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

The following file is part of the Cambior Exploration USA Inc. records

ACCESS STATEMENT

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

CONSTRAINTS STATEMENT

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

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

QUALITY STATEMENT

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

Copperstone Mine Vicinity

Moon Mtn. NE. + SE. 7½' Quads.
Plomosa Mining District
T6N R20W La Paz Co., Arizona

Showing Frank Mack's claims relative Cyprus Minerals' Copperstone Mine and claim holdings.

Boundaries from uncredited map, not checked against courthouse or BLM records.

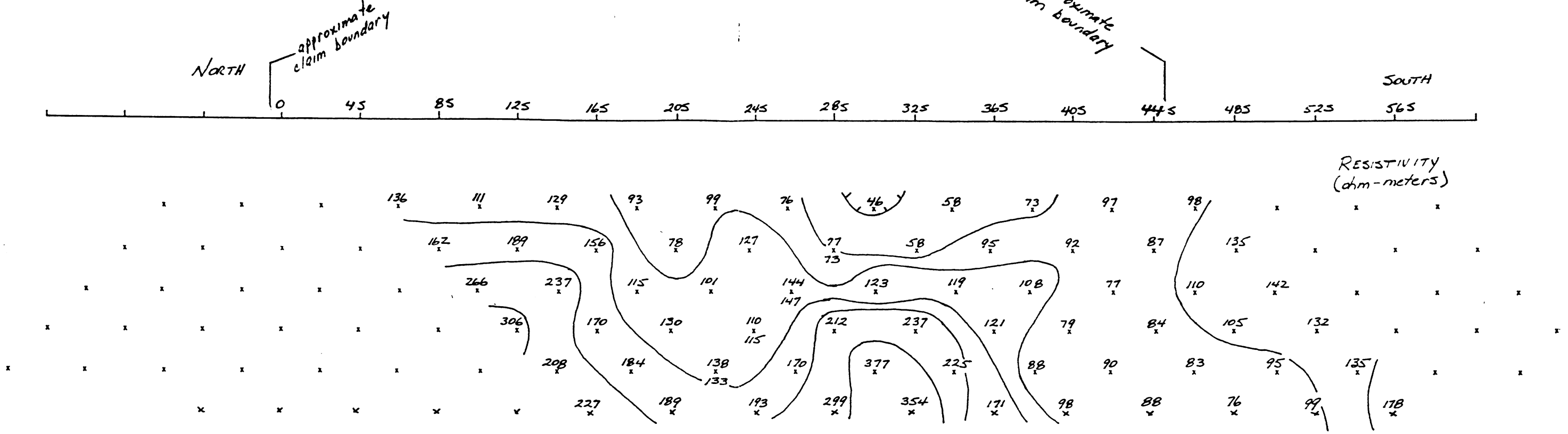
Don C. White - Oct., 1988 (Drill holes added Jan. '89)

IP LINE LOCATION MAP

QUADRANGLE LOCATION

SCALE 1:24 000

CONTOUR INTERVAL 20 FEET

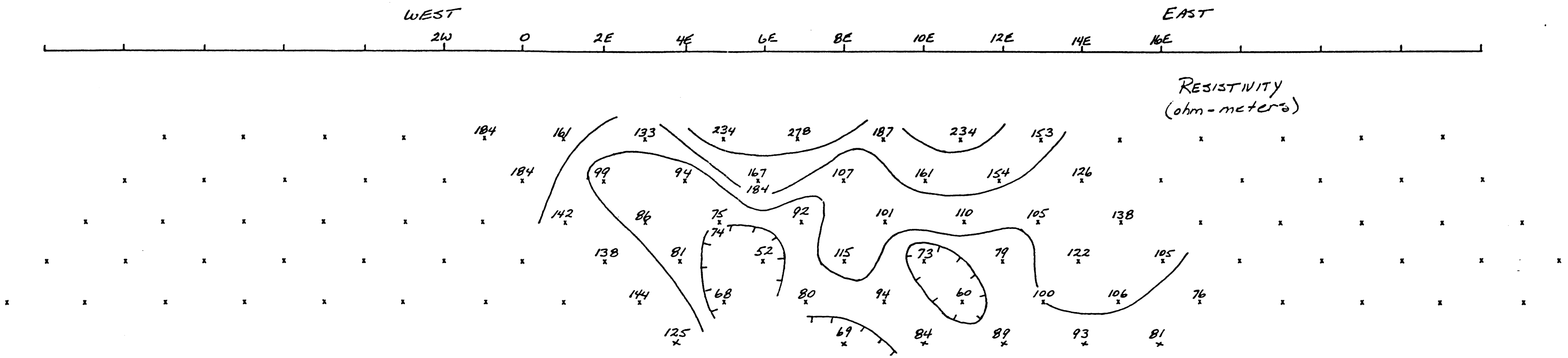


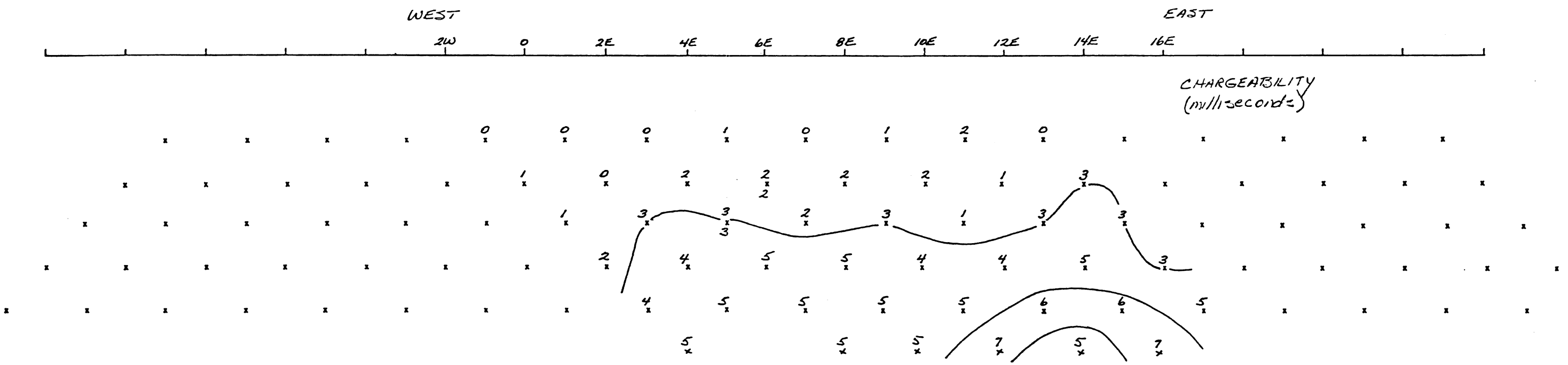
CONTOURS

Resistivity: 50, 75, 100, 150, 200, 300

Chargeability: 3, 6, 9, 12

CALLAHAN MINING CORPORATION
MNM CLAIMS
LA PAZ COUNTY, ARIZONA
INDUCED POLARIZATION SURVEY
LINE 1
DIPOLE SPACING = 400 FEET
APRIL 3 1989





CONTOURS

Resistivity: 75, 100, 150, 200

Chargeability: 3, 6

CALLAHAN MINING CORPORATION
MNM CLAIMS
LA PAZ COUNTY, ARIZONA
INDUCED POLARIZATION SURVEY
LINE 2
DIPOLE SPACING = 200 FEET
APRIL 4, 1989

TO: File
FROM: Bill Gehlen
DATE: May 1, 1991
RE: Copperstone Mine Area, La Paz County, Arizona

INTRODUCTION: Mr. Willis Ray contacted Cambior about an exploration opportunity near the Cyprus Copperstone Mine on April 30, 1991 after reading a Cambior advertisement in the California Prospector magazine. I returned Ray's call at Michel's request to obtain property information.

Ray is seeking someone who will lease his properties and drill geophysical targets already defined. A data review and property visit can be instigated by contacting Ray in Parker, Arizona at (602) 927-6304. He requests a review of information to be made on site, he is reluctant to release copies of information to anyone other than serious parties.

INFORMATION: Ray's property covers an extensive pediment area approximately six miles southeast of the Copperstone Mine. The property consists of about 189 unpatented lode claims in two separate groups owned by three individuals. Ray indicates that open land is available in the area and that adjoining properties could be easily obtained.

Ray indicated that no surface sampling and no drilling have ever been attempted. The only significant information he controls are geophysical surveys and their interpretations. Prior work consists of three years of regional mapping, an extensive ground magnetics survey, and a Geoprobe EM survey. This work supposedly identifies a magnetic anomaly similar to that found over the Copperstone deposit and identifies the alluvium/basement depth at around 180 feet based on geophysical modeling.

The most current lessor of the property was a company called Arizona Exploration who apparently received funding last year through a Placer Dome/Prime Resources joint venture. Other past "intersted" parties, according to Ray, include Reynolds Metals, Cyprus, and Frank Mack, an area consultant.

RECOMMENDATIONS: The geologic controls and exploration potential around the Copperstone Mine were discussed with Randy and Michael; both have been on the mine property. The nature of the proposed target is highly speculative, especially when the marginal character of the deposit model, Copperstone, is considered. Efforts toward evaluation of this blind, relatively deep target would substantially impact our efforts in other, potentially more productive environments of Nevada. I recommend no further evaluation or follow-up of the Ray submittal at this time. Mr. Ray will be contacted concerning Cambior's decision.

BG:lat

cc: M. Drouin
R. Moore

Frank Mack
Consulting Geologist
P.O. Box 2924
Littleton, Colorado 80122
Phone: (303) 799-6620

September 17, 1984

→ B Helmin's respond to

Mr. John I Sharpe
Vice Preisdent-Exploration
Duval Corporation
4715 East Fort Lowell Road
Tucson, AZ

Dear Mr. Sharpe:

Re: MNM Claims near Copperstone Au Prospect
La Paz County-Arizona

Please find enclosed for your information and possible interest a map showing the location of 42 MNM lode mining claims staked by myself during April of this year in La Paz County, Arizona. The claims are immediately adjacent to the southern boundary of the Amoco Copperstone claim block. The Copperstone gold prospect may be a major discovery but to date has not been announced. My claims are available for a lease-purchase arrangement.

Rotary and diamond drilling have been carried out on a yearly basis by Amoco on this prospect since 1980, mainly in the area marked on the map "Area of Drilling". This year, during January, two additional rows of claims were staked south of Copper Peak by Amoco. Three or four holes were drilled in this new area not far from my north claim boundary during the month of May, 1984. The MNM group is only about 2½ miles south of the main drilled area of Copperstone(see claim map). The general area is about midway between Quartzite and Parker and west of Highway 95 about 5 to 6 miles(see location map).

The MNM claims are mostly covered by a relatively thin veneer of alluvium. The western edge has exposed bedrock consisting of banded quartz latite flows intruded by granite. A potential for a similar Copperstone type of deposit beneath alluvium exists in the area of the MNM claims. A program utilizing geophysics etc. will be required to delineate drill targets.

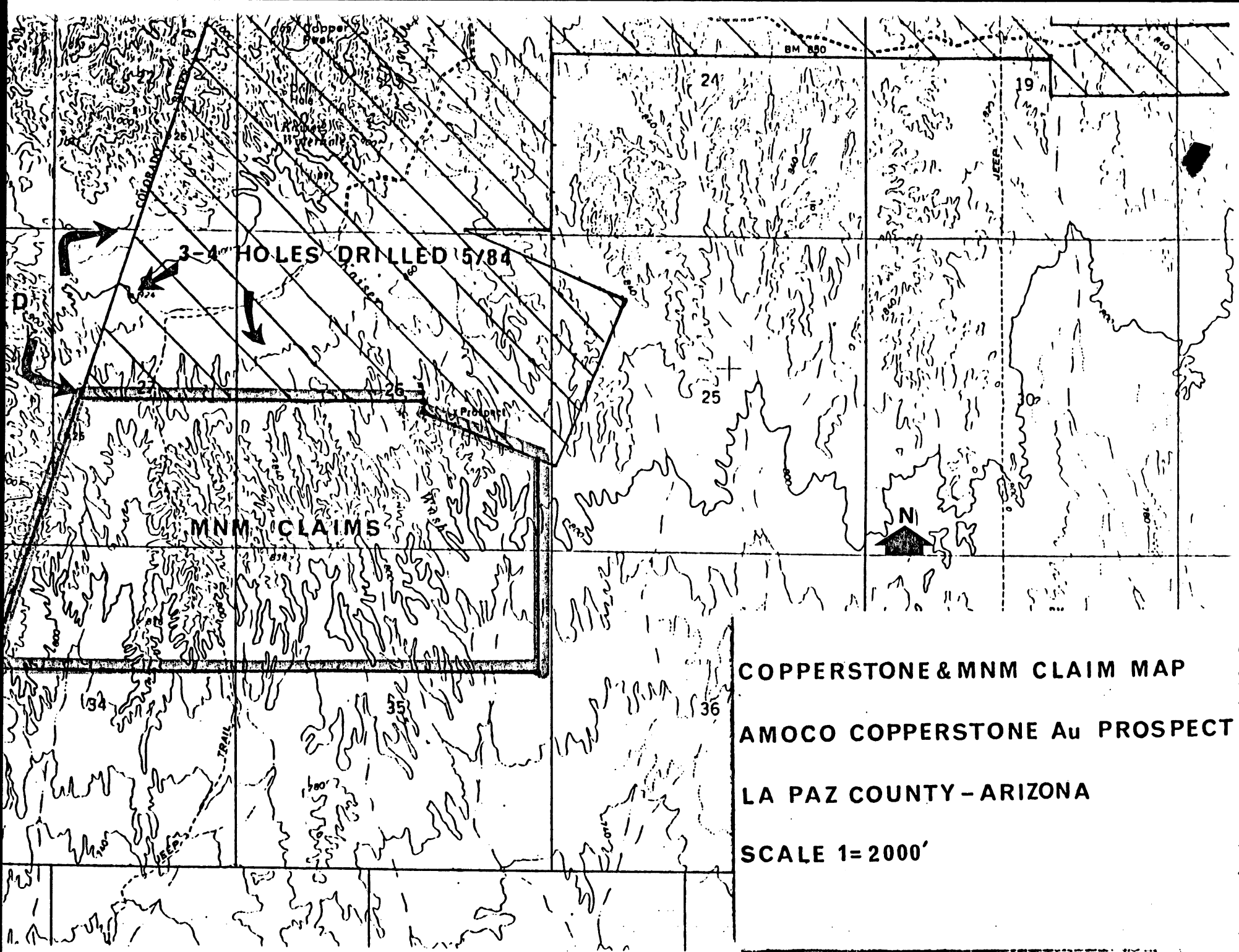
This is an opportunity for an aggressive company to establish an "early on" position in a highly favorable target area close to a possible major gold discovery before the beginning of a staking rush.

If your company has an interest in this property, please write or call me at (303)799-6620. Although I travel a great deal, I keep in close touch with my home for phone messages.

Very truly yours,

F. Mack

Franklin Mack



COPPERSTONE & MNM CLAIM MAP

AMOCO COPPERSTONE Au PROSPECT

LA PAZ COUNTY – ARIZONA

SCALE 1= 2000'

La Paz

POTENTIAL GROUND MAGNETICALLY INDICATED COPPERSTONE TYPE OF STRUCTURES

EXTENSION-GOLD TRAP-JACK POT CLAIM BLOCK-LA PAZ COUNTY, ARIZONA

INTRODUCTION

Ground magnetic surveys have been conducted over an area covered by 124 unpatented lode mining claims located about six miles easterly of the Cyprus Minerals Company Copperstone gold mine now in commercial production(60,000-100,000 ounces of gold per year).

This particular area of the La Posa Plain has a good untested exploration potential for a Copperstone type orebody. Although open pit mining methods would be preferable, consideration for deep ore zones below surface mining methods should not be discounted, especially in light of the newly discovered below open pit mining level ore zones at Copperstone which are soon going to be mined.

The initial exploration drilling at Copperstone depended heavily on the use of ground magnetic surveys to locate potentially gold hosted breccia structures(normal listric faults). Not all of the anomalous breccia zones were gold bearing but most were.

GEOLOGIC MODEL OF COPPERSTONE

The Copperstone gold deposit is hosted in brecciated epizonally metamorphosed Jurassic quartz latite porphyry. The detachment related mineralization is in normal thrust structures in upper plate volcanic rocks. The detachment surface and lower plate rocks were not reached during the exploration drilling phase. Deeper ore zones below the open pit mining methods will be exploited by underground mining methods. Working levels will extend several thousand feet below the surface. The access decline is currently being driven with the first production level planned for about the one thousand foot depth.

POTENTIAL OF EXTENSION-GOLD TRAP-JACK POT CLAIM GROUP

The surface of the above mentioned claims have no ourcropping rock exposures. Some very near surface rocks may be present however their actual existence has not been physically proven.

The widespread E-W magnetic profiles performed to date over the Extension and Gold Trap claims most certainly indicate that the magnetic source anomalies, potentially fault structures, are relatively shallow (within several hundred feet of the surface). By means of aligning similar anomalous signatures, it appears that the strike of the possible structures is NW-SE.

GEOLOGIC HOST ROCKS EXPECTED BELOW ALLUVIUM

Lower and upper plate rocks are exposed to the west of the claims in the Dome Rock Mountains and east of the claims in the Plomosa Mountains. It is expected that detached blocks of of Upper Mesozoic and Tertiary sediments and volcanics moved westward from the metamorphic core complex of the Plomosa Mountains to the area below the claim block. The lower plate or foot wall rocks would presumably be composed of lower Mesozoic gneissic lithology.

Mineralization would be localized in the normal listric faults and at further depth along the detachment surface.

RECOMMENDED EXPLORATION

If prior to drill testing additional exploration geophysical work is considered, gravity and I. P. surveys would be the most practical.

The Copperstone orebody was closely outlined by means of anomalous frequency effects.

Some fill-in ground magnetic surveying would narrow down areas of interest for further I.P. and gravity surveys.

FRANKLIN MACK

CONSULTING GEOLOGIST

March 13, 1989
8655 East Phillips Avenue
Englewood, CO 80112

Mr. Michel Drouin
Cambior Inc.
C.P. 9999, 1075 3e Avenue Est.
Val d'Or, Quebec J9P 6M1
CANADA

Dear Mr. Drouin:

Re: Extension-Gold Trap-Jack Pot
Mining Claims-Copperstone Area-AZ

Please find enclosed for your information and possible interest a brief summary of a ground magnetic geophysically indicated Copperstone type of gold prospect.

Due to a complete lack of rock exposures, preliminary work to date has been by means of ground magnetic surveys which have indicated possible near surface fault structures.

If you wish more data or general information regarding this interesting property or an on site tour please contact:

Bill Rhea at (602)927-6304
or
Frank Mack at (303)799-6620

Very truly yours,

Frank Mack

COMPLEMENTARY INFORMATION

According to my notes, I have sent you a copy of my report and/or ground magnetic surveying results from my MNM claim block which adjoins the southern boundary of Cyprus Minerals Copperstone gold mine property in La Paz County-Arizona.

About a year ago, Callahan Mining Company drilled a fence of RC holes along the northern boundary of my claims. Only a few tens of feet of bedrock was drilled and sampled for gold. Anomalous gold values were detected. After the drill testing, an I.P. - Resistivity survey was conducted over a small area of the claims. Although no mention of radioactivity was noted in the cuttings, Callahan"s consultant did indeed locate high radioactivity in my presence over a bedrock area along the indian reservation boundary.

Exploration work by Cyprus just north of my claims was definitely positive in that significant gold values were encountered during drill testing of the area. At that time, minimum gold values required for additional work was nearly a tenth of an ounce therefore work was temporarily suspended. Several of the holes were cased for future re-entry.

The MNM claim block is probably the least tested zone of the Copperstone Mine area. It has been shown that successive NW-SE trending breccia structures are found NE and SW of the main mine area. The MNM claims are underlain by the same lithology that hosts the Copperstone orebody.

If you have any questions or wish leasing information, I may be reached through my Denver phone number. If I am not in Denver, your message will be forwarded to me for replying purposes.

Frank Mack
3655 E. Phillips Ave.
Englewood, CO 80112
(303)799-6620

M E M O

TO: Bruce A. Bouley

FROM: Don White

DATE: January 17, 1989

SUBJECT: Drilling results and status of exploration of Frank Mack's MNM property

As followup to my memo of October 26, 1988, following is a summary of some minimal surface reconnaissance and sampling and the findings from three new drill holes by Callahan.

SURFACE RECONNAISSANCE - You and I looked at the NE portion of Mack's claims on Dec. 7, 1988 and determined that the "prospect" on the topo sheet and other dozer cuts we found nearby, are only surficial "validation trenches" probably cuts around the 1950's when such was a requirement of claim retention. None of them reached any bedrock.

We located a Cyprus D.H. north of Mack's claims and sampled the chips there. By sorthing the rock chips from Cyprus' drill hole according to lithology, and assaying the separate lithologies, it was determined that vein quartz, ferruginous and clay-altered quartz latite, and even less-altered quartz latite were all anomalous in gold (.02, .02, and .01 oz/t Au respectively). The more massive, coarser grained plutonic rock occurring in that hole was not auriferous. Similarly, for Mack's D.H., chips of quartz latite assayed about 0.01 oz/t while the underlying granodiorite assayed undetectable gold. These results were intended merely to familiarize us with lithologies that could host gold prior to our own drilling.

CALLAHAN DRILLING - Callahan contracted Drilling Services Co. (Layne subsidiary) of Phoenix for reverse circulation drilling of a portion of Mack's claims earlier this month. Three holes totalling 880 feet were drilled on Mack's lease. The logs are accompanying and summarized as follows:

HOLE	LOCATION	SIMPLIFIED LOG	
M-1	Twin of Mack's MNM-2 which encountered some mineralization	0-40'	Pediment debris
		40-233'	Qtz. latite pphy with generally undetectable gold except 5 ft. of .025 oz/t
		233-240+'	Granodiorite; barren
M-2	560 ft out into pediment from M-1	0-180'	Pediment sands and gravels
		180-280+'	Qtz latite pphy with up to .003 oz/t Au, average .001 oz/t.
M-3	600 ft further out into the pediment than M-2	0-305'	Pediment sands and gravels
		305-360+'	Qtz latite pphy with up to .008 oz/t, average .001 oz/t

Trace pyrite and minor iron oxides occurred through much of the quartz latite footages drilled. There was no breccia like Copperstone's nor any evidence of faulting or veining. All cuttings were scanned with both an ultraviolet light and a scintillometer. This was done because the Copperstone mineralization does contain fluorite and is reportedly slightly radioactive. Nothing in the three Mack holes was either fluorescent or radioactive.

CONCLUSIONS

1) Mineralization is known to occur as close as 1/2 mile north of Mack's claims, evidenced by Cyprus drill cuttings. There the 0.02 oz/t Au is hosted by quartz and altered quartz latite.

2) The quartz latite of all three new holes within Mack's claims is virtually unaltered and only subtlely anomalous in gold (barely detectable except for a very few scattered intervals).

3) The quartz porphyry prevails eastward beneath the pediment for at least 1,200 feet from the minor outcrop at the NW extreme of Mack's claims.

4) No structures were found to the depths drilled and for the minor area tested. Hence none of the all-critical breccia unit was located.

5) The bedrock-pediment contact drops off at about a 15° slope, meaning that a cutoff of 500 ft. cover probably eliminates all but the most westerly 2,000 ft. of Mack's claims. This is the side adjacent to the Indian Reservation.

RECOMMENDATIONS

I suggest that you and I mull these findings over and see what Joe Ansman thinks about the appropriateness of I.P. for a reconnaissance line or two. We need to know how far out beneath cover we want or can read the size target that is considered minimal.

Assay Samples from Frank Macks Claim Area

Sample	Description	Assay (oz/t) Au	Ag
FM-1	NE¼ Sec 33 T6N R20W, ~¼ mile W of reservation boundary, 1' "high-grade" core of barite-FeOx-qtz zone in shear within qtz. monz. pluton. Structure is low ∠ N45°W 10-20° NE Barite is as small rosettes + stringers ≤ 1cm. Qtz is wt veins ≤ 2cm. FeOx throughout Trace CuOx/CuCO3	.004	<.10
FM-2	3' qtz monz H.W. to FM-1, some FeOx	.003	<.10
FM-3	3' " " FW to " " "	.006	.14
(FM-4 thru 11)	From Cyprus D.H. cuttings adjacent to 8" open hole NENW Sec 26, T6N, R20W		
FM-4	Red-br. fg. cuttings on top of pile (deep in hole)	.005	.13
FM-5	No sample - skipped number	——	——
FM-6	Overall cuttings, coarser fragments skimmed off surface of pile.	.014	.21
FM-7	Segregated white qtz ± gyp. hem.	.016	.14
FM-8	Segregated tan + red br., lt. wt., porous chips.	.016	<.10
FM-9	Segregated black (manganiferous?) hard, angular fragments	.010	<.10
FM-10	Segregated gray-green, plutonic-textured, qtz-feld rock w/ some alt'n to sericite.	.002	.12
FM-11	Segregated fm same as FM-10 but most alt'n; most sericitic, best foliated.	<.001	<.10
(FM-12-14)	From Macks D.H. cuttings at NW corner of claims (NW¼SW Sec-		
FM-12	Overall cuttings, coarser frags off pile	<.001	<.1
FM-13	Segregated qtz-monz frags., fresh, qtz-felt-bio.	<.001	<.1
FM-14	Segregated gray qtz-latite frags., angular,	.010	<.

IRON KING ASSAY INC.

22-Dec-8

LAB JOB #: MSC03489

Client name: Callahan Mining Corp.

Billing address: 11811 N. Tatum Blvd.
Suite #4055
Phoenix, AZ 85028

Phone number: 778-3140

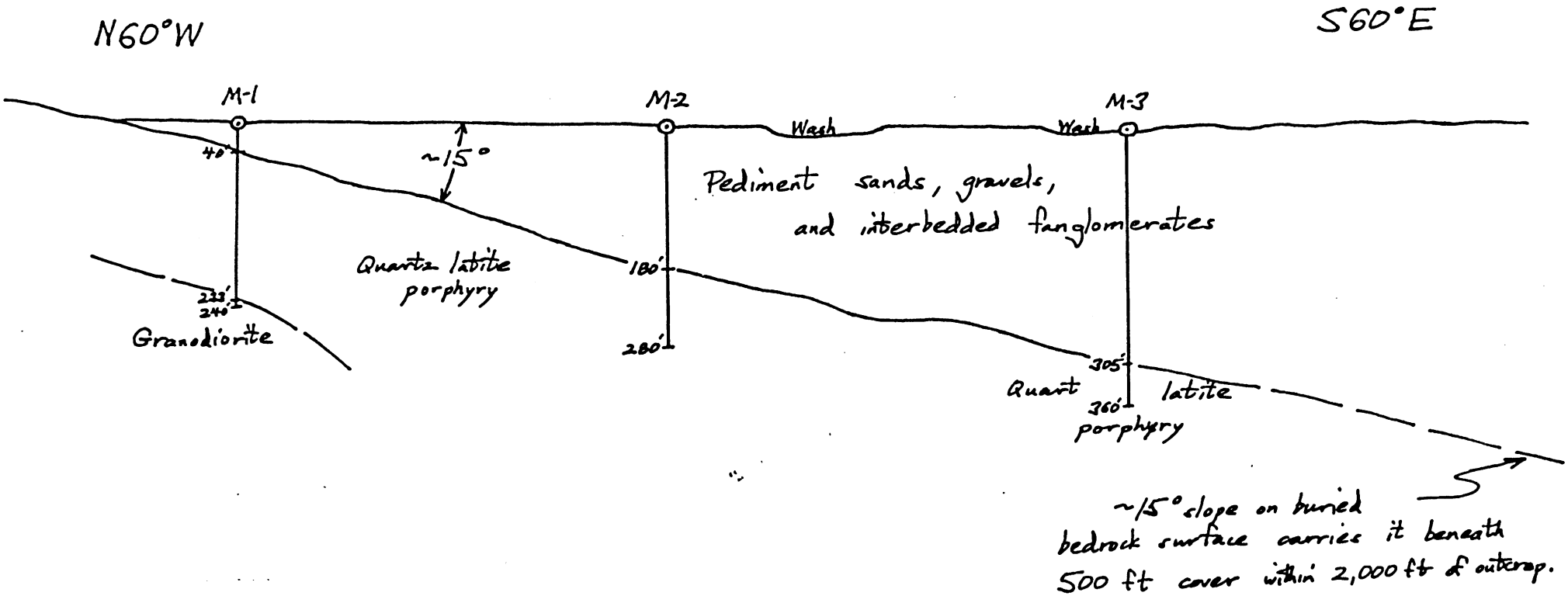
No. Samples: 13
Date Received: 12-09-88
Submitted by: D. White

INVOICE ATTACHED

ANALYTICAL REPORT

Client ID MSC03489	Lab ID	FA/AA Au oz/ton	Fire Assay Ag oz/ton
Batch #3			
FM-1	3489- 1	0.004	<.10
FM-2	3489- 2	0.003	<.10
FM-3	3489- 3	0.006	0.14
FM-4	3489- 4	0.005	0.13
FM-5	missing		
FM-6	3489- 5	0.014	0.21
FM-7	3489- 6	0.016	0.14
FM-8	3489- 7	0.016	<.10
FM-9	3489- 8	0.010	<.10
FM-10	3489- 9	0.002	0.12
FM-11	3489- 10	<.001	<.10
FM-12	3489- 11	<.001	<.10
FM-13	3489- 12	<.001	<.10
FM-14	3489- 13	0.010	<.10

REGISTERED ASSAYER
CERTIFICATE NO.
14315
ROBERT G.
CROOK
Date Signed .....
ARIZONA, U.S.A.



1" = 200'

Vertical Cross Section, looking N30°E
through fence of 3 drill holes in F. Macks MNM property
Note approximately 15° slope on pediment-covered
bedrock (qtz. latite pphy) surface.

Don C. White
Jan. 1989

Property: Frank Mack's MNM claim block Drill Hole No.: M-1

Hole type: Reverse circulation; down-the-hole-hammer - 5½" O.D. hole

Collar location: ~300' due S of claim corner for NW of MNM No. 1 ~60' E of Indian Reservation fence line.; ~30' N.30°E from Mack's hole MNM-2

Collar elevation: ~3' higher than Mack's MNM-2 (± 860')

Inclination: Vertical Bearing: ——

Total depth: 240 feet

Date(s) drilled: Jan. 6, 1989 Logged by: Don C. White

Driller: Drilling Services Co. (Layne) Assayer: Iron King Assay, Inc. Fire/AA - 1 assay ton

Remarks: Dry ; backfilled.

Depth (ft)	Unit	Graphic Log	Dust color	Presence of: Quartz	FeOx	Sulfides	Assays (oz/t) Au	Ag	Remarks
0'	Pediment colluvium + flood debris		Brown-gray						0'-40' Pediment debris, colluvium and flood deposits; abundant granodiorite + qtz-latite-pphy fragments.
40'							.001		
			Light gray with brown + green tint	~20%	Trace hem.	ϕ	Not assayed; Mack's hole, 30' away, barren in this interval		40'-150' Dark gray to black quartz latite porphyry (term from Cyprus + F. Mack) with ~20% qtz. porphyroblasts as ~4x elongated eyes (≤½" thick, ≤3" long) parallel to well developed foliation.
80'									
	q l p						<.001		
120'							.002		↓ Trend downward is for more siliceousness, thus harder + coarser drilling.
							.001		
							<.001		
							<.001		
							<.001		
							<.001		
160'				30		Trace py.	<.001		150'-233' Same but cuttings noticeably more green (olive) perhaps from chlorite.
							<.001		
			Gray-green (more olive than above)				.001		
							.025		
							.001		
							<.001		
							.001		
							<.001		
							<.001		
200'				40	Some lim.		.001		(200'-210' - Some milky wt. + clear gray vein(?) qtz.)
	q l p						.001		
				30	Tr.		<.001		
							.001		
							.001		
							.001		
							.007		233'-240'+ White with black bands (salt + pepper) qtz-plag-hbld-bio. granodiorite ± sericite.
233'							<.001		
T.D. 240'	gd EOH.	+ + +	Light gray	60	Tr	ϕ	<.001		

Property: Frank Mack's MNM claims Drill Hole No.: M-2

Hole type: Reverse circulation; down-the-hole-hammer; 5½" OD. hole

Collar location: 560 ft S60°E from M-1

Collar elevation: ~10' lower than that of M-1 or ~±850'

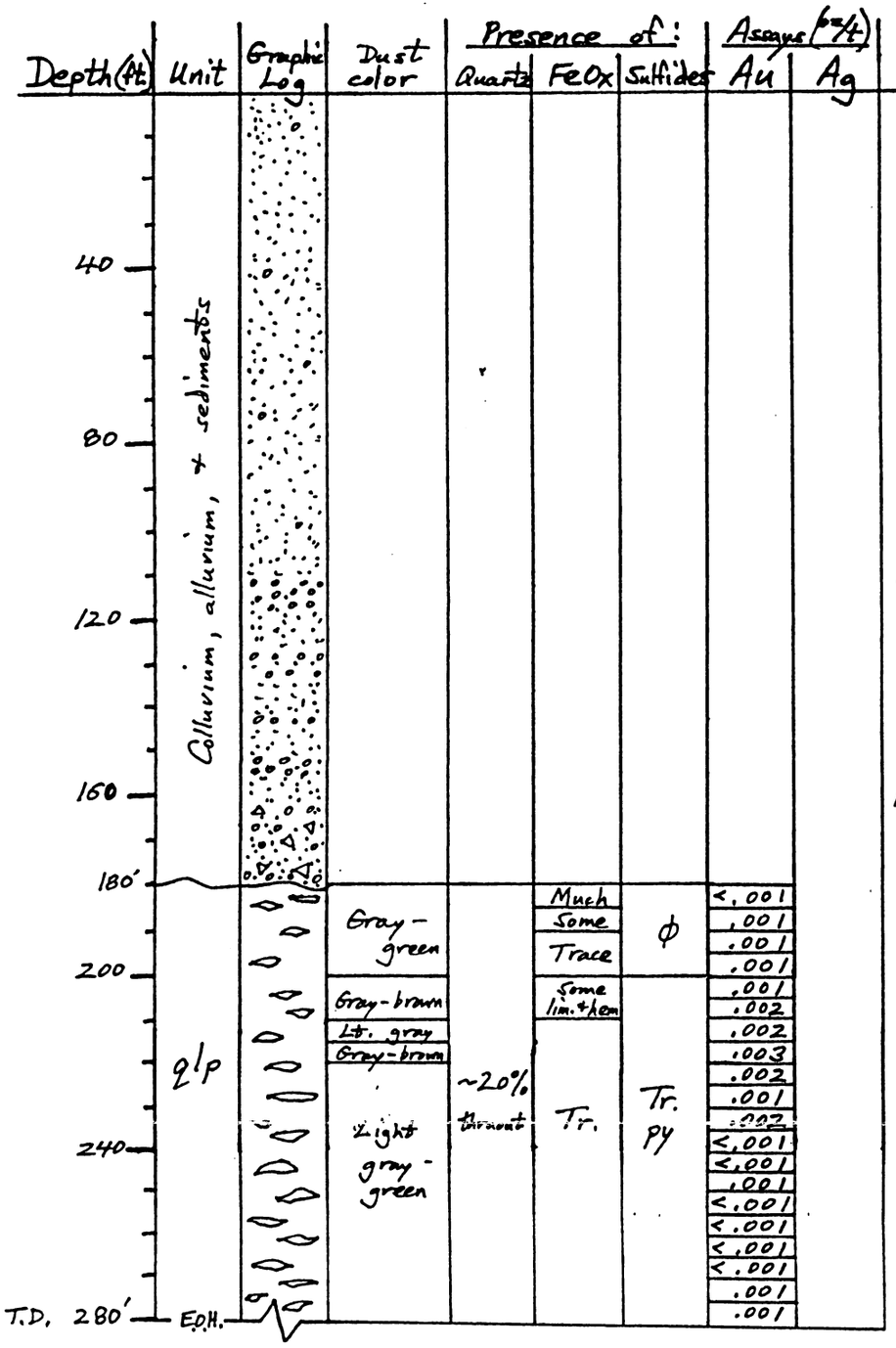
Inclination: Vertical Bearing: —

Total depth: 280 feet

Date(s) drilled: Jan. 7, 1989 Logged by: Don C. White

Driller: Drilling Services Co., Phx., AZ Assayer: Iron King Assay, Inc. Fire/AA - One assay ton

Remarks: Dry; backfilled.



Property: Frank Mack's MNM claims Drill Hole No.: M-3

Hole type: Reverse circulation; down-the-hole-hammer; 5½" O.D. hole

Collar location: ~600 ft. S 68° E from M-2 (low in wash)

Collar elevation: ~10 ft. lower than M-2 or ~±840'

Inclination: Vertical Bearing: —

Total depth: 360 feet

Date(s) drilled: Jan. 7 & 8, 1989 Logged by: Don. C. White

Driller: Drilling Services Co., (Layne) Phx., AZ Assayer: Iron King Assay, Inc. Fire/AA ~~One assay~~ ton

Remarks: Dry; backfilled.

Depth (ft)	Unit	Graphic Log	Dust color	Presence of: Quartz	FeOx	Sulfides	Assays (oz/t) Au	Ag	Remarks
0-200'	Colluvium, alluvium, + sediments (unconsolidated)								0-200' Tan, fine-grained, arkosic sand; unconsolidated, plus occasional pebbles of any + all lithology. Pebbles ≤ 5% of volume. Sand grains rounded.
200-275'									200-275' Cobble + boulder-size debris of qtz-latite-ppy which drills like bedrock just because fragments are so large + abundant. Some tan sand matrix. Occasional rounded pebbles of foreign lithology
275-305'									275-305' Tan sand with a few rounded pebbles.
305-360'+	q.l.p.		Gray-green	~20%	Some	Trace pyrite	.001 .002 .001 .001 <.001 .001 .008 .001 .001 <.001 .001		305-360'+ Black, very fine-grained qtz. latite porphyry (like M-1, 2). Well-foliated. ~20% qtz porphyroblasts up to ¼" thick, 1" long, parallel to foliation.

T.D. 360 E.O.H.

JOSEPH R. ANZMAN
Geophysicist

4971 South Clinton Street • Englewood, Colorado 80111 • (303) 741-5433

DATE: July 30, 1989

TO: Bruce A. Bouley

SUBJECT: Synopsis Interpretation, Induced Polarization Survey, MNM Claims, La Paz County, Arizona

Two lines were surveyed for a total distance of 1.8 line miles. Line 1 was parallel to the Colorado River Indian Reservation Boundary and was surveyed using a dipole spacing of 400 feet. Anomalous chargeability values are seen at the extreme south end of the data, and the response is not completely defined. The geologic source would be located south of the MNM claim block. High resistivity is present at 28S-32S and on the northern edge of the data.

Line 2 was east-west and was surveyed with 200-foot dipoles. No anomalies are present.

Joseph R. Anzman