooksley visited for a half day but did not have his report, so little was accomplished. Much massaging of the data appears to still be necessary, and it is questionable as to the validity of any data without strong depth control.

Our lease on the core storage-office space is up June 1st and will not be available for another yearly lease. Investigation of alternate areas is presently under way.

Estimated balance of authorization is \$8,700.

James D. Self





June 1, 1976

TO: F. T. Graybeal

FROM: J. D. Sell

Monthly Report - May 1976 Superior East Project Pinal County, Arizona

Cooksley's final report on the seismic line from A-5 eastward to AOF-2 across Devils Canyon has been received. His work suggests the Devils Canyon fault does not cause an abrupt escarpment in the bedrock but only gently uplifts it, where it then continues on a gentle rise until the bedrock surface intercepts the Rawhide Canyon fault. If valid, it opens up the potential for additional copper conglomerate to the east while increasing the depth to bedrock in testing for the primary bedrock zone as involved in hole A-2W.

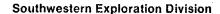
The SLC gravity report on testing for the Schultze granite-Pinal Schist contact has been received. They find the contact to be resolvable when traversed over outcropping units. They then modeled the response under various thicknesses of volcanic cover rock, and the results suggest a very rapid loss of resolution. It is doubtful that a clear-cut response and interpretation are possible with gravity over the dacite.

Our lease on the core storage-office has been extended monthly. A new location has been found in downtown Miami and is presently being repaired and cleaned. All core, etc. will be moved to the new location.

Preliminary investigation for a new drill site on the Rawhide ground has been made south of AI-1. The site will also test the southeasterly extension of the proposed zoning outward from A-2W.

Estimated balance of authorization is \$4,200.

James D. Sell/b-





June 28, 1976

TO: F. T. Graybeal

FROM: J. D. Sell

Monthly Report - June 1976 Superior East Project Pinal County, Arizona

Alternate drill sites and access have been preliminarily checked for drilling south of Al-1 near to the Asarco-ICC boundary line on the Rawhide (ICC) Joint Venture. Olmstead of ICC has also agreed that work expended on a drill site on the Asarco side would be applicable for the assessment expenditures.

The office-core storage has now been moved to a new location on a twoyear lease. The building is at 401 Live Oak, the main street in down-town Miami. The building is larger and more useable, with an overhead drive-in door.

Inspiration has now started road and site clean-up preparation for five holes on the Eder (Powers Gulch) oxide copper area in schist east of our drill hole A-1 on the northeast side of the Margaret claim group. The boundary compromise has been worked out and agreed upon.

Estimated balance of authorization is (\$2,300).

James D. Sell

James D Selo



July 20, 1976

To: F.T. Graybeal

From: J.D. Sell

Monthly Report - July 1976 Superior East Project Pinal County, Arizona

Drill site A-8 has been prepared for testing the extent and grade of the porphyry type alteration-mineralization as found in hole A-2, located 1700 feet northerly. Joy has submitted a bid for coring from the surface after inspecting the site and previous core results.

As reported, Inspiration has agreed that this site is applicable to the Rawhide Project area costs on assessment work.

Estimated balance of authorization is \$108,000.

James D. Sell

James D'Sell

JDS:vh

Aug 2,1976

FROM: F. T. GRAYBEAL

To: JDSelf

SUPERIOR E

You estimate road work \$ 8000

Actual cost \$ 6257,29

Cardistar - not bad!



August 27, 1976

TO: F. T. Graybeal

FROM: J. D. Sell

Monthly Report - August 1976 Superior East Project Pinal County, Arizona

Drill hole A-8 was started August 5 from the surface with NC core. As of the end of the month they had progressed to 1334 feet in dacite. They are within the central densely welded portion of the dacite and will set casing and reduce to NX at the capacity of the unmodified Joy 22 core rig.

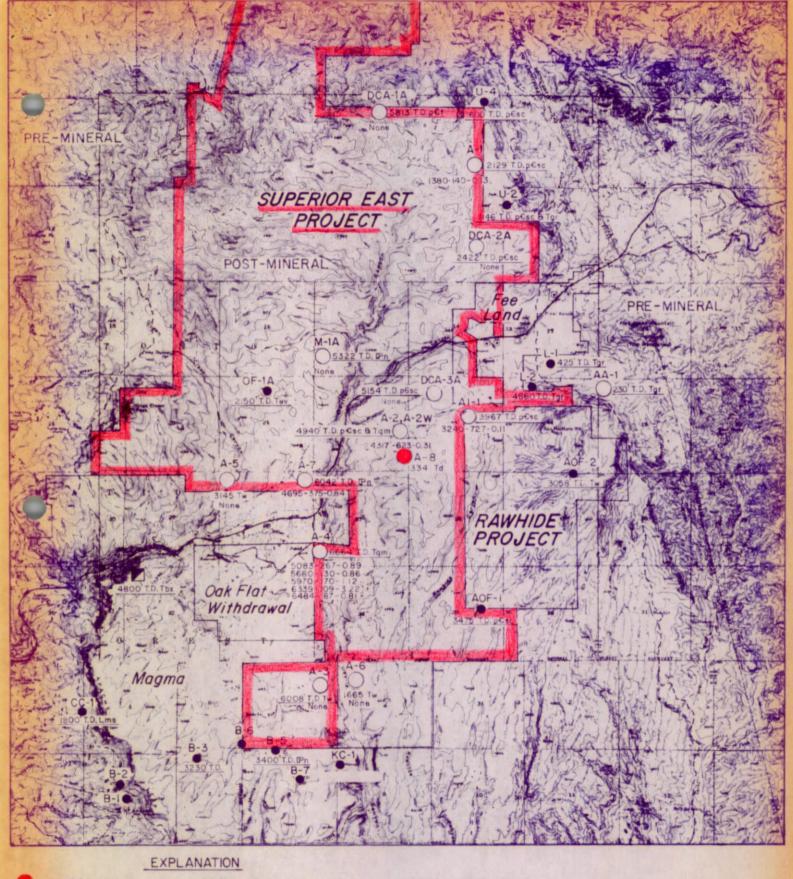
Joy will then replace the rig with a modified Joy 22 HD (heavy duty) for completion of the hole.

Several reports on expenditures were compiled and distributed during the month.

Estimated balance of authorization is \$83,000.

JDS:1b

Att: Map



ASARCO drill hole
Other drill hole
Magma's 49 shaft

DCA-I (hole designation)

Rock type

Bottom hole depth

T.D.— Total Depth

Proposed drill site

POST-MINERAL ROCK UNIT

Td - Dacite
Tev-Early volcanics
Tw-Whitetail

PRE-MINERAL ROCK UNIT

Tbx-Breccia Tqm-Quartz Monzonite Tgr-Granite

Ps - Supai formation
Pn - Naco limestorie

Dm-Martin Ims p€t-Troy qtz p€db-Diabase p€sc-Schist ASSAY DATA KEY

depth-length-%Cu 4317-623-0.31

Drilling Report

DATED 8/27/76

BY V.D. Sell

DRILLING PROGRESS MAP
for the month of Character 1976
SUPERIOR EAST
GILAR PINAL COUNTY ARIZONA

GILA & PINAL COUNTY, ARIZONA SCALE: I = I mile J.D.S.



September 28, 1976

TO: F. T. Graybeal

FROM: J. D. Sell

Monthly Report - Sept. 1976 Superior East Project Pinal County, Arizona

Drill hole A-8 is continuing to make progress with a minimum of difficulties. The unmodified Joy 22 rig completed the NC coring to the depth of 1971 feet where NX casing was set. The rig was exchanged with a Joy 22 Heavy Duty, along with a change of crews. Coring was resumed NX size, and the hole is presently at a depth of 2271 feet.

Synopsis of the hole is as follows:

Surface-1583 Dacite with basal vitrophyre and tuff 1583-2213 Earlier Volcanics 2213-2271 Whitetail Conglomerate

No map is attached to this report.

Estimated balance of authorization is \$61,000.

James D. Sell

JDS:1b



September 28, 1976

TO: F. T. Graybeal

FROM: J. D. Sell

Quarterly Report July-September 1976 Superior East Project Pinal County, Arizona

During the quarter, Bryant Construction repaired the road east of Devils Canyon and continued building the road and drill site of A-8. The road had been worked on in March 1975 but was terminated and delayed at that time.

Joy Drilling Co. bid the hole A-8 coring from the surface, after inspection of the available core of rock types anticipated. Joy collared the hole August 5, 1976, using an unmodified Joy 22. They cored NC size to 1971 feet and set NX casing with shoe. An exchange of crews and rigs was made with a Joy 22 Heavy Duty rig continuing the core NX size to a depth of 2271 feet by the end of the quarter.

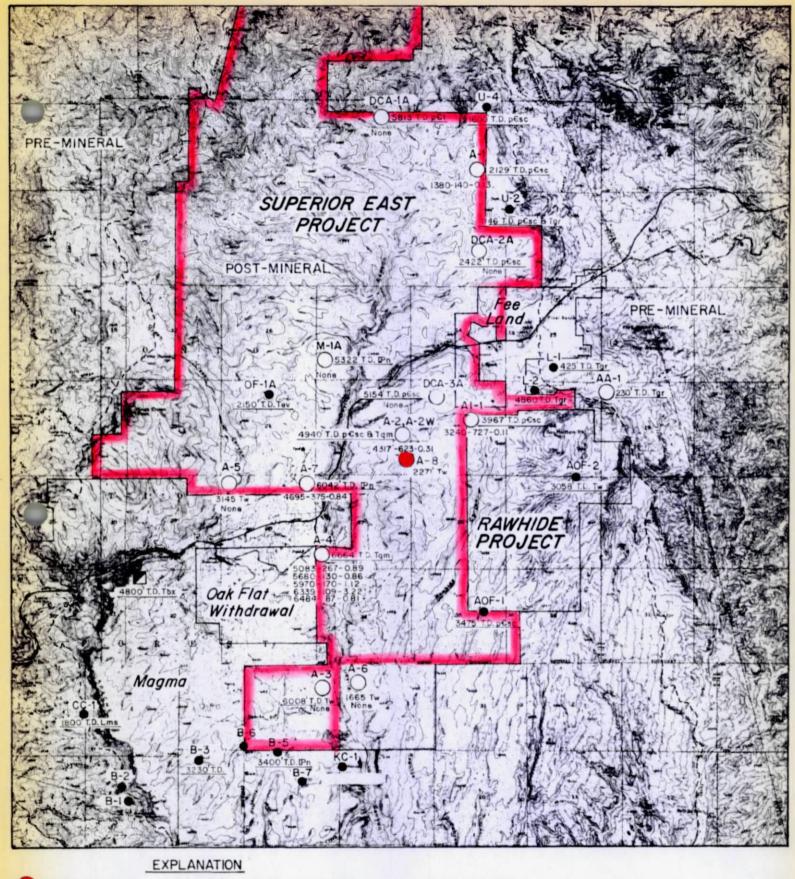
Synopsis of the hole is as follows:

Surface-1583 Dacite with vitrophyre and tuff 1583-2213 Earlier Volcanics 2213-2271 Whitetail Conglomerate

The drilling progress map is attached.

James D. Sell

JDS:1b Att.



ASARCO drill hole
Other drill hole
Magma's #9 shaft

DCA-I (hole designation)
O
40II Tw
Rock type

Rock type
Bottom hole depth
T.D. — Total Depth

Proposed drill site

POST-MINERAL ROCK UNIT

Td - Dacite
Tev-Early volcanics
Tw - Whitetail

PRE-MINERAL ROCK UNIT

Tbx-Breccia Tqm-Quartz Monzonite Tgr-Granite

Ps - Supai formation
Pn - Naco limestone
Me - Escabrosa limestone

Dm-Martin Ims p€t-Troy qtz p€db-Diabase p€sc-Schist ASSAY DATA KEY

depth-length-%Cu 4317-623-0.31



DRILLING PROGRESS MAP

for the month of .

SUPERIOR EAST

GILA & PINAL COUNTY, ARIZONA SCALE: 1 = 1 mile J.D.S.



October 27, 1976

TO: F. T. Graybeal

FROM: J. D. Sell

Monthly Report - Oct. 1976 Superior East Project Pinal County, Arizona

Joy's crews and rig on A-8 continue to give good results. NX core was terminated at 3197 feet and casing set. BX coring continued below the casing with a slight problem of broken and lost core. Careful attention to the mud program has helped the problem and excellent core recovery is being made in brecciated and gougy Pinal Schist. The hole is presently at 3478 feet.

Synopsis of the present total hole is as follows:

Surface-1583 Dacite

1583-2213 Earlier Volcanics

2213-3226 Whitetail Conglomerate

3226-3478 Pinal Schist, brecciated

Minor native copper in Whitetail has been scattered in runs from around 2440 depth with persistent, but very low, amounts from around 2850 depth. The last ten feet of Whitetail contained native in diabase and schist clasts as well as some in the matrix. The core was not split but is estimated to run in excess of one percent copper.

Only minor native was found in the schist block from 3226-3240 with none found at deeper levels. The Pinal Schist block is probably the leached capping block found above a flat fault as in AI-I, A-2, & DCA-3A. The first hundred feet of schist core contained a variable amount of black indigenous iron ranging from 10-25%. Since then the iron content has fallen and ranges from 1 to 5%, mostly as indigenous but with minor yellow-orange transported limonite. The schistosity is generally between 10-20 degrees and is often veined by dense, unmineralized white quartz. It is cut by strong breccia and gauge zones which are probably mostly tectonic. Projection of data from the previous holes is complicated by the steep cross-fault cutting the low-angled "oxide-sulfide" fault (or basal fault to the leached capping blocks) and, at present, the low-angled fault is projected to be intercepted around 3700 feet in depth. The schist block is variably altered with clay and sericite being the common product. Biotite is noticeable along schistosity but is thought to be primary.

No map is attached. Estimated balance of authorization is \$39,700.

James D. Sell



November 29, 1976

TO: F. T. Graybeal

FROM: J. D. Sell

Monthly Report, Nov. 1976 Superior East Project Pinal County, Arizona

Coring of A-8 continues in very badly broken, crushed, and gougy Pinal Schist. As of close down for the Thanksgiving holidays, the BX hole was at 4366 feet.

Synopsis of the present total hole is as follows:

Surface-1583 Dacite

1583-2213 Earlier Volcanics

2213-3226 Whitetail Conglomerate

3226-3774 Pinal Schist, brecciated, oxidized, and leached capping, with minor Laramide aplite.

3774-3777 Basal fault zone

3777-3879 Pinal Schist, weakly to moderately altered, weak oxidation, minor chalcocite. 3' of basal gouge.

Laramide biotite feldspar porphyry with sericite dusting 3879-3885

and minor py-qtz-cc. 1' of basal gouge.
Pinal Schist, broken, some gouge, with qtz-sericite 3885-4008 alteration and gtz-py-cc veins with bornite in lower portion.

4008-4176 Laramide biotite feldspar porphyry, groundmass pervasively altered with sericite dusting of feldspar. Minor disseminated cc-bornite, increasing with depth (probably a sill injection).

Pinal Schist. Pervasively qtz-sericite altered with relic 4176-4248 schistosity containing variable chalcocite and some bornite in basal portion.

Faulted quartz-sulfide vein with central six feet of 4248-4268 massive bornite-chalcocite with walls of interspersed qtz-bornite-chalcocite.

4268-4366 Pinal Schist, crushed, broken, and gouge with pervasive qtz-sericite-qtz veining and variable bornite, minor chalcocite.

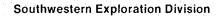
Mineralization is erratic with quartz-sericite bands and quartz veining carrying chalcocite and bornite interspersed with relatively barren, altered, schist bands. Pyrite content is very low. The upper chalcocite is undoubtedly mainly secondary but from just above the faulted quartz sulfide vein the bornite-chalcocite intergrowth is of primary origin.

No core has been split for assay. No map is attached. Extimated balance of authorization is \$18,000.

J. D. Sell/2 J. D. Sell

To F16 From JOS Monthly Report Nov. 1976 Sugarior East Project Prince County, Any Corin of A-8 contenues in very body broken, crushed, and garyy Pivel Schiet. As of close down for the Threalisgining holiday, the BX hole was at 4366 feet. Segrops is of the present total hele is as follows: Surface 1583 block 1583-2213 Earlies Voloanies 2213-3226 Whitelad Conformate 3226 - 3774 Penal Schiet, breacrated, oxidered and looked capsing, when havamide aplite. 3774 - 3777 Bosal-Fault Zone 3777- 3279 Pend Sheet, weally to made attly altered, weak oxidation, minos chalcocits. 3 of base gauge. 3879-3885 Lavamide brothe felloga porphyry sirlls
sometidustini, and suren pry-gty-ce. I of basal 3885 - 4008 Rival Schiet, broken, some grouse, with gity-seried selection and gly-py-ce vein with bornet èn lower portion. 4008-4170 Lacamile brotile feld per portyry, groundwars perosioly altered with sericely desting of fellyaes. Minor disservinto ec-bornite, increa will deith (probably a silf injection). Priol schut Rewasinely gty-serior altered 4174-4248 with ratio schools contening world cholocate and some bounte in basal portion sixfect of massive hornt-cholocoite with 4248-4268 wolls of interpersed gly bornit cholocit. 4248-4346. Period Shist, cushed proben, 4 Jourgy with bornite, menos choleveite.

Mericalization is enable with quarty-sericit lands:
and quarty, verying caroising cholocots abornite interspersed
with relatively barren, aftered, schiet brends. light content
is new low. The regges characteristic is undoubtedly
mainly secondary but pearly spulled quarty sufficience
the bornite-cholocotte intersperse is of simony origin.
The core has been split forcesses, He may is
attacked. Estimated balance of authoryation is. Jewes D. Leve



ASARCO

December 23, 1976

TO: F. T. Graybeal

FROM: J. D. Sell

Monthly Report, Dec. 1976 Superior East Project Pinal County, Arizona

Drill hole A-8 continued coring during the month with BX from 4366 to 4767. The total hole synopsis is as follows:

	· 1986年,1987年,1987年, - 1987年,
Surface-1583	Dacite with vitrophyre and tuff.
1583-2213	Earlier Volcanics.
2213-3226	Whitetail Conglomerate.
3226-3774	Pinal Schist with four (4-10 ft. thick) Laramide
	granite aplite dikes. Oxidized, leached capping (slide block).
3774-3777	Basal fault zone dipping 15°-20°.
3777-3879	Pinal Schist, oxidized, leached capping with basal fault gouge.
3879-3885	Laramide biotite feldspar porphyry with quartz-
2075 2005	pyrite-copper sulfides.
3885-4008	
3005-4000	Pinal Schist with 3 qtz-sulfide veins and quartz-
1,000 1,176	sericite alteration bands.
4008-4176	Laramide biotite feldspar porphyry with quartz-
1,76 1616	sericite bands containing sulfides.
4176-4612	Pinal Schist with 4 qtz-sulfide veins and quartz- sericite alteration bands.
4612-4646	Laramide biotite feldspar porphyry with minor
	quartz-sericite-sulfides.
4646-4660	Pinal Schist with minor alteration-mineralization
	as above.
4660-4664	Laramide aplitic bfp. Altmin. as above.
4664-4712	
4712-4744	
4744-4767	

Mineralization continued to be erratic with quartz-sericite banding in both Pinal Schist and Laramide biotite feldspar porphyry. Mineralization is also scattered throughout with quartz-bornite-chalcocite veins cutting the schist.

Individual footage-assays are listed in the Quarterly Report and will not be repeated here. Basic groupings of assays indicate the following subdivisions in the sulfide intercept.

Unit	Top of Intercept	Footage	Copper Assay
	Tire recor	rootage	<u>/1330/</u>
Lbfp	3879	6	0.62
p€sc	3885	37	0.39
qtz vn	3922	2	6.45
p€sc	3924	54 °	0.85
qtz vn	3978	r e	15.64
p€sc	3979	26	0.37
qtz vn	4005	3	4.90
Lbfp	4008	127	0.41
Lbfp	4135	41	1.31
p€sc	4176	72	1.12
qtz vn	4248	20	19.05
p€sc	4268	70	0.25
qtz vn	4338	22	4.27
p€sc	4360	19	0.39
qtz vn	4379	25	3.62
p€sc	4404	39	0.82
qtz vn	4443	20	2.42
p€sc	4463	62	0.60
p€sc	4525	78	0.15
p€sc	4603	9	1.35
Lbfp	4612	34	0.24
p€sc	4646	14	0.24
Lbfp	4660	4	0.05
p€sc	4664	48	0.05
Lbfp	4712	18	0.05

The Lbfp continues to 4744 with p€sc below to 4767 at end of reporting period.

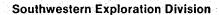
The 646 feet between 3879 and 4525 averages 1.57% copper. Of this, the seven veins total 93 feet of 7.06% copper.

Chalcocite was dominant to 3958 where bornite and covellite are visible. Below 4135, bornite predominates but is mixed with chalcocite. Rare chalcopyrite is also found. Study of polished sections suggests that all the chalcocite is the same from just below the oxide zone down to the lowest depths, indicating primary, hypogene, bornite, and chalcocite intermixtures. Below 4744, where the values appear to be quite low, only a few remnant bornite-chalcocite grains are found. Pyrite and chalcopyrite veins are noted but in relatively minor amounts.

The hole deviation was found to be slight down to 4440. The bottom hole temperature at this depth was $131^{\circ}F$.

Two new drill sites have been proposed. One northeast about 900 feet is being prepared in the old road section. The western site at about 800 feet will need road construction from the end of the present road at the A-8 site.

F. T. Graybeal December 23, 1976 The additional drilling and road work have overexpended the authorization by \$8,000. Quiest Sell James D. Sell JDS:1b No map is attached (see Quarterly Report).





December 22, 1976

TO: F. T. Graybeal

FROM: J. D. Sell

Quarterly Report October-December 1976 Superior East Project Pinal County, Arizona

Drill hole A-8 continued coring during the quarter. The total hole synopsis is as follows:

	그녀는 그 사람이 교회가 가려서 하는 사람들은 사람들이 가한 것이 되었다.
Surface-1583 1583-2213	Dacite with vitrophyre and tuff. Earlier Volcanics.
	Whitetail Conglomerate.
3226-3774	
3220-37/4	granite aplite dikes. Oxidized, leached capping (slide block).
3774-3777	Basal fault zone dipping 15°-20°.
3777-3879	Pinal Schist, oxidized, leached capping with basal fault gouge.
3879-3885	Laramide biotite feldspar porphyry with quartz- pyrite-copper sulfides.
3885-4008	Pinal Schist with 3 qtz-sulfide veins and quartz- sericite alteration bands.
4008-4176	Laramide biotite feldspar porphyry with quartz- sericite bands containing sulfides.
4176-4612	
4612-4646	Laramide biotite feldspar porphyry with minor quartz-sericite-sulfides.
4646-4660	Pinal Schist with minor alteration-mineralization as above.
4660-4664	Laramide aplitic bfp. Altmin. as above.
	Pinal Schist with altmin. as above.
	Laramide bfp; altmin. as above.
4744-4767	Pinal Schist with altmin. as above.
7/77 7/0/	THE TOTAL CONTROL OF CONTROL OF THE

Sulfide mineralization from 3879 to 4767 is predominantly chalcocite and bornite with minor pyrite and chalcopyrite. Polished section studies suggest the chalcocite and bornite are primary hypogene intergrown minerals, although chalcocite predominates to 3958 where bornite and covellite appear. Below 4135, bornite predominates over chalcocite and persists to around 4744. The last few runs below 4744 contain chalcopyrite as the dominant copper sulfide with increased pyrite content.

The plus 0.50% copper intercept extends from the oxide-sulfide interface at 3879 to the depth of 4525. The 646 feet have a weighted average of 1.57% copper. Within this footage are seven veins with an aggregate

core length of 93 feet containing a weighted average of 7.06% copper, while the remaining 553 feet of contained wallrock have a weighted average of 0.64% copper.

A lower value area from 4525 to 4767 contains three biotite feldspar porphyry dikes within the Pinal Schist and lower amounts of sulfide mineralization. The available assays show the 135 feet (4525-4660) average 0.26% copper while the remaining assays of 70 feet (4660-4730) average 0.05% copper.

Table One attached is a footage-assay-rock unit tabulation of the available assays in the sulfide intercept.

A hole deviation-temperature survey has been completed to 4440 depth. The hole at this depth was 78 feet east and 32 feet north of the collar. The temperature at this depth was $131^{\circ}F$ with a gradient of around $6-1/2^{\circ}$ per 500 feet of depth in the sulfide zone.

Drill site examination has been made for a site approximately 900 feet northeast of A-8 and another 800 feet west of A-8. The eastern site is along the new road and will require no new road construction, whereas the western site is an extension of the present A-8 road. Approval has verbally been given by the Forest Service for the eastern site and the contractor is moving in. The western site has not been approved and it may not be possible to start construction prior to the vacating of A-8.

James D. Sell

JDS:1b

Unit abbreviations: pesc Precambrian Pinal Schist

Lbfp Laramide biotite feldspar porphyry qtz vn quartz vein with sulfide masses

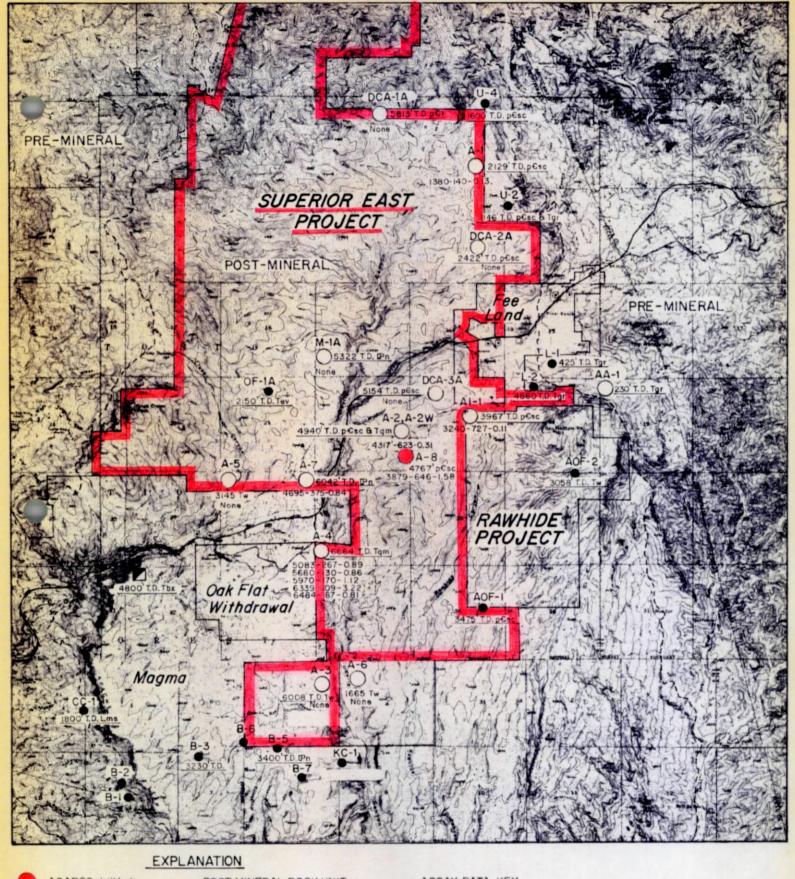
	Initial	Intorcent	Damaant
Unit	Depth	Intercept Footage	Percent Copper
			<u> </u>
p€sc	3843	36	0.008
(leached			
capping)		.16:4	
l b fn	3879	ulfide interface	0 62
Lbfp p€sc	3885	6 1 1 1 1 1 1 1 1 1	0.62 0.32
pese	3886	8	0.63
	3894	ii ii	0.47
	3905	4	0.23
	3909	2	0.20
er en frestation en en en en en en en en en en en en en	3911	11	0.24
qtz vn	3922	2 8	6.45
	3924	8	0.63
	3932	12 8	0.62
	3944	8	0.94
	3952	.	0.54
	3957	10	1.04
	3967	11	1.17
qtz vn	3978 3070	1	15.64
	3979	11	0.24 0.46
qtz vn	3990 4005	4 4 5 5 6 3 7 5 6 6	4.90
Lbfp	4008	11	0.18
- co.b	4019	8	0.69
	4027	ıĭ .	0.44
	4038	8	0.38
	4046	14	0.44
	4060	15	0.45
	4075	15	0.46
	4090	20	0.45
	4110	25	0.29
	4135	15	1.16
	4150	15	1.20
-6	4165	ļļ.	1.66
p€sc	41 <i>7</i> 6 4190	14	1.35 0.64
	4197	7 9 9	0.86
	4206	q	0.77
	4215	11	0.66
	4226	9	1.45
	4235	9	2.57
	4241	- 7 - 1	1.03
qtz vn	4248	4	16.54
qtz vn	4252	2	58.99
qtz vn	4254	4	28.13
qtz vn	4258	6	4.59
qtz vn	4264		14.18

Unit	Initial Depth	Intercept Footage	Percent Copper
	4268 4284 4301 4325	16 17 24 4	0.29 0.16 0.16 0.39
	4329	9	0.55
qtz vn	4338	7-1/2	1.09
qtz vn	4345-1/2 4348	2-1/2	3.92
qtz vn	4340 4354	6 6	8.32 4.33
qtz vn	4360	7	0.56
	4367	12	0.29
qtz vn	4379	6	3.22
qtz vn	4385	6	6.86
qtz vn	4391	10	1.12
qtz vn	4401	3	6.24
	4404	12	0.74
	4416	14	0.73
	4430	13	0.99
qtz vn •	4443	8	1.19
qtz vn	4451 4456	5 7	5.25 1.80
qtz vn	4463	12	0.38
	4475	9	0.99
	4484	17	0.46
	4501	ii	0.94
	4512	13	0.44
	4525	12	0.13
	4537	14	0.13
	4551	12	0.09
	4563	15	0.17
	4578	13	0.18
	4591	12	0.18
	4603 4607	4	1.17
Lbfp	4607 4612	2	1.50 0.67
LDIP	4615	5 3 12 6	0.13
	4627	6	0.11
	4633		0.24
	4642	9 2 2	0.78
	4644	2	0.11
p€sc	4646	14	0.24
Lbfp	4660	4	0.05
p€sc	4664	18	0.06
	4682	13	0.05
	4695	9	0.03
166-	4704 4712	9 8 8	0.06 0.04
Lbfp	4720	10	0.04
	4730	Not avail	
	15. 1. 利力では、14.47~ 19年 かんと		

Lbfp continues to 4744; ptsc to 4767 foot depth at end of reporting period.

Scattered sampling for Pb, Zn, Mo, Au, and Ag indicates very low values. Sample distribution included the hi-grade bornite-chalcocite veins.

Element	Number of Samples	Ave.Value
DL.		0.5
Pb Zn	25 25	25 ppm 22 ppm
Мо	61	31 ppm
Au Ag	12	0.004 oz/ton 0.23 oz/ton



ASARCO drill hole
Other drill hole
Magma's #9 shaft

DCA-I (hole designation) 4011 Tw

Bottom hole depth
T.D. — Total Depth

Proposed drill site

POST-MINERAL ROCK UNIT

Td - Dacite
Tev-Early volcanics
Tw-Whitetail

PRE-MINERAL ROCK UNIT

Tbx-Breccia Tqm-Quartz Monzonite Tgr-Granite Ps-Supai formation

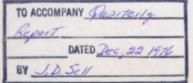
Me-Escabrosa limestone

Pn-Naco limestone

Dm-Martin Ims p€t-Troy qtz p€db-Diabase p€sc-Schist

ASSAY DATA KEY

depth-length-%Cu 4317-623-0.31



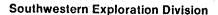
DRILLING PROGRESS MAP
for the month of Oct. Nov. Dec. 1976

SUPERIOR EAST

GILA & PINAL COUNTY, ARIZONA SCALE: I'= I mile J.D.S.

TAB

1977





February 3, 1977

TO: F. T. Graybeal

FROM: J. D. Sell

Production-Reserve Figures Superior East Area Pinal-Gila Counties, Arizona

Magma Mine, Newmont Corp.

Magma Veins (1911-1966) Koener Vein (1953-1958)

Replacement Ore

Devonian (1950-1972) Stacked (1973-1975)

TOTAL 1911-1975

8,500,170 tons ore 1,000,000 tons ore

5,500,902 tons ore 2,363,459 tons ore

17,364,531 tons of ore

produced 1,916,032,770 pounds of copper. Historic average 5.52% Cu, 1.93 oz. Ag, & 0.031 oz. Au.

Reserves (1975): Stacked Replacement Ore, around 12 million tons of 5% copper. Breccia Vein around 1 million tons of 5% copper. (Both open ended.)

Belmont Mine, Newmont Corp. (on lease-purchase option) In oxide zone produced 21,600 tons of ore averaging 0.80% copper, 11.3 oz. Ag, and 0.17 oz. Au. Of this, some 1,000 tons were 2-6% copper ore.

Possible reserves of 500,000 tons of Cu-Ag-Au in old workings. May have been increased by drill holes to the northeast.

L. S. & A. Mine, Newmont Corp.

In oxide zone from bedding horizons & intersecting steep faults. 1904-1929, est. 5,500 tons of 9.5% Cu, 2.37 oz. Ag, & 0.22 oz. Au. 1932-1952 85,000 tons of 0.45% Cu, 0.86 oz. Ag, & 0.47 oz. Au. 1943-1958 51,330 tons of manganese ore to strategic stockpile. Reserves unknown, but updip from replacement ore zone.

Silver King Mine

Est. 155,000 tons of 40 oz. Ag. Reserves not known to occur.

Pinto Valley-Castle Dome Mine, Cities Service Co.

Castle Dome 1943-1953 produced 41,492,617 tons of ore with 514,390,317 pounds of copper. (Note: leach copper produced is recorded in Miami leach.)

Castle Dome leach 1955-1970 (terminated) produced 64,815,451 pounds of copper.

Castle Dome historic production averaged 0.62% Cu, 0.013 oz. Ag, and 0.0002 oz. Au.

Pinto Valley deposit lies under the CD area. Initial production July 1974, rated at 14,500,000 tons of ore per year (40,000 tpd) with 120,000,000 pounds of copper per year.

Reserve estimate (1973) of 350,000,000 tons of 0.44% copper. (Note: 1975 production was 13,895,820 tons containing 107,498,466 pounds of copper and 159,136 pounds of moly recovered. Recovery grade of 0.39% copper.)

Carlota-Cactus Deposit (Principally Cities Service Co.)
Carlota 1929-1944. 5000 tons of oxide ore with 440,000 pounds of copper produced. Reserves estimated at 8,600,000 tons of 1.3% copper oxide.

Cactus 1908-1929. Very minor production. Reserves estimated at 20,000,000 tons of 0.5% copper oxide.

Possible additional reserves: Carlota, 7 million of 1.0%, Cactus, 20 million of 0.5%.

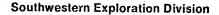
Powers Gulch Deposit, Inspiration Consolidated Copper Co.
Some 30 holes drilled, some with oxide copper. Possible overall reserve of 100,000,000 tons of 0.40% copper oxide in west dipping layer 100 feet thick.

Native Copper in Whitetail, Asarco, Newmont, USFS.
Inferred reserve of 430 million tons of 0.8% copper in zone thickness of 250 feet or better.
Inferred geological reserve, based on basin parameters, of 1 billion tons at 0.8% copper.

Porphyry system with vein structure, Asarco
Possible 500 million tons of 1% copper sulfide with vein system
450 feet wide containing 20 million tons of 5% copper.

James D. Sell

JDS:1b





January 31, 1977

TO: F. T. Graybeal

FROM: J. D. Sell

Monthly Report, Jan. 1977 Superior East Project Pinal County, Arizona

Drill hole A-8 was completed during the month to the terminal depth of 4907 feet. As reported in the last report, the hole at 4767 was in Pinal Schist with erratic and minor alteration-mineralization. This continued to the bottom of the hole with very minor K-spar addition, with quartz as well as minor specularite appearing toward the bottom of the hole. Assays at the bottom of the hole continued as follows:

Lbfp	4730	17	0.05%	
p€sc	4747	53	0.11	
p€sc	4800	60	0.06	
p€sc	4860	47	0.06	total depth.

The drill rig was moved approximately 900 feet to the northeast where hole A-9 was collared. As of the end of the reporting period the hole had reached a depth of 596 feet in dacite. Lost circulation in the upper fractured portion of the dacite sheet has plagued the drilling. After numerous unsuccessful cement jobs, they are now drilling blind with complete fluid loss. This will continue until they case out at around 2000 feet.

The new hole A-9 and associated road work for A-9 and A-10 (to be located approximately 800 feet west of A-8) have been authorized. Forest Service clearance has been approved with an EIS paper prepared.

Estimated balance of the authorization is \$116,000.

James D. Sell

JDS:16



February 28, 1977

TO: F. T. Graybeal

FROM: J. D. Sell

Monthly Report, Feb. 1977 Superior East Project Pinal County, Arizona

Drill hole A-9 completed the NC core to a depth of 2357 feet and set NX casing. They have resumed NX core drilling and as of the end of the reporting period were at a depth of 2902 feet.

Synopsis of the hole is as follows:

Surface-1478 Dacite 1478-2194 Earlier Volcanics 2194-2902 Whitetail Conglomerate

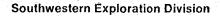
The Cross fault structure was intercepted at 1502-1522 and confirms the strike and dip directions. It is anticipated that the slide block unit will be around 3150 feet with the top of in-place bedrock being around 3600 feet. Depending upon the strike and dip of the bornite-chalcocite vein zone, the structure would be intercepted at the bedrock surface if the structure is dipping to the north. If dipping to the south, then the intercept as known might not be fully intercepted until a depth of 4100 feet.

The drill site west of A-8 has been completed as well as a revamp of the access road down at the main gate. This should aid in hauling water and supplies.

Estimated balance of authorization is \$58,000.

James D. Sell

JDS:16





March 24, 1977

TO: F. T. Graybeal

FROM: J. D. Sell

Monthly Report, March 1977 Superior East Project Pinal County, Arizona

Drill hole A-9 completed the NX coring to a depth of 3624 feet and presently is at 2760 feet, drilling with BX.

Synopsis of the hole continues from end of February (2902 feet).

2902-3275 Whitetail Conglomerate (continued)
3275-3337 Slide Block of M-IA type. Pinal Schist with minor quartz monzonite and q.m. porphyry. Variable amount of "matrix", abundant flat fault structures, variable but weak alteration-mineralization (leached).
3337-3521 Slide Block of A-2 type. As above, rare matrix materi

3337-3521 Slide Block of A-2 type. As above, rare matrix material but thoroughly brecciated. Minor and variable hematite and sericitic alteration.

3521-3528 Flat fault with gouge at 10°-30°

3528-3682 Slide Block of A-2 type, Schist only, thoroughly brecciated and crushed, generally subparallel to schistosity with increased hematite (leached capping) and quartz-sericite alteration bands.

3682-3693 Flat fault with qtz-sericite gouge at 10°-15° in top portion, steeper below.

3693-3760 Pinal Schist, oxidized, probably in-place block, minor crushing, increased hematite (leached capping), increased quartz-sericite banding and overall flooding. Alteration band parallel and cross-cut schistosity.

The leached capping and alteration (often totally obscuring the schistosity) looks very encouraging with mainly fine disseminated remnants. The oxidesulfide interface is expected within the next fewweeks of drilling.

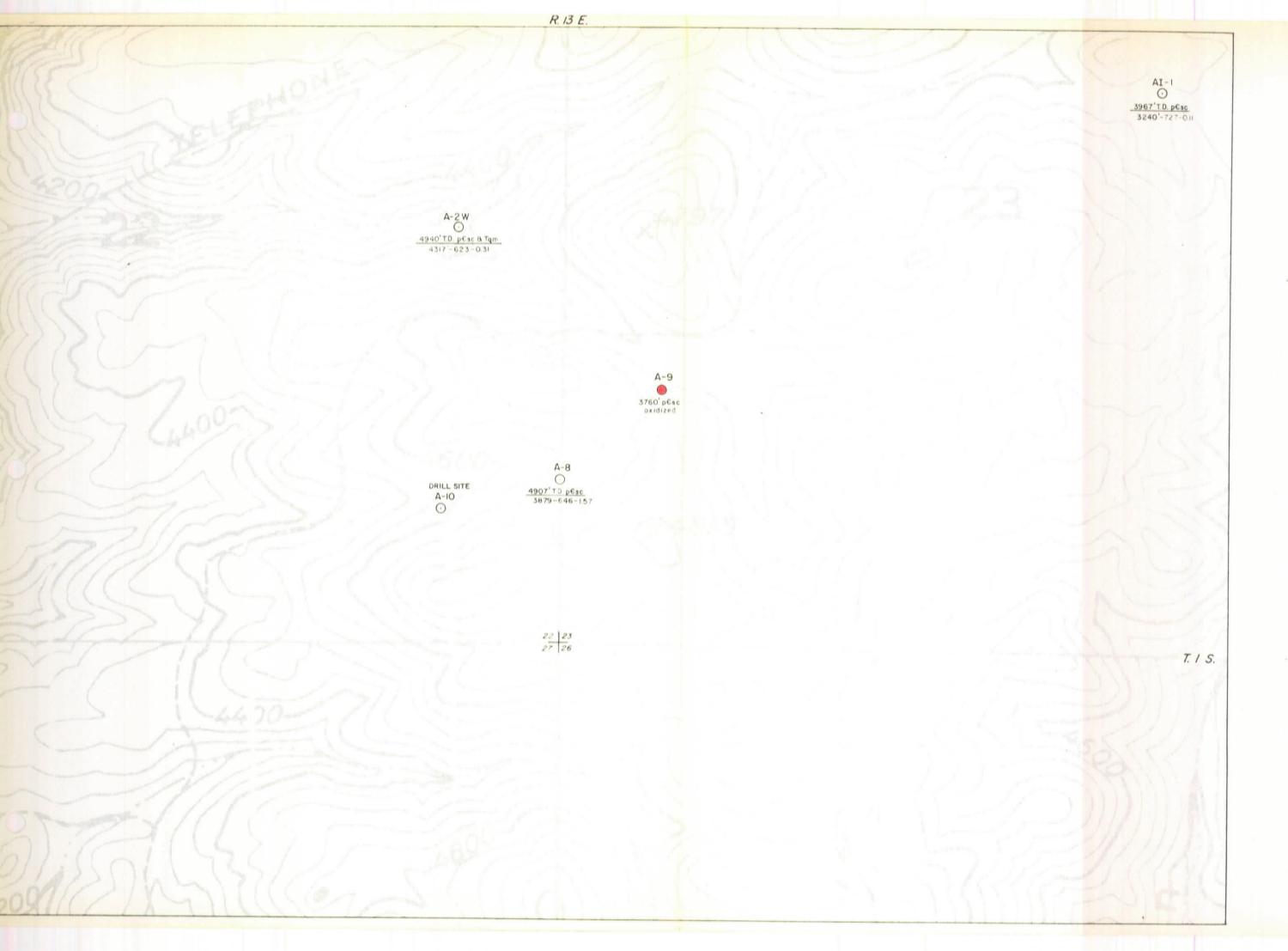
The extra costs in construction of a future drill site and road west of A-8 plus revamping of the lower gate and road area have aided in depleting the authorization and it is expected to exceed the authorization before the final intercept is cut.

A geophysical probe of the hole will be made prior to the termination.

Estimated balance of the authorization is \$40,000.

James D. Sell

JDS:1b Att.



EXPLANATION

8-A

ASARCO Hole & Designation

4907'T.D. p€sc 3879 - 646-1.57 Total Depth - Rock Type Depth - Length - % Cu

(A)

Proposed Drill Site

POST-MINERAL ROCK UNIT

Td-Dacite Tev-Early Volcanics Tw-Whitetail

PRE-MINERAL ROCK TYPE

Tbx-Breccia

Tqm-Quartz Monzonite

Tgr-Granite

Pe-Supai Formation

Pn-Naco Limestone

Me-Escabrosa Limestone

Dm-Martin Limestone

p€t-Troy Quartz

p€db-Diabase

p€sc-Schist

DATED MANUAL STATES

DRILLING PROGRESS MAP
For The _/=_Quarter, 1977

SUPERIOR EAST

Pinal County, Arizona SCALE: I"= 500'



April 27th, 1977.

TO: F. T. Graybeal

FROM: J. D. Sell

Monthly Report, April 1977 Superior East Project Pinal County, Arizona

Drill hole A-9 is presently at a depth of 4,684 feet, drilling BX.

Synopsis of the hole continues from the end of March (3,760 feet).

3760-3785 Pinal Schist, oxidized, 10-15% Fe0x, minor brecciation, quartz-sericite bands paralleling schistosity (10-25°) and crosscutting.

3785-3794 Fault zone at 30-45°.

3794-3921 Pinal Schist, oxidized, 2-5% Fe0x, minor brecciation and fault gouge (some with increased Fe0x and remnant chalcocite), minor quartz veins and quartz-sercite bands.

3921-3924 Granite aplite. Totally sericitized with specularite and leached chalcocite as dissemination and in their bands.

3924-4025 Pinal Schist, oxidized, 1-2% Fe0x, broken, minor brecciation, few quartz-sericite bands and laminas.

4025-4032 Granite aplite, contacts at +70°, engulfing schist.

4032-4044 Pinal Schist and granite aplite, crushed, broken, gougy, at 30-50 with jarosite FeOx.

OXIDE-SULFIDE interface.

4044-4176 Pinal Schist with several 3-5' quartz monzonite dikes. Variably altered, generally subparallel to schistosity (15-30°) with some crosscutting bands. Crushed zones generally follow schistosity. Variable disseminated and vein mineralization of pyrite, chalcopyrite, bornite, and minor chalcocite.

4176-4340 Pinal Schist, minor porphyry, increased to pervasive quartz-sericite with relic schistosity (15-30°) with gouge and crushed zones subparallel to schistosity. Increased disseminated and veined pyrite and bornite. Fault gouge at base (20°).

Pinal Schist with dikes of biotite feldspar porphyry.

Pervasive quartz-sericite with pyrite, bornite, and chalcocite-enargite (?) along schistosity (20-30°) and 40-70° crosscutting zones accompanied by increased brecciation and crushed zones at 30-70°.

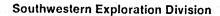
F. T. Graybeal Superior East Project page 2

4535-4684 Pinal Schist with minor feldspar porphyry, variably altered with few quartz-pyrite-chalcopyrite-bornite veins and gouge zones at 30-45°. Minor specularite in quartz veins.

Approximately three hundred feet of the sulfide portion of the core has been split and submitted for assay (4044-4230 and 4435-4535). The samples range from weakly mineralized to well disseminated zones. No well defined quartz-sulfide veins were cut in the above sampling, although narrow broken zones of quartz and thin $(\frac{1}{4}\Pi-\frac{1}{2}\Pi)$ massive sulfide veins are scattered throughout in various sections.

Jamés D. Sell

JDS: | 1h





May 27, 1977

TO: F. T. Graybeal

FROM: J. D. Sell

Monthly Report, May 1977 Superior East Project Pinal County, Arizona

Drill hole A-9 was terminated at a depth of 4903 feet in Precambrian Pinal Schist. Continued from last month:

4684-4903 Pinal Schist with minor Laramide quartz monzonite and biotite porphyry dikes and few quartz sulfide veins contain variable amounts of pyrite, chalcopyrite, and bornite.

Assays have been completed and the assay result memo dated May 24, 1977 has been distributed. In the sulfide intercept the best combination is 454 feet of 0.90% copper. The 0.5 plus intercept is 626 feet of 0.81% copper.

A graphic log-assay result summary is also in preparation.

Mollenhauer Surveying Company completed a deviation-temperature survey and reported the hole to have deviated (at a depth of 4830 feet) a distance of 154 feet west and 6 feet north of the collar of the hole. The temperature at that depth was 136-1/2°F.

Hole A-10 was collared approximately 800 feet westerly from A-8 and as of the end of the month was at the dacite-earlier volcanics contact at 1598 feet.

A triangulation net has been laid out in the Sec. 23 area with a tie-in to the ICC points. T. Gant will survey the net plus all the drill holes in the present area during the next week.

Estimated balance of the authorization is \$108,500.

James D. Sell

JDS:1b



June 10, 1977

TO: F. T. Graybeal

FROM: J. D. Sell

Monthly Report, June 1977 Superior East Project Pinal County, Arizona

The graphic log-assay result section of A-9 has been completed and distributed. Also, the daily drilling rate-unit contact report for A-9 has been distributed.

Hole A-10 was at the dacite-earlier volcanics contact at the end of last month with a depth of 1598 feet. During the month they continued coring to the earlier volcanic-Whitetail Conglomerate contact at 2138 feet. NC coring continued in conglomerate to casing point at 2437 feet. Coring continued to 2647 feet, in conglomerate, at the end of the month.

T. Gant surveyed the triangulation net established, as well as the six drill holes in the immediate area.

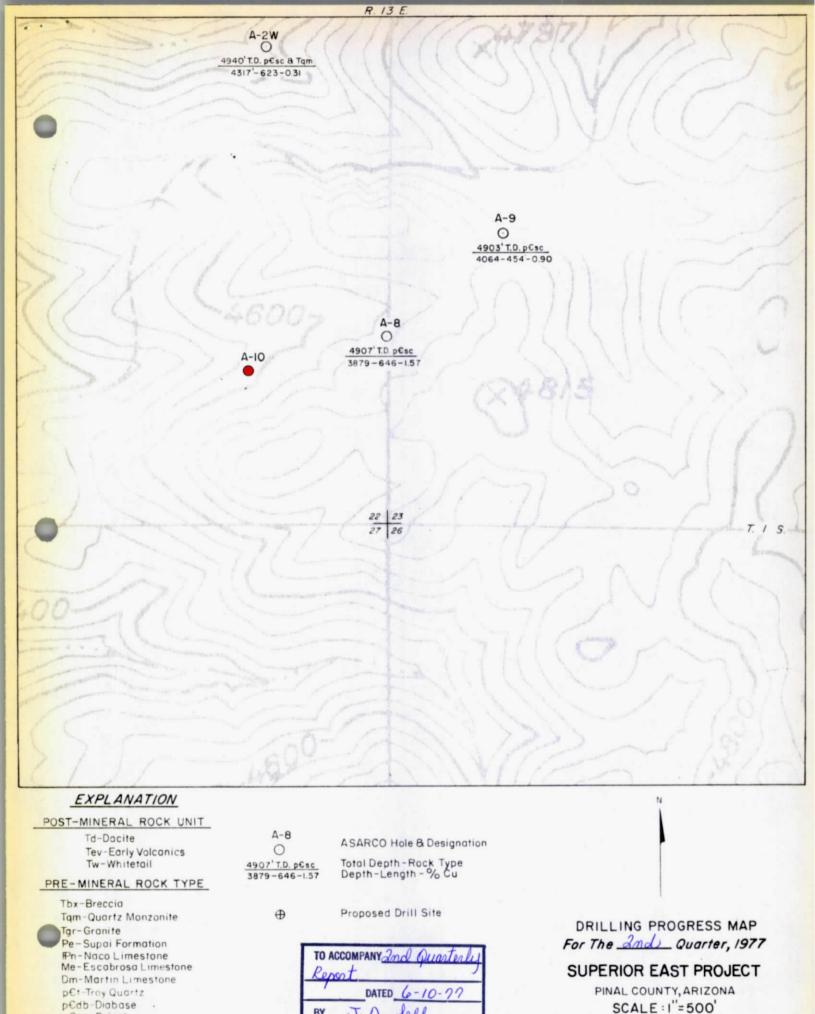
Tentative site for hole A-11, to further test the down-dip extension of the shear-vein system, has been selected some 500 feet southeasterly from hole A-8, near the triangulation point A-10.

P. Bryant has been taken over the site area. He also has been asked to clean the muck from around the big tank (which has been pumped very low during coring of A-9 and A-10) and stack it for future use at the A-9 drill site. Joy will pull the casing from A-9 as the GP crew from Salt Lake City has completed their test with no response being observable.

Estimated balance of the authorization is \$79,000.

James D. Sell

JDS:1b Att.



p€sc-Schist

MVK-3041

June 1977

J.D. Sell

ASARCO

Southwestern Exploration Division

July 27, 1977

TO: F. T. Graybeal

FROM: J. D. Sell

Monthly Report, July 1977 Superior East Project Pinal County, Arizona

Drill hole A-10 continued during the month, reaching a depth of 3417 feet.

NX coring of Whitetail conglomerate continued to 3405 feet where a 1-foot fault gouge zone was found. Drilling continued to 3417 feet in highly broken and brecciated Precambrian Pinal Schist. The schist is undoubtedly a part of the M-1A type slide block as found in the adjacent A-8 drill hole.

Drilling conditions in the last 400 feet of conglomerate were quite bad and with the better ground in the Pinal Schist block the hole will probably be cased at the end of the present bit life (i.e., 3500-3600 feet).

Present plans are to case the hole, then move the rig to the Mineral Creeke project. Upon completion of the MC work, the rig will again occupy A-10 and take it to completion.

Bryant Construction has cleaned the big pond east of A-9, raised the damsome 3 feet, poured a cement spillway, and will riprap the spillway portion of the dam. This work has secured some 90 loads of excellent road-building muck as well as providing approximately double the water volume storage capacity of the pond.

The special use permit for constructing the road to site A-11 has been received from the Forest Service and it is expected that Bryant Construction will start work around August 1.

Joy has pulled the casing from hole A-9 with a moderate loss of bottom casing.

Estimated balance of the authorization is \$58,600.

James D. Sell

JDS:1b



August 31, 1977

TO: F. T. Graybeal

FROM: J. D. Sell

Monthly Report, August 1977 Superior East Project Pinal County, Arizona

Drill hole A-10 was carried to a depth of 3571 feet after BX casing was set at 3417 feet. The 154 feet of BX coring continued in oxidized, broken Pinal Schist cut by 2 to 15-foot thick dikes of Laramide quartz biotite porphyry. Quartz veining and quartz-sericite zones cut both rock units and contain limonites after pyrite with some after chalcopyrite. The crushed and gougy zones generally contained increased amounts of limonite as found in the previous holes in the area. The character of the unit below the 1-foot fault gouge at 3406 feet suggests going from the M-1A type slide block into the A-2 type slide block.

As noted in last month's report, the hole A-10 has been temporarily closed down and the drill and crews moved to the Devils Canyon Project where end of the year work is critical.

Estimated balance of the authorization is \$54,000.

James D. Sell

JDS:1b





September 26, 1977

TO: F. T. Graybeal

FROM: J. D. Sell

Monthly Report - Sept. 1977 Superior East Project Pinal County, Arizona

As reported in last month's report, hole A-10 has temporarily suspended drilling at a depth of 3571 feet. The hole had been cased after drilling NX to the depth of 3417 feet. BX drilling continued to 3571 feet, the hole was filled with heavy mud, a cement cap placed over the casing, and a large pile of rocks piled on top.

Road work for a new site southeast of A-10 was planned but not initiated after clearance with the Forest Service.

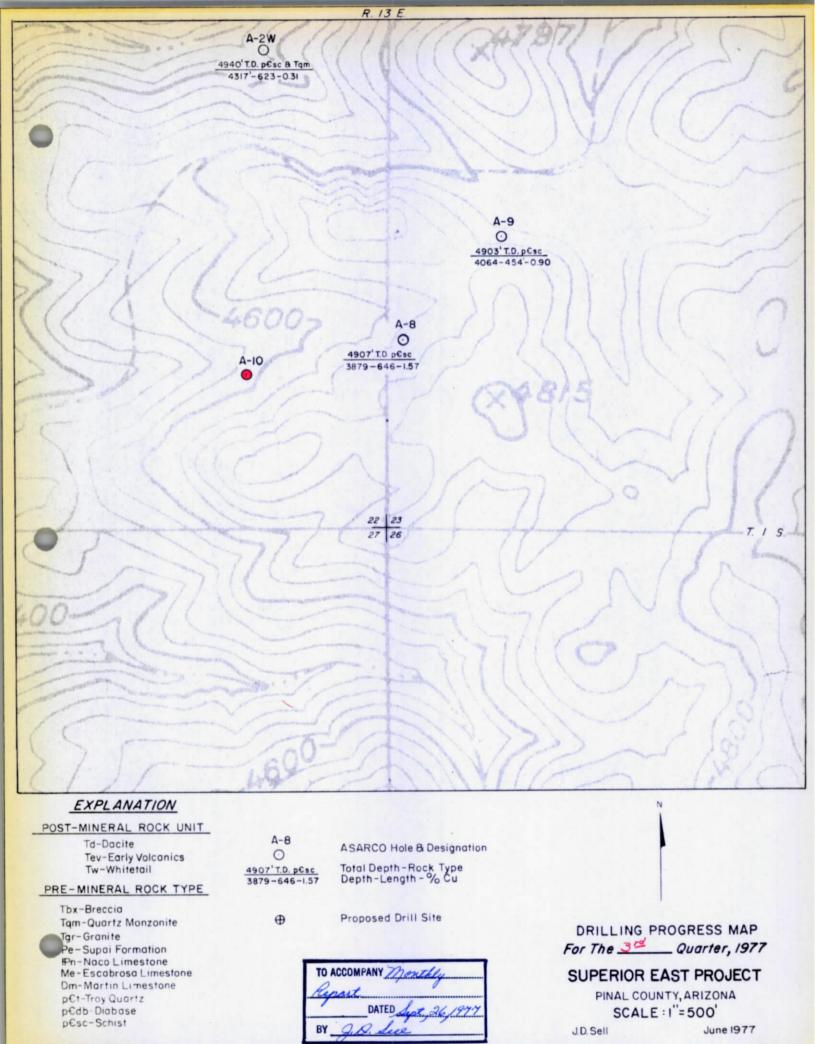
Newmont has moved Longyear into the State Section 8 on the west side of Devils Canyon and reentered hole B-7 (Asarco nomenclature). Cuttings found at the site suggested they are in the top part of the Whitetail (memo in preparation).

Estimated balance of the authorization is \$54,100.

Junes D. Sell

JDS:1b

Att: Drilling Progress Map



MVK-3041

	October 1977		
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November 30, 1977

TO: F. T. Graybeal

FROM: J. D. Sell

Monthly Report — Nov. 1977 Superior East Project Pinal County, Arizona

Drill hole A-10 was reentered in the middle of the month. The hole was temporarily stopped at 3571 at BX size and has now progressed to 3900 feet.

The hole has penetrated broken and brecciated units of Pinal Schist with sills of Laramide biotite feldspar porphyry with minor Laramide black porphyry (A-4 type).

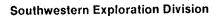
All the units to 3900 feet are oxidized and the first remnant chalcocite was noted at 3597 feet. Quartz sericite zones with remnant chalcocite and completely leached Fe0x after chalcocite have been evident within the cored interval. Most quartz-sericite-Fe0x bands are at 30°.

Numerous flat fault-gouge-breccia zones have also been found but none are as clear cut as in the previous holes as being the basal fault to the A-2 type mineralized breccia slide block. The schistosity is between 55° and 70° which is much steeper than the adjacent hole A-8.

None of the oxidized portion has been sampled.

Estimated remainder of authorization is \$44,200.

James D. Sell





December 27, 1977

TO: F. T. Graybeal

FROM: J. D. Sell

Monthly Report - December 1977 Superior East Project Pinal County, Arizona

Drill hole A-10 has progressed from 3900 feet to 4259 feet during the month.

The last flat fault structure was cut at 3859 feet in oxidized schist and is probably the basal fault structure to the A-2 type mineralized breccia slide block. Oxidized schist with sills of biotite feldspar porphyry continued to 3953 feet. Also below the basal fault structure specularite became a noticeable part of the mineralization suite. In the sulfide zone below 3953 feet the schist, biotite feldspar porphyry, and black porphyry sills contain quartz-sericite bands with minor pyrite and sparse chalcocite with specularite. Secondary biotite is also present and in one porphyry sill disseminated native copper is visible.

A quartz-sulfide zone with chalcocite was cut at 4209-4212 feet with altered walls and breccia gouge on the footwall of the zone. Scattered thin veinlets of chalcopyrite have also been found but do not constitute a major sulfide value, and in one 2" vein were distributed as blebs within the specularite gangue. Lower values and decreasing quartz-sericite banding are encountered in the lower portion of the hole.

Split samples have been sent for assay but the results are not presently available.

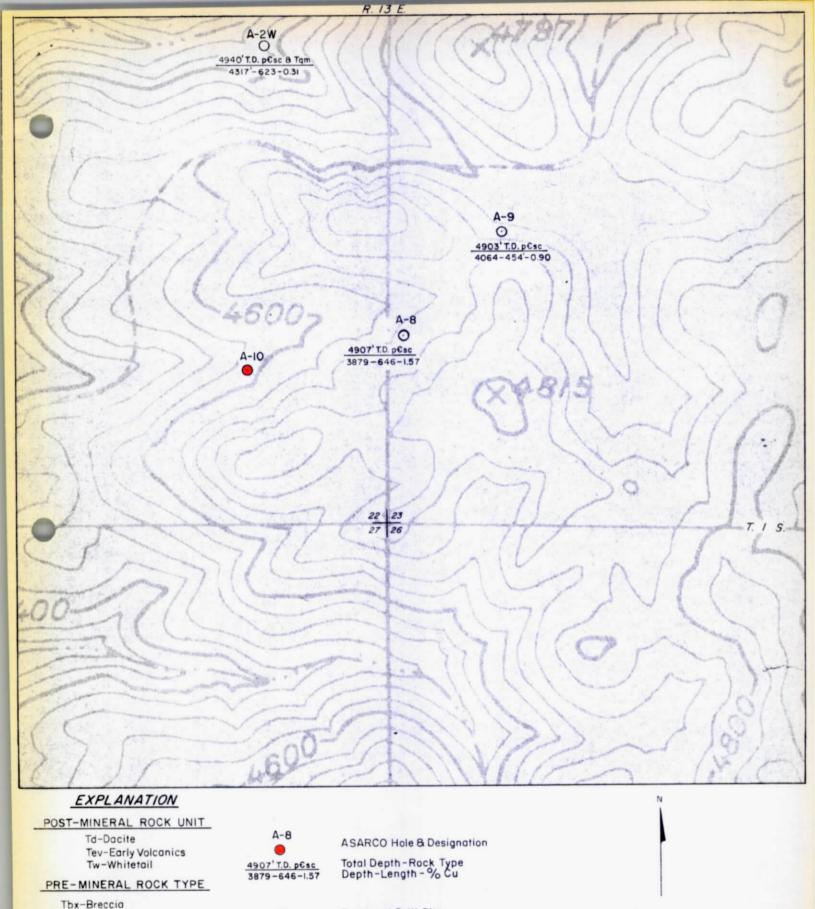
The hole has been surveyed for deviation and temperature.

Estimated balance of the authorization is \$9,500.

James D. Sell

JDS:1b

Att: Drilling progress map



Tam-Quartz Monzonite
Tgr-Granite
Pe-Supai Formation
Pn-Naco Limestone
Me-Escabrosa Limestone
Dm-Martin Limestone
p€t-Troy Quartz
p€db-Diabase

p€sc-Schist

Proposed Drill Site

Mulling Report

DATED Lee. 27,1977

BY G. D. Sue

DRILLING PROGRESS MAP
For The ______ Quarter, 1977

SUPERIOR EAST PROJECT

PINAL COUNTY, ARIZONA SCALE: I''=500'

J.D. Sell

June 1977

TAB

1978



January 27, 1978

TO: F. T. Graybeal

FROM: J. D. Sell

Monthly Report -- Jan. 1978 Superior East Project Pinal County, Arizona

Drill hole A-10 progressed from 4259 feet to the terminal depth of 4282 feet during the month. The hole ended in weakly altered and mineralized biotite feldspar porphyry.

The assay report has been completed and distributed. The total sulfide intercept of 329 feet averaged 0.27% copper with only a few quartz-sulfide veins with slightly higher values.

The hole deviation-temperature survey was completed to near the bottom of the lost BX string of rods at 3930' depth. Deviation at this depth was 282 feet west and 173 feet south of the collar of the hole and indicated a rather constant direction and amount from the collar. Based on the last measure increments and projecting to the terminal depth of 4282 feet, the total deviation is 345 feet in a S.65°W. direction from the collar. The temperature at 3930 feet was recorded at 126-1/2°F., a slightly warmer amount than recorded in A-8 or A-9 at the same comparable depth.

Estimated balance of the authorization is \$5,500.

James D. Sell



March 3, 1978

TO: F. T. Graybeal

FROM: J. D. Sell

Monthly Report -- Feb. 1978 Superior East Project Pinal County, Arizona

No drilling was done on the project during the month.

Office work included preliminary report writing and sections. An additional suite of material for thin-sections and polished sections was collected and has been submitted for preparation.

Skeletonizing of the core is continuing with clean-up of sample pulps and rejects. Also, minor repair on the core house roof has been made to cut down on leakage into the building. Additional shelving was also installed.

Estimated balance of the authorization is \$20,000.

James D. Sell



March 23, 1978

TO: F. T. Graybeal

FROM: J. D. Sell

Monthly Report -- March 1978 Superior East Project Pinal County, Arizona

No drilling was accomplished during the month.

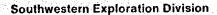
Clean-up work in the office, roof repair, samples, etc. continue.

The thin-section material has been returned with the study pending. Progress on the Interim Report continues.

Estimated balance of the authorization is \$19,600.

James D. Sell/

No Reports - No activity April - May - June - July , 1978





August 31, 1978

TO: F. T. Graybeal

FROM: N. P. Whaley

Superior East Project Progress Report August 1978

A new diamond drill hole designated as A-11 was started on August 2. Under a single-shift drilling schedule it was advanced to 504 ft. at the end of the day on August 25.

Expenses for the month were \$12,350, leaving an estimated balance of \$139,000.

N. P. Whaley

NPW:1b

cc: JDSellv





September 25, 1978

TO: F. T. Graybeal

FROM: N. P. Whaley

Superior East Project
Pinal County, Arizona
Progress Report -- Sept. 1978

During the period of August 26 through September 25 the diamond drill hole designated as A-11 was advanced from 504' to 1205' on a continued one-shift schedule.

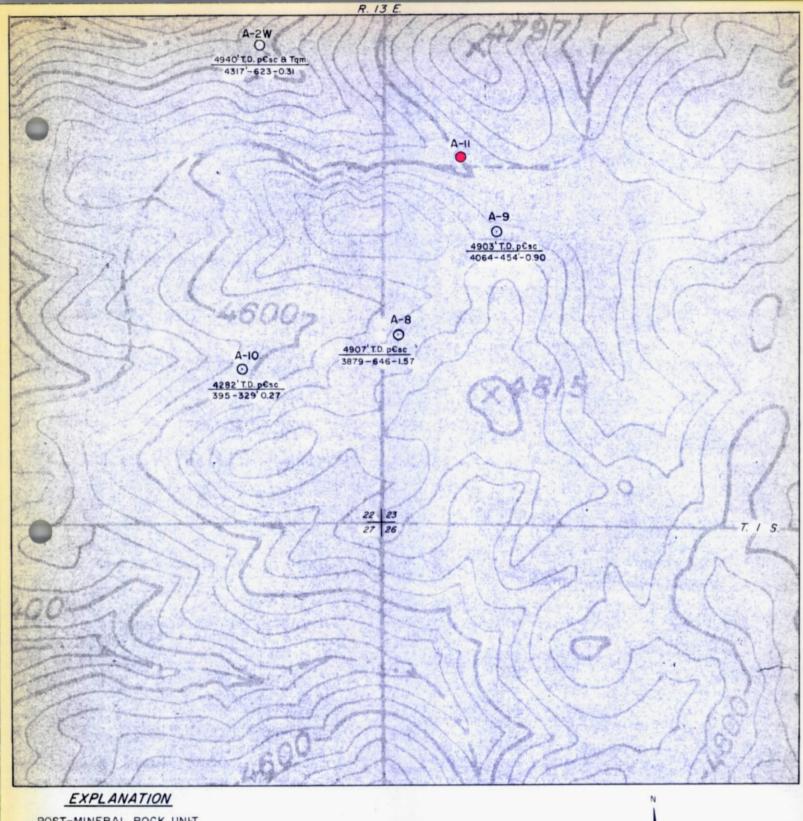
It is still in the uppermost post-mineral unit defined as dacite by J. D. Sell.

Expenses for the month were \$12,000, leaving an estimated balance of \$127,400.

N. P. Whaley
N. P. Whaley

NPW:1b Att.: Map

cc: JDSelly



POST-MINERAL ROCK UNIT

Tev-Early Volcanics Tw-Whitetail

PRE-MINERAL ROCK TYPE

Tbx-Breccia

Tam-Quartz Monzonite Tgr-Granite Pe-Supai Formation Pn-Naco Limestone Me-Escabrosa Limestone Dm-Martin Limestone p€t-Troy Quartz p€db-Diabase p€sc-Schist

A-8 ASARCO Hole & Designation 0 Total Depth-Rock Type Depth-Length-% Cu 4907 T.D. p€sc 3879-646-1.57

> 0 Proposed Drill Site

> > TO ACCOMPANY Montaly BY . n. P. Whaley

DRILLING PROGRESS MAP For The 3 Quarter, 1978

SUPERIOR EAST PROJECT

PINAL COUNTY, ARIZONA SCALE : 1"=500"

J.D. Sell

June 1977



October 31, 1978

TO: F. T. Graybeal

FROM: J. D. Sell

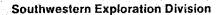
Superior East Project Pinal County, Arizona Progress Report - Oct. 1978

During the month the drill hole A-II was advanced from 1205' to 1640'. The contact between dacite and the earlier volcanics is at 1456 feet, with earlier volcanics continuing to the advanced footage.

A second shift had been put on the rig, but were there less than a week before being moved off to another job.

Expenses for the month were \$9,500, leaving an estimated balance of \$117,700.

James D. Selly James D. Sell





November 29, 1978

TO: F. T. Graybeal

FROM: J. D. Sell

Superior East Project Pinal County, Arizona Progress Report - Nov. 1978

During the month the drill hole A-11 was advanced from 1640' to 2215' in Earlier Volcanics (i.e., 575') and to 2342' in Whitetail Conglomerate (i.e., 127') for a total of 702 feet for the month.

The lead driller, Mr. Power, has been on vacation for part of the time but is scheduled to return Dec. 4.

Expenses for the month were \$15,300, leaving an estimated balance of \$102,600.

James D. Sell





December 21, 1978

TO: F. T. Graybeal

FROM: J. D. Sell

Superior East Project
Pinal County, Arizona
Progress Report - Dec. 1978

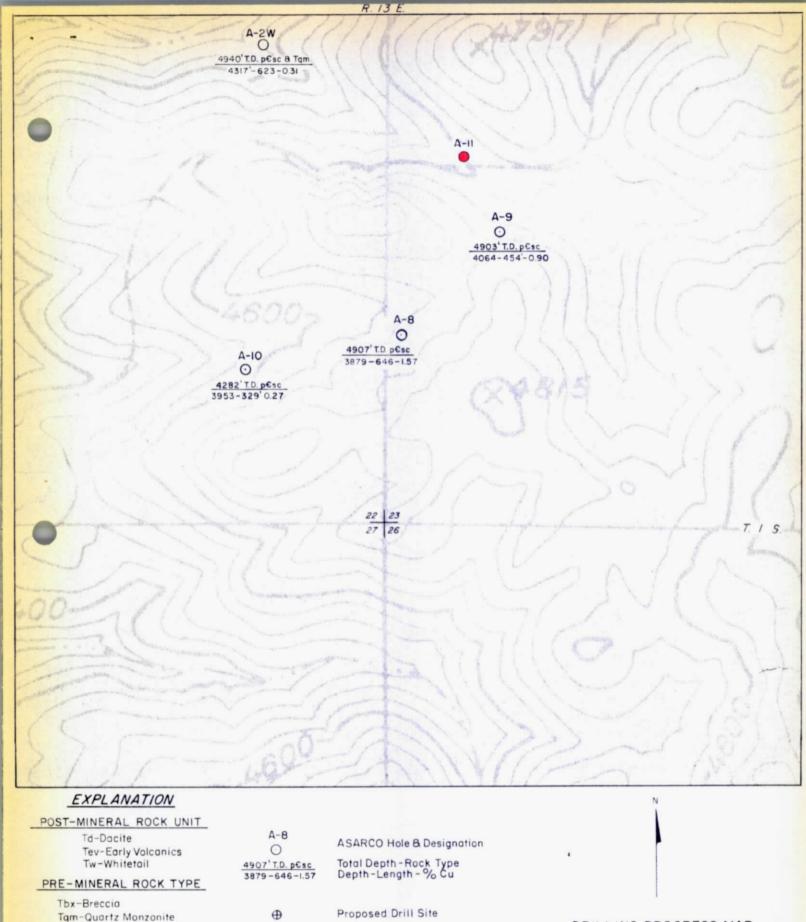
Hole A-11 was advanced in Whitetail Conglomerate from 2342' to 2876', a stotal of 534' for the month.

NC core was taken to the depth of 2580 feet where casing was set with NC scontinuing below that depth.

Expenses for the month-were \$11,100, leaving an estimated balance of \$91,500.

James D. Sell/ James D. Sell

JDS:16



Tam-Quartz Monzonite

Tar-Granite
Pe-Supai Formation
Pn-Naco Limestone
Me-Escabrosa Limestone
Dm-Martin Limestone
p€t-Troy Quartz
p€db-Diabase

pEsc-Schist

TO ACCOMPANY Monthly
Report
DATED Dec 21, 1978
BY J.D. Sell

DRILLING PROGRESS MAP For The 4th Quarter, 1978

SUPERIOR EAST PROJECT

PINAL COUNTY, ARIZONA SCALE : 1"= 500'

J.D. Sell

June 1977

TAB

1979



January 30, 1979

TO: F. T. Graybeal

FROM: J. D. Sell

Superior East Project Pinal County, Arizona Progress Report - Jan. 1979

Hole A-11 was advanced from 2876 feet to 3606 feet, a total of 730 feet, all NX core. The last several boxes are predominantly schist with brick red matrix suggestive of being a part of one of the underlying slide blocks. Logging of the interval was not completed. Casing will undoubtedly be set within the next several hundred feet and the hole continued BX size.

Heavy rains, snow, and ice have hindered the operations, as well as lack of manpower.

Bryant Construction added road material in late December as well as enlarging a portion of the drill site. The past few weeks of rain have again badly washed the road and a number of road-cut slumps have occurred.

Joy is extending the original drilling contract to depths of 6000 feet and the additional incremental footage rates will be submitted soon.

Estimated expenses for the month were \$17,500, leaving an estimated balance of \$74,100.

James D. Sell





March 1, 1979

TO: F. T. Graybeal

FROM: J. D. Sell

Superior East Project Pinal County, Arizona Progress Report - Feb. 1979

Hole A-11 was advanced from 3606 feet to 4157 feet, a total of 551 feet for the month. Of this total, 166 feet were NX core, where casing was set at 3772 feet, and 385 feet of BX core.

Synopsis of the hole is as follows:

2215-3492 Whitetail Conglomerate 3492-4157 Pinal Schist with minor porphyry

A strong fault-gouge zone lying at 15°-20° was penetrated between 4060 and 4085 feet and contained abundant crystalline native copper as matrix in brecciated quartz and open spaces.

Above the fault the schist is of the A-2 slide block type of leached capping in a weak to moderately quartz-sericite altered unit with 1-4% black-maroon limonite. The block contained a number of dikes and sills of biotite feldspar porphyry, weakly altered, and cut by a number of steep dipping quartz structures. Brecciation was common throughout. Traces of native copper were noted.

Below the fault, the schist is very strongly altered with quartz-sericite and secondary biotite and the minor dikes of biotite feldspar porphyry have clay and quartz-sericite alteration with secondary biotite. The block is cut by high-angled quartz veins with quartz-sericite selvages, and contains some native copper. The limonites are black-maroon and range from 1 to 5%, as excellent leached capping material.

The depths to the various unit contacts are deeper than originally projected and may indicate the hole is deviating to the north.

Bryant Construction repaired a portion of the access road and the crews are now able to drive to the site rather than using the water truck and chains.

Estimated expenses for the month were \$17,000, leaving an estimated balance of \$57,300.

James D. Sel





March 27, 1979

TO: F. T. Graybeal

FROM: J. D. Sell

Superior East Project
Pinal County, Arizona
Progress Report - March 1979

Hole A-11 was advanced from 4157 feet to 4615 feet, a total of 458 feet of BX coring.

Synopsis of the hole is as follows:

4157-4261 Pinal Schist with minor porphyry (oxidized)
4261-4615 Pinal Schist with minor porphyry (sulfides)

The contact between oxidized material and sulfides was along a strong, flattish structure of fault gouge which contained a one-inch slab of massive vein bornite, obviously sheared off of an A-8 type vein.

Assays, starting at 4262 feet at the base of the fault gouge and continuing to 4553 feet (total of 291 feet), averaged 0.40% copper. A strong fault-gouge vein zone of quartz-bornite for the next 33 feet averaged 1.21% copper. The last seven feet of returned assays averaged 0.42% copper.

The strong fault-gouge vein structure trapped the rods for three days, but rescue operations were successful and drilling has resumed at the end of the month.

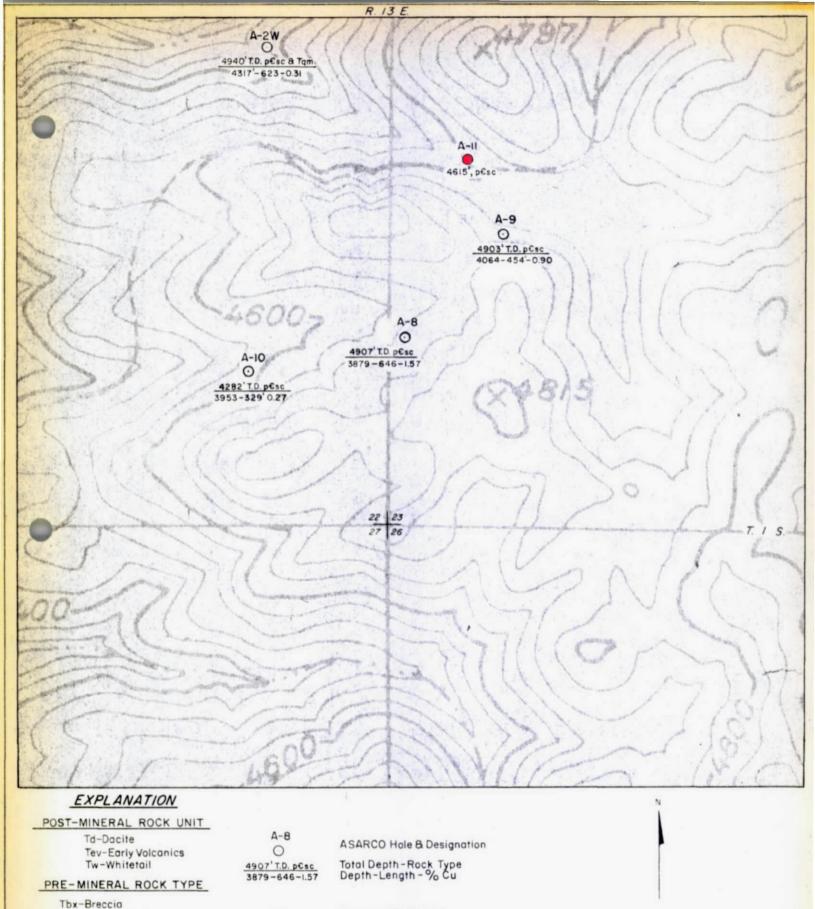
It would appear that the drill hole has cut into the top portion of the quartz-sulfide vein system as encountered in A-8 and A-9. As the hole has intercepted the zone well into the disseminated sulfide zone, it will afford a full interval of values located some 800 feet down-dip from the A-9 intercept.

A hole deviation survey was conducted to 4400 feet and indicated the hole bottom was some 120 feet westerly from the collar and deviating rapidly to the northwest at about 10 feet per hundred of depth.

Estimated expenses for the month were \$15,300, leaving an estimated balance of \$43,000.

James D. Sell

JDS:1b Att: Map



Tqm-Quartz Monzonite
Tgr-Granite
Pe-Supai Formation
Pn-Naco Limestone
Me-Escabrosa Limestone
Dm-Martin Limestone
p€t-Troy Quartz
p€db-Diabase
p€sc-Schist

Proposed Drill Site

TO ACCOMPANY Monthly

Report

DATED 3/27/79

BY J.D. Sell

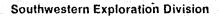
DRILLING PROGRESS MAP
For The __/= Quarter, 1979

SUPERIOR EAST PROJECT

PINAL COUNTY, ARIZONA SCALE: 1"=500'

J.D. Sell

June 1977





April 30, 1979

TO: F. T. Graybeal

FROM: J. D. Sell

Superior East Project Pinal County, Arizona Progress Report - April 1979

Hole A-11 was advanced from 4615 feet to 4857 feet, a distance of 242 feet, all BX coring. Hole conditions are deteriorating and the decision was made to put the BX rods on bottom, then use them as "casing." Thus the rods, core barrel, and bit are on bottom at 4857 feet. AX coring will ream the barrel latch, the inside of the diamond bit, and commence coring AX from 4857 feet.

The hole continues in altered and mineralized Pinal Schist with minor porphyry.

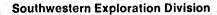
From the strong fault-gouge zone reported last month at 4553 feet, the hole continues in quartz-bornite-vein-breccia zones cutting schist and porphyry as found in hole A-9 to the south. The intercept from 4553 feet to 4796 feet is 243 feet averaging 1.02% copper. The remainder of the BX hole is similar, but probably slightly lower grade.

The bottom hole survey below 4400 shows about the same trend and amount of offset (10 feet per 100 feet to the northwest) down to 4750 feet.

Estimated expenses for the month were \$12,000, leaving an estimated balance of \$31,400.

James D. Sell

James Whell





June 4, 1979

TO: F. T. Graybeal

FROM: J. D. Sell

Superior East Project Pinal County, Arizona Progress Report -- May 1979

Hole A-11 was advanced from 4857 feet to 4939 feet by AX drilling. Due to adverse drilling angle in relation to the quartz-sulfide vein structures being encountered, a decision was made to place a 1-1/2 degree wedge in the hole in an attempt to cross-cut the structures at a more favorable angle.

The quartz-sulfide structures were encountered at 4553 feet and to the depth of 4939 feet; this 386 feet averaged 1.16% copper.

After setting the wedge, coring off the wedge started at 4924 feet and by the end of the month had progressed to around 4960 feet. The few feet that have been examined were similar in type and grade to that of the initial hole.

Discussions with Christensen Drilling on the use of their Navi-drill directional drilling tool have been undertaken. They will submit several alternatives on how to secure additional penetrations of the qsv system, one to be northeast, and another southerly with the turn out being between 2500 and 3000 foot (depth) out of the A-11 hole.

Estimated expenses for the month were \$14,400, leaving an estimated balance of \$16,400.

James D. Sell



June 26, 1979

TO: F. T. Graybeal

FROM: J. D. Sell

Superior East Project Pinal County, Arizona Progress Report - June 1979

Hole A-11, after being turned by a wedge to the south, had progressed to 4960 feet. Drilling this month continued the hole to a depth of 5175 feet where it will be terminated. The hole is being surveyed and the BX rods, which had been left as casing, will be removed prior to capping the hole.

Complete assays of the wedge hole from 4924 feet to 5017-1/2 feet return values of 1.36% copper for the 87-1/2 feet. The next twelve feet of assays return only 0.27% copper and visual estimate of the remaining core to 5175 feet suggests similar low grade values. The end of the plus 0.5% copper was a 19-1/2 foot intercept of quartz-sulfide vein material which averaged 4.63% copper.

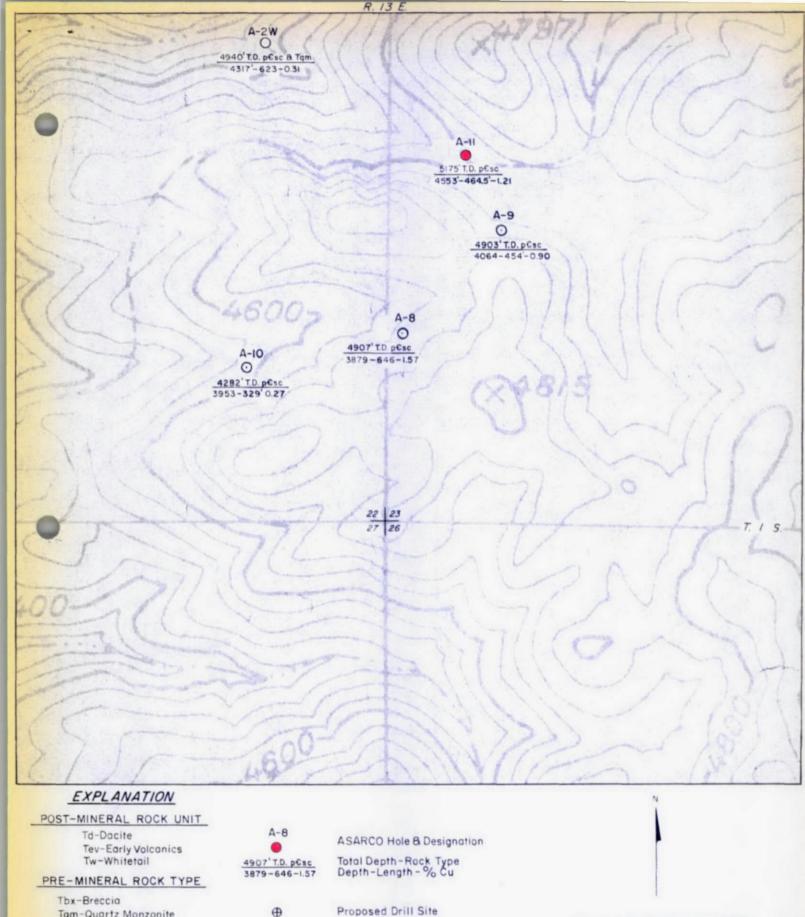
As reported last month, the unwedged portion of the hole from 4553 feet to 4939 feet averaged 1.16% copper. Combining the overlap portion of the hole returns an average of 1.21% copper for 464-1/2 feet from 4553 feet to 5017-1/2 feet.

Estimated expenses for the month were \$16,000, leaving an estimated balance of \$-0-.

As noted, the casing within the NC and NX portions of the hole will remain and be rented until such time as the hole will be reentered and several directional drilled holes completed.

James D. Self/2

JDS:1b Att: Map



Tam-Quartz Monzonite Tar-Granite e-Supai Formation Pn-Naco Limestone Me-Escabrosa Limestone Dm-Martin Limestone p€t-Tray Quartz p€db-Diabase p€sc-Schist

Proposed Drill Site

TO ACCOMPANY Monthly Report DATED 6/26/79 BY J.D. Sell

DRILLING PROGRESS MAP For The 2nd Quarter, 1979

SUPERIOR EAST PROJECT

PINAL COUNTY, ARIZONA SCALE : 1"=500"

J.D. Sell

June 1977



July 30, 1979

TO: F. T. Graybeal

FROM: J. D. Sell

Superior East Project
Pinal County, Arizona
Progress Report -- July 1979

The completed assays for hole A-11 have been received and the +0.50% copper value can be extended to a depth of 5086 feet with a slight decrease in grade, i.e. 1.12% copper for 553 feet (4553-5086). An assay report is being compiled.

Four composite samples were compiled and indicate a two to three-fold increase in gold-silver values in the sulfide portion of A-11 vs. the other holes in the area. The gold ranges from 0.009 to 0.015 oz./ton with silver ranges of 0.41 to 0.78 oz./ton.

After three weeks of Joy Drilling attempting to recover the BX rods left in as casing for the AX hole, with no progress, the decision was made to bring in McCullough Services (Farmington) to locate the "free-point" and back off the rods. Three hours after they arrived at the site, the rods were free at 3755 feet and all were recovered. At least six cuts were made by Joy above the 3772 mark (depth of the BX casing in the NX hole) with no success.

Lost in the hole were BX rods from 3755'-4850' (1095') plus an outer core barrel, latch coupling, and BXWL bit.

Also left in the hole and being rented by the month are three strings of casing:

137

4" surface pipe - Surface - 12 feet
NX Casing (NC hole) - Surface - 2850 feet
BX Casing (NX hole) - Surface - 3772 feet

Several discussions have been held with Christensen Directional Drilling Services on use of their Navi-Drill. They have submitted an initial program, but later discussions suggested alternate thoughts and new programs will be submitted, as well as detailed cost estimates. Mr. Wayne Craig, directional drill operator, has inspected the core of A-11 cutting the expected route of the drill. They (Christensen-Craig) apparently do not have a Navi-Drill operational, as Craig now says they have arranged with Dyna-Drill to lease the equipment directly to Asarco. Other thoughts have been discussed with Graybeal and Kurtz.

Estimated expenses for recovering the BX rods and rental of the casing left in place plus service group costs are estimated at \$18,000 for the month, leaving an estimated balance of (\$17,600).

James D. Sell/





September 26, 1979

TO: F. T. Graybeal

FROM: J. D. Sell

Superior East Project Pinal County, Arizona Progress Report - Sept. 1979

Discussions with directional drill engineers have continued for off-set drilling from within hole A-11. Wayne Craig (Christensen, Salt Lake City, Ut.) and Tommy Thompson (Thompson Associates, Grants, N.M.) have both submitted proposals. Jim Breaux (EMCO, Denver, Co.) continues to request information and says he will submit a drilling offer plan, but such has not been received at this office.

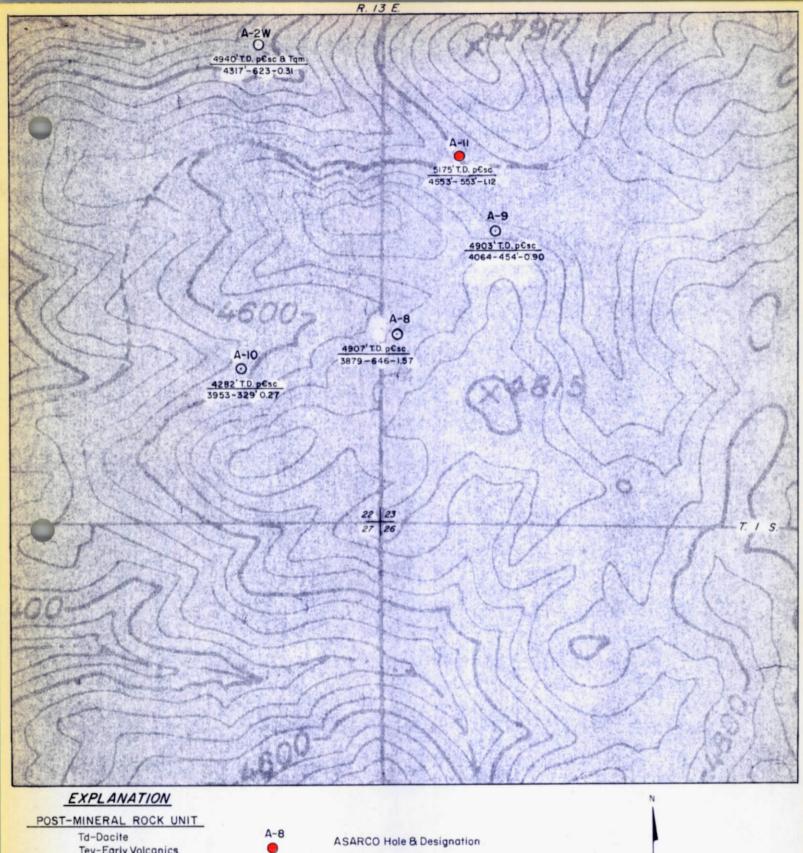
N. Whaley has continued discussions on drill rig availability and has also concluded an agreeable discussion with Mr. Jim Koontz, Manager of Joy Drilling, on the final billing of hole A-II; however, the new invoices have not been submitted to Asarco.

The attached quarterly map shows the extended depth of +0.5% copper values from the top of sulfides at 4553 feet to a depth of 5086 feet, or 533 feet averaging 1.12% copper. As reported in the assay report, dated July 13, 1979, four composite samples were prepared and assayed for copper, moly, gold, and silver. The copper (1%)-moly (0.002%) values are similar to those found in comparable zones in holes A-8 and A-9; both the gold and silver values are higher in A-11 than in the adjacent holes. In hole A-11 the gold is around 0.01 oz/ton versus less than 0.004 oz/ton, while the silver returned around 0.6 oz/ton versus less than 0.2 oz/ton in A-8 and A-9.

Estimated expenses for the month were \$4,050, leaving an estimated balance of (\$21,100).

James D. Sell

JDS:1b Att: Map



Tev-Early Volcanics Tw-Whitetail

PRE-MINERAL ROCK TYPE

Tbx-Breccia Tam-Quartz Monzonite

Tgr-Granite e-Supai Formation Pn-Naco Limestone Me-Escabrosa Limestone Dm-Martin Limestone p€t-Troy Quartz p€db-Diabase p€sc-Schist

4907'T.D. p€sc 3879-646-1.57

0

Total Depth-Rock Type Depth-Length-% Cu

Proposed Drill Site

TO ACCOMPANY Monthly by. 1. D. Sell

DRILLING PROGRESS MAP For The 314 Quarter, 1979

SUPERIOR EAST PROJECT

PINAL COUNTY, ARIZONA SCALE : 1"=500"

J.D. Sell

June 1977



December 26, 1979

TO: F. T. Graybeal

FROM: J. D. Sell

Superior East Project Pinal County, Arizona Progress Report - Dec. 1979

Discussions have been held by Norm Whaley and myself with Wayne Craig, Tommy Thompson, and Jim Breaux for directional drilling proposals out of hole A-11. Proposals have been received from Craig and Thompson. Apparent cost-service results are comparable, with Craig probably being lower cost. It has been suggested to use each contractor, one for each of the two holes intended to be deviated out of A-11. The holes are comparable and will allow us to better judge the two contractors.

The billing with Joy on hole A-11 has been clarified with their agreement to some of the Asarco points. Continued discussion with Joy concerning a larger rig for the directional drilling, and continued coring, has taken place and a submittal has been received. Boyles has also submitted a proposal.

The access road is being cleaned up, as well as the A-11 site enlarged, by Bryant Construction.

Estimated expenses for the month were \$10,000, leaving an estimated balance of (\$40,700).

Junes D. Sell

TAB

1980





January 29, 1980

TO: F. T. Graybeal

FROM: J. D. Sell

Superior East Project Pinal County, Arizona Progress Report -- Jan. 1980

The drill site at A-11 has been enlarged for the additional equipment, etc. needed for drill hole A-12, using the Dyna-drill for a directionally controlled hole to the south. The Dyna-drill will kick off around 2800 feet in the NX hole of A-11. Thompson and Associates will do the Dyna-drill work, and a Joy-36 machine with Joy crews will provide the back-up and the remaining coring, etc. Joy moved on the site on Jan. 14 and have removed the BX casing to 2932 feet and have cleaned the hole in preparation of placing a cement plug. 840 feet of BX casing remain to a depth of 3772 feet.

Heavy rains during and subsequent to move-in were very damaging to the access road, as well as the site (8 inches of mud on site), prompting the addition of heavy gravel to the road and site and additional water bars for stabilization of the access and site.

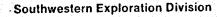
Dyna-drill work should be initiated in the latter part of the last week of January.

Road and drill site preparation to the south (P-6 and P-7 area) should also be initiated about the same time.

Proposals to the Forest Service have been prepared for the remaining roads and sites and will be submitted soon.

Estimated expenses for the month were \$34,000, leaving an estimated balance of \$167,300.

James D. Sell





February 28, 1980

TO: F. T. Graybeal

FROM: J. D. Sell

Superior East Project Pinal County, Arizona Progress Report -- Feb. 1980

Drill hole A-12 work continued during the month.

Joy retrieved the BX casing to 2932 feet with the aid of McCullough in finding the free-point and cutting the casing. The hole was then cleaned and a cement plug emplaced. The plug was washed to 2690 feet, then drilled and trimmed to 2750 feet.

The Dyna-drill (operated by Thompson and Associates) was placed in operation, with an NX drill string and two stainless steel rods, and ran for approximately seven feet. Very poor penetration rate was experienced and the machine pulled after four days and a conventional core of eight feet was cut to check on the status of the hole. The core was only cement and no directional kick-off was obtained.

T&A believed that the NX string was partially the problem and opted to reduce to BX rods (this had been discussed earlier with T&A prior to the submitting of bids).

As they had no BX non-magnetic rods needed for surveying and no kick-off, it was decided to set a deflection wedge to help establish this deviation.

The wedge was set, oriented southerly, cemented in, then the cement was drilled out and the core hole continued in conglomerate to the depth of 2790 feet.

The Dyna-drill work was then resumed with two BX aluminum rods for surveying and the remaining BX string. By the end of the month the Dyna-drill had progressed to 2867 feet with less than 1.5 feet-per-hour penetration rate. Also it was found that the hole was now oriented westerly and with a lesser deviation angle than had been established by the coring off of the wedge. The BX aluminum rods have also cracked and are unsuitable for use in the hole until they are rethreaded. (The BX stainless steel rod has been ordered from the East Coast, but its whereabouts are unknown.)

At present T&A have placed the 2nd Dyna-drill in the hole on magnetic rods and thus cannot survey the hole as to direction. The poor overall performance of T&A is very discouraging.

Heavy rains during middle February had some impact on the access road, but it is still usable; however, the rains devastated the additional road work of drilling and blasting to the south.

Estimated expenditures during the month were \$74,500, leaving a balance of \$92,800.

James D. Sell/L James D. Sell



April 14, 1980

TO:

J. D. Sell

N. P. Whaley

FROM: F. T. Graybeal

Superior East Project Pinal County, Arizona

I consider further exploration of the A-8 shear zone the priority target on the project, most of which will be by Dyna-Drill. Therefore, as soon as we can get a new Dyna-Drill contractor on the project we should shut down the Joy 36 rig, case the hole, and move the rig back to A-12. It will not be necessary to carry the hole to an obvious casing point other than to spend an additional 1-2 days to get below troublesome ground. All further road work and vertical drilling should be scheduled to optimize the number of available Dyna-Drill sites. Therefore, upon completion of A1-2 that rig would presumably move to the vertical site west of A-11. I assume we are functioning on a 24-hour basis at all times except(?) during Dyna-Drill activity. It should be clear that acquisition of a Dyna-Drill contractor should be of top priority on your schedules.

J.T. Graybeal
F. T. Graybeal

FTG:1b

cc: WLKurtz





March 31, 1980

TO: F. T. Graybeal

FROM: J. D. Sell

Superior East Project Pinal County, Arizona Progress Report - March 1980

Since the end of the last reporting period, Thompson and Associates have drilled in hole A-12, with the Dyna-drill, from 2867 to 2879 feet. The lack of non-magnetic rods, poor penetration rate, and lack of supervision direction prompted the termination of the T&A Dyna-drill contract. The hole was reamed to NX size, cleaned, and 15 feet of core recovered to the depth of 2894 feet i.D. when the hole was temporarily terminated. The hole A-12 was surveyed by Mollen-hauer and at the depth of 2875 feet was found to have a drift angle of \$13°W and a drift angle of 4-1/2° off vertical.

The bottom of hole A-12 is in the proximity of the proposal submitted by Mr. Wayne Craig of Christensen and is open for reentry. Craig has terminated his employment with Christensen (and they in turn the contract at Pine Grove for Getty which Craig had been supervising) and is no longer available for Dyna-drill work. Under the Craig proposal, normal diamond drilling would continue the hole for an additional 600 feet before the final eastward correction would be made. Continued positional checking of the hole during diamond drilling would be essential.

Preliminary discussions on Dyna-drill operations have been conducted with Mr. Mollen-hauer, who has operated the machine in the past.

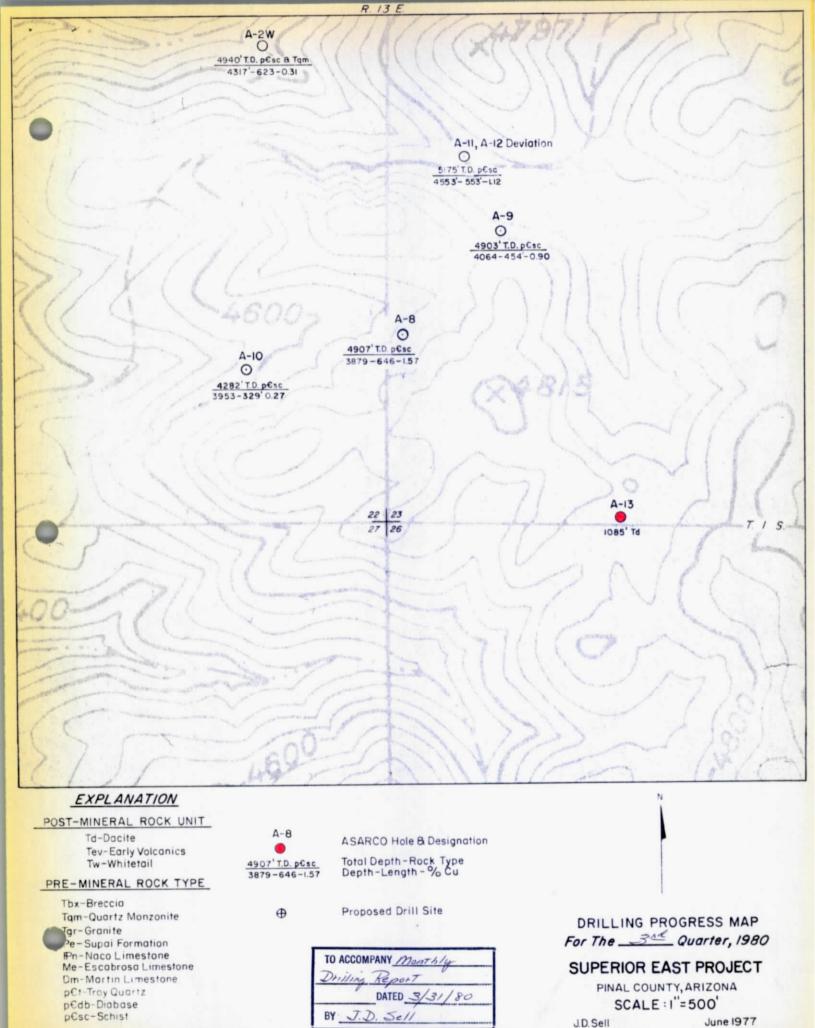
The continued rain showers have hampered the drilling somewhat, but have impacted the road building program even more. Bryant Construction has completed the revamp of the road to the P-9 site, build the site (hole A-13), and moved eastward toward the P-7 site. Bryant is now some 100-150 feet from the P-7 site and should be on it early next week. Several days of drilling will be necessary at the site on the Inspiration Conto claims. The road drill crew will move back to the pond area and prepare the revamp of the access road toward old hole A-8 and start the new road from the saddle westward to the flagged P-3 site. The dozer and truck will finalize the P-7 site and newly constructed road. Verbal clearance for the P-3 site and road work have been secured from the Forest Service by Mr. Crist.

The Joy 36 rig was moved from the A-12 site south to the A-13 hole site (P-9) and as of the 25th had progressed from the surface to 1085 feet with NC core. The coring is going well even with the normal drill fluid loss experienced in the upper portions of the fractured dacite.

The attached map has the A-13 site plotted. Estimated expenditures for the month were \$68,000, leaving a balance of \$23,600.

James D. Sell/ James D. Sell/

JDS:1b Att.



MVK-3041



April 30, 1980

T0:

F. T. Graybeal

FROM:

J. D. Sell

Superior East Project Pinal County, Arizona Progress Report - April 1980

The Joy 36 rig continued on hole A-13, NC core size, from 1085 feet to 1733 feet with the following formations:

Surface-1580 Tertiary dacite 1580-1733 Tertiary earlier volcanics

Several sandy, crushed zones were found in the lower part of the dacite and, to date, five sequences of oxidized rubble flow top with andesitic basalt flow base have been cut and these units have caused a slow down of penetration rate. Use of barite mud has helped to stabilize the walls for better penetration.

Hole A-13 was surveyed during the month for location-elevation.

Continued discussion with Mollen-hauer on Dyna-drill use has taken place and a solution may be near. The Joy 36 will be moved back to A-12 site when directional drilling resumes.

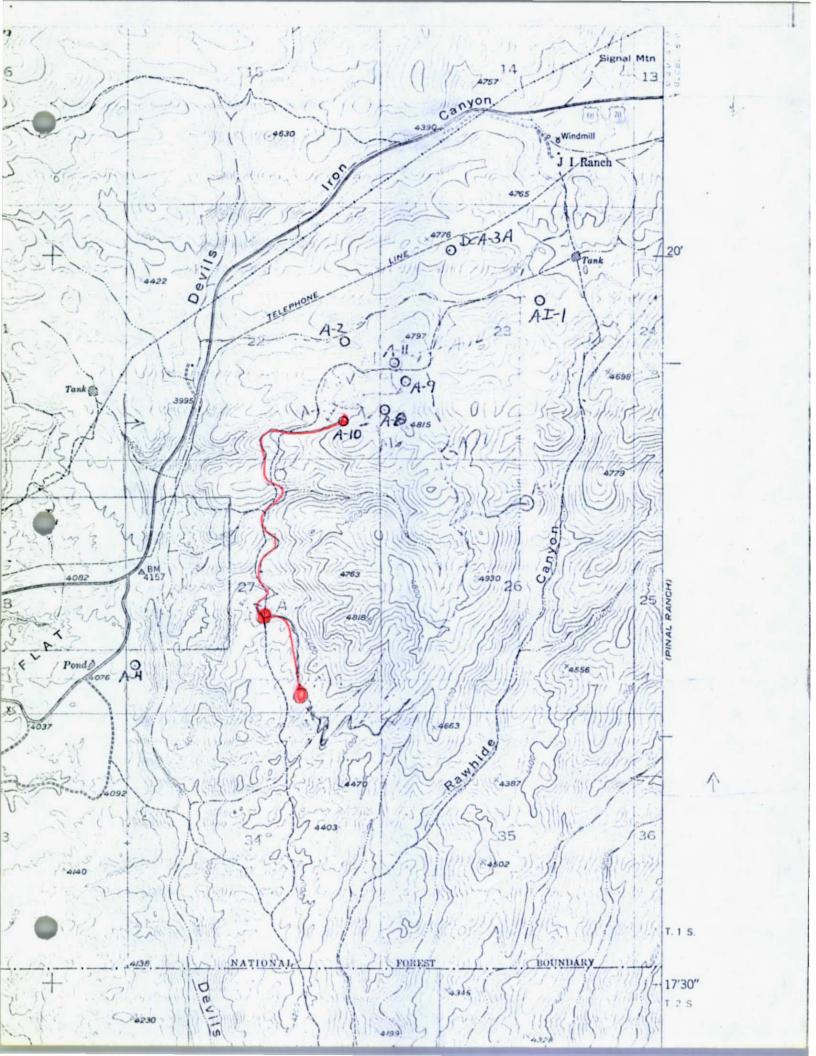
The road and site to P-3 have been constructed, but additional fill will be necessary to complete the surface.

Minor realignment of the area around the pond is being undertaken and a cattle guard will be built at the pond out of old drill steel.

The road past hole A-10 toward Devils Canyon and drill sites P-8 and P-9 will be started in the next week.

Estimated expenditures for the month were \$32,000, leaving a balance of (\$7,400).

James D. Sell/ James D. Sell/







May 29, 1980

TO: F. T. Graybeal

FROM: N. P. Whaley

Superior East Project Pinal County, Arizona Progress Report--May, 1980

During the period April 26 through May 25 the diamond drill hole designated as A-13 was advanced from 1733' to 2421' on a two- to three-shift/day schedule.

Formations represented in the core were reported to be as follows:

1733'-2036'

Tertiary earlier volcanic rocks

20361-24211

Whitetail conglomerate

At 23631 the hole was reduced from NCD to NX.

Bryant Construction Company continued to pioneer the access road southward toward the proposed site locations P-10, P-9, and P-8.

Estimated expenditures for the period were \$45,000, leaving an estimated balance of (\$49,800).

N. P. Whaley

N. P. Whaley

NPW: 1b

cc: JDSell w



June 30, 1980

F. T. G.

TO: F. T. Graybeal

FROM: J. D. Sell

Progress Report - June, 1980 Superior East Project Pinal County, Arizona

During the period of May 26 through June 25, 1980 the diamond drill hole A-13 advanced from 2421 feet to 3429 feet, a distance of 1008 feet of NX core.

Synopsis of the cored formations follows:

Surface-1580' Tertiary Dacite

1580'-2036' Tertiary Earlier Volcanics 2036'-3071' Tertiary Whitetail Conglomerate

3071'-3429' Precambrian Pinal Schist

The Pinal Schist has not been logged in detail, but contains some silicification and narrow veins of specularite, as well as quartz-sericite bands. All the schist has been oxidized.

Bryant Construction Company continued the access road southward for the proposed site locations of P-10, P-9, and P-8. Site P-10 was bypassed until further control on the site location can be obtained. The road is presently nearing the drainage bottom south of P-10. Approximately six weeks has been expended in road construction to this point from Hole A-10, and it is estimated that an equal amount of time may be required to connect into an old air-trac road just north of the P-9 site. From that connection on south to P-8 will be modification and alignment of the air-trac road.

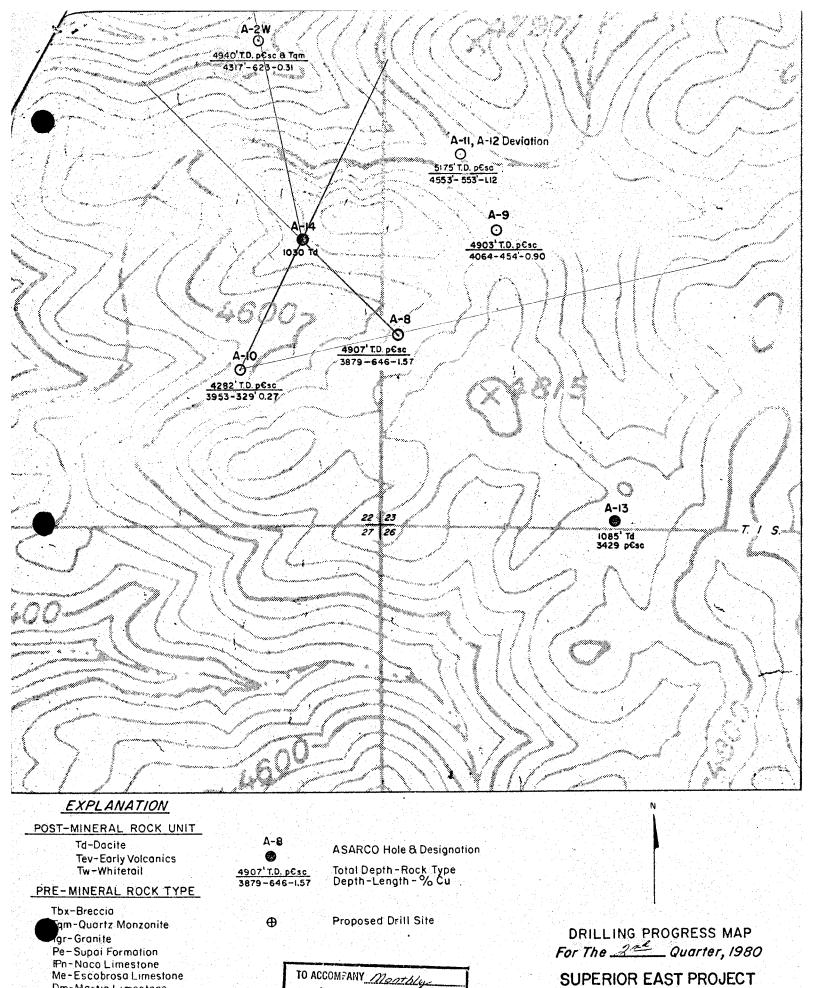
An air-hammer rig has been placed on Hole A-14 (P-3 site). The hole has progressed from the surface to 1030 feet in Tertiary Dacite.

Estimated expenditures for the month were \$70,000, leaving an estimated balance of \$680,900.

James D. Sell/L

JDS:1b Att.

cc: NPWhaley

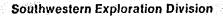


Dm-Martin Limestone

pCt-Troy Quartz

p€db-Diabase pCsc-Schist

PINAL COUNTY, ARIZONA SCALE:1"=500" 64 J.D. Sell June 1977 J.D. Sell





July 31, 1980

TO: W. L. Kurtz

FROM: J. D. Sell

Progress Report - July 1980 Superior East Project Pinal County, Arizona

Drill hole A-13 has progressed NX core from 3429 feet to 4132 feet, a total of 703 feet for the month. The hole continues in Precambrian Pinal . Schist cut by Laramide monzonite.

As reported last month, the premineral rock was totally oxidized and was highly brecciated. A flat fault-breccia zone (at 5°-10° from horizontal) was cored from 3465'-3471'. Some brecciation contined below, with the schist containing definite quartz-sericite bands being present. The first sulfides of pyrite, chalcopyrite, and chalcocite appeared at 3499', while the near total oxidation continued to 35891. Zones of partial oxidation extend to nearly 4000' of depth.

Minor pyrite-chalcocite in quartz-sericite alteration band and quartz veins, generally at 30° to 60° to the core, extend to 3983 feet with some native copper appearing toward the base of this interval. The amount of quartz veining increases around this depth, as does the amount of chalcocite, and continues with variable grades down to 4111 feet. Very fine chalcocite as dissemination and fine veins extend to the bottom of logging at 4202', in similar quartz-sericite alteration and quartz veining.

The above core has been logged and marked for splitting, but none has been split except for the interval 4040-4048 which returned 0.39% copper, 13 PPM moly, 0.06 oz. silver, and .003 oz. gold.

Drill hole A-14 has been rotaried to a depth of 1535 feet with $4\frac{1}{2}$ casing set and cemented. This hole will fully test the mineral intercept north and between holes A-8 and A-9.

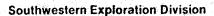
The Bryant Construction access road subparallel to Devils Canyon, and between holes A-4 and A-13 drill sites, has been temporarily halted after turning south and passing the first major drainage.

Estimated expenses for the month were \$27,000, leaving an estimated balance of \$654,800.

James D. Sell/

JDS:1b

cc: GWPickard





June 30, 1980

TO: F. T. Graybeal

FROM: J. D. Sell

Progress Report - June, 1980 Superior East Project Pinal County, Arizona

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Synopsis of the cored formations follows:

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3071'-3429' Precambrian Pinal Schist

The Pinal Schist has not been logged in detail, but contains some silicification and narrow veins of specularite, as well as quartz-sericite bands. All the schist has been oxidized.

Bryant Construction Company continued the access road southward for the proposed site locations of P-10, P-9, and P-8. Site P-10 was bypassed until further control on the site location can be obtained. The road is presently nearing the drainage bottom south of P-10. Approximately six weeks has been expended in road construction to this point from Hole A-10, and it is estimated that an equal amount of time may be required to connect into an old air-trac road just north of the P-9 site. From that connection on south to P-8 will be modification and alignment of the air-trac road.

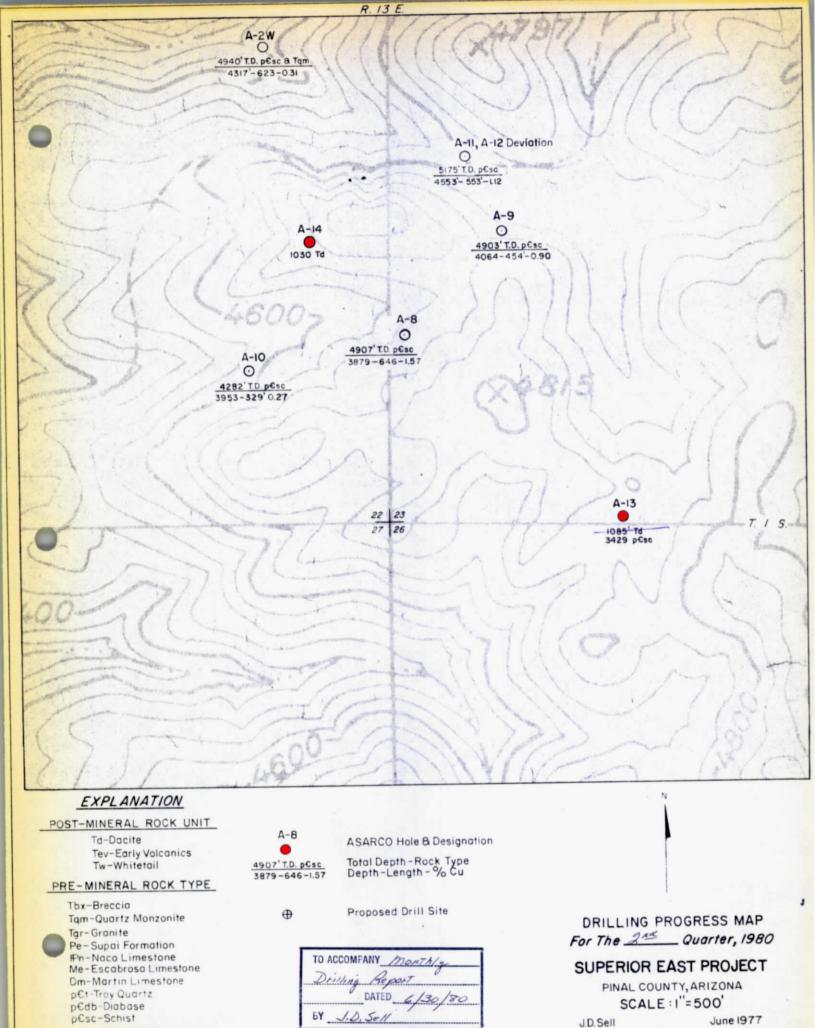
An air-hammer rig has been placed on Hole A-14 (P-3 site). The hole has progressed from the surface to 1030 feet in Tertiary Dacite.

Estimated expenditures for the month were \$70,000, leaving an estimated balance of \$680,900.

James D. Sell/

JDS:1b Att.

cc: NPWhaley



MVK-3041





July 31, 1980

TO: W. L. Kurtz

FROM: J. D. Sell

Progress Report - July 1980 Superior East Project Pinal County, Arizona

Drill hole A-13 has progressed NX core from 3429 feet to 4132 feet, a total of 703 feet for the month. The hole continues in Precambrian Pinal Schist cut by Laramide monzonite.

As reported last month, the premineral rock was totally oxidized and was highly brecciated. A flat fault-breccia zone (at 5°-10° from horizontal) was cored from 3465'-3471'. Some brecciation contined below, with the schist containing definite quartz-sericite bands being present. The first sulfides of pyrite, chalcopyrite, and chalcocite appeared at 3499', while the near total oxidation continued to 3589'. Zones of partial oxidation extend to nearly 4000' of depth.

Minor pyrite-chalcocite in quartz-sericite alteration band and quartz veins, generally at 30° to 60° to the core, extend to 3983 feet with some native copper appearing toward the base of this interval. The amount of quartz veining increases around this depth, as does the amount of chalcocite, and continues with variable grades down to 4111 feet. Very fine chalcocite as dissemination and fine veins extend to the bottom of logging at 4202', in similar quartz-sericite alteration and quartz veining.

The above core has been logged and marked for splitting, but none has been split except for the interval 4040-4048 which returned 0.39% copper, 13 PPM moly, 0.06 oz. silver, and .003 oz. gold.

Drill hole A-14 has been rotaried to a depth of 1535 feet with $4\frac{1}{2}$ casing set and cemented. This hole will fully test the mineral intercept north and between holes A-8 and A-9.

The Bryant Construction access road subparallel to Devils Canyon, and between holes A-4 and A-13 drill sites, has been temporarily halted after turning south and passing the first major drainage.

Estimated expenses for the month were \$27,000, leaving an estimated balance of \$654,800.

James D. Sell/ James D. Sell/

JDS:1b

cc: GWPickard



August 28, 1980

He Jem - Will send the forms you requested tomorrow. Sais 1/2

TO: W. L. Kurtz

FROM: G. W. Pickard

Progress Report - Aug., 1980 Superior East Project Pinal County, Arizona

Drill hole A-13 has progressed NX core from 4132 to 4580 feet, a total of 448 feet for the month. The hole continues in Precambrian Pinal schist cut by Laramide monzonite.

Bands of quartz-sericite continued in the schist with intervals of coarse barren quartz veining. Some narrow pyrite veinlets and patches of pyrite with occasional grains of chalcopyrite.

The monzonite showed generally strong quartz-sericite alteration with weak, very finely disseminated pyrite, chalcopyrite, and chalcocite and some minor marrow barren quartz veining.

The above core has been logged and marked for splitting and some selected intervals of schist and monzonite showing mineralization from 4419-4547' will be split for assay before the end of the month.

Estimated expenses for the month were \$20,600, leaving an estimated balance of \$633,000.

G. W. Pickard

S.W. Pichand

GWP:1b

cc: JDSell /

AMERICAN ANALYTICAL and RESEARCH LABORATORIES

ASSAYERS • CHEMISTS • METALLURGISTS

TUCSON, ARIZONA 85714

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-4439			.02									20,520	
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-4452.5			.07										Schist
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October 29, 1980

T0: W. L. Kurtz

FROM: G. W. Pickard

Progress Report - Oct., 1980 Superior East Project Pinal County, Arizona

Drill hole A-14 has progressed NC core from 1845 to 2623 feet, a total of 778 feet for the month. The hole was in Tertiary earlier volcanics to 2290 feet, remainder in unmineralized Whitetail conglomerate.

Estimated expenses for the month are \$19,700, leaving an estimated balance B. W. Pickard Willing Mix of \$589,000.

GWP:1b

cc: JDSell



December 3, 1980

TO: W. L. Kurtz

FROM: G. W. Pickard

Progress Report - Nov. 1980 Superior East Project Pinal County, Arizona

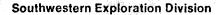
Drill hole A-14 has progressed NC core from 2623 to 2891 feet and NX from 2891 to 3559 feet, a total of 936 feet for the month. The hole was in Whitetail conglomerate to 3467 feet and the remainder in oxidized breccia (M-1A type) of Pinal schist and quartz monzonite with sections of fault gouge.

Estimated expenses for the month are \$32,000, leaving an estimated balance of \$557,000.

9 W. Pickard

GWP:16

cc: JDSell





September 30, 1980

TO: W. L. Kurtz

FROM: J. D. Sell

Monthly Report - Sept. 1980 Superior East Project Pinal County, Arizona

Drill hole A-13 continued NX core from 4580 feet to the terminal depth of 4663 feet where the hole was completed on September 8. The hole continued in Precambrian Pinal Schist cut by Laramide monzonite to the terminal depth with very low assays in the lower portion.

Only partial assays have been received and these suggest values, from 3499 feet where the first sulfides were noted, the following intercepts:

3499'-3564' = 65' @ 0.41% Cu 4040'-4048' = 8' @ 0.39% Cu 4419'-4547' = 128' @ 0.05% Cu

Minor gold (0.001-0.002 oz/ton) and silver (0.02-0.05 oz/ton) are also indicated.

The Joy rig was moved on September 18 to drill site A-14 which had previously been rotary drilled and cased to a depth of 1534 feet.

Core hole A-14 continued to the depth of 1845 feet as of this report. The hole was in Tertiary dacite from the surface to 1646 feet and in Tertiary earlier volcanics to the present depth.

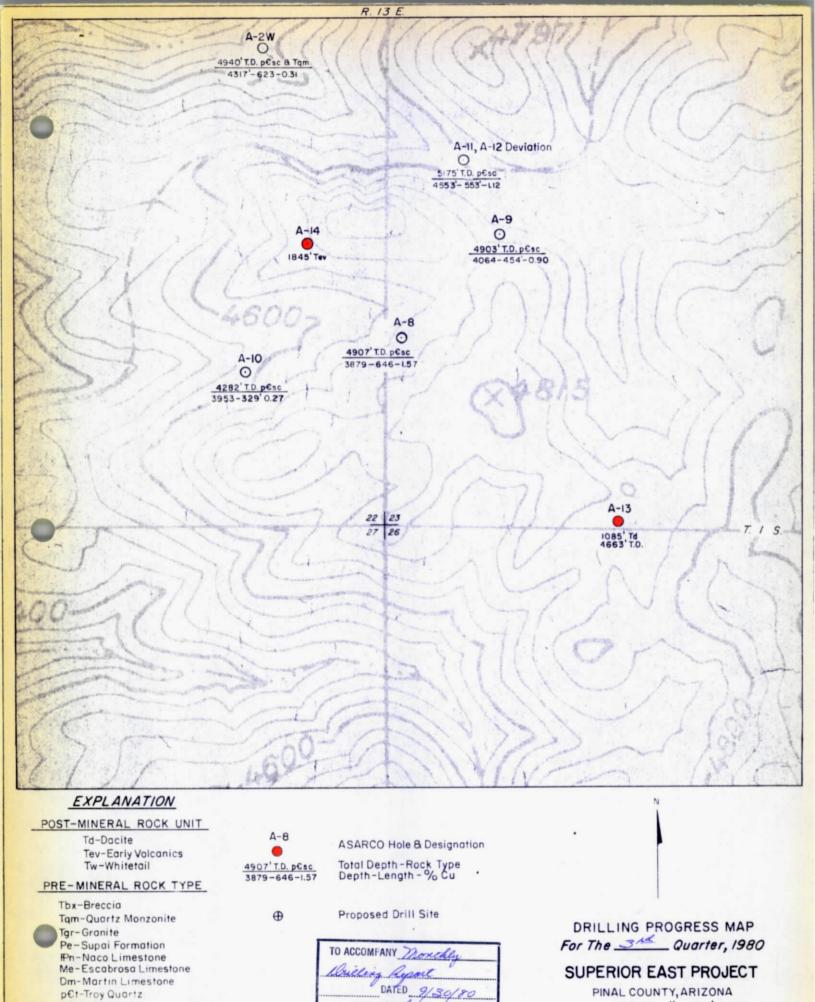
Expenses during the month are estimated at \$24,500, leaving an estimated balance of \$608,200.

The forthcoming quarter will involve completing the assay intervals of the hole A-13, the integration of this data, the drilling and sampling of hole A-14 down to 5500-6000 feet where it is anticipated to cut the A-8 system of mineralization. The proposed drill road east of Devils Canyon should also be resumed in the cooler-wetter months. Follow-up integration of the A-13 and AI-2 information will probably suggest a test northeasterly from A-13 and north of AI-2.

James D. Sell

JDS:1b Att.

cc: GWPickard



p€db-Diabase p€sc-Schist

MVK-3041

June 1977

SCALE : 1"=500"

J.D. Sell



January 5, 1981

Jim -Consected report

TO: W. L. Kurtz

FROM: G. W. Pickard

Progress Report - Dec. 1980 Superior East Project Pinal County, Arizona

-Drill hole A-14 has progressed NX core from 3559 to 4296 feet, a total of 737 feet for the month. The hole was in oxidized breccia (M-1A type) containing fragments of Pinal schist and occasional quartz monzonite to 3841 feet. The remainder of the hole was in altered and hematite stained Pinal schist with barren 1/8-1/4" quartz veining and cut by short intervals of highly sericitized quartz monzonite. No remnants of former sulfides were noted.

Drilling will continue into the first quarter of 1981.

Hole No. A-13 has been split from 3676 to 4654 feet and assay results are pending.

Estimated expenditures for the month are \$26,000, leaving an estimated balance of \$531,500.

G. W. Pickard

6.W. Fisherd

GWP:1b



December 29, 1980

-T0:

W. L. Kurtz

FROM: G. W. Pickard

-Progress Report - Dec. 1980 Superior East Project Pinal County, Arizona

Drill hole A-14 has progressed NX core from 3559 to 4296 feet, a total of 737 feet for the month. The hole was in oxidized breccia (M-1A type) containing fragments of Pinal schist and occesional quartz monzonite to 3841 feet. The remainder of the hole has been in Pinal schist with moderate to strong 1/8-1/4" quartz veining and minor intervals of highly altered sericitized quartz monzonite.

Drilling will continue into the first quarter of 1981.

Estimated expenditures for the month are \$26,000, leaving an estimated balance of \$531,500.

> H. W. Pickard/1 G. W. Pickard

GWP:1b

See Consecred herent

TAB

1981



January 29, 1981

TO: W. L. Kurtz

FROM: G. W. Pickard

Progress Report - Jan. 1981 Superior East Project Pinal County, Arizona

Drill hole A-14 has progressed NX core from 4296 to 4943 feet, a total of 647 feet for the month. The hole was in Pinal schist with finely disseminated chalcopyrite and pyrite along quartz-sericite bands and in narrow quartz veins. The schist is cut by short intervals of highly silicified quartz monzonite with occasional narrow quartz veins with minor pyrite-chalcopyrite.

Assays of interest from Hole No. A-13 are as follows:

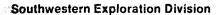
Estimated expenditures for the month are \$29,000, leaving an estimated balance of \$502,500.

G. W. Pickard

B. W. Pichard

GWP: 1b

cc: JDSell





March 4, 1981

TO: W. L. Kurtz

FROM: J. D. Sell

Superior East Project
Pinal County, Arizona

Drilling continued during the month in Precambrian Pinal Schist cut by steeply dipping Laramide biotite, feldspar, porphyry dikes. Minor mineralization accompanied by quartz-sericite bands is found throughout. Below 5160 feet, the biotite, feldspar, porphyry continues uninterrupted and contains 10-20% K-feldspar veins, but only minor mineralization except for some 1"-4" pods of chalcopyrite and red, fine crystalline hematite.

The core size was reduced to BX size at 5493' and as of 3/3/81 the hole had progressed to 5603'.

A deviation survey indicates the hole is rapidly flattening to the northwest with the change from a southwest direction to the present course at around 4300-4400.

Talks have been held with Navi-Drill for a directional drill hole either from the present A-14 hole or reentry into hole A-12 which was partially deviated.

Expenses during February are estimated at \$33,000, leaving an estimated abalance of \$471,000.

James D. Sell

JDS:1b



March 30, 1981

T0: W. L. Kurtz

FROM: J. D. Sell

March Monthly Report Superior East Project Pinal County, Arizona

Drilling of hole A-14 was terminated at the depth of 5722 feet after converting to BX core. The core recovered remained in K-spar veined biotitefeldspar-porphyry with minor pyrite, chalcopyrite, and red hematite.

The short chalcocite zone cored beneath the oxidation limit (i.e., about 4113 to 4150 feet) is apparently the only mineral intercept of any significance in the hole.

Total reevaluation is pending until the core has been logged and assay values returned.

The Joy 30 rig has been moved to hole A-11 and the hole plus the old Dyna-Drill portion of the deviated hole A-12 have been cleaned and a new core cut in the bottom of A-12 prior to the reentry using a deviation drill head.

The Navi-Drill directional drill company arm of Christensen Diamond Products (of which Boyles Brothers Drilling Company is also a part) is presently on the job and continuing drill hole A-12 as a controlled hole to the south.

Mr. N. P. Whaley is our representative on the hole and will submit his report on the deviated hole progress.

Expenses during the month are estimated at \$91,000, leaving an estimated balance of \$378,400.

James D. Sell/

JDS:1b Att.

cc: NPWhaley - w/att.



p€db-Diabase

pEsc-Schist

MVK-3041

June 1977

SCALE : 1"=500"

J.D. Sell



March 26, 1981

TO: W. L. Kurtz

FROM: N. P. Whaley

Superior East Project Pinal County, Arizona Progress Report - March 1981

In his progress report for February J.D.Sell reported hole A-14 as being 5603' measured depth (MD) on March 3. This hole was continued BX to 5738', where it was bottomed on March 9. Shift reports indicate the BX casing was broken at 2523' and that section pulled. This would leave 2970' of BX casing in the hole (2523' to 5493'). Since the hole had been cased to 2891' NX, there is a 368' overlap in the two casing sizes left in the hole -- a consideration in planning any directional drill-outs from this hole in the future.

On March 12 the Joy-36 drill was relocated on hole A-11/A-12 and the hole reentered, cleaned to the previous bottom of 2879' (MD) in A-12, and cored to 2900' (MD). At this point Christensen Diamin Tools, Inc. (CDT) in conjunction with Joy Manufacturing Company initiated the use of CDT's Navi-Drill, advancing the hole to 2938' while slightly reducing the drift angle.

The operation was converted to the coring mode at 2938' and remained in this mode with monitoring, single-shot surveys throughout the balance of the period. At the end of the graveyard shift for March 25 the MD was 3238'.

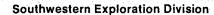
The second quarter of this year should hopefully see the completion of the A-12 directionally controlled drill-out (once a final target is selected), and, based on the geologic information obtained and the mechanical-economic feasibility of the drilling method(s), perhaps the start of another drill-out from either A-11 or A-14.

N. P. Whaley

N. P. Whatey

NPW: 16

cc: JDSellv





April 27, 1981

TO: W. L. Kurtz

FROM: J. D. Sell

April Report, 1981 Superior East Project EA-0010 Pinal County, Arizona

The Navi-Drill has operated satisfactorily in the hole A-12 which is out of hole A-11.

The combination of Navi-Drill and conventional core drilling has progressed to a depth of 3874 feet as of the end of the report period.

The Whitetail-Pinal Schist slide block contact was cored and was within several feet of the 3492-foot depth found in hole A-11. (Hole A-12 has not been detail logged.)

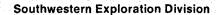
It is anticipated that the basal fault will be cut around the 4060-foot depth and instructions have been verbally made for the zone to be cored if at all possible.

Although the Navi-Drill deviated more westerly than originally planned, it is of no consequence, as it in reality gives more room to make a better turn to the east. The last several survey shots indicate the Navi-Drill will have no problem turning against the schistosity trend which has a westerly component.

Junes D. Sell

JDS:1b

cc: NPWhaley





May 1, 1981

TO: W. L. Kurtz

FROM: N. P. Whaley

Superior East Project Pinal County, Arizona Progress Report - April 1981

During the period March 26 through April 25 the drill-out from A-11, designated A-12, was drilled NX size from a measured depth (MD) of 3238' to 3874' (MD), an advance of 636'. Approximately 39% (247') of this drilling was done with Christensen Diamin Tools, Inc. Navi-Drill. The balance of the footage was cut by conventional NXWL coring by Joy Manufacturing Company.

While it is certainly too early in the program to know what ultimate costs might run, direct, per-foot costs as derived from the cost estimate for this period might be of interest. These costs are shown below as estimated for the two operators.

<u>Operator</u>	Cost/ft.
a) Christensen Diamin Tools, Inc.	\$ 40.45
b) Joy Manufacturing Company	62.62
Combined	\$103.07

Since these estimated cost-per-foot figures reflect the initial phase of an attempt to utilize directional control of drilling out of an existing diamond-drill hole, and are probably closely related to the on-bottom time and penetration rate of the Navi-Drill, one might expect some decrease in them as bit-type selection is optimized and drilling techniques are refined.

Estimated expenses for the month are \$78,000, leaving an estimated balance of \$335,600.

M. P. Whaley h.

NPW: 1b

cc: JDSell,

May 26, 1981

Southwestern Exploratio Conected copy Will do Chief
Cons later forget to when I
did This one. for

TO: W. D. Payne

FROM: J. D. Sell

Monthly Report -- May 1981 Superior East Project EA-0010 Pinal County, Arizona

During the month, hole No. A-12 was continued by use of convention coring and use of the Navi-Drill for turning the hole. As of the end of the report period (25th) the hole was at a depth of 4135 feet and in oxidized bedrock schist containing moderate pervasive quartz sericite alteration cut by bands of intense quartz sericite with leached veins of chalcocite (now predominantly hematite limonite filling).

Mr. N. P. Whaley will submit a report on the drilling activity. (All set to !)

Hole A-14, previously drilled, was logged in the bedrock and sample splits flagged. A few samples were split by S. A. Catlin prior to the splitter ceasing to function. The splitter is in for repair and should again be available in a few days. A-14 has not been completely logged except in the better mineralized zone.

Hole AI-2, previously drilled, was quickly scanned and will be logged in the coming weeks. It has a several-hundred-foot intercept containing visible moly along with minor chalcocite, chalcopyrite, along with specularite, in schist.

James D. Selly James D. Sell

JDS: 1b



June 30, 1981

TO: W. D. Payne

FROM: J. D. Sell

Monthly Report - June 1981 Superior East Project EA-0010 Pinal County, Arizona

During the month the current hole A-12 was continued by Navi-drill to the depth of 4217 feet where the drilling was terminated in sulfide mineralization in Pinal Schist. Conventional NX coring continued from 4217-4343 feet. At that point NX oriented core was taken from 4343-4375 feet. Conventional NX core was resumed and by the end of the report period had reached a depth of 4666 feet.

The oriented core recovered badly faulted Pinal Schist with a few stringers of sulfide (bornite-chalcocite-pyrite-chalcopyrite). Orientation of the features suggest an east-northeast strike and a southerly dip.

Below the faulted portion, the hole again increased in the amount of quartzsericite banding and contained sulfide mineralization.

Using the goniometer, cores from other holes in the area were examined using the premise that all schistosity strikes nearly east-west (as found in the oriented study of A-12 cores). The resolutions strongly indicate a south-digging component to the various features studied. (See my reports of June 18 and June 26 for details on the oriented core studies).

Preliminary resolution of the south-dipping features suggests that the mineralized intercept of hole A-11, lying about 250 feet north of hole A-12, should be encountered between the depth of 5000-5100 feet in hole A-12. The drift angle in A-12 is decreasing from 18°S (from vertical) at 4225 foot depth (end of Navi-drill control), to 16°S at 4300 feet, and to 14°S at 4400 feet. The conventional coring will probably continue the decreasing angle and may indeed turn to a northward component as it did in hole A-11.

Based on the above, the hole A-12 will be continued to test for the downdip extension of the 533 feet of 1.12% copper found in hole A-11.

The assays received in hole A-12 give the following averages:

4217-4232; 15' @ 1.75% copper 4232-4335; 103' @ 0.38% copper

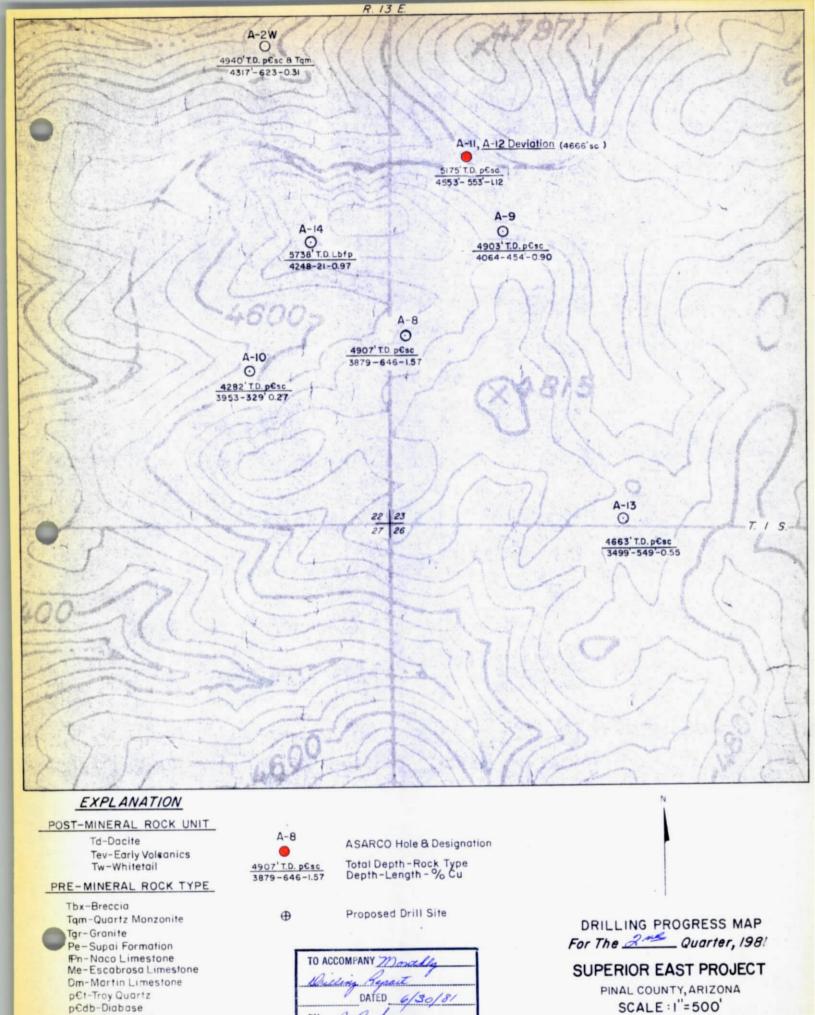
The low-grade values are estimated to continue to 4450 feet where the quartz-sericite-sulfide banding again becomes evident and continues to the depth reported (4666'). Only minor biotite feldspar porphyry dikes have been noted to date.

Estimated expenditures for the month are \$55,000, leaving an estimated balance of \$226,000.

James D. Sell

JDS:rg

Att: Drill Map



p€sc-Schist

MVK-3041

June 1977

J.D. Sell

ANNUAL	PROJECT	PLANNING	SHEET
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Geol.

Progress for the Month of _____June 1981

	EXPEND RES	TYPE OF	F PROJECT	C 09	ST ESTIMATE &	
DISTRICT: Southwest	1. Month of 6/81 \$ 55,000		Recon			A standard to the State of the
PROJECT NAME: Superior East	2. Current Year Expenses to Date		Drilling			
PROJECT NUMBER: 0010	thru 6/81 \$ 305,096	- <u>^</u> -	Pre-			
PROJECT SUPERVISOR: J.D.Sell	3. Budget for Current Year	1 . 1	· · ·	Current Yr. Or	ig. Budget	\$600,000
PROJECT GEOLOGIST: J.D.Sell	1981 \$ 600,000		Other	Current Yr. Ad	ld. Request @	\$
PREPARED BY/DATE: JDS/6-3-81	4. Thru previous year, since project began \$2,992,124	<u> </u>	•. 	Current Yr. Ad New Total	d. Request @	\$\$

OBJECTIVE: Confirmation and testing of qtz-sulfide vein system (of A-8 type) with two deviation holes, and completion of drill road to south for further testing; by Dec. 31, 1981 at a cost not to exceed \$600,000.

	PLANNED TASKS	RESPONSIBILITY/TIME TO COMPLETE	TARGET DATE	% COMPLETE	PROGRESS TO DATE
) Split and assay A-14.	JDS & SAC/1 week	6-15-81	100%	
2)	Complete drill hole summary of A-13 and A-14.	JDS/3 weeks	7-1-81	20%	
3)	Drill A-12, deviation to south, from A-11 hole; to determine dip of previously found vein system (A-9, A-11). Complete drill hole summary.	JDS, TCB, & Joy Drilling & Navi-drill company/ 8-9 months	9-15-81	±3 months for	Deviation completed June 1. Conventional coring continuing. Passed through original target vein, now going for another intercept @ ±5000-5100 of vein cut in A-11 (which lies ±250'N of A-12).
4)	Start deviated hole to north, from hole A-II, to determine dip of previously found vein system (A-9, A-II).	JDS, TCB, Joy & Navi- drill/3 months	12-31-81	See note —	Orientation core and studies in A-12 and previous holes strongly suggest that the various structures dip to south. Therefore, the north deviated hole would not test the target as originally stated.
5)	Complete road to the southwest from A-10 pad (3/4 mile).	JDS & P.Bryant Constr./ 6 weeks	12-15-81		
6)	Status report for Superior East.	JDS/3 weeks	12-31-81		

ASARCO

June 30, 1981

TO: W. D. Payne

FROM: J. D. Sell

Quarterly Report April-May-June, 1981 Superior East Project Pinal County, Arizona

Drill hole A-12 was the only hole being drilled during the quarter. Hole A-12 is a deviated hole started at 2750 feet in hole A-11 where a wedge was set and a deviated hole initiated. At the end of the March reporting period, the hole A-12 had been advanced by directional controlled Navi-drill and conventional NX coring to a depth of 3238 feet. At the end of this quarter, the hole had been advanced to 4666 feet, with the Navi-drill being terminated at 4217 feet.

It is estimated that the bedrock oxidized-sulfide contact was at 4170 feet, and with the first NX conventional core below that point at 4217 feet, an unknown value, but probably comparable to the next interval, is related to the 4170'-4217'; 47' at ?% copper;

4217'-4232'; 15' at 1.75% copper; 4232'-4335'; 103' at 0.38% copper.

Assay results are pending on the A-12 samples below 4335', but they are estimated to remain low-grade to around 4450' where again the quartz-sericite banding with variable bornite-chalcocite is evident.

As mentioned in the June monthly report, the oriented core studies suggest a southerly dip to the qsv system. To test this, hole A-12 will be continued by conventional core to depth. It is estimated that A-12 will intercept the qsv system found in hole A-11 at a depth of between 5000-5100 feet and some 250 feet south. The hole A-11 intercepted 533 feet of 1.12% copper starting at 4553 feet.

Hole A-13, previously drilled, was split and assayed during the quarter. The following intercepts were cut.

3456-3499; 43' of 0.08% Cu, Pinal Schist Oxidized Sulfide 3499-3637; 138' of 0.32% Cu; pi & mz 3637-4029; 392' of 0.67% Cu; monzonite 4020-4062; 33' of 0.23% Cu; mixed pi & mz T. D.

Hole A-14, previously drilled, was split and sent for assay during the quarter. The following intercepts were cut.

4076-4096; 20' of 0.04% Cu; pi & porphyry Oxidized Sulfide
4096-4149; 53' of 0.50% Cu; mixed pi-Tp. 4149-4248; 99' of 0.25% Cu; mixed pi-Tp. 4248-4269; 21' of 0.97% Cu; Tporphyry 4269-4408; 139' of 0.07% Cu; pi 4408-4409; 1' of 2.10% Cu; pi 4409-4413; 5' of 0.34% Cu; pi.

Assay results for splits below are pending but are estimated to not average above 0.3% Cu.

Reevaluation of all holes in the area is being undertaken with the assumption that the structures intercepted in the various holes dip to the south.

James D. Sell

JDS:rg

Att: Drilling Map



MVK-3041

June 1977

J.D. Sell



July 28, 1981

TO: W. D. Payne

FROM: J. D. Sell

Monthly Report - July 1981 Superior East Project EA-0010 Pinal County, Arizona

Conventional core drilling NX size continued in hole A-12 with a total of 419 feet for the month; this progressed the hole from 4666 to 5085 feet.

Variable amounts of sulfides in steeply dipping quartz sericite bands continue in the hole.

Assays returned to date from A-12 have a weighted average of 0.95% copper, distributed as follows:

oxide/sulfide interface? 4170 continued Navi-drill to 4217; thus this interval was not cored or sampled.

4217-4232 = 15' @ 1.75% copper 4232-4343 = 111' @ 0.38% 4343-4375 = 32' of oriented core, not split $4375-4395\frac{1}{2} = 20\frac{1}{2}' @ 0.45\%$ $4395\frac{1}{2}-4401 = 5\frac{1}{2}' @ 16.90\%$ 4401-4488 = 87' @ 0.67% 4488-4501 = 13' @ 2.07% 4501-4523 = 22' @ 0.37% 4523-4554 = 31' @ 2.30% $4554-4662\frac{1}{2} = 108\frac{1}{2}' @ 0.41\%$ $4662\frac{1}{2}-4705 = 42\frac{1}{2}' @ 1.25\%$

End of calculated assays. (456 feet @ 0.95% copper.) Samples have been split and sent for assay to the depth of 5083 feet.

The hole is continuing to intercept the suggested south dipping structure found in hole A-11.

When A-12 is completed and surveyed, it is recommended that the hole be plugged and a wedge set at 4150 up in the oxidized bedrock, and 300 feet of core be cored to catch the missed interval and overlap into the previously sampled portion of A-12.

Graphic logs have been sketched and sent to the drafting department for holes A-13 and A-14. The assay results were received and tabulated and sent in for typing.

Estimated expenditures for the month are \$33,000, leaving an estimated balance of \$169,000.

James D. Sell

AS CO MONTHLY DRILLING SUMMARY

DISTR

EA-0010

Project <u>Superior East & Rawhide</u> Project No. <u>EA-0041</u> State <u>Arizona</u> County <u>Pinal</u> Month <u>July</u> Year <u>1981</u> Page <u>1</u>

Hole No. Collar location			D :	Footage drilled							
Hole No.	Collar location	Bearing	Dip	From To Feet		Feet	Remarks (significant intersections, geology and/or assay intervals, etc.)				
S.E. A-12	Navi-drilled hole from A-8; AzCentral 846,600N; 744,150E	Southerl	y 8-12°	4666	5085	419	Presently drilling in Pinal Schist. Oxide/sulfide interface cut during Navi-drilling (±4170') has weighted average of 456'@0.95% copper to 4705' (535' actual feet including Navi-drill and oriented core which was not sampled and/or split.				
S.E. A-13	Az Central 845,800N 775,600E	Vertical			4663 TD		Previously drilled. Best intercept: 3637-4029' or 392'@0.67% copper. Graphic log and assay result memo in press and drafting. Pinal Schist and Laramide monzonite bedrock.				
S.E. A-14	Az Central 847,200N 773,500E	Vertical			5738 TD		Previously drilled. Sulfide assays start 4096'; have 53'@0.53%, then 99'@0.25%, then 21'@1.20% copper (or 173'@0.45%) ending 4269'; interpreted to be lower end of qsv system. T.D.@5738'. Graphic log and assay result memo now in press and drafting.				
				-							
Rawhide Al-2	Az Central 846,500N 777,600E	Vertical			3612 TD		Previously drilled. Best intercept: 2850-3160' or 310'@0.37% copper. Graphic log and assay results memo in press and drafting. Pinal Schist bedrock.				
			-	-							
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	•					-					

DISTRICT: Southwes	st
PROJECT NAME: Supe	erior East
PROJECT NUMBER:	0100
PROJECT SUPERVISOR:	J.D.Sell
PROJECT GEOLOGIST:	J.D.Sell
PREPAREN BY/NATE.	IDS /6-2-81

Dec. 31, 1981 at a cost not to exceed \$600,000.

	EX	PENDITU	in_5		
h	of	7/81	\$33	000	

			1	
1.	Month	of	7/8/	\$33,000

- 2. Current Year Expenses to Date thru <u>7/8/</u> \$ 363 000
- 3. Budget for Current Year 1981 \$ 600,000
- 4. Thru previous year, since project began \$2,992,124

deviation holes, and completion of drill road to south for further testing; by

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COST ESTIMATE &

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OBJECTIVE: Confirmation and testing of qtz-sulfide vein system (of A-8 type) with two

Progress for the Month of July 1981

	PLANNED TASKS	RESPONSIBILITY/TIME TO COMPLETE	TARGET DATE	% COMPLETE	PROGRESS TO DATE
1)	Split and assay A-14.	JDS & SAC/1 week	6-15-81	100%	
2)	Complete drill hole summary of A-13 and A-14.	JDS/3 weeks	7-1-81	100%	
3)	Drill A-12, deviation to south, from A-11 hole; to determine dip of previously found vein system (A-9, A-11). Complete drill hole summary.	JDS, TCB, & Joy Drilling & Navi-drill company/ 8-9 months	9-15-81	Continued Coring	Partially Navi-drilled sulfide zone, plus oriented core study core not split; of core split have weighted average of 456 @ 0.95% copper (ie, total sulfide intercept ±4170-4705 or 535 feet of similar grade. Additional samples below (to 5083) suggest mixed high and low values; probably overall lower than above average. Presently drilling below
4)	Start deviated hole to north, from hole A-11, to determine dip of previously found vein system (A-9, A-11).	JDS, TCB, Joy & Navi- drill/3 months	12-31-81	See June	5083 to intercept system indicated in A-11.
5)	Complete road to the southwest from A-10 pad (3/4 mile).	JDS & P.Bryant Constr./ 6 weeks	12-15-81		
6)	Status report for Superior East	JDS/3 weeks	12-31-81		

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August 28, 1981

TO: J.D. Sell

FROM: T.C. Benavidez

Superior East Project Pinal County, Arizona DDH A-12 Monthly Progress Report August 1981

Between July 26 and August 26, 1981, A-12 was advanced from 5,085 to 5,320 feet (235'). The hole was reduced to BXWL at 5,085 feet. Numerous drilling difficulties continued with bridging and/or coring to present depth, plus 132 feet of BX rods were dropped taking four days (96 hours) to recover and continue coring. The condition of the hole made bit changing a common occurrence. The final mishap was the breaking of the Kelly rod just below the chuck; hydraulic pressure being in the down position, it caught the top of the tools and consequently overturned the rig. This may have damaged the rods (belled and telescoped), and recovering the whole string might be a problem and the hole would be lost. However, there is the possibility that enough tools (BX and NX) can be pulled to set the wedge at the 4,100 foot kick-off point to be redrilled.

There are two zones of ± 2 feet each (5,230' and 5,287') that are of interest, containing qtz, CuFeS₂, Cu₅FeS₄,and disseminated CuFeS₂ in the last 100 feet of core that was looked at. Average drilling progress for the month was 9.4 feet/day. Estimated, overall drilling costs were \$19,589.80 or 235 feet @ \$83.36/foot.

Estimated expenses for the month are \$40,400, leaving an estimated balance of \$129,500.

J.C. Benavides

TCB/m1m

c: W.D. Payne



September 28, 1981

TO: W. D. Payne

FROM: J. D. Selli

Monthly Report - Sept. 1981 Superior East Project EA-0010 Pinal County, Arizona

During the month, the hole A-12 was cored from 5320' to 5477', a total of 157 feet, in Pinal Schist and Laramide biotite feldspar porphyry (bfp). The overall low footage production was basically the lost time when the Joy 36 machine was turned over and was changed out with a Joy 22HD, now drilling.

Due to the damage and sticking of the BX drill string, it had been decided to drill through the BX bit with an AX string and continue coring. This was done, but only one foot of core was cut and recovered before the BX string released and fell down the hole. At this point, the entire AX and BX strings were recovered from the hole and a new BX string made up for coring. The first "new" BX core was recovered on September 10 and an average of 12 feet per day has been maintained including bit changes (5), hole cleaning, etc. The extreme number of kinks in the hole (i.e., a large "S" curve) adds concern and caution during drilling.

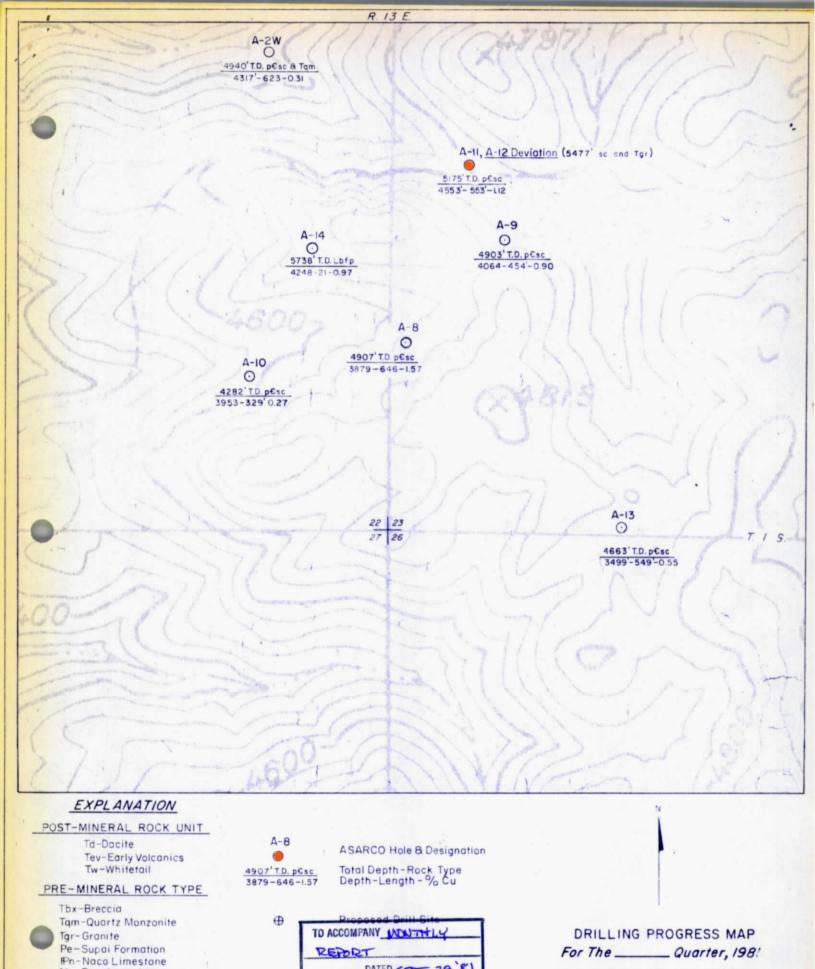
Assays have been received to 5083 feet and suggest 499 feet of 0.94% copper (to 4748'). The actual footage of mineral intercept is longer, but the Navi-drilled portion was lost for assay and the oriented core study core has not been split for assay (see July report). Below 4748 feet are 211 feet of 0.41%, 32 feet of 0.85%, and 92 feet of 0.58% (to 5083 feet). It is estimated that the remaining footage will be low (0.10-0.40%), with zones of +0.50% copper.

Drilling will continue to test for an intercept of the proposed south-dipping structure found in the adjacent hole A-11.

Estimated expenses for the month are \$42,719, leaving an estimated balance of \$86,781.

James D. Sell

JDS:1b Att: Map



Me-Escabrosa Limestone

Dm-Martin Limestone

p€t-Troy Quartz

p€db-Diabase

p€sc-Schist

BY 5.5. SELL SUPERIOR EAST PROJECT PINAL COUNTY, ARIZONA

SCALE : I"= 500'
J.D.Sell June 1977

DISTRIC	T: Sout	thwes	t		
PROJECT	NAME:	Supe	rior E	ast	
PROJECT	NUMBER:	0	010	/	
PROJECT	SUPERVIS	SOR:	J.D.S	ell1/	
PROJECT	GEOLOG19	ST:	J.D.S	ell	

PREPARED BY/DATE: JDS/6-3-81

1.	Month of _	9/8/043	2,719
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,	I HERART VA	aar Evnanca	c to Date

EXPENDITURES

2.	Current Year Expenses	to Date
	thru 9/8/\$ 4/6,	119_

3.	Budge	ť	for	Current	Year
	19 <u>81</u>	\$_	600,	000	

4.	Thru previous	year, since
	project began	\$2,992,124

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OBJECTIVE: Confirmation and testing of qtz-sulfide vein system (of A-8 type) with two deviation holes, and completion of drill road to south for further testing; by Dec. 31, 1981 at a cost not to exceed \$600,000.

Progress	for	the	Month	of	September	1981	•
-	-						

PLANNED TASKS	RESPONSIBILITY/TIME TO COMPLETE	TARGET DATE	% COMPLETE	PROGRESS TO DATE
1) Split and assay A-14.	JDS & SAC/I week	6-15-81	100%	
 Complete drill hole summary of A-13 and A-14. 	JDS/3 weeks	7-1-81	100%	
3) Drill A-12, deviation to south, from A-11 hole; to determine dip of previously found vein system (A-9, A-11). Complete drill hole summary.	JDS, TCB, & Joy Drilling & Navi-drill company/ 8-9 months	9-15-81	Continued Coring	Assay values below 4748' are in range of 0.40 - 0.50% copper with some strongly altered - mineralized zones of 0.80 - 1.00% copper; assays complete to 5083'. Lower values estimated below. Drilling continuing to test for A-11 intercept extension at depth of 5400'.
4) Start deviated hole to north, from hole A-II, to determine dip of previously found vein system (A-9, A-II).	JDS, TCB, Joy & Navi- drill/3 months	12-31-81	See June	
5) Complete road to the southwest from A-10 pad (3/4 mile).	JDS & P.Bryant Constr./ 6 weeks	12-15-81	•	
6) Status report for Superior East	JDS/3 weeks	12-31-81		

ASTRO MONTHLY DRILLING SUMMARY

Id

Project No. <u>EA-0010</u> State <u>Arizona</u> County <u>Pinal</u> Month <u>September</u> Year <u>1981</u> Page __ Superior East Footage drilled Hole No. Collar location Bearing Dip Remarks (significant intersections, geology and/or assay intervals, etc.) To Feet From Navi-drilled hole | Southerly 5320 5477 Presently drilling in Pinal schist and fine-grained Laramide biotite feldspar porphyry. 1571 S.E. Average of assays from 4217' to 4748' of 0.94% Cu; 4960'to 4992' @ 0.85% Cu; remainder ± 0.50 or less. from A-8; Az. Cen-A-12 tral 846, 600 N;744, 150 E.

September 1981



Southwestern Exploration Division

September 28, 1981

TO: W. D. Payne

FROM: J. D. Sell

Quarterly Report July-August-September 1981 Superior East Project Pinal County, Arizona

Drill hole A-12 continued during the quarter, with coring from 4666 feet to 5477 feet or 811 feet in Precambrian Pinal Schist and Laramide biotite feldspar porphyry.

Additional assays have been received and it is reported that the interval from 4217'-4748' averaged 0.94% copper, followed by 211' @ 0.41%, 32' @ 0.85%, and 92' @ 0.58% copper to a depth of 5083 feet. Visual estimation suggests that the remainder will be between 0.10-0.40% with zones of +0.50% copper down to the depth of 5477 feet. The mineralization is mainly chalcopyrite with minor bornite noted.

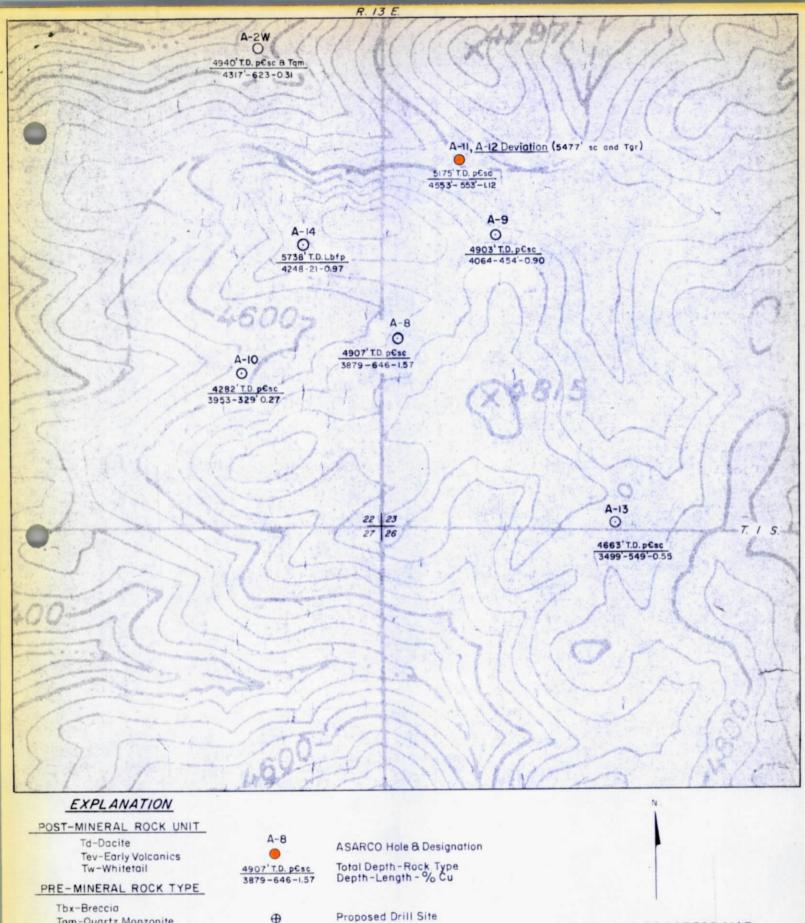
An oriented core study was undertaken during the second quarter and the results suggest south-dipping quartz-sulfide vein structures. A present re-evaluation suggests that the qsv structure (ending at 4748') in A-12 is the same structure as nicked in hole A-14. This places the qsv found in hole A-11 as a separate structure which should cut below the A-12 hole. We are continuing the A-12 hole to test this concept and expect to be in the A-11 qsv extension by around the 5400 foot depth, dependent on the hole deviation.

James D. Sell

gnes D. Sell

JDS:1b

Att: Drill Map



Tam-Quartz Monzonite Tar-Granite Pe-Supai Formation Pn-Naco Limestone Me-Escabrosa Limestone Dm-Martin Limestone p€t-Troy Quartz p€db-Diabase p€sc-Schist

Proposed Drill Site

TO ACCOMPANY QUARTERLY DATED 998 81 BY J. D. SEU

DRILLING PROGRESS MAP For The 3 1 Quarter, 1981

SUPERIOR EAST PROJECT

PINAL COUNTY, ARIZONA SCALE :1"=500"

J.D. Sell

June 1977



October 27, 1981

T0:

W.D. Payne

FROM:

J.D. Sell Jenes DSe P

Monthly Report, October 1981 Superior East Project, EA-0010 Pinal County, Arizona

During the month, hole A-12 was continued from 5477' to the terminal depth of 5724' in low grade values.

The hole has been surveyed by Mollen-hauer and found to continue to drift to the south and west.

Work presently is cleaning the hole by pulling the BX casing. This has been cut at 4900' and 4700' with another cut being planned for 4500'. Depending upon where the casing is removed from will in part determine where the wedge will be set for coring our non-assayed interval originally cut by the Navi-drill and the oriented core run.

Split core has been submitted but the results of the last ones have not been returned.

Estimated expenses for the month are \$15,750.00, leaving an estimated balance of \$71,031.00.

JDS/mlm

ANNUAL PROJECT PLANNING SHEET

	EXPENDITURES	TYPE OF PROJECT COST ESTIMATE ε APPROPRI	ATION REQUEST
DISTRICT: Southwest	1. Month of October \$ 15,750.	Recon	
PROJECT NAME: Superior East	2. Current Year Expenses to Date	y Drilling	Approvals
PROJECT NUMBER: 0010	thru 10/81 \$ 431,869.		Dist. West.
PROJECT SUPERVISOR: J.D.Sell	3. Budget for Current Year	Pre- Development Current Yr. Orig. Budget \$6	00,000 Geo1. U.S.
PROJECT GEOLOGIST: J.D.Sell	1981 \$ 600,000	Other Current Yr. Add. Request @ 5	
PREPARED BY/DATE: JDS/6-3-81	4. Thru previous year, since project began \$2,992,124	Current Yr. Add. Request @ \$ New Total \$	

OBJECTIVE: Confirmation and testing of qtz-sulfide vein system (of A-8 type) with two deviation holes, and completion of drill road to south for further testing; by Dec. 31, 1981 at a cost not to exceed \$600,000.

Progress for	the Month of	October 1981		
				 -

PLANNED TASKS	RESPONSIBILITY/TIME TO COMPLETE	TARGET DATE	% COMPLETE	PROGRESS TO DATE
1) Split and assay A-14.	JDS & SAC/1 week	6-15-81	100	
2) Complete drill hole summary of A-13 and A-14.	JDS/3 weeks	7-1-81	100	
3) Drill A-12, deviation to south, from A-11 hole; to determine dip of previously found vein system (A-9, A-11). Complete drill hole summary.	JDS, TCB, & Joy Drilling & Navi-drill company/ 8-9 months	9-15-81	Continued Coring	Hole terminated at 5724' in low grade values; work continuing in cleaning nole to place wedge at ± 4100' to core portion cut by the Navi-drill and oriented core study.
4) Start deviated hole to north, from hole A-11, to determine dip of previously found vein system (A-9, A-11).	JDS, TCB, Joy & Navi- drill/3 months	12-31-81	See June	Note: Upon completion of hole A-12, it is recommended that the rig be moved to hole A-14, recover the rented casing and core to the south either by turn-out using Navi-drill or oriented wedges, to test south portion of GSV system
5) Complete road to the southwest from A-10 pad (3/4 mile).	JDS & P.Bryant Constr./ 6 weeks	12-15-81	* 14. • 14. 14.	found in hole A-14 just below the oxidized bedrock.
6) Status report for Superior East	JDS/3 weeks	12-31-81		

Sugerior East October 1981

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Southwestern Exploration Division

December 1, 1981

TO: William D. Payne

FROM: James D. Sell

> Monthly Report, November 1981 Superior East Project, EA-0010 Pinal County, Arizona

Drill hole A-12 was completed to 5724 feet T.D., and surveyed for departure, inclination, and temperature at the end of the previous month.

As it is planned to set a wedge and core the Navi-drilled and oriented core portions of hole A-12, it was necessary to remove the BX casing down to the wedge point. Unfortunately, after numerous cuts with the retractable knife blades, the casing refused to budge and N.L. McCullough was called in to locate the "free point" and cut the casing. However, when the necessary strain was placed on the casing, the casing parted and it was some days before a proper hook-up was made. After 76 hours of stand-by, McCullough was released.

More time was lost in cleaning the hole, reconnecting the various strings of pipe, etc., and attempting to place a cement plug for the wedge (after deciding to drill through the casing).

As of the end of the month (11/25/81), a wedge has been set at 4095 feet and cemented. They have now (as of 11/30) cored out the cement (not set very hard) and have drilled with the pilot-reamer hit, hitting the top of the wedge at 4084 feet and have drilled some 5 feet beyond. They believe they have penetrated the wall of the casing and now have a regular core bit on and are going in the hole to cut a core. The next 24 hours will indicate how successful they have been in going off the wedge and into oxidized capping.

The top of sulfides is estimated to be at 4170 feet.

no planning sheetaltached.

Expenses for the month are estimated at \$7,637.00, leaving an estimated actual 42,000 bed last months's our of 35,000 now come et. J.

balance of \$63,394.00.

JDS/mlm

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Southwestern Exploration Division

December 28, 1981

TO: W.D. Payne

FROM: J.D. Sell

Monthly Report, December 1981 Superior East Project, EA-0010 Pinal County, Arizona

Junes D. Self

As reported last month, a wedge hole (A-12-A) was started BX size by reaming through the casing. The first core recovered was at 4093 feet in oxidized capping in Precambrian schist and Laramide porphyry. This excellent capping contained minor oxidized remnant chalcocite and native copper near the base. The sulfide, non-oxidized, interface was at 4171' and coring continued to the terminal depth of 4240'. This coring overlaps the portion of the sulfide zone which was Navi-drilled in the original A-12 hole.

This portion of the core has not yet been split and sent for assay and when it is split, so will the oriented core portion of the hole be split. These two zones are expected to be about the same as the present average for the core which has been split (plus 0.8% copper).

Some 2900 feet of BX rods (as casing) were removed but only 30 feet of NX casing was recovered. The tight hole and broken top of casing presented additional casing removal without anticipated time consuming procedures. The hole was closed in.

The rig has been moved to A-14 site and left hand rods are now in the hole preparing to retrieve available BX casing (rods). The NX casing will be left in the hole and bought by ASARCO.

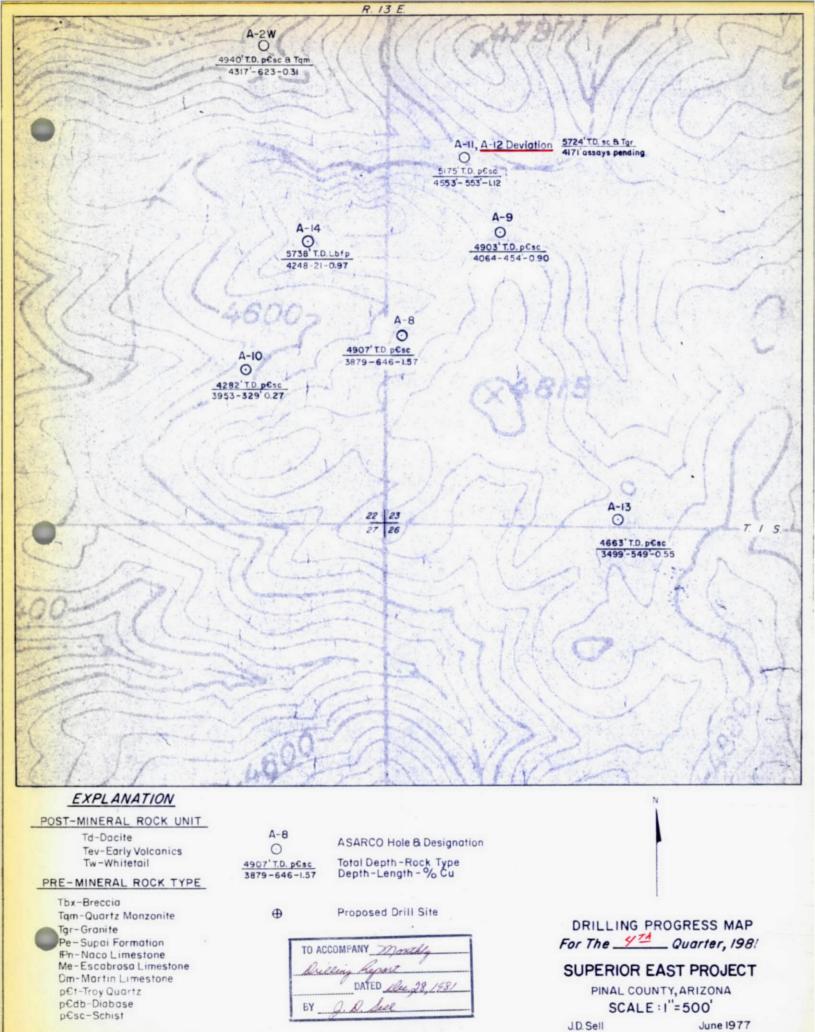
Economic considerations at this time necessitates the closing of the project after A-14 work has been completed.

In addition to the A-12 assay report, a report summarizing the project in the area of A-12 is in progress.

Expenses for the month are estimated at \$ 39,028.00 , leaving an estimated balance of \$24,366.00.

JDS/mlm

Attachments(3):
Drilling Progress Map
Drilling Summary Sheet
Planning Sheet



MVK-3041

ASARCO MONTHLY DRILLING SUMMARY

DISTRICT Southwest U.S.

Project Superior East Project No. EA-0010 State Arizona County Pinal Month December Year 1981 Page Footage drilled Hole No. Collar location Bearing Remarks (significant intersections, geology and/or assay intervals, etc.) То Feet From Southerly 6°-10° Terminated at Navi-drilled from A-12-A was cored to provide an overlap in the sulfide section of A-12 which was blindly A-8; AZ.Central 5724 Feet drilled by the Navi-drill in A-12. The total hole is in Precambrian Pinal Schist and 846,600N;744, 150E Laramide biotite feldspar porphyry. Intercepts are: Oxide sulfide @ 4171' Wedge in A-12 at unknown 4093 4240 147 A-12-A Unknown 4171-4217', 46 foot assays pending from core cut by A-12-A. 4095' (base) 4217-4232, 15' @ 1.75% Cu. 4232-4343', 111' @ 0.38 4343-4375, 32' (oriented core, assays pending) 4375-4401', 26 feet @ 1.10 4401-4488', 87 feet @ 0.67 4488-4501', 13 feet @ 2.07 4501-4523', 22' @ 0.37 4523-4554', 31 feet @ 2.30 4554-4662½', 108½ feet @ 0.41 4662½-4705', 42½ feet @ 1.25 4705-4748', 43 feet @ 0.80 4748-5257, 509 feet @ 0.46

December

Summary Sheet

ANNUAL PROJECT PLANNING SHEET

DISTRICT: _	Sou	thwest			
PROJECT NAM	1E: _	Superior	East		
PROJECT NUM	IBER:	0010			

PROJECT NUMBER: 0010
PROJECT SUPERVISOR: J.D.Sell

PROJECT GEOLOGIST: J.D.Sell

PREPARED BY/DATE: ___JDS/6-3-81

ΕX	PEND	ITU	RES
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- 1. Month of 12/81 \$ 39,028.00
- 2. Current Year Expenses to Date thru <u>12/81</u> \$ 478,534.00
- 3. Budget for Current Year 1981 \$ 600,000
- 4. Thru previous year, since project began \$2,992,124

ΓΥΡΕ	0F	PROJECT	

Recon

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Pre-Development

Other

Current Yr. Orig. Budget Current Yr. Add. Request @

Current Yr. Add. Request @ __ New Total

w lotal \$

Progress for the Month of December 1981

COST ESTIMATE & APPROPRIATION REQUEST

\$600,000

Approvals

Dist. West.

Geol.

U.S.

OBJECTIVE: Confirmation and testing of qtz-sulfide vein system (of A-8 type) with two deviation holes, and completion of drill road to south for further testing; by Dec. 31, 1981 at a cost not to exceed \$600,000.

Dec. 31, 1981 at a cost	not to exce	eed \$600,000.	rurence ees	cing, by	* * * * * * * * * * * * * * * * * * *			
				1				
PLANNED TASKS		RESPONSIBILITY/TIME	TARGET	% COMPLETE		PROGRESS TO D	ATE	

	PLANNED TASKS	TO COMPLETE	DATE	% COMPLETE	PROGRESS TO DATE
.1)	Split and assay A-14.	JDS & SAC/1 week	6-15-81	100	
2)	Complete drill hole summary of A-13 and A-14.	JDS/3 weeks	7-1-81	100	
3)	Drill A-12, deviation to south, from A-11 hole; to determine dip of previously found vein system (A-9, A-11). Complete drill hole summary.	JDS, TCB, & Joy Drilling & Navi-drill company/ 8-9 months	9-15-81	Coring 100; Report in progress	Original A-12 hole terminated at 5724' with ore-grade values from 4170' to 4748'. A second wedge hole, A-12-A, cored from 4093' to 4240', overlapping the hole non-cored by the Navi-drill of A-12. The oriented core in A-12 also taken will now be split, along with A-12-A portion core. Complete assays are pending.
4)	Start deviated hole to north, from hole A-11, to determine dip of previously found vein system (A-9, A-11).	JDS, TCB, Joy & Navi- drill/3 months	12-31-81	Cancelled - See June Sheet	
5)	Complete road to the southwest from A-10 pad (3/4 mile).	JDS & P.Bryant Constr./ 6 weeks	12-15-81	Cancelled	The rig was moved to hole A-14 where the BX rods (casing) will be recovered as available. The NX casing will remain, being bought
6)	Status report for Superior East	JDS/3 weeks	12-31-81	Report in progress	by ASARCO, for hole retention in the event of a hole wedge out toward the south in future drilling considerations.
					The project has been closed until further drilling and road work funds are available.

Slanning Sheet



Southwestern Exploration Division

December 28, 1981

TO:

W.D. Payne

FROM:

J.D. Sell

Quarterly Report, 4th Quarter October-November-December, 1981 Superior East Project, EA-0010 Pinal County, Arizona

Coring of drill hole A-12 was continued during the quarter, advancing from 5477' to 5724' where the hole was terminated. The hole continued in Precambrian Pinal Schist and Laramide biotite feldspar porphyry to the terminal depth.

A wedge was then set at 4095' (base) and a hole milled out through the BX casing and BX coring then resumed from 4093' to 4240' where the hole was closed down. This wedge portion (A-12-A) was to core the oxide-sulfide interface (found at 4171') and continued down to a depth sufficient to overlap the A-12 hole where no core had been recovered in the Navi-drill portion. The core of A-12-A will be split, along with the oriented core from the interval 4343' to 4375', and assayed to give a complete interval of assays.

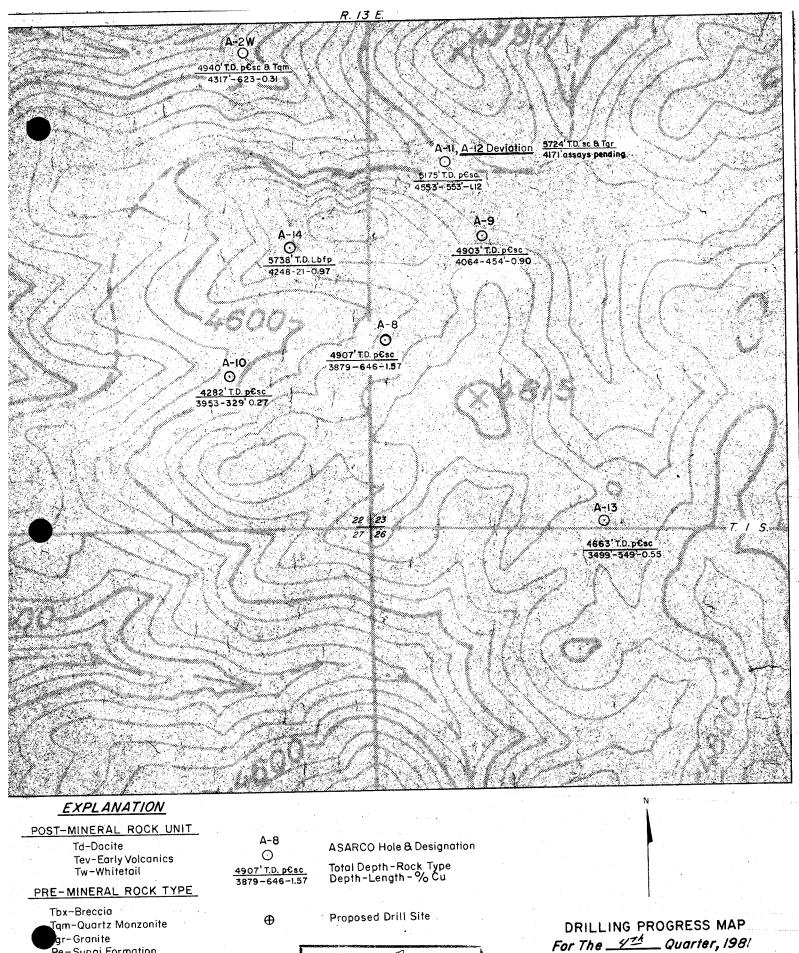
The rig has been moved to hole A-14 where various casings had been left in anticipation of a wedge drill out similar to A-12. With the economic close down of drilling projects, the BX casing in hole A-14 will be salvaged as far as possible and the NX casing will be bought by ASARCO and left in the hole for future drilling possibilities.

The summary reports on hole A-12 and the reinterpretation of the sulfide intercepts in holes A-8 through A-14 are now in progress.

JDS/m1m

Attachment: Drilling Progress Map

James D. Self



Pe-Supai Formation Mn-Naco Limestone Me-Escabrosa Limestone Dm-Martin Limestone p€t-Troy Quartz p€db-Diabase p€sc-Schist

TO ACCOMPANY Que DATED See, 38, 1981

SUPERIOR EAST PROJECT

PINAL COUNTY, ARIZONA SCALE:1"=500

J.D. Sell

June 1977

TAB

1982

Southwestern Exploration Division

ASARCO

January 26, 1982

TO: W. D. Payne

FROM: J. D. Sell

Monthly Report, January 1982 Superior East Project, EA-0010 Pinal County, Arizona

The assays have been received from the holes A-12 and the overlap wedge hole A-12-A which cored the portion which was lost by Navi-drilling. The oriented core run was also assayed. These assays were reported in two reports:

1) Additional Coring and Assay Splits, A-12 and A-12A (January 13), and

2) Assay Report, Holes A-12 and A-12-A (January 15).

The combined interpretation suggests (starting at 4171): 317 feet at 0.64% copper followed by 260 feet at 0.92%, followed by 509 feet at 0.46%, with a rapid drop-off below.

The rig, after moving to hole A-14, was successful in removing 3750 feet of BX casing. This leaves BX casing from 3750'-5493'. All the NX casing to 2891 feet was left in place. A six-sack cement plug was set at 3000 feet which probably filled the hole up into the NX casing. The plug was set to stabilize the hole and be available for setting a wedge in the event that a wedge hole is desired from A-14.

All holes have been capped and the sites cleaned.

Expenses for the month are estimated at \$59,377,00, leaving an estimated overrun of \$35,011.00.

No planning sheet is attached.

James D. Sell

James D. Sell

JDS:mek



February 25, 1982

TO: W. D. Payne

FROM: J. D. Sell

Monthly Report, February 1982 Superior East Project, EA-0010 Pinal County, Arizona

An update report on all the drilling, assays, and interpretaion for the A-8 porphyry copper area has been completed in draft form.

Mr. Jim Stringham of the Southwestern Mining Department visited the core shack one day to review the overall features with special interest in rock stability for mining parameters.

About sixty samples were collected from the hole A-12 and sent for preparation of thin-sections, polished thin sections, and polished sections to supplement those previously collected from other drill holes. A study will be undertaken to secure a better grasp of the alteration-paragenesis of the units-minerals encountered.

Expenses for the month are estimated at \$7,417.00 giving an estimated overrun of \$5,359.

James D. Sell
James D. Sell

JDS/cg

Attachment

		and the second s	
COST ESTIMATE	3	APPROPRIATION	REQUE

DISTRICT: Southwes	st
PROJECT NAME: Supe	erior East
PROJECT NUMBER:	0010
PROJECT SUPERVISOR:	J.D.Sell
PROJECT GEOLOGIST: _	J.D.Sell
PREPARED BY/DATE.	IDS /6-2-81

Dec. 31, 1981 at a cost not to exceed \$600,000.

1.	Month	of	Feb.	\$ 7,417.	00

2. Current Year Expenses to Date thru Feb. \$ 45,903

3. Budget for Current Year

4. Thru previous year, since project began \$3,475,741.

OBJECTIVE: Confirmation and testing of qtz-sulfide vein system (of A-8 type) with two

deviation holes, and completion of drill road to south for further testing; by

TYPE	OF PROJECT
	Recon
Х	Drilling
	Pre- Development
	Other

Approvals Dist. West. Geol. U.S. Current Yr. Orig. Budget with \$600,000 Current Yr. Add. Request @ Current Yr. Add. Request @ New Total

Progress for the Month of February 1982

(Continuation of 1981-no new funds)

PLANNED TASKS	RESPONSIBILITY/TIME TO COMPLETE	TARGET DATE	% COMPLETE	PROGRESS TO DATE
1) Split and assay A-14.	JDS & SAC/1 week	6-15-81	100	
Complete drill hole summary of A-13 and A-14.	JDS/3 weeks	7~1-81	100	
3) Drill A-12, deviation to south from A-11 hole; to determine dip of previously found vein system (A-9, A-11). Complete drill hole summary.	JDS, TCB, & Joy Drilling & Navi-drill company/8-9 months	9-15-81	100	
4) Start deviated hole to north, from hole A-11, to determine dip of previously found vein system (A-9, A-11).	JDS, TCB, Joy & Navi- drill/3 months	12-31-81	Revokedsee June 1981	
5) Complete road to the southwest from A-10 pad (3/4 mile).	JDS & P.Bryant Constr./ 6 weeks	12-15-81	Postponed for Reevaluation	See December 1981
6) Status report for Superior Eas	t.JDS/3 weeks	12-31-81	95	In rough draft form to typist. Review and critique prior to final drafting and typing.

Southwestern Exploration Division

March 25, 1982

TO: W. D. Payne

FROM: J. D. Sell

Monthly Report, March 1982 Superior East Project, EA-0010 Pinal County, Arizona

A report entitled "Summary and Interpretation of Drilling Results thru Holes A-14 and AI-2, Porphyry Copper Area" has been completed and is now awaiting the final map attachments prior to distribution.

The samples collected from hole A-12 have now been converted into polished thin-sections, etc. It is anticipated that I will have only minor time for their study and intergration until after the summers work elsewhere.

Mr. H. M. Stone is in the process of checking the claims of the area, replacing any missing notices, and building up the monuments if necessary.

Expenses for the month are estimated at \$ 5,953 , with a total project overrun of \$18,833.

James D. Sell

Junes D Sell

JDS:mek

Att. (Planning Sheet)

Approvals Dist. West.

U.S. Luc

	EXPENDITURES	TYPE OF PROJECT COST ESTIMATE & APPROPRIATION	REQUEST
DISTRICT: Southwest	1. Month of <u>Mar.</u> \$ 5,953	Recon	Appr
PROJECT NAME: Superior East	2. Current Year Expenses to Date	X Drilling	Dist.
PROJECT NUMBER: 0010	thru <u>Mar.</u> \$ <u>\(\/8,833\)</u>	Pre-	Geol.
PROJECT SUPERVISOR: J.D.Sell	3. Budget for Current Year	Development Current Yr. Orig. Budget \$600,000 Current Yr. Add. Request @ \$	wol-
PROJECT GEOLOGIST: J.D.Sell	198 \$ 4. Thru previous year, since	Other Current Yr. Add. Request @ \$	
PREPARED BY/DATE: JDS/6-3-81	project began \$3,475,741	New Total \$	
OD ISST US Confirmed and a second		Progress for the Month of March 1982	

OBJECTIVE: Confirmation and testing of qtz-sulfide vein system (of A-8 type) with two deviation holes, and completion of drill road to south for further testing; by Dec. 31, 1981 at a cost not to exceed \$600,000.

	PLANNED TASKS	RESPONSIBILITY/TIME TO COMPLETE	TARGET DATE	% COMPLETE	PROGRESS TO DATE
1)	Split and assay A-14.	JDS & SAC/1 week	6-15-81	100	
2)	Complete drill hole summary of A-13 and A-14.	JDS/3 weeks	7-1-81	100	
3)	Drill A-12, deviation to south, from A-11 hole; to determine dip of previously found vein system (A-9, A-11). Complete drill hole summary.	JDS, TCB, & Joy Drilling & Navi-drill company/ 8-9 months	9-15-81	100	
4)	Start deviated hole to north, from hole A-11, to determine dip of previously found vein system (A-9, A-11).	JDS, TCB, Joy & Navi- drill/3 months	12-31-81	Revokedsee June 1981	
5)	Complete road to the southwest from A-10 pad (3/4 mile).	JDS & P.Bryant Constr./ 6 weeks	12-15-81	Postponed for Reevaluation	See December 1981
6)	Status report for Superior East	JDS/3 weeks	12-31-81	100	Completed report now in drafting for attachments.
ata net same t					

MINE EXAMINATION & DEVELOPMENT EXPENSE

OFFICE: TUCSON OFFICE PROJECT: SUPERIOR EAST

April 13, 1982

MONTH MARCH - 1982

GENERAL LEDGER NO. (20-23)	SUBSIDIARY LEDGER NO. (24-29)	DEPT/COST CENTER (30-33)	EXPENSE NO. (34-36)	EXPLANATION (54-71)	MONTH (43-53)		YEAR	-	TO DATE	
	00	0521	100	Salaries		-	144	94	17, 029	_
	00	0521	150	Wages					235	
A	00	0521	200	Additional Labor					421	_
	00	0521	220	Social Security Txs				23	9.51	20
	00	0521	230	Group Life Insurance				29	244	_
	00	0521	240	Retirement Annuity			24	50	1, 9.35	100
	00	0521	400	Supplies		-			9, 294	9
	00	0521	530	Postage						1_
	00	0521	600	Traveling			137	26	4, 637	12
	00	0521	750	Services	1, 938	32	52, 668	59	667, 219	190
	00	0521	801	Sales Tax					/ 03	1
	00	0530	100	Salaries			5,850	77	17, 839	14
	00	0530	200	Additional Labor					353	3 5
	00	0 5 3 0	220	Social Security Txs			442	54	788	7
	00	0530	230	Group Life Insurance			47	89	215	-
	00	0530	240	Retirement Annuity			741	80	z, z 33	
	00	0530	400	Supplies		7.1			36	1
	00	0530	600	Traveling					1 248	
	00	0530	801	Sales Tax					, 478	
	00	0540	100	Salaries				1=		14
	00						829	89	<u> </u>	
3	00	0540	150	Wages		<u> </u>			95%	
	1	0540	200	Additional Labor					5-9	
	00	0540	220	Social Security Txs		<u> </u>	44	.38	115	. 8
	00	0540	230	Group Life Insurance			10	40	34	4
	00	0540	240	Retirement Annuity			112	34	3 48	14
	00	0540	350	Equipment Rental					1	1_
	00	0540	400	Supplies					198	5
	00	0540	600	Traveling					293	_
	00	0540	750	Services			149	00	6,009	
	00	0540	801	Sales Tax				1	14	
	00	0570	100	Salaries	1.446	00	1. 666	00	1.757	-
	00	0570	220	Scoial Security Txs	1,000		129		135	
	00	0570	230	Group Life Insurance		25		05		
	00	0570	240	Retirement Annuity	21	58	<u> </u>	58	22	_
· · · · · · · · · · · · · · · · · · ·					223		223		2.3.3	
	00	0570	600	Supplies		08		08	4.3	
		0570		Traveling	508		508	00	514	
	00	0570	801	Sales Tax		72		72		8
	00	0580	100	Salaries					400	
1 1	00	0580	200	Additional Labor					89	
	00	0580	600	Traveling		1			22	z
	00 _	0580	750	Services					52,549	92
	00	0580	790	Rent	139	00	417	00	2, 849	٠,
	00	0580	801	Sales Tax		54		68	775	
	00	0610	100	Salaries					2.317	
	00	0610	200	Additional Labor		<u> </u>			141	
	00	0610	220	Social Security Txs				 	191	
#	00	0610	230	Group Life Insurance		<u> </u>		 		
	00	0610	240						24	
	00	0610		Retirement Annuity				-	201	
	·		400	Supplies				 		15
	00	0610	500	Communications	35	20	7.0	33	408	
· · · · · · · · · · · · · · · · · · ·	00	0610	600	Traveling		ļ				48
	00	0610	780	Fuel, Power, Water	14	50	74	69	.589	- 1
 	00	0610	790	Rent		-	<u> </u>	ļ	4,800	5/10
	00	0610	801	Sales Tax				<u> </u>		12
	00	0620	100	Salaries	152	00	539	00	3, 680	21
	00	0620	200	Additional Labor					198	
	00	0620	220	Social Security Txs	11	77	40	23	ما گ ا	
	00	0620	230	Group Life Insurance	1	88		57	39	
	00	0620	240	Retirement Annuity	10	39		28		
	00	0620	400	Supplies		90	5		105	
<u> </u>	00	0620	500	Communication	<u> </u>	12	3 1	13	103 5	
-	00	0620	801	Sales Tax		07		04		. 3
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MONTH MARCH - 1982

MINE EXAMINATION & DEVELOPMENT EXPENSE

OFFICE: TUCSON OFFICE PROJECT: SUPERIOR FAST

Marie Marie

April 13, 1982

Form. ME-3



March 25, 1982

TO: W. D. Payne

FROM: J. D. Sell

Quarterly Report, 1st Quarter Jan.-Feb.-March 1982 Superior East Project, EA-0010 Pinal County, Arizona

Work during the quarter included removing a portion of the casing from hole A-14. At present, 2891 feet of NX casing is complete from the surface and a cement plug was placed at 3000 feet and allowed to fill up into the casing. This is to stabilize and preserve the hole in the event we wish to reenter the hole with a directional controlled machine for further intercepts.

Complete assays for hole A-12 and the overlap wedge hole A-12-A have been reported in an assay report. The sulfide intercept is as follows, starting at 4171' from the surface:

A summary report on all the holes in the porphyry copper area has been typed and is now awaiting the drafting of the attachments prior to being distributed. A potential within the holes A-8, -9, -11, and -12, suggests around 54 million tons at 0.95% copper as block caving type potential 700 feet thick with an increase to between 200-500 million tons at a probable lower grade based on available drill holes at a distance of 1300-2000 feet away from the central core area. A five-hole program is proposed to firm up the overall size and grade potential of the area.

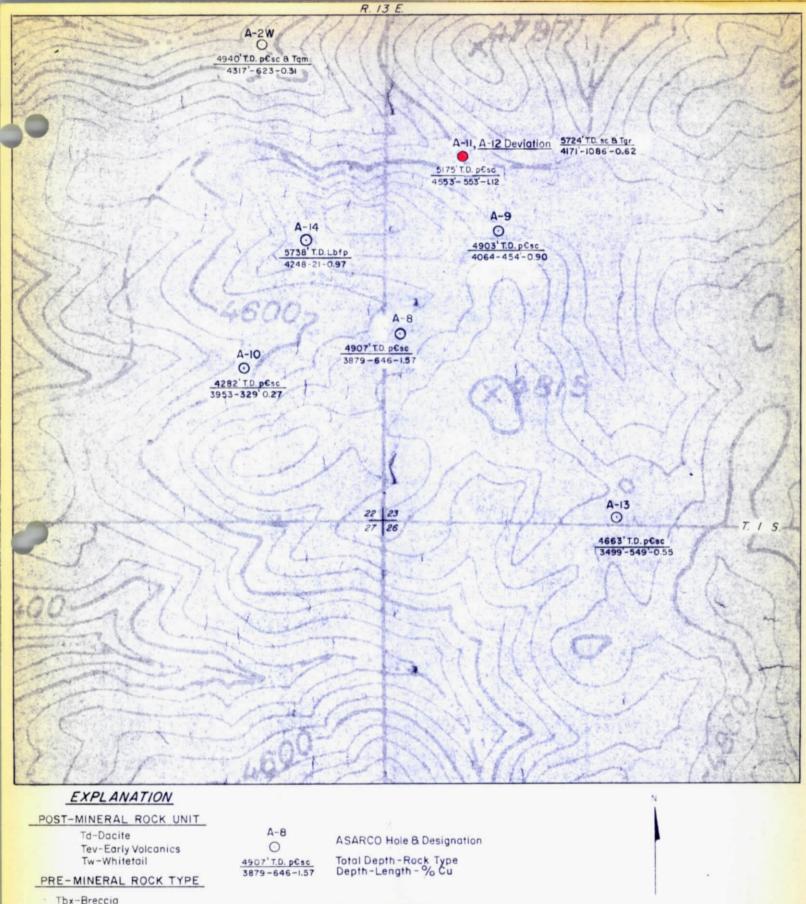
Additional samples for petrographic study of the alteration-mineralization and rock types have been received from hole A-12, but it is doubtful that I'll be able to complete a study until after the summer work in the Utah-Nevada limestone replacement deposit potential.

Mr. H.M. Stone is presently rechecking each claim in the area and replacing any missing notices as well as adding to the claim monument size. This will be an on-going project as time allows.

James D. Sall
James D. Sell

JDS:mek

Att. (Drilling Progress Map)



Tbx-Breccia Tam-Quartz Monzonite

Tgr-Granite

Pe-Supai Formation

Pn-Naco Limestone

Me-Escabrosa Limestone

Dm-Martin Limestone

p€t-Troy Quartz

p€db-Diabase p€sc-Schist \oplus

Proposed Drill Site

TO ACCOMPANY Quarterly
Bepett
DATED 3/25/82
BY J.D. Sell

DRILLING PROGRESS MAP
For The _____ Quarter, 1982

SUPERIOR EAST PROJECT

PINAL COUNTY, ARIZONA SCALE: 1"=500"

J.D. Sell

June 1977



Tgr-Granite

Pe-Supai Formation

Pn-Naco Limestone

Me-Escabrosa Limestone

Dm-Martin Limestone p€t-Troy Quartz

p€db-Diabase

p€sc-Schist

TO ACCOMPANY Quarterly DATED 3/25/82

DRILLING PROGRESS MAP For The _____ Quarter, 1982

SUPERIOR EAST PROJECT

PINAL COUNTY, ARIZONA SCALE :1"=500"

J.D. Sell

June 1977

April 27, 1982

To: Project File

From: J. D. Sell

Monthly Report, April 1982 Superior East Project, EA-0010 Pinal County, Arizona

Mr. Stone has continued some work on the claims. No other activity is reported.

Expenses for the month are estimated at \$4,699, leaving a total project overrun of \$22,632.

J. D. Sell

JDS/cg

Approvals
Dist. West.

Geol.

U.S.

	ANNUAL PROJEC	PLANNING SHEET			
	EXPENDITURES	TYPE OF PROJECT		COST ESTIMATE & APP	ROPRIATION REC
DISTRICT: Southwest	1. Month of April \$ 4,699	Recon			
PROJECT NAME: Superior East	2. Current Year Expenses to Date	X Drilling			
PROJECT NUMBER: 0010	thru April \$ 70,593 (22632)	Pre-			-
PROJECT SUPERVISOR: J.D.Sell	3. Budget for Current Year 198 \$	Development		r. Orig. Budget r. Add. Request @	\$600,000
PROJECT GEOLOGIST: J.D.Sell	4. Thru previous year, since	Other		r. Add. Request @	Š Š
PREPARED BY/DATE: JDS/6-3-8:	project began \$3,475,741		New Total		\$
on increase Confirmation and traction of			Progress	for the Month of Apr	il 1982
OBJECTIVE: Confirmation and testing of deviation holes, and completion of dril					

Dec. 31, 1981 at a cost not to exceed \$600,000.

-	PLANNED TASKS	RESPONSIBILITY/TIME TO COMPLETE	TARGET DATE	% COMPLETE	PROGRESS TO DATE
	1) Split and assay A-14.	JDS & SAC/1 week	6-15-81	100	
	 Complete drill hole summary of A-13 and A-14. 	JDS/3 weeks	7-1-81	100	
	3) Drill A-12, deviation to south, from A-11 hole; to determine dip of previously found vein system (A-9, A-11). Complete drill hole summary.	JDS, TCB, & Joy Drilling & Navi-drill company/ 8-9 months	9-15-81	100	
	4) Start deviated hole to north, from hole A-11, to determine dip of previously found vein system (A-9, A-11).	JDS, TCB, Joy & Navi- drill/3 months	12-31-81	Revokedsee June 1981	
	5) Complete road to the southwest from A-10 pad (3/4 mile).	JDS & P.Bryant Constr./ 6 weeks	12-15-81	Postponed for Reevaluation	See December 1981
	6) Status report for Superior East	JDS/3 weeks	12-31-81	100	Completed report now in drafting for attachments.
					NO ACTIVITY CHANGE FOR APRIL

SOUTHWESTERN EXPLORATION DIVISION

26th <u>April</u> thru 25th <u>May</u>, 1982

HTROM	Y COST	SUMMARY	1

Superior Cast Project, Sina (Coun	ity)	(State)
RECT DRILLING (Acct. 521-)		(State)
NTRACTORS' CHARGES		
Invoiced during month covering prior month's work		
Contractors' Services (Invoice Amt.)	en de la companya de la companya de la companya de la companya de la companya de la companya de la companya de La companya de la co	
(Prior month's estimate)		
(Invoice Amt.)		
(Prior month's estimate)		
Invoiced during month covering current month's wor	k	
Contractors' Services	Statement Amt.	
Estimated balance of contractors' charges covering	work through 25t	h of current mont
Contractors' Services	Statement Amt.	
		en en en en en en en en en en en en en e
Supplies and Freight		
Supplies and Fleight		
Field Trailer Rental		
Water Purchases (Drilling)		
Surveying of Drill Holes		
TE PREPARATION (Acct. 580-)		
NTRACTORS' CHARGES		
Invoiced during month covering prior month's work		
Contractor's Services (Invoice Amt.)	•	
(Prior month's estimate)		
Invoiced during month covering current month's wor	k	
Contractor's Services	Statement Amt.	
Estimated balance of contractor's charges covering	work through end	of current month
Contractor's Services	Estimated Cost	
Supplies and Freight		

Soo Page 2

1b rev. 1/06/81

<u>Name</u>			No. Days Allocated to Project During Month (show as ratio to total working days in month, i.e., 24/26)	
No. 20				
<u>Name</u>		No. of Strai Time Hours During Month	Hours During	
Traveling an	d Living Expenses	- ASARCO Salari	ed Personnel	
Name			Estimated or Actual Traveling Expenses Incurred During Month	
	_			
Supplies - I	temize individual	purchases of \$2 ses under Misc.	5.00 or more -	
Supplies - I	Itemize individual group small purcha	ses under Misc.	5.00 or more -	
<u> </u>	Itemize individual group small purcha	ses under Misc.		
<u> </u>	Itemize individual group small purcha	purchases of \$2 ses under Misc.		
Item Assaying	Itemize individual group small purcha	purchases of \$2 ses under Misc.	Charge or Estimated Expense for Assaying	

BRYANT CONSTRUCTION CO.

General Contractors Lic. No. A-43332 843 SPRAY ST., SUPERIOR, AZ 85273 Phone 689-2627 1NVOIC 00136:

9	ASARCO Incorporated Southwestern Exploration Di	vision	Ma	y 7, 19	32		
Ó	P.O. Box 5747 Tucson, Arizona 85703	o de la companya de l					
CUST. ORDER NO.	DATE SHIPPED VIA TER	MS	SALESMAN	F.O.B.		OUR ORDER	NC
QUANTITY	D E S C R I P T I O	N		UNIT PRI	CE	AMOUNT	
	Moving Pipe to J I Ranch 7	inch					i 1 1
l½ hrs 4 hrs	Truck and Trailer BackhoeLoading Pipe One Man (Labor)			\$32.50 \$16.00	hr hr	187 48 64	17
	Total State Tax 2.6%				1	\$300 7	28
	Total					\$308	C
		OK for key Demes to Sugarios	Sell				1
		Legerion	East Red	EACO	10		1
						er frances en grade en de la company de la c	i i



May 27, 1982

To: Project File

From: J. D. Sell

Monthly Report, May 1982 Superior East Project, EA-0010 Pinal County, Arizina

The only activity on the project was the moving of some pipe to the ranch stock-pile.

Expenses for the month are estimated to be \$1,029 leaving an estimated overrun of \$23,526.

James D. Sell

JDS/cg

ANNUAL PROJECT PLANNING SHEET

DISTRICT: Southwest PROJECT NAME: Superior East	EXPENDITURES 1. Month of May \$ 5029	Recon	<u>COST ESTIMATE 8</u>	& APPROPRIATION R	REQUEST Approve
PROJECT NAME: Superior East PROJECT NUMBER: 0010 PROJECT SUPERVISOR: J.D.Sell PROJECT GEOLOGIST: J.D.Sell PREPARED BY/DATE: JDS/6-3-81	2. Current Year Expenses to Date thru May \$ 7/,487 3. Budget for Current Year 198 \$ 4. Thru previous year, since project began \$ 3,475,741	X Drilling Pre- Development Other	Current Yr. Orig. Budget Current Yr. Add. Request @ Current Yr. Add. Request @ New Total		Dist. V Geol.
OBJECTIVE: Confirmation and testing of deviation holes, and completion of dr Dec. 31, 1981 at a cost not to exceed	f qtz-sulfide vein system (of A-8 type) ill road to south for further testing; \$600,000.	with two by	Progress for the Month of	MAY 1982	

	PLANNED TASKS	RESPONSIBILITY/TIME TO COMPLETE	TARGET DATE	% COMPLETE	PROGRESS TO DATE
1)	Split and assay A-14.	JDS & SAC/1 week	6-15-81	100	
2)	Complete drill hole summary of A-13 and A-14.	JDS/3 weeks	7-1-81	100	
3)	Drill A-12, deviation to south, from A-11 hole; to determine dip of previously found vein system (A-9, A-11). Complete drill hole summary.	JDS, TCB, & Joy Drilling & Navi-drill company/ 8-9 months	9-15-81	100	
4)	Start deviated hole to north, from hole A-11, to determine dip of previously found vein system (A-9, A-11).	JDS, TCB, Joy & Navi- drill/3 months	12-31-81	Revokedsee June 1981	
5)	Complete road to the southwest from A-10 pad (3/4 mile).	JDS & P.Bryant Constr./ 6 weeks	12-15-81	Postponed for Reevaluation	See December 1981
6)	Status report for Superior East.	JDS/3 weeks	12-31-81	100	Completed report dated March 10, 1982
					NO ACTIVITY CHANGE FOR MAY

TAB

1983

Southwestern Exploration Division



September 29, 1983

Memorandum to File

3rd Quarter Report July - September 1983 Superior East Project (EA-0010) Pinal County, AZ

There was no activity on this project during this quarter.

James D. Sell

JDS/cg



December 22, 1983

File Memorandum

4th Quarter Report October-December 1983 Superior East Project (EA-0010) Pinal County, AZ

No activity was conducted on the property during this quarter.

James D. Sell
James D. Sell

JDS/cg

cc: JRStringham



March 14, 1984

File Memorandum

lst Quarter Report January-March 1984 Superior East Project Pinal County, AZ

Joy Drilling Company has been given the contract to re-enter drill hole A-15 and expend the monies for the Rawhide and Superior East claim blocks for the assessment year ending August 31, 1984.

The hole is drill cased to 2029 feet in Earlier Volcanics. The BX hole will be in volcanics for the next several hundred feet before entering the Whitetail Conglomerate. The top of the premineral units is expected between 3800 and 3900 feet of depth.

Joy is scheduled to move on site during the final week of the quarter.

James D. Sell

JDS/cg

cc: JRStringham

Tex 2009

____ 38-50 =

premin



May 8, 1984

File Memorandum

Monthly Report - April 1984 Superior East Project, EA-0010 Pinal County, AZ

Joy Drilling Company re-entered drill hole A-15 on March 28, 1984 and reamed out the corebarrel and bit which had been left in the hole from last year.

BX wireline coring commenced at 2029 feet in Earlier Volcanics on April 3, 1984 and reached the base of the Earlier Volcanics at 2069 feet.

Whitetail Conglomerate has extended from 2069 feet to 3033 feet as of the end of the month (April 25).

James D. Sell

JDS/cg

Southwestern Exploration Division



July 3, 1984

FILE MEMORANDUM

2nd Quarter Report April-June 1984 Superior East Project Pinal County, AZ

Drilling resumed in hole A-15 by Joy Manufacturing Company on March 27, 1984 at the previously cased depth of 2029 feet. The hole was resumed at BX size and continues at a depth of 4450 thru the quarter.

Synopsis of the entire hole, as of 6/25/84, is as follows:

Surface - 1512	Dacite w/basal virtophyre and tuff.
1512 - 2069	Earlier Volcanics, 12½ flow units.
2069 - 2905	Whitetail Conglomerate, with limestone
	marker bed at 2302-04.
2905 - 3338	A-2 Type Slide Block, oxidized Pinal
	Schist, few altered bands, basal fault
	breccia.
3338 - 3622	Pinal Schist, oxidized, weak leached
	capping.
3622 - 4450	Pinal Schist, with variable alteration
	and sulfide content.

Scattered assays have been taken down the hole, some in trace native copper in the conglomerate with the best value of 0.12% copper at 2260-2270. The best in the slide block was 0.27% copper at 3000-3010.

Continuous assays have been cut from 3600 feet to 4082 feet. Weighted averages include (all as copper percent):

3600 - 3622; 22' @ 0.01% oxide sulfide

3622 - 3670; 48' @ 0.14% 3670 - 3739; 69' @ 0.98% 3739 - 3802; 63' @ 0.46% 3802 - 2918; 116' @ 1.31% 3918 - 4082; 164' @ 0.48% The hole to date is similar to others in the area with the more altered quartz zones carrying chalcocite and bornite with minor pyrite.

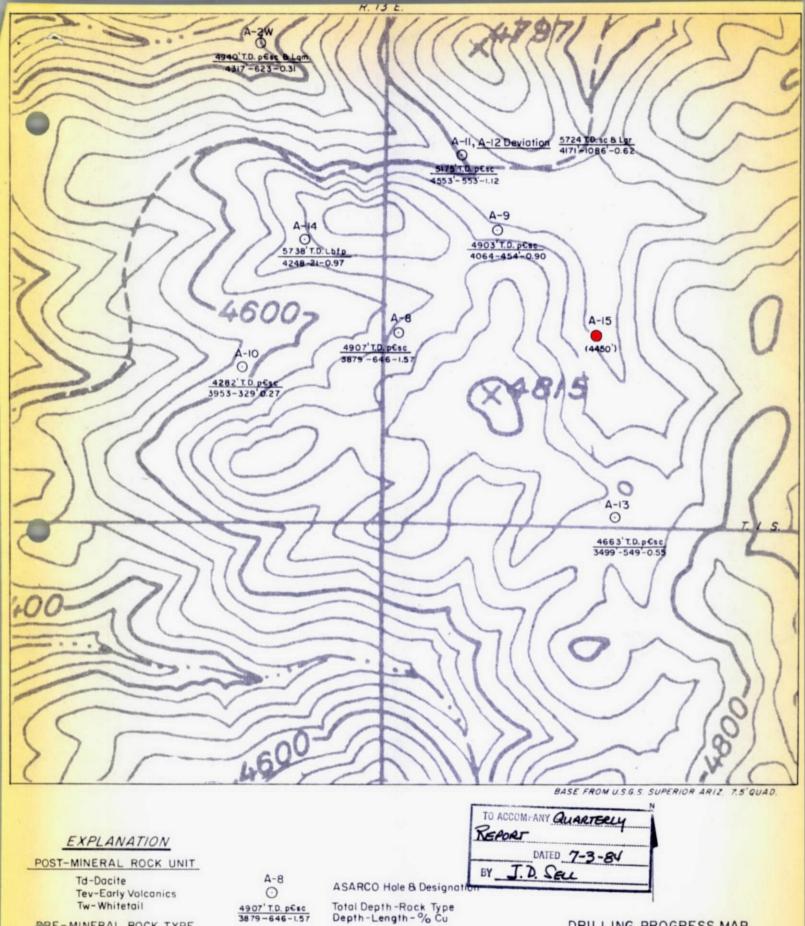
The mineralization was changed from cc-bn to chalcopyrite across a fault zone at 4067-4143', but at depth has again picked up higher grade chalcopyrite-bornite. The additional sampling is underway.

The quarterly drilling map is attached.

James D. Sell

JDS:mek Att.

cc: J. R. Stringham



RE-MINERAL ROCK TYPE

Lbx-Breccia Lbfp-Laramide Biotite Feldspar Porphyry

Lam-Quartz Monzonite

Lgr-Granite pCsc-Schist 0

Proposed Drill Site

DRILLING PROGRESS MAP For The ZNO Quarter, 1984

SUPERIOR EAST PROJECT

PINAL COUNTY, ARIZONA SCALE : 1"= 500"

J.D. Sell

June 1977

MIN. TOA

ASARCO

Southwestern Exploration Division

April 19, 1985

FILE MEMORANDUM

1st Quarter Report January-March 1985 Superior East, EA-0010 Pinal County, AZ

No physical work was performed on the property in the quarter other than requesting Forest Service permission to construct an access road and drill pad in the SW quarter of Section 23, TlS, R13E.

It is expected to request the funds for this work during the next quarter.

JDS:mek

James D. Sell James D. Seil



March 27, 1986

T0:

J. D. Sell

FROM:

H. G. Kreis

Superior East Project March Monthly Report Pinal County, Arizona

The Superior East thin sections are being described. Particular attention is being paid to the alteration and the texture and composition of the igneous rocks.

The igneous rocks exhibit some textural and mineral composition variations. The textures vary from medium-grained, hipidiomorphic granular in drill hole LB-4 to varying degrees of porphyritic development in fine-grain sized rock to a strongly developed porphyritic texture having very fine-grained groundmass. When thin sections of igneous rocks from each of the drill holes has been described, the textures will be compared to see if they indicate a heat source in a particular direction.

Most of the igneous rocks in the A-2 and A-10 area, an area of good copper mineralization, are altered by clay. Typically, the plagioclose is partially to totally altered by kaolinite with small amounts of biotite, sericite-muscovite, and calcite. Primary biotite and K-feldspar remain unaltered. Superimposed on this alteration is locally strong sericitization. This sericitization occurs in selvages along quartz veins. So far, too few thin sections have been examined to develop well defined zoning patterns as was done at Santa Cruz.

A few thin sections of Pinal Schist were casually examined. There may be some difficulty telling metamorphic minerals from alteration minerals. If this turns out to be the case, the alteration zoning patterns may have to be determined from the alteration of the igneous rocks.

H. G. Kreis

H. G. Kreis

HGK/kh



ASARCO

September 26, 1986

FILE MEMORANDUM

3rd Quarter Report Superior East Project Pinal County, AZ

The annual assessment work for the year ending August 31, 1986, has been completed by field and research work. Affidavits have been submitted to the Pinal County Recorder and the Bureau of Land Management.

JDS:mek

James D. Sell



December 23, 1986

FILE MEMORANDUM

4th Quarter Report October - December 1986 Superior East Project Pinal County, AZ

James D. Sell
James D. Sell

The report "Alteration and Petrography of Igneous Rocks - Superior East Project" has been completed and submitted by H.G. Kreis.

JDS:mek

cc: W.D. Gay

ASARCO

June 19, 1987

FILE MEMORANDUM

2nd Quarter Report Superior East Project Pinal County, AZ

Discussions with Joe Harness Drilling Company, P.O. Box 43367, Tucson, AZ 85733, phone: 623-4668, have led to an agreement for submitting a drilling bid for a rotary hole from the surface at the new site of hole A-16. Work should commence in early July.

The Forest Service has been notified that the previously approved and constructed site will be occupied.

The State Water Resources will be notified as soon as the drill contract is secured.

This work will complete the annual assessment work for the year ending August 31, 1987.

JDS:mek

James D. Sell

James to Sell

cc: W.D. Gay