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James Doyle Sell Mining Collection

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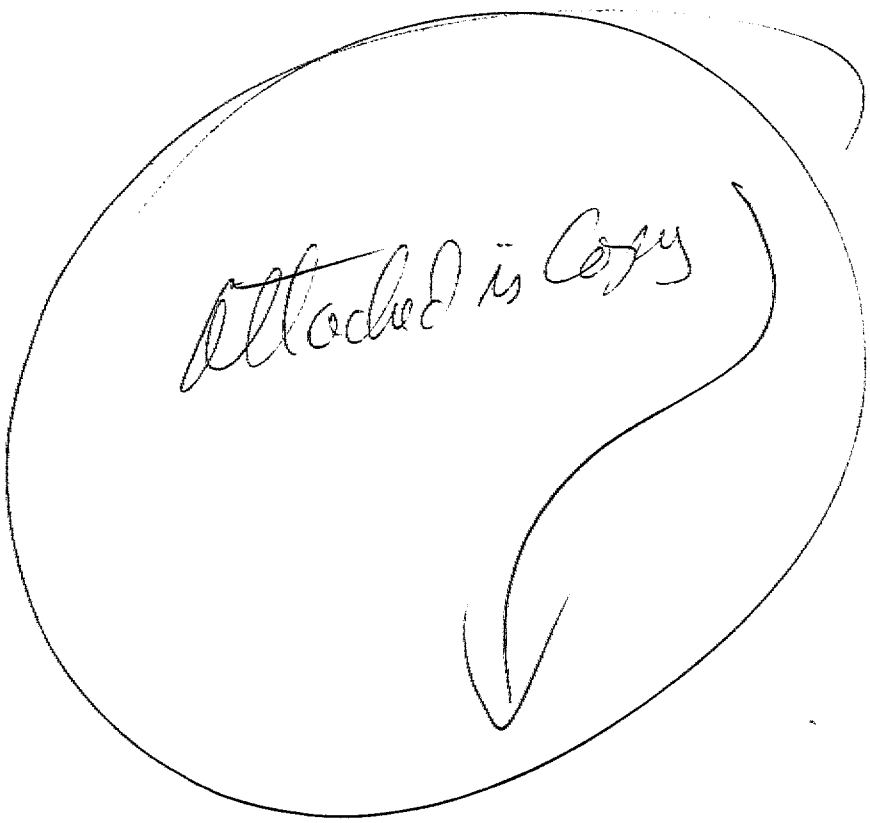
Little Hills Mine Area
Pinal Co., AZ

Bunney Mine Area

Copy Jan 24, 1976 report of Wilkinson
Aug 31, 1976 report of JR Gloss

Lois. Please copy all of the reports down to the stat of SEA Photography billing(s) →
Will handle it after I return.

Thanks,
Jim



~~BXXXXXXX~~
JDSell

Would you please look this over for possible interest? We have extensive file data (Little Hills Mine) and Perry Durning wrote his MS thesis in this area courtesy AMAX who drilled in general area.

Thanks.

FTG
4/27/79

Fred:
I never got to this - maybe it can wait 6 mos or someone else could look into it.
Bart

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

BJD

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

REPORT OF SPECTOGRAPHIC ANALYSIS

Values reported in parts per million, except where noted otherwise, to the nearest number in the series 1, 1.5, 2, 3, 5, 7 etc.

Element	Little Hill Mine	
Fe	2%	
Ca	0.05%	
Mg	0.03%	
Ag	200 ppm	5.84 oz/ton
As	<500	
B	50	
Ba	700	
Be	<2	
Bi	<10	
Cd	<50	
Co	<5	
Cr	200	
Cu	150	
Ga	10	
Ge	<20	
La	<20	
Mn	700	
Mo	30	
Nb	<20	
Ni	50	
Pb	10,000	292 oz/ton
Sb	<100	
Sc	<10	
Sn	<10	
Sr	50	
Ti	3,000	0.3 %
V	150	
W	<50	
Y	10	
Zn	500	14.6 oz/ton
Zr	700	

TO:

ASARCO, INCORPORATED
Southwestern Exploration Division
P. O. Box 5747
Tucson, Arizona 85703

Attn: Robert B. Crist

REMARKS:

Spectrographic analysis

CERTIFIED BY:

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
5/1/79	5/29/79	TAJ 050

GEOLOGY and MINERALIZATION

of the

BURNEY MINES AREA

PINAL COUNTY ARIZONA

for

Little Hill Mines, Inc.

January 26, 1976

Tucson, Arizona

W. Perry Durning

John E. Dreier

Contents

Appendix

Illustrations

SUMMARY

The Burney Mines area is about 25 airline miles north-northeast of Tucson, Arizona on the northwestern flank of the Santa Catalina Mountains. The Burney Mines property consists of 32 unpatented federal lode claims located for the most part within the boundaries of the Coronado National Forest.

The rocks exposed in the area are from oldest to youngest the Precambrian Pioneer Shale, Barnes Conglomerate, Dripping Spring Quartzite, Mescal Limestone and diabase sills. These rocks are overlain by the Cambrian Bolsa Quartzite and Abrigo Formation and the Pennsylvanian Horquilla Limestone. All of these rocks are cut by Tertiary monzonite porphyry dikes and sills.

The principal structure in the area is a broad northwest trending syncline bounded on the east and west by large normal faults which create a northwest to southeast oriented graben. Rocks within the graben are cut by numerous low angle and high angle normal and reverse faults, the majority of which are oriented northeast to east-west.

The majority of the mineralization in the Burney Mines area occurs in the Bolsa Quartzite, Horquilla Limestone and the Dripping Spring Quartzite. Mineralization occurs in veins and breccia zones where these rocks are cut by northeast

to east-west trending high angle faults or locally as replacements in favorable beds up to a few feet away from the faults.

Mineralization is limited on the east by the normal fault which bounds the graben to the east and to the west by shaley beds near the top of the Dripping Spring Quartzite.

Mineralization at Burney Mines consists of Cu, Pb, Zn, Au, and Ag in both the oxide and sulfide zones. The Pb and Au values are similar in the oxide and sulfide zones while the Cu and Ag values may be dramatically enriched, and Zn may be almost entirely removed in the oxide zone. Oxidation generally persists only a few tens of feet below the surface outcrops.

At the Birthday mine Ag, Cu, Pb, Zn, Au mineralization grading up to 11 oz/ton Ag, 3.75% Cu and 7% Pb occurs in the Birthday fault and in fractured quartzite up to 20 feet south of the fault. The highest grade mineralization occurs in thin beds within 10 feet of the fault. High copper and silver values here are believed to be due to secondary, surface enrichment.

At the Birthday Extension Pb, Zn, Ag, Au mineralization grading about 1 oz/ton Ag, 1% Pb and .5 to 1% Zn occurs in the 6 inches to 2 feet thick Birthday vein. Wall rocks consist of the Bolsa Quartzite on the north side of the fault and Abrigo shales on the south side.

At the Lead Reef mine Ag, Pb, Zn, Cu mineralization averaging about 1 oz/ton Ag, .5% Cu, 6-7% Pb and .5% Zn occurs in an irregular body of brecciated quartzite about 100 feet long, 20 feet wide and of unknown depth. If the mineralized body is cut off by a fault 25 feet below the outcrop it would contain about 3,000 tons of rock.

At the Stove Lid mine Pb, Zn, Ag, Au mineralization averaging about 0.5 oz/ton Ag, 0.002 oz/ton Au, 2.25% Pb and 1.4% Zn occurs in the Stove Lid vein which is 6 inches to 5 feet wide. The vein was traced for about 550 feet along strike but was mined for only 80-90 feet along strike and 80-90 feet down dip.

At Slims mine Pb, Ag mineralization averaging about 5 oz/ton Ag and up to 2% Pb occurs in two veins from a few inches to 2 feet thick. These veins are less than 100 feet long. The veins have been greatly distorted by post-ore faulting.

At the Soldine mine Pb, Zn, Ag, Cu mineralization grading up to 1.5 oz/ton Ag, 3.4% Pb and 3% Zn occurs in thin veins dipping gently to the north. The veins are explored by approximately 200 feet of tunnels. Over a mining thickness of 5 to 6 feet mineralized rock would contain perhaps 0.5 oz/ton Ag, 0.5% Pb and 0.2% Zn.

At the Pretty Fair mine mineralization occurs along a N45E fault vein which averages 1' to 2' wide. Ore minerals are galena, sphalerite and copper oxides and occur in economic concentrations only in small pockets.

Numerous other prospects were visited during the course of this study but none show any economic potential.

CONCLUSIONS

Most of the mineralization at Burney Mines occurs in veins in east-west to northeast trending reverse faults near the axis of a northwest trending syncline. In the Pretty Fair, Birthday Extension, Slims, Stove Lid, Soldine and Gold mines these mineralized veins are narrow averaging 6 inches to 2 feet wide and contain metal values principally in Pb, Zn and Ag. In the oxidized zones of these veins which extend from a few feet to as much as 10 or 20 feet below ground surface silver values are enriched 10 to 20 times above sulfide zone grades, lead may be slightly enriched, and zinc is almost entirely leached from the outcrop. Typical values over a 1 to 2 foot vein width in the oxidized zone are 20 to 50 oz/ton Ag, 3 to 5% Pb and a trace of Zn. In the sulfide zone these same veins average 2 to 4 oz/ton Ag, 3 to 5% Pb and 2 to 3% Zn. Wall rocks on either side of the vein contain significantly lower metal values. As the minimum underground mining width is usually about 6 feet the grade

per ton of mined ore would be about 1/3 to 1/2 of the above values depending on values in the wall rock and on the width of the vein. In other words, for these prospects mining grades would be about as follows:

Au	Ag	Pb	Zn
0.007 oz/ton	1-2 oz/ton	2%	1-2%

In addition to being small and low grade these veins are offset by numerous post-ore faults and are sheared and contorted by post-ore movement along the vein. In a mining operation, therefore, one could expect serious support problems and expect difficulties in keeping track of the vein.

Mineralization at the Lead Reef mine consists of oxidized Pb, Ag, and Cu in an irregular body of brecciated quartzite. If this is cut off by a fault about 25 feet below ground surface it would contain about 3,000 tons of ore worth about $40 to $45/ton. As this ore is oxidized it would have to be directly shipped to a lead-zinc smelter as flux or treated at a special mill and shipped as concentrate to a custom smelter.

At the Birthday and Birthday Extension mines mineralization occurs in the Birthday fault vein, a narrow structure 6 inches to 2 feet wide, and in fractured quartzite up to 20 feet away from the fault. This fault was traced along strike for over 750 feet from Canada del Oro to the Birthday Extension mine

and was tentatively extended several hundred feet east of the Birthday Extension. High-grade copper-silver mineralization in the Birthday mine is believed to be due to secondary, surface enrichment so that the nature and grade of mineralization at depth should approximate that found at the Birthday Extension except that zinc values should be higher. At depth, along the fault Ag-Pb-Zn mineralization grading 1-2 oz/ton Ag, 2-3% Pb and 1-2% Zn might be expected with an average value of $30/ton.

It was concluded that the best mineral occurrences had been prospected and that there were no potential mines which were untested.

The only target of potential interest on the property is the Birthday vein zone, and prior to any decisions to buy or lease the property for mining purposes this target would have to be tested by drilling.

RECOMMENDATIONS

I) The only prospect which may meet the objectives of this evaluation of the Burney property is the Birthday vein and it is recommended that no further work be done on any other prospects.

II) Additional work on the Birthday vein should consist of a few angled air holes to penetrate the Birthday fault at various depths down to 100 feet. At this initial test stage

diamond drilling and underground development are not warranted. If favorable results are obtained from the air drilling program several angled core holes should be drilled.

III) Any further work should be done with the help of a qualified geologist since the geology and mineralization are very complex.

INTRODUCTION

At the request of Dave McGee of Little Hill Mines, Inc., W. Perry Durning and John E. Dreier made a geological and mine evaluation study of the Burney Mines area. The purpose of this study was 1) to determine if a mineable tonnage (+ 10,000 tons) of high grade ore (+ $40/ton) existed at any of the known prospects; 2) to identify other favorable mineralized areas if they exist on the property; 3) to determine if it would be feasible to profitably mine any of the mineralized zones at 25 to 50 tons per day; and 4) to make recommendations for further work to be done on the property if warranted.

The Burney Mines area is about 25 airline miles north-northeast of Tucson, Arizona on the northwestern flank of the Santa Catalina Mountains. The property consists of 32 unpatented federal lode claims which are principally within the boundaries of the Coronado National Forest. The claims occupy parts of Sections 15, 16, 22, 23, 26 and 27 T10S R15E (Figure 1).

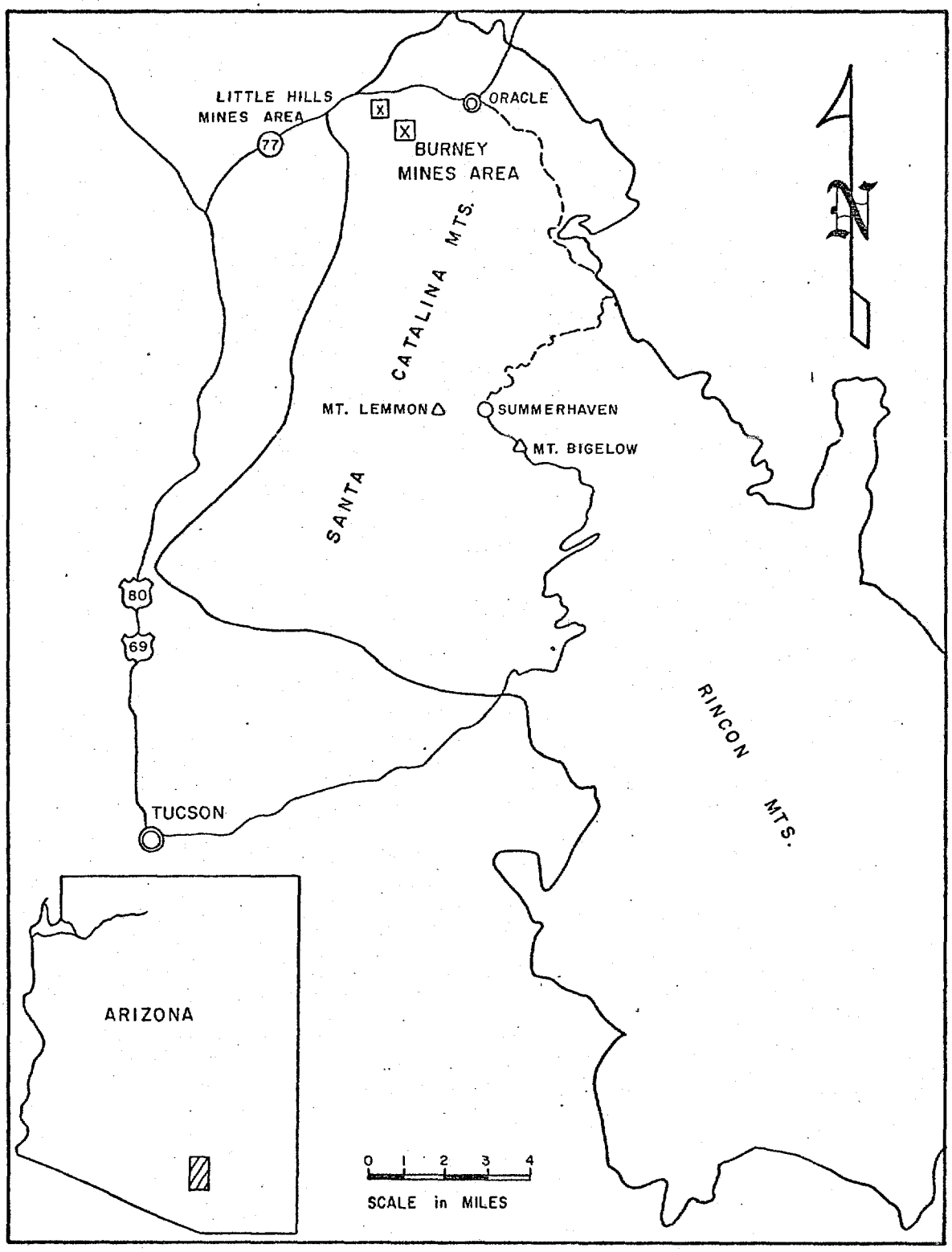


Figure 1. Location Map, Burney Mines Area, Pinal County, Arizona

Twelve man days were spent in the field in order to make a reconnaissance geological map of the area and examine and map each mine in detail. Six man days were spent in the office preparing for the examination and writing the report. Samples were collected from each favorable mine working in order to determine the grade of ore over possible mineable widths. Some prospects and undeveloped structures were also sampled to aid in determining their future potential. A total of 41 samples were collected and assayed for one or more of the following elements: gold, silver, copper, lead, zinc and molybdenum.

GEOLOGY

The geology in the Burney Mines area is a broadly folded and complexly faulted sequence of sedimentary and igneous rocks which occupy a graben structure centered on Canada del Oro creek (Figure 2 in pocket).

The rocks exposed in the area from oldest to youngest are the Precambrian Pioneer Shale, Barnes Conglomerate, Dripping Spring Quartzite and Mescal Limestone all of which are intruded by Precambrian diabase sills. Overlying the Precambrian rocks are the Cambrian Bolsa Quartzite and Abrigo Formation. In the western part of the area the Pennsylvanian Horquilla Limestone is found in fault contact with the older rocks. Tertiary monzonite porphyry dikes and sills intrude all of the older rocks.

The Pioneer Shale occurs in the southwestern part of the property and consists of a thick sequence of shales and sandstones.

The Barnes Conglomerate also outcrops in the southwestern part of the property and is a chert to quartzite pebble conglomerate with an arkcosic matrix. It averages about 20 feet in thickness and is an excellent marker bed.

The Dripping Spring Quartzite occupys much of the area west of Canada del Oro creek. It consists of a thick sequence of thin to massive bedded quartzite, sandstone and shale.

The Copper Rose mineralization occurs in this formation but other mineral occurences within it are low grade and pyritic.

The Mescal Limestone occurs in small areas in the western part of the property and is a white, thinly-bedded limestone.

The diabase sills intrude all of the Precambrian rocks in the Burney Mines area and are a greyish-green, coarsely crystalline, equigranular rock.

The Bolsa Quartzite outcrops in the central and eastern part of the area. It is a massive, coarse grained, reddish-weathering quartzite. The reddish hue of Red Hill is due to the weathering of minor amounts of pyrite and magnetite in the rock. The Bolsa which forms many of the cliffs and steep slopes in the area is also the principle mineralized rock unit. Mineralization at the Lead Reef, Birthday, Soldine and Pretty Fair mines all occurs in the Bolsa. The Bolsa is the best host for mineralization in the area because of its hard, brittle nature and its ability to maintain open channel ways for mineralizing fluids. Because the Bolsa is nearly pure quartz it is also an excellent flux rock.

The Abrigo formation occurs in the central and western part of the area and is a thick sequence of brown, thinly-bedded shales. The Abrigo where present acts as an effective cap to mineralization.

The Horquilla Limestone outcrops in the extreme west central portion of the property. Near the top of the unit it is a brown massive limestone which grades downward into a thinly-bedded, yellow-brown, limy siltstone at its base. Fossils are locally abundant in some of the lower units. Mineralization at the Stove Lid mine and Slims mine are in the Horquilla.

The monzonite porphyry dikes and sills occur throughout the area and are characterized by large feldspar phenocrysts in a light-colored, medium-grained matrix. A monzonite porphyry dike near the Birthday mine contains pyrite and may be related to mineralization at the mine.

Structure

The principle structure in the Burney Mines area is a broad northwest trending syncline bounded on the east and west by large normal faults which create a northwest to southeast oriented graben. The rocks within the graben are cut by numerous low angle and high angle normal and reverse faults with their principle orientation being northeast to east-west (Figure 2).

The syncline is a gentle flexure the axis of which follows the center of the mapped outcrops of Horquilla Limestone and Abrigo formation. The graben which bounds the syncline is bounded by the normal fault along the east

edge of the mapped area and a normal fault just west of the mapped outcrops of Pioneer shale. These normal faults have down dropped this entire block of sedimentary rocks from 1,500 to 3,000 feet. No significant mineralization exists beyond the limits of the graben in the Burney Mines area.

The low angle (<45° dip) faults show both normal and reverse movement and occur frequently as bedding plane and locally as cross-cutting faults throughout the entire area. They are present at every prospect but are mineralized only at the Soldine mine. At the other mines they add only to the complexity of the geology.

High angle (>45° dip) normal and reverse faults also occur throughout the area. High angle faults localized the mineralization at the Copper Rose, Lead Reef, Stove Lid, Slims, Birthday and Pretty Fair mines. A northeast to east-west fault trend is the most favorable for mineralization.

Economic Geology

Mineralization at the Burney Mines area occurs in the hard, brittle units of the Bolsa Quartzite, Horquilla Limestone or Dripping Spring Quartzite. The mineralization frequently occurs where a northeast to east-west trending high angle fault cuts one of the favorable units. Mineralization consists of sulfides and quartz deposited in the fault breccias or as replacements in selected favorable horizons for a few feet away from the fault. The mineralized fault zones average 1½ to 4 feet wide but may open up to as wide as 20 feet as at the Lead Reef mine. Replacement zones generally 3' to 4' thick occur at the Birthday mine up to 10'-20' away from the fault.

The principle sulfide minerals at the Burney Mines are pyrite (FeS_2), chalcopyrite ($CuFeS_2$), galena (PbS) and sphalerite (ZnS). No silver or gold minerals were observed in the sulfide zone but they probably occur with the other sulfide minerals. These sulfide minerals near the surface have been oxidized and redeposited as limonite ($FeO(OH)\cdot nH_2O$), hematite (Fe_2O_3), chalcocite (Cu_2S), chalcanthite ($CuSO_4\cdot 5H_2O$), malachite ($Cu_2CO_3(OH)_2$), cerussite ($PbCO_3$), anglesite ($PbSO_4$), smithsonite ($ZnCO_3$), wulfenite ($PbMoO_4$), and other less abundant minerals. No silver or gold minerals were observed in the oxidized rocks although assays show them to be enriched by oxidation. The silver and gold probably occur with the copper, lead, and zinc minerals in the oxide zone.

All of the mines in the Burney Mines area were examined and mapped in detail and are described individually below.

The Birthday Mine

The Birthday mine is located in the SE1/4 of the NE1/4 of sec. 22 T10S R15E uns. along the east-west trending Birthday fault. The workings consist of an adit 90 feet long and 15 feet wide by 15 feet high at the opening from which an estimated 1,200 to 1,300 tons of rock were removed. According to J. Glass, 1970, material of the following tonnage and grade was shipped from the workings.

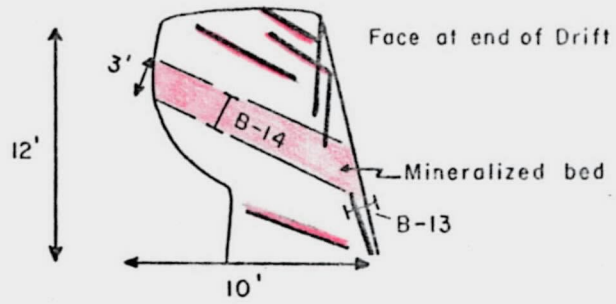
Smelter Liquidation	Tonnage	Au	Ag	Cu	Pb	Zn
Oct. 8, 1948	42.95	.105	38.08	.02	--	
Oct. 28, 1948	44.16	.165	49.20	.20	13.00	
Oct. 30, 1948	41.93	.071	24.18	.02	--	
Nov. 18, 1948	47.55	.090	17.98	.28	.5.6	
Nov. 30, 1948	47.27	.055	11.89	.35	--	
Dec. 15, 1948	47.40	.045	10.95	.02	--	
Jan. 14, 1949	35.08	.040	25.30	2.97	15.40	
Jan. 28, 1949	35.84	.040	13.40	.55	3.20	
Mar. 18, 1949	40.97	.040	18.40	.85	5.60	
Mar. 18, 1949	46.29	.040	17.20	1.82	5.00	
Apr. 13, 1949	47.86	.030	9.70	.70	6.70	
Apr. 20, 1949	35.55	.030	7.20	1.10	4.80	
Dec. 5, 1966	37.92	.035	25.60	1.85	10.10	
May 2, 1967	26.50	.105	32.50	3.45	8.90	
Total Tonnage Shipped	577.27					
Weighted Avg. Grade of Ore Shipped		.063	21.54	1.01	7.83	

In the Birthday mine the Birthday vein strikes N65W, dips 70° to the east and is 6 inches to two feet wide. Au, Ag, Cu, Pb mineralization occurs in the vein, in certain beds up to three feet thick and along bedding planes in the Bolsa Quartzite for about 20 feet south of the fault (Figure 3). As the workings do not extend north of the fault the extent of the mineralization there is not known. At the back of the mine samples were taken of the vein, of a three feet thick mineralized bed and of a 10 feet thick section of rock below the mineralized bed with the following results.

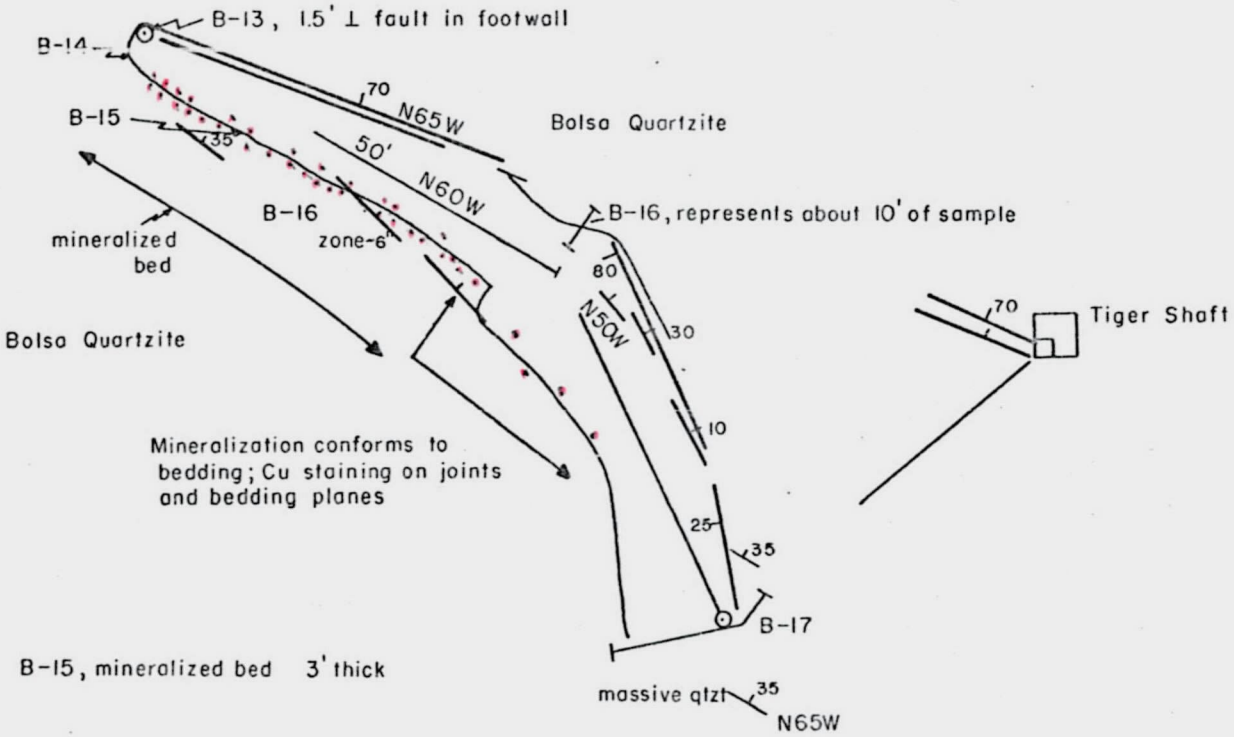
Sample	Description	Thick.	Ag oz/T	Au oz/T	Cu%	Pb%	Zn%
B-13a	vein	2'	0.87	0.008	0.11	1.86	NR
B-14	mineral bed	3'	11.14	0.035	3.75	7.00	0.08
B-15	qtzite below B-14	10'	3.75	0.012	0.64	3.05	NR
B-16	qtzite 15' from vein	10'	1.59	0.013	0.28	0.80	NR
B-17	qtzite 35' from vein	19'	1.50	0.014	0.03	0.34	NR

Discussion and Recommendations

This zone of mineralization is possibly of interest. Our examination indicates that the Birthday fault-vein is continuous along strike for at least 750 feet; that it contains Ag, Au, Pb, Zn, Cu mineralization in at least three locations; and that it cuts the Bolsa Quartzite, a favorable unit for both



B-14, mineralized zone about 3' thick ⊥ bed



Note:

Mineralization consists of chalcocite along with pyrite & Cu sulfides in one prominant horizon at the mine face. The bed thins away from the face and mineralization becomes spotty, occurring in irregular pockets along the horizon and in other beds. $CuSO_4$ mineralization occurs along several other bedding planes.

B-13 Sample location

Fault

Mineralized fault

Disseminated mineralization

Scale 1"=20'

0 20 feet

Figure 3. Geologic Map, Birthday Mine

mining and mineralization for at least 750 feet along strike and about 400 to 500 feet down dip. If the structure is continuously mineralized along its known strike length of 750 feet and down dip for 100 feet over a width of 15-20 feet, it could contain in the neighborhood of 100,000 to 150,000 tons of mineralized rock. Some or all of which could contain ore-grade values. In the Birthday mine the mineralized zone is about 20 feet wide south of the fault and of unknown width north of the fault. Sampling indicates that the inner 10 feet of this zone on the south side of the fault contain values which average somewhere between those given by sample B-14, $37/ton and B-15, $125/ton depending on the thickness, frequency and grade of the mineralized beds.

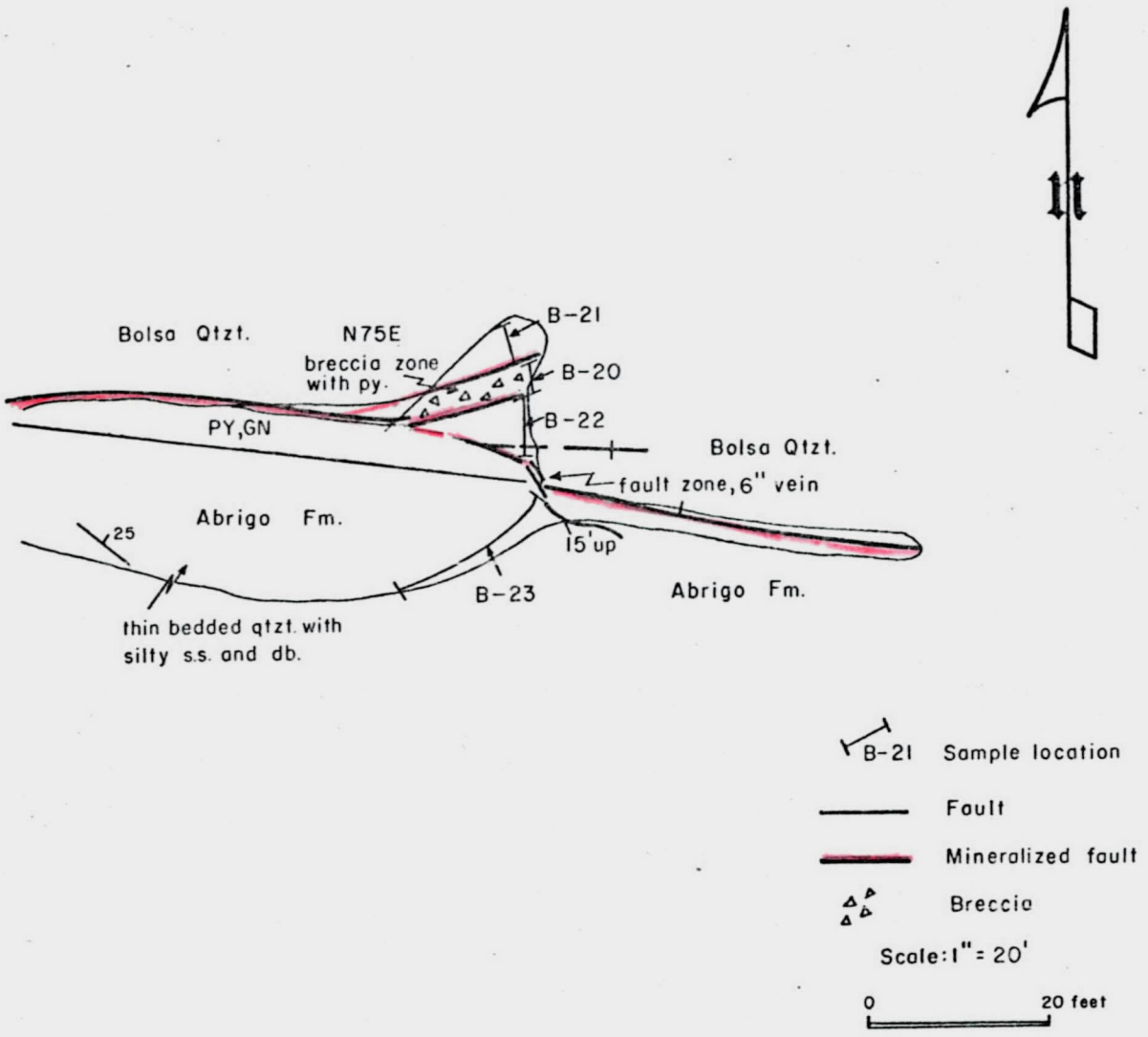
Negative factors here are that 1) copper mineralization occurs as secondary chalcocite coating pyrite so that copper and silver values should decrease with depth, and it is expected that at depth values should approximate those from the Birthday open cut. 2) Samples collected along the fault east and west of the Birthday mine contained very low values of all metals of interest and the areas of known mineralization (Birthday, Birthday extension, workings in Canyon del Oro) may be the only areas of mineralization along the fault.

We recommend that this structure be tested by drilling fans of air hammer holes angled to hit the fault at several locations along the fault. If results of that program are

favorable then core drilling or underground exploration should be undertaken. The target here would be a Pb-Zn-Ag vein-replacement deposit similar to the Birthday open cut but hopefully higher in grade. Again, as the high copper and silver values in the Birthday mine are probably due to a thin blanket of secondary enrichment, these should not be expected at depth.

Birthday Extension Mine

The Birthday open cut is in the SW1/4 of the NW1/4 of section 23 T10S R15E uns. and occurs on the Birthday fault about 500 feet east of the Birthday mine. The open cut is about 60 feet long by about 20 feet high at the back by about 20 feet wide. Here the Birthday fault is from 6 inches to two feet thick and trends about N85W and dips 80° to the north (Figure 4). Wall rocks north of the fault are quartzites of the upper part of the Bolsa Quartzite and south of the fault are shales of the Abrigo formation. Mineralization here consists of galena, pyrite, and minor sphalerite and occurs principally in the vein although some sulfide mineralization was seen in brecciated quartzite. Sample results from the Birthday open cut are as follows:



Note:

Mineralization at the Birthday Ext. is pyrite and galena in brecciated Bolsa quartzite. The adjacent Abrigo Fm. is barren.

Figure 4. Geological Map, Birthday Extension Mine

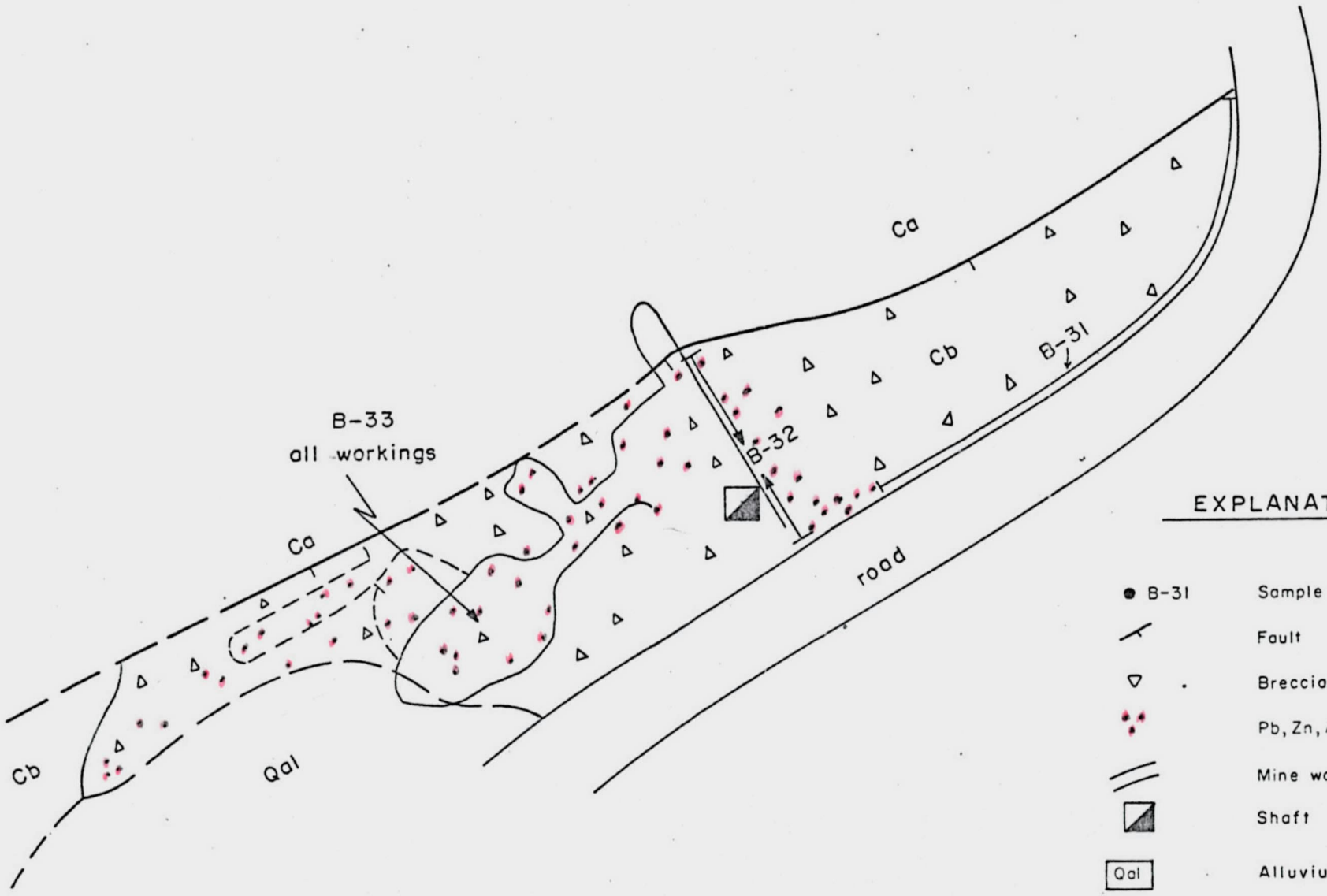
Sample	Description	Thick.	Ag oz/T	Au oz/T	Pb%	Zn%
B-20	N80W flt./gogue	7'	0.50	0.001	0.56	0.66
B-21	Gray qtzt. N. of Spl. B-20	5'	0.34	0.043	0.36	NA
B-22	Qtzt. S. of Spl. B-20	2'	0.42	0.006	0.75	NA
B-23	Abrigo Sh. S. of B-Day flt.	20'	0.12	0.001	0.05	NA
B-24	B-Day vn. in incline above cut	6"-2'	1.14	0.011	1.60	NA

Conclusions and Recommendations

At the Birthday open cut the mineralization is too low grade to be of interest. The Bolsa Quartzite, a unit highly favorable for mineralization, occurs on both sides of the fault within 20 to 50 feet of the outcrop. Therefore this area is considered to be a favorable target for further exploration.

Lead Reef Mine

The Lead Reef mine is located in the SW1/4 of the NE1/4 of section 22 T10S R15E uns., in a thin wedge of Bolsa quartzite caught between two northeast trending faults. The present workings trend roughly N55E and sample the mineralized zone for about 70 feet along strike. Approximately 1200 tons of material have been removed from the workings and of this 143.26 tons having values as shown below were shipped to the smelter.



EXPLANATION

- B-31 — Sample location
- Fault
- Breccia
- Pb, Zn, Ag, Cu mineralization
- Mine workings
- Shaft
- Qal — Alluvium
- Ca — Abrigo Formation
- Cb — Bolsa Formation

0 20 feet

Scale: 1" = 20'

Figure 5. Lead Reef Mine

Smelter Liquidation	Tons	Ag	Au	Cu	Pb	Zn
Nov. 3, 1948	47.46	1.95	0.05	3.80	15.95	3.00
Nov. 23, 1948	41.40	1.70	0.04	2.00	11.80	0.20
Feb. 15, 1949	22.71	14.75	0.04	0.82	27.00	
Mar. 16, 1951	31.69	3.70	0.01	1.12	12.20	1.30
Weighted Avg.		4.29	0.36	2.21	15.67	1.30

Evidently, ore was hand sorted prior to shipping as only about 10% of ore mined was shipped. The mineralized zone is an irregular body of brecciated quartzite about 100 feet long, NE-SW, 20 feet wide, and of unknown vertical extent although, as Burney encountered shale 23 feet below the shaft collar, it may be cut off by a fault only a few feet beneath the outcrop (Figure 5). In addition interpretation of the structure in this area and the presence of large quantities of diabase and Mescal Limestone on the lower dump indicate that the body cannot extend more than 50 to 100 feet below the outcrop. Mineralization at the Lead Reef consists of limonite, cerussite and other oxides, carbonates and sulfates of Pb, Cu, Zn and Ag. Samples taken from the walls of the workings and perpendicular to the strike of the body, near the shaft gave the following results.

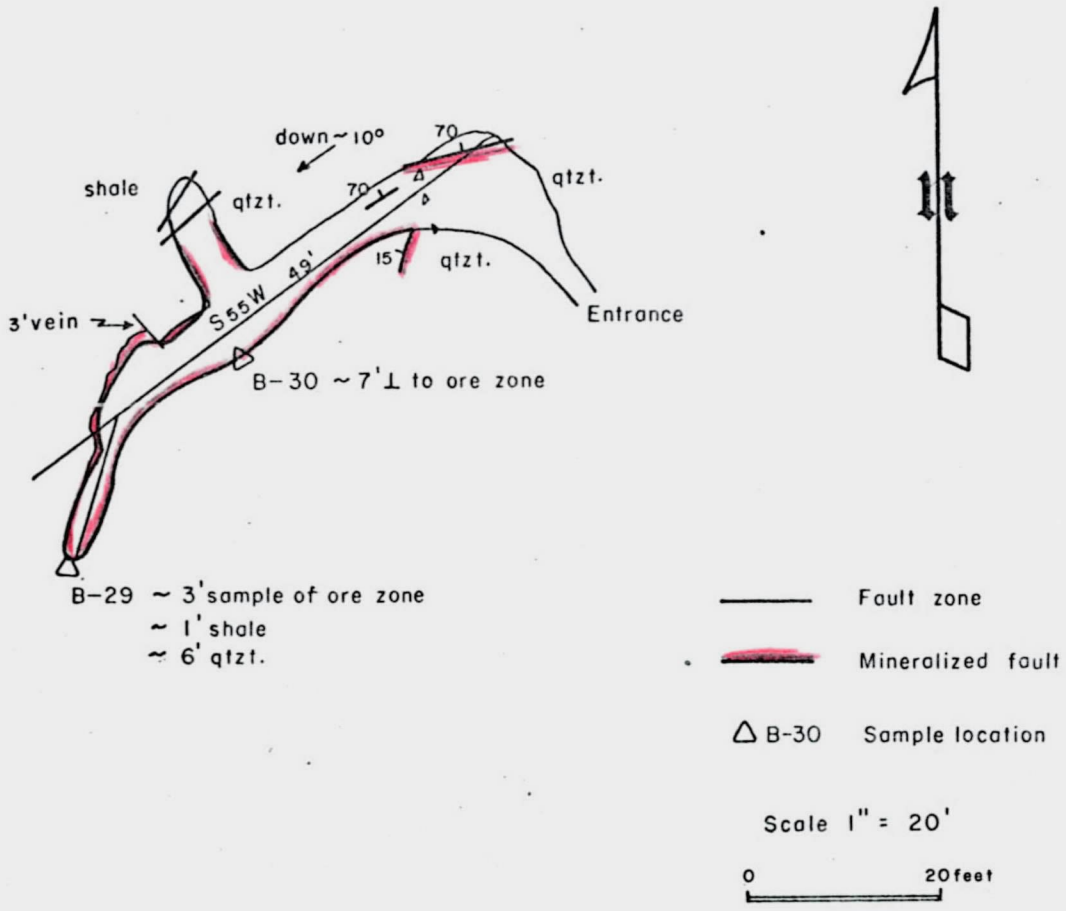
Sample	Description	Length	Ag	Au	Pb	Zn	Cu
B-32	Perp. to strike	20'	0.65	--	6.90	0.60	0.56
B-33	Walls of stope		1.15	0.009	6.45	0.51	0.53
B-31	Qtzt. along road	75'	0.28	--	0.12	0.02	0.01

At January, 1976 prices rock in the breccia zone has a value of about $41/ton. Because this mineralized body is localized at the intersection of at least two faults it is likely to be highly irregular in shape and of unpredictable dimensions at depth. Using measured surface outcrop areas and projecting these down 30 feet below the surface the body would contain between 3,000 and 5,500 tons of rock.

If the material were mined it would have to be concentrated by gravity separation techniques or be shipped as flux to a smelter which handles Pb-Zn-Ag-Cu ores.

About 250 feet northeast of the Lead Reef mine is a small tunnel along a N55E 15-70° dipping fault (Figure 6). Mineralization occurs in a 1-3 foot thick breccia zone as wulfenite, cerrusite and iron oxides. The tonnage potential at this prospect is very limited. Assays obtained from two samples at the prospect gave the following results:

Sample	Description	Thick.	Au oz/T	Ag oz/T	Cu%	Pb%	Zn%	Mo%
B-29	Flat fault zone	3'	0.017	2.01	1.78	NA	NA	0.1697
B-30	6' wall rocks 1' flt. vein ⊥ to vein	7'	0.011	0.35	0.13	1.03	0.14	NA



Note:

Mineralization is oxide, hematite, cerrusite, wolfenite, and geothite. It occurs in a flat fault zone, from 1 to 3' thick, between the overlying Abrigo Fm. and underlying Bolsa Qtzt. The strike of the fault varies from N30E 15SW at the entrance to N55W 70N on the north side of the workings.

Figure 6. Geological Map, Lead Reef Extension Mine

Stove Lid Mine

The Stove Lid mine is located in the N1/2 of the NE1/4 of section 22 T10S, R15E uns. and occurs on the northeast trending south dipping Stove Lid fault. The Stove Lid fault can be traced along strike for about 500 feet from Canada del Oro to the wash east of the mine but has been mined for only about 80 to 90 feet along strike and 80 to 90 feet down dip (Figure 7). In the mine the vein is from a few inches to 10 feet wide and consists of thin stringers of lead and zinc sulfides separated by zones of quartz and calcite. The mine consists essentially of one stope about 30 to 80 feet long, 3 to 5 feet wide and 80 feet down dip. Perhaps 1,500 to 2,000 tons of rock were mined from the workings and 507 tons as given below were shipped to the smelter. Evidently, this material was hand sorted prior to shipping.

Smelter Liquidation	Tonnage	Au	Ag	Cu	Pb	Zn
Apr. 8, 1947	50.53	--	3.30	.05	9.90	3.2
June 25, 1947	50.89	.020	1.60	.05	8.15	5.0
May 1947	50.79	--	2.40	.10	10.20	4.4
March 1948	54.33	.013	2.40	.07	10.00	5.3
June 1948	86.60	--	2.00	.07	7.30	5.4
August 1948	61.96	.002	1.50	.22	5.59	4.5
Sept. 1948	12.52	.005	1.50	.05	4.90	5.9
June 13, 1949	51.89	.010	1.40	.05	5.00	3.0
Feb. 24, 1949	43.11	.010	1.80	.07	6.40	4.8
Mar. 18, 1949	44.43	.010	1.60	.09	6.05	5.6
Total Tonnage Shipped	507.05					
Weighted Avg. Grade of Ore Shipped		.006	1.98	.08	7.53	4.57

Samples collected by us are in good agreement with the smelter liquidation sheets if it kept in mind that the sulfide stringers are separated by zones of low-grade material. Sample B-25 is from a pillar largely of waste material, and B-26 is from a pillar containing several sulfide stringers.

Sample	Ag	Au	Cu	Pb	Zn
B-25	0.36	0.07	NR	0.77	0.17
B-26	2.30	0.10	NR	7.80	2.80
B-27	0.24	0.007	NR	0.24	0.15

B-27 is from a small adit on the vein about 250 feet east of the Stove Lid mine. As the ratio of ore shipped to rock mined is about .25 to .3 then the values given in the smelter liquidation sheets should be multiplied by these numbers to give the true value of material in the vein. Multiplying the weighted average values from the smelter liquidation sheets by .3 gives the following average values for material mined from the vein:

Ag	Au	Cu	Pb	Zn
0.48	.002	.027	2.26	1.37

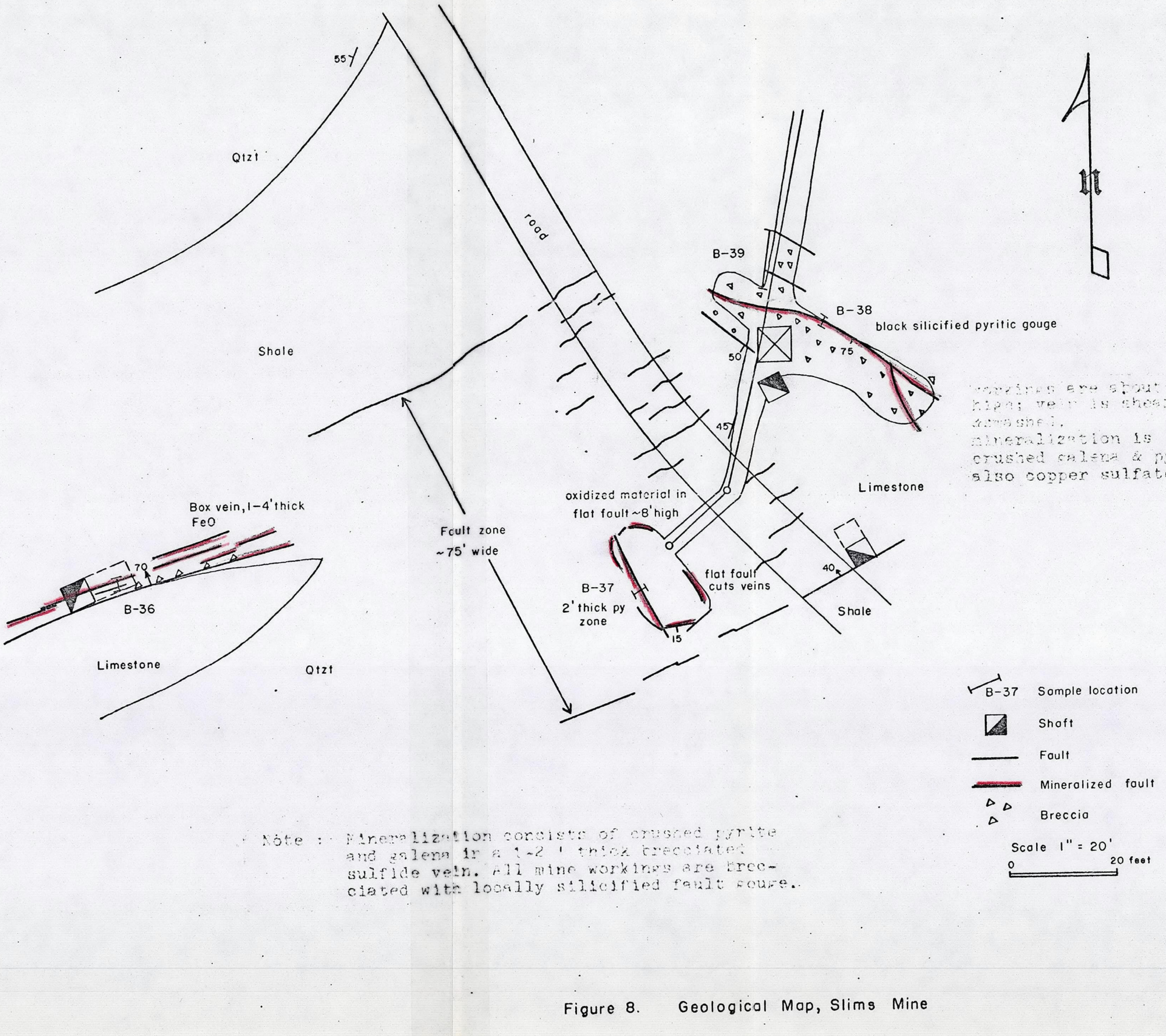
The dollar value of this at January, 1976 prices is about $22/ton.

Conclusions and Recommendations

Pb, Zn and Ag mineralization in the Stove Lid fault-vein occurs in thin stringers over a width of 5 to 10 feet. The mineralized body is too small to support a mill of 25 TPD capacity and the grade is too low to cover the costs of underground mining, treatment and shipping. We therefore recommend that no further work be done here.

Slims Workings

Slims workings are located in the NE1/4 of the NE1/4 of section 22 T10S R15E uns. along a major east-west trending fault which may also pass through the Lead Reef mine. The workings consist of a crosscut about 100 feet long trending S15W and two stopes one about 20 feet long and the other about 50 feet long and a winze 30 feet deep (Figure 8). About 600 tons of material was removed from the two stopes but production figures for this material were not available when this examination was made. The two stopes are developed on two separate veins which both strike northwest and dip to the southwest. These two veins occur within a major fault zone about 70 feet wide which here trends about S75W so that the veins trend at an angle of about 50° to that of the major fault. Consequently, the veins cannot be much longer than about 100 feet. The larger of the two stopes is developed on a vein consisting of quartz, calcite, galena,



Note : Mineralization consists of crushed pyrite and galena in a 1-2 ' thick brecciated sulfide vein. All mine workings are brecciated with locally silicified fault soure.

Figure 8. Geological Map, Slims Mine

pyrite, and perhaps other sulfide minerals from one to three feet in width which is sheared, contorted and brecciated by post mineral faulting. According to Slim, the caretaker of the Burney area, this vein was encountered in the shaft about 27 feet below the workings and contained good values. Samples of the vein and brecciated wall rocks gave the following results.

Sample B-38 was from the two foot wide sulfide vein in the main stope and showed 0.015 oz. Au, 4.82 oz. Ag, 0.07% Cu, 0.29% Pb, and 0.03% Zn, and is believed to be indicative of grades to be expected below the oxidation on this vein. Sample B-39 was of brecciated wall rock adjacent to the vein over a width of 20 feet and returned values of 0.015 oz. Au, 2.10 oz. Ag, 0.02% Cu, 0.06% Pb, and 0.06% Zn.

The vein in the smaller stope strikes about N30W, dips to the southwest at a low angle and is about 2 feet thick. This vein is entirely oxidized and consists of limonite, cerussite and probably other oxides, carbonates and sulfates of iron and lead. A sample of the vein gave the following results.

Sample	Ag	Au	Cu	Pb	Zn
B-37	23.41	0.03	0.07	1.79	0.07

The high silver value in this sample is believed to be due to surface enrichment. Another sample of oxidized material

collected about 100 feet west of the workings gave the following results and again, the high silver value is believed to be due to surface enrichment.

Sample	Ag	Au	Cu	Pb	Zn
B-36	48.80	0.024	0.09	3.10	0.07

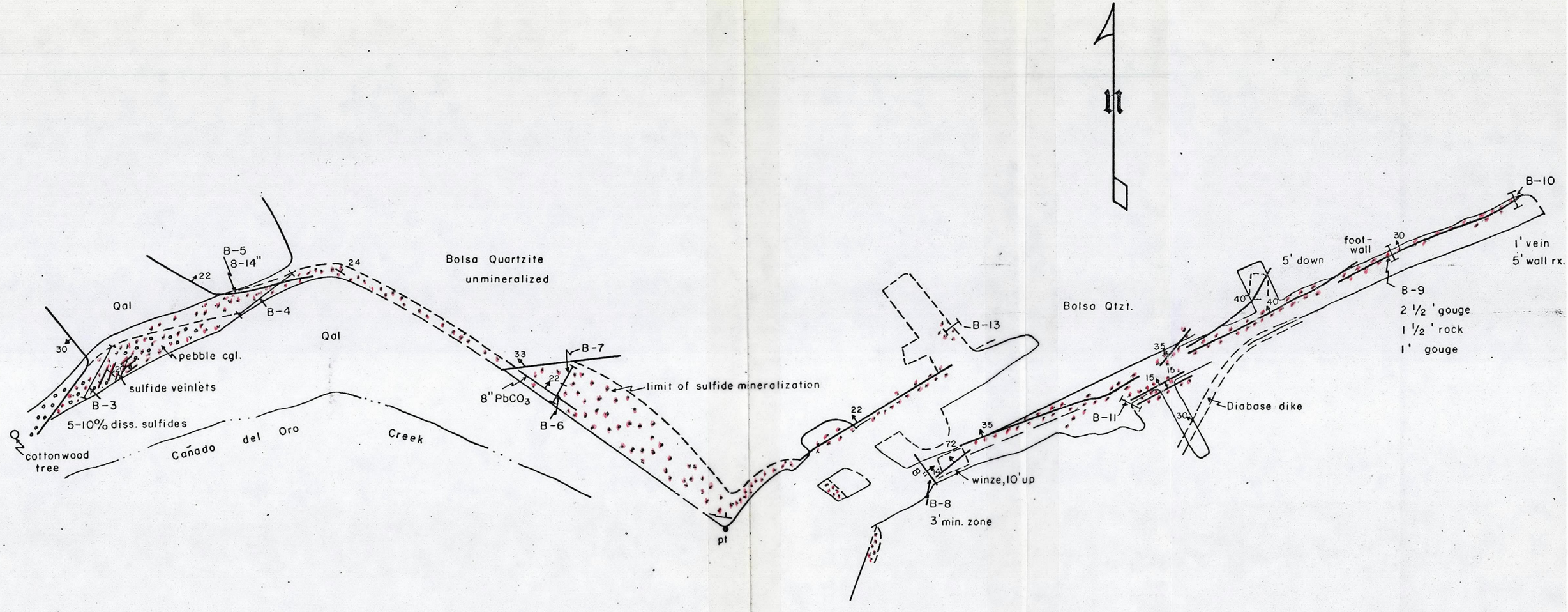
Conclusions and Recommendations

It is recommended that no further work be done here for the following reasons: 1) the veins are probably less than 100 feet long; 2) the primary grade of the veins is well below $40/ton; 3) the veins occur in highly broken ground which would pose serious problems to large scale mining; and 4) the veins have been displaced by post ore faults and could, therefore, be extremely difficult to keep track of in a mining operation.

Soldine Mine

The Soldine mine is located in the S1/2 SW1/4 Section 23 T10S R15E. Mineralization at the Soldine mine occurs in brecciated Bolsa Quartzite along both flat lying and high angle faults. Mine workings are located on both the east and west sides of Canada del Oro creek.

The workings on the east side of the creek lie just above the creek bottom and consist of two sub-parallel adits about 15 feet apart (Figure 9). The eastern-most adit is 160 feet



Note: Mineralization at the Soldine Mine consists of wolferite, hematite, pyrite, cerrusite and copper sulfates in a series of 3 parallel NNE 30-35W fault zones. The mineralized faults are from 6" to 1' in thickness. Adjacent to the mine workings pyrite mineralization is abundant but no Pb, Zn, or Cu sulfides were identified.

Figure 9. Geological Map, Soldine Mine Area.

long in a N65E direction. It averages about 8 feet wide and 6 feet high. A second adit 15' to the west is 55' long in a N60E direction with a 20'long N40W inclined winze near the back. These workings are about 8' wide by 6' high. About 1,000 tons of material has been removed from these workings and none has been shipped as ore.

Mineralization in the two adits consists of three parallel low angle fault zones trending N65°E and dipping 30-35° to the west. Mineralization in these fault zones is hematite, wulfenite, pyrite and chalcanthite. The 3 fault zones aggregate 2-1/2 to 3-1/2 feet and show anomalous but not ore grade values in Ag, Pb, and Zn.

Adjacent and to the west of these workings over a distance of 120 feet is a 3' to 10' thick zone of pyritized quartzite. This pyritized rock is cut by several low angle faults and shows low grade values of Au, Ag, Pb, and Zn.

The workings on the west side of Canada del Oro creek consist of several short adits aggregating about 100' of working. About 400-500 tons of material have been removed but none has been shipped as ore.

Mineralization in these workings consist of pyrite in brecciated quartzite along an E-W 60° N fault zone. No ore minerals were seen and no samples were taken.

Assay values for samples taken on the east side of Canada del Oro creek are given below and located on Figure

Sample	Description	Au oz/T	Ag oz/T	Pb%	Zn%
B-3	11' tk zone ⊥ to beds	0.003	0.06	0.03	0.40
B-4	20' tk zone ⊥ to beds	0.007	0.04	0.07	NA
B-5	1' tk flt. gague	0.009	0.14	0.10	NA
B-6	6' tk zone, 1' tk gague w/$PbCO_3$	0.008	0.54	2.07	0.45
B-7	10' tk zone ⊥ to beds above B-6	0.001	0.15	0.13	NA
B-8	3' tk zone ⊥ to beds	0.011	1.56	3.42	0.20
B-9	Main adit 3½' gague 1' qtzt.	0.008	0.29	0.97	0.84
B-10	4' tk zone w/ 1' gague	0.001	0.13	0.17	0.67
B-11	5' tk zone w/5-10% Py	0.006	1.00	3.05	0.24
B-12	Same as #8	0.004	0.82	2.90	0.16
B-13	5' tk zone in winze	0.005	1.00	2.60	3.05

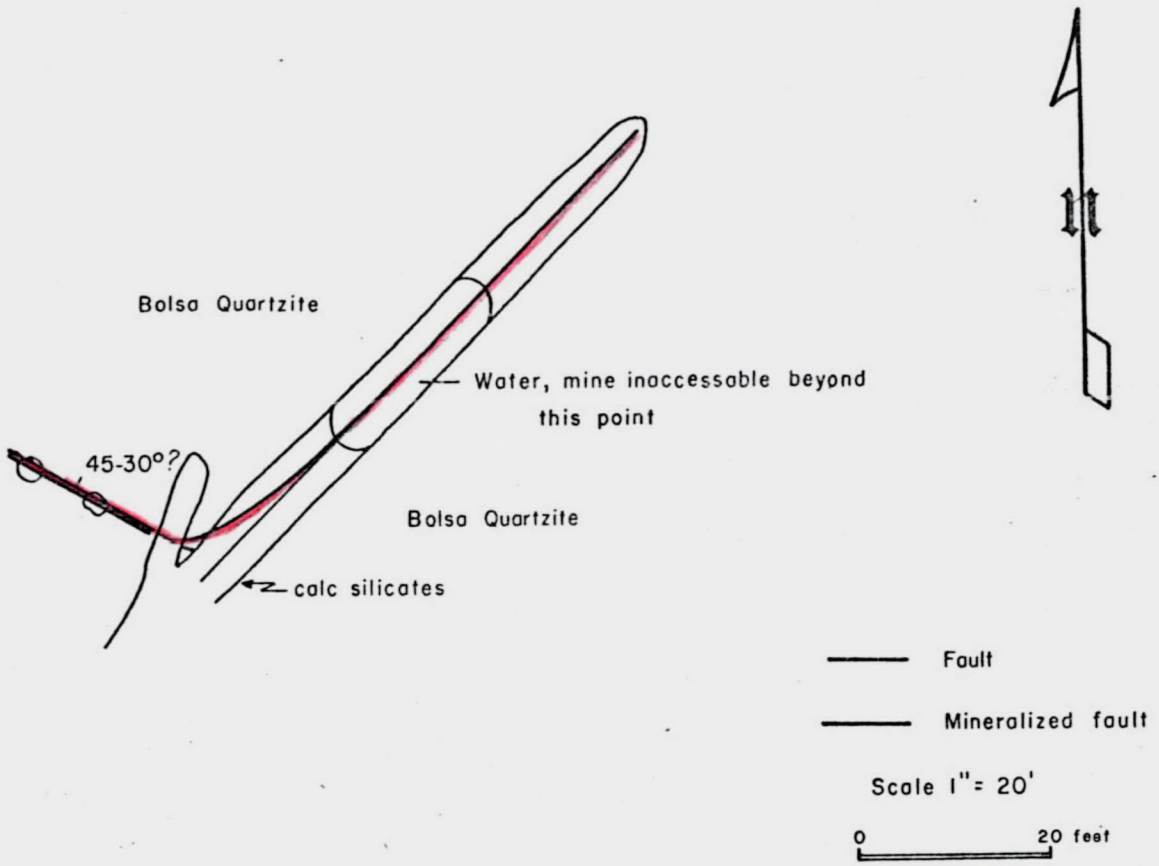
Samples B-3 to B-7 are surface samples. Samples B-8 to B-13 are underground samples.

Discussion

The mineralization as mapped and assayed at the Soldine mine is thin, erratic and to low grade to be of interest to the small mine operator. No ore was shipped from the mine and we doubt that any significant ore reserve exists at the Soldine mine.

Pretty Fair Mine

The Pretty Fair mine is located in the NE1/4 NW1/4 section 26 T10S R15E uns. The mine workings follow along a steeply dipping N45E fault (Figure 10). The fault zone



Note:
Mineralization consists of galena, sphalerite, pyrite, and copper oxides in a 1 to 2' thick zone along a N45E fault zone.

Figure 10. Geological Map, Pretty Fair Mine

is in brecciated Bolsa Quartzite and is mineralized over a width of 1-2' at the portal with Pb, Zn, Cu and Ag minerals. The mine workings were largely flooded and inaccessible at the time our field work was carried out.

J. Glass, 1970, collected one sample at the portal of the workings which assayed 1.50 oz. Ag, 5.25% Cu, and 0.20% Pb.

No sampling was done during the present study but it is felt that the Prelty Fair structure is to narrow to be of interest to the small mine operator.

Other Prospects

Several other prospects were examined during the course of the investigation. Some prospects showed scattered occurrences of Pb, Zn or Cu, or were large brecciated zones in quartzite. Several samples were collected for assay but none showed any significant metal values. These prospects are scattered throughout the entire area but are most abundant and best mineralized in the Bolsa Quartzite.

Assays from these prospects are given below and located on Figure 2.

Sample	Location and Description	Au oz/T	Ag oz/T	%Cu	%Pb	%Zn	%Mo
B-1	W. side Red Hill bx Qtzt in flt zone	0.005	0.40	NA	NA	NA	NA
B-2	Pros 3000' S60W from Red Hill bx Qtzt	0.006	1.20	NA	0.99	NA	NA
B-28	Lower Lead Reef adit selected gossan on dump'	0.332	0.62	NA	NA	NA	NA
B-34	Au Pros. 800' N60E from Cu Rose gossan on dump	0.097	3.01	NA	NA	NA	NA
B-35	Rd. cut 100' up from Lead Reef. Bx Qtzt over 40' width	0.008	0.14	NA	0.11	0.01	NA
B-40	1000' E. of B-Day open cut on B-Day flt. S/c Qtzt bx	0.009	0.18	NA	NA	NA	NA

3441 East Milber

Phone 889-5787

AMERICAN ANALYTICAL and RESEARCH LABORATORIES

ASSAYERS · CHEMISTS · METALLURGISTS

TUCSON, ARIZONA 85714

SAMPLE SUBMITTED BY Mr. Perry Durning

DATE January 17, 1976

SAMPLE MARKED	GOLD OZ / TON	SILVER OZ./TON	PER CENT COPPER	PERCENT LEAD	PERCENT ZINC	PERCENT MOLYBDENUM	PERCENT IRON	
B-1	.005	0.40						
2	.006	1.20						
2A	.338	0.62		0.99				
3	.003	0.06		0.03	0.40			
4	.007	0.04		0.07				
5	.009	0.14		0.10				
6	.008	0.54		2.07	0.45			
7	.001	0.15		0.13				
8	.011	1.56		3.42	0.20			
9	.008	0.29		0.97	0.84			
10	.001	0.13		0.17	0.67			
11	.006	1.00		3.05	0.24			
12	.004	0.82		2.90	0.16			
13	.005	1.00		2.60	3.05			
13A	.008	0.87	0.11	1.86				
14	.035	11.14	3.75	7.00	0.08			
15	.012	3.75	0.64	3.05				
16A & B	.013	1.59	0.28	0.80				
17ABC	.014	1.50	0.03	0.34				
18	.001	0.05		0.06				
19	.002	0.20	0.02	0.09				
20	.001	0.50		0.56	0.66			
21	.043	0.34		0.36				
22	.006	0.42		0.75				
23	.001	0.12		0.05				

Invoice # 13317

CHARGES $ 219.75

Date Signed 1/17/76

Arizona U. S. A.

3441 East Miller

Phone 889-0201

AMERICAN ANALYTICAL and RESEARCH LABORATORIES

ASSAYERS · CHEMISTS · METALLURGISTS

TUCSON, ARIZONA 85714

SAMPLE SUBMITTED BY Mr. Perry Durning

DATE January 17, 1976

SAMPLE MARKED	GOLD OZ./TON	SILVER OZ./TON	PER CENT COPPER	PERCENT LEAD	PERCENT ZINC	PERCENT MOLYBDENUM	PERCENT IRON	
B-24	.011	1.14		1.60				
25	.007	0.36		0.77	0.12			
26	.010	2.30		7.80	2.80			
27	.007	0.24		0.24	0.15			
29	.017	2.01	1.78			.1697		
30	.011	0.35	0.13	1.03	0.14			
31		0.28	0.01	0.12	0.02			
32		0.65	0.56	6.90	0.60			
33	.009	1.15	0.53	6.45	0.51			
34	.097	3.01						
35	.008	0.14		0.11	0.01			
36	.024	48.80	0.09	3.10	0.07			
37	.030	23.41	0.07	1.79	0.07			
38	.015	4.82	0.07	0.29	0.03			
39	.015	2.10	0.02	0.06	0.06			
40	.009	0.18						

Invoice # 13317

CHARGES $ 162.75

(43)

Reports By

J. R. Glass

&

H. Wober

REPORT

on

BURNEY MINES LTD. PROPERTY

Pinal County, Arizona, U. S. A.

Location: Approx. 110° 41' Long.,
32° 30' Lat.,

for

SABINA INTERNATIONAL INC.,

August 31, 1970 J. R. Glass, B.Sc.,

Vancouver, B. C.

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MAPS

Geological Maps	Scale 1" = 200 feet
Geochemical Maps	
(a) Copper	Scale 1" = 200 feet
(b) Lead	Scale 1" = 200 feet
Geophysical Maps	
(a) Chargeability	Scale 1" = 200 feet
(b) Resistivity	Scale 1" = 200 feet

SUMMARY

The Sabina International Inc. property consists of twenty-six claims optioned from Burney Mines Inc. (an Arizona corporation), five and one half claims optioned from Mr. and Mrs. Robert Burney and fifty claims which were recently staked and recorded in the name of Sabina International Inc.,

Recent surveys carried out on this property by Metals Petroleum & Hydraulic Resources Consulting Ltd show the existence of coincidental geochemical soil anomalies and Induced Polarization anomalies over areas containing showings of economic mineralization. Limited underground mining on some of the showings and veins returned consistently high values in silver, lead, copper and some zinc and gold values.

It is recommended that the following work be done on the property:

1. Additional geochemical soil survey,
2. Additional Induced Polarization survey,
3. A combination percussion and diamond drilling programme to sample the bedrock under the coincidental Induced Polarization-geochemical anomalies and under the vein structures which contain the showings and old mines.

It is anticipated that the budget for this proposed programme will be $150,000.00.

CONCLUSIONS

1. Successful highgrade mining has been carried out on this property intermittently since the Spanish days. The smelter liquidation sheets show that 1878.88 tons of material with a calculated dollar value of $48.16/ton have been shipped from this property.

2. It is felt that there is a possible 50,000 tons of material containing + 1% oxide copper in the main showing of the Copper Rose structure. Coincidental geochemical and geophysical anomalies over this area strongly indicates the continuation of this mineralization both along strike and down dip. This area is considered to be a prime target for future drilling.

3. Sampling the walls and faces of four of the small underground mines indicates that high grade ore material still remains in these mines.

(1) Samples of the mineralization contained in the Birthday structure indicates that high grade material still remains in the face of the main workings (Bob workings), ore grade material can be found on surface and mineralization is reported at a depth of 80 feet.

An induced polarization anomaly, directly along strike from this zone indicates the presence of a large zone of massive or disseminated sulphides.

This area is a prime target for future drilling.

(2) Samples of the surface zone contained in the Soldine structure indicates that economic mineralization can be found. High grade material is reported to have occurred underground.

An induced polarization anomaly correlating extremely well with a geochemical anomaly straddles the strike extension of the Soldine structure. These are positive indications of economic sulphide mineralization continuing to some depth.

This area is also a prime target for future drilling.

(3) Sampling of the Lead Reef, the Stove Lid Extension and the Pretty Fair structures show the existence of high grade material in all three structures.

The Lead Reef and the Stove Lid Extensions have extremely high geochemical expression which is correlating very well with the known structure. No geochemistry has been done on the Pretty Fair.

At this time there is no geophysical data covering these showings so there is no evidence of any sulphides at depth along strike.

Future induced polarization surveys will be done over these zones of economic mineralization.

(4) A large amoebic like, geochemical copper anomaly covers the Red Hill area. Extremely high lead values are also found in the soil of this area, in the vicinity of the known copper mineralization.

(5) The results of the geochemical soil survey carried out on this property are excellent. The correlation between known mineralization and geochemical highs is very good. It follows therefore that

geochemical highs found over areas with no known mineralization should be explored in detail.

Taken on a broad sense the geochemical anomaly is roughly 4500 feet long and up to 2500 feet wide and is still open to the south west. An anomaly of this size and containing these values can be indicative of a large tonnage stataform deposit. Every effort should be made, and exploration should be directed toward any large target zone which could contain such a deposit.

(6) The Induced Polarization survey indicates that there are four large anomalous areas in the immediate vicinity of the known mineralization and all zones correlating with the geochemical results. It is strongly recommended that all four zones be tested by diamond drilling with holes to a depth of at least 800 feet.

4. There are other mineralized showings in the area which have not been examined. Future work will be directed toward these showings.

RECOMMENDATIONS

1. Perform a geochemical soil survey over the southwestern and southern portion of the ground. Samples should be taken at 200 foot intervals along lines spaced 400 feet apart.

2. Perform an induced polarization survey over the western portion of the claim group as outlined by P. P. Neilson in his report dated August 19, 1970 which is included with this report.

   Perform an induced polarization survey over any extension of the geochemical anomaly which may be found during the future work.

3. Sample the bedrock under the existing induced polarization anomalies by diamond drilling. It is expected that these holes would be drilled to a depth of at least 800 feet.

4. Sample the strike extensions of the high grade vein deposits using percussion or rotary drills.

BUDGET FOR PROPOSED PROGRAMME

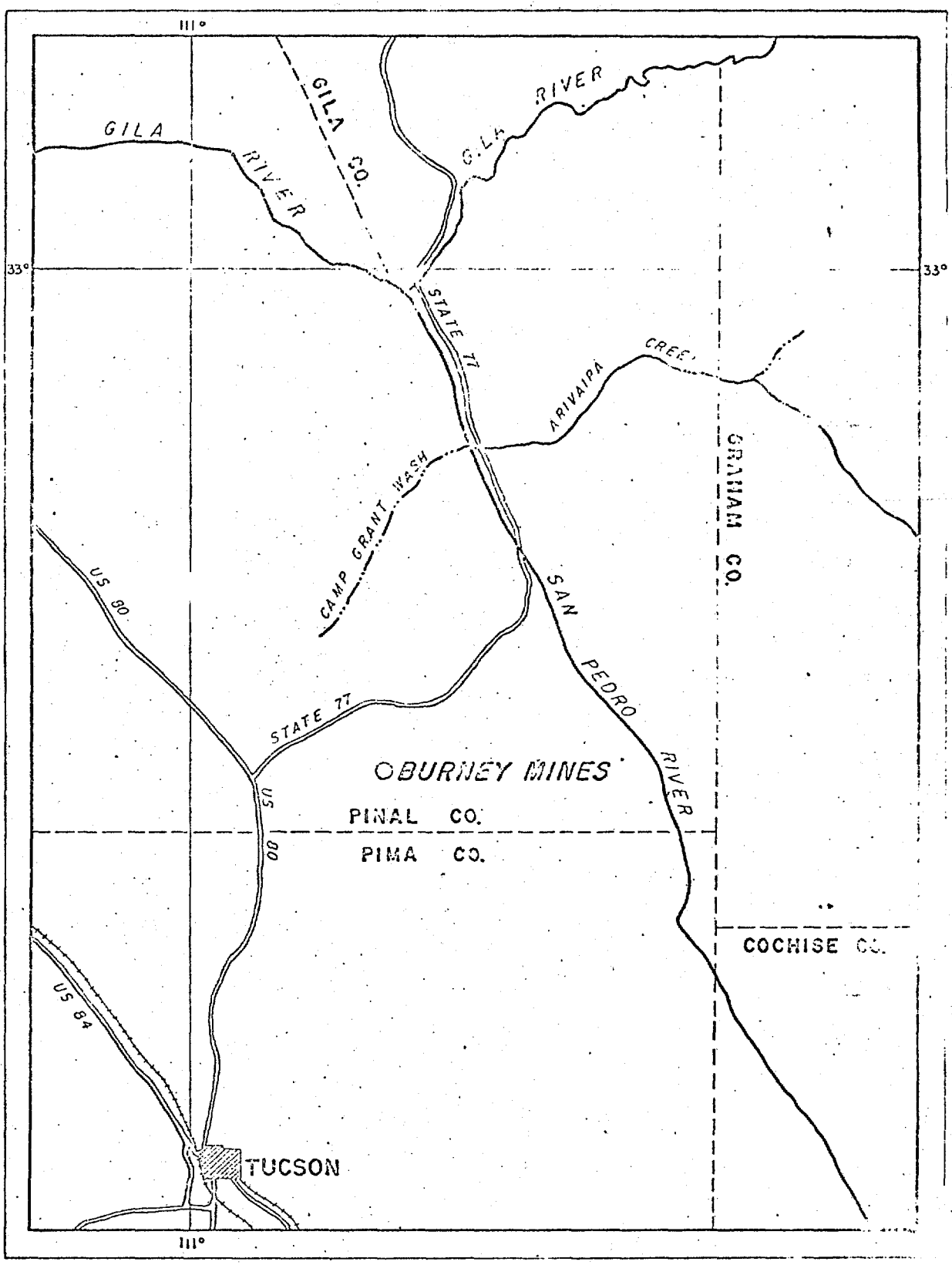
PHASE I

Geochemical surveys		$ 5,000.00
Geophysical surveys		10,000.00
Diamond drilling 4800' @ $12.00/ft BX wireline 6 holes 800' deep		57,600.00
Percussion drilling		
Birthday structure 500' @ $4.00	$ 2,000.00	
Lead Reef structure "	2,000.00	
Stove Lid Extension structure "	2,000.00	
Soldine Structure "	2,000.00	
Pretty Fair structure "	2,000.00	
Copper Rose structure "	2,000.00	
Stove Lid structure "	2,000.00	
Anomalies 2000'	8,000.00	22,000.00
Drill roads and drill pads		10,000.00
Travel		2,000.00
Living & accommodations		6,900.00
Geologist		5,000.00
Administration & communication		10,000.00
Surveying and mapping		4,000.00
Vehicles		4,000.00
10%		13,500.00
		$150,000.00

PHASE II

If the results of the above programme are positive it is anticipated that a programme involving underground development drifting combined with diamond drilling would be undertaken. The objective of this programme would be to prove and develop any ore bodies which might be encountered during Phase I.

A budget of $300,000-$400,000 for this type of programme could be justified.



SABINA INTERNATIONAL INC.

BURNEY MINES PROP.

PINAL COUNTY, ARIZONA PROPERTY

LOCATION MAP

SCALE

5 0 20 MILES

INTRODUCTION

Sabina International Inc. holds under option a contiguous group of miner claims listed as follows:

Binder	Stephen Hall	Gem
Gem # 1	Zipper Lead	Zipper
Lead Reef	Lead Reef # 1	Copper Giant
Copper Rose	Copper Rose # 1	Copper Rose # 2
Amphitheatre	Amphitheatre # 1	Amphitheatre # 2
Amphitheatre # 3	Amphitheatre # 4	Amphitheatre # 5
Stove Lid Ext. # 3 (Silver Line)	Good Chance	Bridge # 1
Iron Cap	Iron Cap Ext.	Stove Lid
Stove Lid # 1	Stove Lid # 2	

Mr and Mrs Burney:

NE1/2 Pretty Fair	Pretty Fair # 1	Old Soldine
Old Soldine # 1	Humbolt	Humbolt # 1

Sabina International Inc. has staked and recorded the following claims:

Sab # 1	to	Sab # 15	=	15 claims
Ina # 1	to	Ina # 16	=	16 claims
Rob # 1	to	Rob # 8	=	8 claims
Loco # 1	to	Loco # 23	=	5 claims
Hobo # 18	to	Hobo # 23	=	6 claims
				50 claims

All of these claims are located in the Mammoth area, Pinal County, Arizona, U. S. A. and were recorded August 20, 1970 in the Pinal Coun. Courthouse, Florence, Arizona.

Between April 17, 1968 and November 19, 1968 the writer spent approximately fourteen days carrying out preliminary mapping, sampling and geochemical soil surveys.

Between June 3, 1970 and July 27, 1970 a major geochemical survey and Induced Polarization survey and geological mapping programme was carried out on behalf of Sabina International Inc., over this ground.

The results and discussions which follow are based on all the work done by Metals Petroleum & Hydraulic Resources Consulting Ltd.

LOCATION

This property is located 35 miles north-east of Tucson, Arizona. It is seven miles south of the Oracle-Oracle Junction highway and can be reached by rough secondary road which is maintained by Mr. Burney.

TOPOGRAPHY

The property is in the Santa Catalina Mountains. The topography is mountainous with elevations ranging from 3700 feet to over 4800 feet.

CLIMATE AND VEGETATION

Because of the elevation the climate is more moderate than desert conditions generally found in this part of Arizona. Precipitation in the area is in the order of 20-25 inches per annum occurring principally in the mid-winter and mid-summer months.

The river runs in the Canyon Del Oro all year around, although in the dry months the volume is low. It is felt that enough water can easily be developed to meet any mining needs.

Vegetation includes stunted oak, cottonwood, and desert cactus.

WATER AND SURFACE RIGHTS

Mr. Burney has the water rights to call claims but two, and has the surface rights to all his mining claims. Any water that is ultimately developed is therefore available for mining and milling operation, as is surface rights for both mill site and tailings disposal.

There appears to be enough water in the Canyon Del Oro river to sustain any moderate milling operation, although engineering feasibility studies would dictate this.

HISTORY

Mining of high grade veins has been carried out on this property since the Spanish days. One of the zones of mineralization is known as the Spanish Mine because parts of an old "chicken ladder" used by the Spaniards can still be seen.

Gold was won during the 1930's from both placer and lode deposits in the vicinity, and from the property itself. These workings are in evidence for nearly a mile along the Canyon del Oro.

In the year 1946 Mr. Robert Burney obtained ownership of a number of the claims and in the years following gradually increased his holdings. Mr. Burney started mining and shipping ore from the property in the year 1948 and continued to ship until 1953. The smelter liquidation sheets available show that Burney shipped 1,878.88 tons of material which using today's prices has a value of over $90,000.00 or an average of $48.16 per ton. A breakdown of these shipments is included with this report.

In the year 1950 Burney erected a 50-ton flotation and gravity concentration mill on the property. The amount of ore that was mined and milled using this plant is unknown. It is known however that a number of shipments of concentrates were made; some smelter liquidation sheets are available.

Some time between the years 1950 and 1951 the Mammoth-St. Anthony Mining Company held an option on the property for a short period. It is reported that they performed no geophysical or geochemical surveys and did no exploration drilling. It is reported that they shipped more than 700 tons of ore from the property, and did a small amount of underground exploration.

In the year 1965 Mr. Dave McGee took an option on the property and shipped some surface material from the Copper Rose Mine. In the year 1966 this option was dropped.

Since that time the only exploration work done on the property was done by personnel of Metals Petroleum & Hydraulic Resources Consulting Ltd the results of which are included with this report.

REGIONAL GEOLOGY

The Burney Mines property is in the northern portion of the Santa Catalina Mountains. These mountains were formed by a large Laramide granite mass which intruded and distorted Precambrian granites and Precambrian sediments of the Apache Group.

In the north-western portion of this mountain range there is a well defined mineralized belt on which a number of economic ore deposits have already been developed, and many more promising showings have yet to be explored.

In this mineralized belt the following mines have been located:

Mine	Economics	Location
Little Hills Mine	Reported 8 million tons of + 1% Cu	2 1/2 miles N-W of Burney Mines
Leatherwood Mine Group	Reported 1 million tons of + 1% Cu., 1/2 million tons of 2% Cu	5 miles S-SE of Burney Mines
Corn Cob Mine	Reported 3 million tons of 3% Cu	20 miles S-E of Burney Mines

Between these mines there are numerous old abandoned workings, some of them dating from the Spanish era.

LOCAL GEOLOGY

The rocks underlying this property consist of Tertiary monzonite porphyry and diabase, Precambrian limestones, bedded quartzites, and shales. Silicification and alteration at the contacts has occurred in many areas.

Post mineral cross faulting and intense folding has complicated the local geology, while talus slopes and skree obscure some of the softer formations.

Over a distance of twenty five hundred feet there is a sharp syncline and anticline structure. It is felt that this intense folding which was caused by the Tertiary granitic intrusion is related to ore control. The Birthday Structure and the Soldine Structure are very near the trough of the syncline, as is the Red Hill while the Copper Rose is on the nose of the anticline. Future diamond drilling will define these ore controlling features in more detail.

Dykes and sills of quartz monzonite porphyry are also closely associated with the mineralization. This porphyry is very evident in the Birthday and the Soldine structures, can be seen in the Red Hill again near the C. [illegible] Rose and is reported in the Lead Reef. The exact relationship at this time is unknown and will be investigated during the future work programs.

MINERALIZATION

Ore has been shipped from a number of separate structures located on the property. These showings are referred to as mines although it must be noted that the total tonnage shipped is less than 2000 tons. A description of the individual mines follows:

1. BIRTHDAY MINE

The Birthday Mine is located at an elevation of 3960 feet on the west side of Canyon del Oro, 3000 feet southeast of the Camp and Stove Li[illegible] Mine. It is located in an area of massive white quartzite beds that locally strike N 75° W and dip northeast at 22-24°. The beds are broken by three well marked fracture zones that strike N 80° W and dip east at 70-80° and also in the Bob Incline by a series of N 10° W fractures. The Tiger Shaft is located on one of the east trending breaks. Between the Tiger Shaft and Pat Incline, along the road, a quartz monzonite porphyry mass intrudes the bedded quartzite. It extends along the road and appears to dip under the Pat Incline. The porphyry is mineralized, carrying pyrite, and sphaler[illegible] and showing a little copper stain. The Pat Incline follows along a fracture in quartzite that strikes N 80° W, and dips N at 80°. This incline from 6 to 15 feet wide and from 6 to 10 feet from floor to roof, is really a stope from which 113 tons of ore was shipped that are reported to have averaged 4.5% lead, 4.56% zinc 2.83% copper and $2.40 gold. All the material [illegible]

the Pat Incline was shipped as ore. There is practically no du... The ore was in a thin-bedded, shaley quartzite lying below a bed of whit... mass quartzite.

The Tiger Shaft on the Birthday Mine, was sunk in 1950 as a prospect... It dips 60° to the north, and was sunk to a depth of 85 feet. Water stood ... feet below the collar of shaft so was unable to inspect this developmen... Mr. Burney, who did the drilling, has supplied the following data:

> "At 60 feet below the collar, a drift was run 80 feet to the west along the fracture. Two short "long holes," one north and one south, were drilled 45 feet from the shaft in quartzite without encountering ore. Two holes, 60 and 70 feet in length, were drilled in the face parallel to the fracture, and one to the southwest which showed good mineralization."

2. BOB WORKINGS

The Bob Workings, the most westerly on the Birthday ground, consist of an open stope whose floor dips to the north so that in a length of 65 feet at the face of the work, the floor is 25 feet below the level at the entrance. The stope is 10 to 15 feet wide between two well defined north trending nearly vertical fractures. The stope face is along an east-west fracture that dips north at 70°. All the quartzite in this triangular area was brecciated and mineralized. Sphalerite and galena are seen in the angular fragments and the filling between fragments filled with plumbojarosite, cerrusite and horn silver. Chip samples of the material in this work... taken by a field man employed by Metals Petroleum & Hydr...lic Resource... Consulting returned the following:

Width	Au oz/ton	Ag oz/ton	Pb %	Cu %
18" (oxide material)	.1[illegible]0	21.34	not assayed	.07
6' (surface)	.320	22.54	[illegible]	not assayed
12" (stubb stope)	.050	58.19	50.5	.39
4' (main stope)	.040	23.28	14.8	2.72
2' (back sample)	.040	71.68	41.8	4.19

The material that was mined out of this working is tabulated as follows:

Tonnage	Au oz/ton	Ag oz/ton	Cu %	Pb %
557.27	.063	21.54	1.01	7.83

2. COPPER ROSE MINE

The Copper Rose Mine is on the summit of the ridge, 2,50[illegible] southwest of the Stove Lid, at an elevation of 4,575 feet. At this place [illegible] are two large open cuts 20 to 30 feet wide, 20 to 30 feet deep and with [illegible] 25 feet high in brecciated quartzite. A massive quartzite caps the ridge. In the north pit, a strong fracture that strikes N 58° E and dips southeast at 67° is seen near the centre of the pit face. The mineralization extends out at least 15 feet on either side of this fracture. In the south pit, about the same conditions exist, but the zone of mineralization is wider.

One sample of the north pit taken by the writer returned the following:

Width	Cu %
35 feet	1.44

Three other samples of the same zone returned the following:

Width	Au oz/ton	Ag oz/ton	Cu %
8'	.005	2.76	4.10
12'	tr.	1.58	2.64
15'	.005	4.36	4.72

Material was mined from these open cuts and shipped to the smelter. A breakdown of the liquidation sheets is calculated as follows:

Tonnage	Ag oz/ton	Cu %
651.30	2.10	2.68

On the east side of the ridge, about 300 feet from the main workings, there is another copper showing which is felt to be an extension of the main zone. A chip sample, taken along the structure for five feet, returned the following:

Width	Au oz/ton	Ag oz/ton	Cu %
?	.010	7.01	7.92

It is felt by the writer that approximately 50,000 tons of material of grade + 1% Cu is indicated on the main showing of the Copper Rose. If the mineralization is continuous between the main showing and the extension located some 300 feet away there is a possibility of quickly developing additional tonnage of ore grade material.

3. LEAD REEF MINE

The Lead Reef Mine upper workings lie about 1,700 feet southwest of the Stove Lid and camp at an elevation of 4400 feet. This is near the summit or the ridge west of Canyon del Oro. The lower working is a short tunnel the portal of which is located 280 feet northeast of the main working along the strike of the prominent quartzite reef which contains the ore zone. A third adit has been driven, the portal of which is located approximately 300 feet northeast of the lower working.

Neither of the two lower workings were inspected by the w

At the upper works, an irregular stope, 30 feet long by 20 feet wide, and to a height of 20 feet has been opened on the south face of a massive iron stained quartzite breccia dyke. The breccia is filled with a mixture of cerusite and plumbojarosite, and in some places remnants of galena with some anglosite coatings is found along the more or less persistent fra... There is a quantity of mineralized quartzite of mill grade left in the st..., the exact amount at this time unknown. Sampling of this zone returned ... following:

Width	Au oz/ton	Ag oz/ton	Pb %	C...
20'	.030	1.15	19.1%	0.8+%

It is reported that the ore has been cross-cut 20 feet below the stope for a width of 20 feet, but below this level thin-bedded, shaley quartzite dipping to northwest appears and no ore has been found.

The material which was mined and shipped from the upper zone is tabulated as follows:

Tonnage	Au oz/ton	Ag oz/ton	Cu %	Pb %	Zn %
143.26	.036	4.29	2.21	15.67	1.30

A showing of similar material in the same host rock located some 450 feet from the main zone was sampled by the writer.

The results are as follows:

Width	Au oz/ton	Ag oz/ton	Pb %	Cu %
3'	.040	.46	3.10	.0...

At this time it is felt that this mineralized breccia is not part of the str...

extension of the main Lead Reef showing, but only future investigations will confirm this fact.

4. STOVE LID MINE

The Stove Lid workings are located just east of the main camp on the east side of Canyon del Oro at an elevation of 3940 feet. The workings are in an area of massive limestone, that strikes west, northwest and north at medium angles. A quartz monzonite dike crosses Canyon del Oro 180 feet southwest of the collar of the shaft.

At the tunnel level, the zone is from 3 to 8 feet between well defined walls. The inclined shaft is 75 feet deep, but water stands 30 feet below the tunnel which is 25 feet below the collar of the shaft. A drift on the tunnel level, northeast on the vein, is out about 80 feet long with stopes above to the surface and below for at least 30 feet. In the stopes, the ore in places is 12 feet between walls. It consists of sheared, altered limestone with numerous sub-parallel bands of solid galena-sphalerite up to 8 inches wide. Sulphide ore was mined at the surface, but beginning about 50 feet down the shaft the ore was oxidized and continued so to the lower level according to Burney. It is also reported that at the east face of the 100 foot drift on the lower level is a cross fracture cut off the ore. Burney reports he has drilled several "long holes" to the northeast, and picked up ore offset to the southeast about 15 feet. A chip sample taken at surface across 3 feet of the structure returned the following:

Width	Au oz/ton	Ag oz/ton	Pb %	Zn %
3'	.005	4.14	6.9	not assayed

What may be the eastward continuation of the Stove Lid fracture zone has been opened by some shallow workings on the south side of Dodge Wash between 560 and 720 feet northeast of the shaft. Oxidized lead minerals are to be

seen in the fractured limestone.

Fairly extensive mining was done on the main Lead Reef structure. The material shipped is tabulated as follows:

Tonnage	Au oz/ton	Ag oz/ton	Cu %	Pb %	Zn %
507.05	.006	1.98	.08	7.53	4.57

5. STOVE LID EXTENSION MINE

The Stove Lid Extension Mine is located near the Stove Lid [illegible] and is on the same limestone formation. These mines are structurally related in some way although the relationship at this time is not clear.

Two samples taken in the main drift of the mine returned the following:

Width	Au oz/ton	Ag oz/ton	Cu %	Pb %
3'	.010	19.86	15	not assayed
5'	.004	6.06	11	11

Although a small amount of mining has been carried out there is no record of the ore taken from this mine.

6. SOLDINE MINE

The Soldine structure appears to be a large crush zone in massive quartzite associated with a fault which strikes approximately east-west and dips nearly vertical. The gossan outlining this structure can be traced for nearly 1000 feet and contains a number of mineralized showings.

Chip samples taken from the mineralized portion of this zone returned the following:

Width	Au oz/ton	Ag oz/ton	Pb %	
5' (surface)	nil	4.14	1.20	.0
5' (surface)	nil	0.20	0.55	.03
5' (surface)	not assayed	2.64	1.40	.120
20' (surface)	not assayed	2.58	6.20	.075

It is reported that underground workings in this structure encountered ore grade material. One 5-ton sample is reported to have assayed 10% Pb per ton Ag. Surface caving of these workings rendered underground sampl impossible.

A heavily oxidized quartz monzonite dyke containing very heavy concentrations of pyrite intrudes this structure. Chip samples across this porphyry returned values in copper from 0.010% to 0.025%.

There are no smelter liquidation sheets noting ore shipped from this zone.

7. PRETTY FAIR

The Pretty Fair showing was flooded and as a result inspecti... sampling was impossible. The showing appears to be contained in a fau. zone which cuts massive quartzite beds. It is reported that the main vein of mineralization is four feet wide and that on the hanging wall side of the vein there is a structure containing lead-silver mineralization. A ... sample taken from the wall at the portal of the small tunnel on this sh... returned the following:

Width	Au oz/ton	Ag oz/ton	Cu %	Pb %
nil	not assayed	1.50	5.25	0.20

There are no smelter liquidation sheets showing ore shipments from this zone.

8. RED HILL

What is known as the Red Hill lies east of the Birthday Mine on the north side of Canyon del Oro, 4,300 feet southeast of the Stove Lid Mine. The hill is about 1,200 feet long running northwest to southeast and 600 feet in width. It consists of thin-bedded, somewhat shaley dark-colored argillites overlain by massive beds of white brecciated quartzite. In general, the bedding strikes easterly and dips from 15 to 75° to the north. The whole area is cut by a series of east and northwest trending fractures. There are a large number of shallow cuts on mineralized fractures. There is no work of any size, although it is reported that in the 1880's a considerable quantity of chalcosite ore was taken from the hill. Large and small chunks of high grade copper ore are widely scattered over the hill slopes at present, so it seems probable that the old Spanish gambosinos might have produced a modest output by gathering up the float.

OTHER SHOWINGS:

There is evidence of other mineralized showings both on the ground currently held by Sabina International Inc., and on the surrounding ground. None of these showings has been inspected by the writer since there is no record of production from them and no recent work has been done.

GEOCHEMICAL SURVEY

A geochemical soil survey has been carried out over part of the Sabina International Inc. property. The soil samples were taken from the "C" soil horizon at 200 foot intervals along lines spaced 300 feet, 400 feet and 500 feet, measurements made by careful pace and compass readings. The spacing of the lines was chosen to give close coverage to areas containing economic mineralization and at the same time cover as much area as possible with a reconnaissance survey. All samples were analyzed for total parts per million copper and lead and some were analyzed for total zinc. All assays were done at the laboratory of Southwestern Assayers & Chemists Inc., of Tucson, Arizona, using the atomic absorption method.

The results of this survey are plotted on maps of scale 1 inch = 200 feet included with this report.

DISCUSSION OF RESULTS

A. Copper:

Background values in copper appear to be in the order of 30 parts per million. Any value over 100 parts per million is considered to be anomalous and worthy of further investigation.

ANOMALY "A" - which has dimensions roughly 1100 by 200 feet straddles the Copper Rose showing. Values in this zone vary from 104 parts per million to 6400 parts per million (0.64% Cu). A northern extension of this anom

has dimensions roughly 800 by 500 feet and is connected to Anomaly "A" by one anomalous value. Readings in this area vary from 124 parts per million to 410 parts per million.

This large irregular anomaly gives evidence that the mineralization associated with the Copper Rose Structure may have a strike extension of 1500 feet. Singular high copper values farther south along strike give evidence of a possible extension of that main zone for a further 1000 feet. More detailed work will be necessary to establish whether this is true.

The northern anomalous zone which is located over the lower limestone member is a new area of interest measuring roughly
It indicates that there may be economic bedrock mineralization in the limestone in this area.

ANOMALY "B" is an amoebic shaped anomaly the body of which coincides with the trough of the structural syncline located at the base of the Red Hill. Two separate thin arms extend to the southwest, one for a distance of over 2400 feet. The main body of the anomaly measures roughly 1100 feet by 500 feet.

Values in this anomaly vary from 100 parts per million to 3960 parts per million (0.39% Cu) with the high values probably caused by down slope "leakage" from known copper showings on the Red Hill area. The middle part of the anomaly coincides very well with the known copper mineralization on the Red Hill and is a reflection of the copper mineralization which occurs on the Red Hill but the arms which stretch up the slope to the west reflect additional mineralization which at this time is unexplained. Future work should be directed toward these areas in an effort to locate the bedrock source of the soil copper anomaly.

ANOMALY "C"- is a sausage shaped zone which measures roughly 1300 feet by 200 feet. Values in this area vary from 104 parts per million to 280 parts per million. The bedrock source of this low order anomaly is unknown since no known mineralization occurs in the vicinity. Future work will be done on the area in an effort to locate the bedrock source.

ANOMALY "D" - is a reflection of the Soldine structure with dimens[illegible] at present of 1000 feet by 200 feet. Future work should be done in an effort to extend and define this zone which is currently open on three sides. The correlation of the soil anomaly and the bedrock mineralization at this time is exceptionally good. Future work will be done on this promising struct[illegible]

B. Lead:

Background values in lead appear to be approximately 60 parts per million. Any value over 600 parts per million is considered to be anomalous and worthy of further investigation.

The lead anomaly on the Sabina International Inc. property is exceptionally large in aerial extent and contains many exceptionally high values. The anomalous zone is roughly 4500 feet long and up to 2500 feet wide with values recorded as high as 10,000 parts per million (1%). A blank zone roughly in the middle of the anomaly coincides very well with a bed of massive quartzite which is known to be barren of mineralization. It is felt that the limestone members both below and above this quartzite are favourable beds for lead-silver mineralization and the geochemical results are a reflection of possible bedrock mineralization. The correlation between the known mineralization and the high anomalous readings is good, so that new areas of high readings are considered to be extremely important.

The lead anomaly associated with the Soldine structure is separate from the main anomaly and measures roughly 2000 feet by 200 feet.

One anomalous reading at the south end of the present grid is worthy of note. Further work will be directed toward this zone.

The southwestern portion of the anomaly is still "open". Future work will define the limits of this anomalous area which appears to be about 1700 feet wide at this time with individual values over 3000 parts per million. It is recommended that the soil survey be extended in this direction to further extend and delineate the limits of this strong anomaly.

It is felt that the large anomalous area located on the Sabina International ground gives evidence and could be the reflection of a large tonnage situation. The limestone members which outcrop on the property could be a favourable host rock for a large strataform lead-silver deposit and the veins and showings of lead-silver that have so far been developed are some sort of "off shoots" of a much larger zone.

GEOPHYSICAL SURVEY

During the months of June and July, 1970, an induced polarization survey was carried out by Metals Petroleum & Hydraulic Resources Consulting on behalf of Sabina International Inc. The base line for this survey was surveyed with a transit and the cross lines were chained along a compass bearing. The survey was carried out along eleven lines spaced 600 feet apart with an electrode spacing of 400 feet using a dipole-dipole configuration, and searching to a theoretical depth of 1000 feet.

The results of this survey and the report prepared by Mr. P. P. Nielsen, geophysicist are included with this report.

DISCUSSION OF RESULTS

Mr. Nielsen states that there are four anomalous areas indicated by the induced polarization survey. Only one of the areas has been drilled; the three other anomalies appear to be extending into areas not covered by the survey and are still "open." He further states that sulphide mineralization, either massive or disseminated, could be the cause of all these anomalies and recommends that they be explored by drilling to a depth of at least 800 feet.

CERTIFICATE

I, James R. Class of 910 Ash Street, Vancouver, B. C. certify that:

1. I graduated from McGill University in Montreal in 1961 and hold a Bachelor of Science in Geology.

2. I am a Fellow of the Geological Association of Canada, a member of the American Institute of Engineers and have practised my profession continuously for nine years.

3. I have based the Conclusions and Recommendations for this report on experience and knowledge gained during my work on the property between April 17, 1968 and July 1970 and on the results obtained by staff personnel who carried out the geochemical and geophysical surveys.

4. I hold no interest directly or indirectly in this property on the Companies mentioned in this report and do not expect to receive any such interest.

James R. Glass, B. Sc.,

Vancouver, B. C.

August 31, 1970

APPENDIX "A"

Report on Induced Polarization
Survey by P. P. Nielsen, B. Sc.,

REPORT ON

AN INDUCED POLARIZATION SURVEY

BURNEY MINES LTD PROPERTY

SABINA INTERNATIONAL INC. OPTION

Pinal County, Arizona, U. S. A.

Location: Approx. 110° 41' long.,
32° 30' Lat.,

FOR

Metals, Petroleums & Hydraulic Resources Consulting Ltd.,

by

Philip P. Nielsen, B. Sc.,

August 19, 1970

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INTRODUCTION

This report contains the results of an Induced Polarization survey carried out by Mr. Carlos Aiken, a geophysicist employed by Metals, Petroleum & Hydraulic Resources Consulting Ltd on some 33 claims owned by Burney Mines Ltd., and Mr. Bob Burney. The report was written in Vancouver, B. C. on behalf of M. P. & H. R. to assist in the delineation and evaluation of known mineralized outcrops and to test the potential for a large mineral deposit suggested by geological and geochemical investigations on the property.

LOCATION AND ACCESS

The property is located 35 miles north-east of Tucson, Arizona. It is seven miles south of the Oracle-Oracle Junction Highway and can be reached by rough secondary road which is maintained by Mr. Burney.

GEOLOGY

The property is located in the northern portion of the Santa Catalina Mountains which were formed by a large Laramide granite mass which intruded and distorted both earlier granites and sediments.

The north-west portion of this mountain range consists of a well defi mineralized belt on which a number of economic ore deposits have be developed.

The rocks underlying the property consist of Tertiary monzonite porphyry intruding limestones, bedded quartzites, and shales. Silicification and alteration at the contacts has been observed and post mineral cross faulting has complicated the local geology.

SURVEY SPECIFICATIONS

Instrumentation:

The Induced Polarization equipment used was a 2.5 kw. pulse-type transmitter manufactured by , combined with a Scintrex Newmont type MKVII receiver.

Type of current	-	Direct current broken at periodic intervals.
Pulse duration	-	2 seconds "current on" 2 seconds "current off" Alternate pulses have reverse polarity.
Integrating time	-	650 milliseconds
Delay time	-	450 milliseconds
Maximum available current	-	5.0 amps.

Measurements taken in the field were:

1) Current flowing through current electrodes C_1 and C_2.
2) Primary voltage, V_p, between measuring electrodes during "current on" time.
3) Secondary voltage, V_s, between measuring electrodes during "current off" time. V_s divided by V_p gives the apparent chargeability (Ma) in milliseconds.

The apparent resistivity is calculated by dividing V_p by the current and multiplying by the geometrical factor appropriate to the electrode array being used.

Electrode Configuration:

The entire survey was carried out using the dipole-dipole configuration or array. The current electrodes C_1 and C_2 and the potential electrodes, P_1 and P_2 are moved in unison along the survey line. Current is applied to the ground at two points a distance (a) feet apart. The potentials are measured at two other points (a) feet apart, in line with the current electrodes. The distance between the nearest current and potential is an integral number (n) times the basic distance(a). For this survey "a" was chosen to be 400 feet and "n" values of 1, 2, 3 and sometimes 4 were used.

The product of "n" and "a" is a rough approximation of the maximum depth of penetration. Covering the survey area using multiple separations provides more information as to depth, dip, location and metallic distribution of sources than does a single profile.

Presentation of Data:

The survey results are plotted in the two-dimensional "pseudo-section" manner with apparent resistivity in ohm-feet being plotted above the survey line and chargeability (Ma) in milliseconds below. This method of display is not to be taken as the vertical section of the electrical properties of the ground surveyed. The electrode separation is only one factor that determines the depth to which the ground affects a measurement. It is rather a convenient way of plotting all the data, especially lines of limited length.

The reading for any given set up is the mid-point between the centre point of the current electrodes and the centre point of the potential electrodes.

Contour plan maps of the apparent resistivity and chargeability were also plotted for n= 2.

The data received by the author of this report is believed to be accurate the survey appears to have been well executed.

INTERPRETATION

The interpretation was based on a study of the existing chargeability and resistivity data both in "pseudo-section" as well as in contour form. Generally, highest priorities were given to anomalous areas having high chargeabilities and low apparent resistivities along with greatest lateral and depth extent.

The two-dimensional "pseudo-sections" were mainly used to obtain information regarding apparent dip, depth determinations, and vertical distribution of metallically conducting material along the lines surveyed.

The contour plans provide information concerning strike, true dip, lateral distribution between survey lines and were used to correlate chargeability and resistivity with geological and geochemical data.

SECTIONS

Line # 1 — The maximum chargeability value was 11 milliseconds which is considered to be below an estimated background level of 15 milliseconds for the property.

Line # 2 — A high M_a of 30 msecs. at the south-westernmost end of the line (40W) could be extrapolated to near surface at 44W. There is good high M_a and low ρ_a correlation with the causative source having an apparent dip of 45° to the north-east. Should the results from line 3 be encouraging this line should be extended to the southwest.

Line # 3 — The results appear to illustrate a favourable mineralized rock unit within both limbs of a truncated anticlinal structure. The axis of the feature crosses the line at 31W. The south-west limb is not completely defined due to the termination of the survey in that direction but the north-east limb is nearest surface at 26W and has

apparent dip of 45° to the NE. There is very good M_a and ρ_a correlation at 24W, N = 2.

Line # 4

A very shallow, broad anomalous feature occurs at 6W to 2W but is still open to the north-east. Poor correlation. The anomaly at 22W and dipping approximately 45° NE could be the continuation of the NE limb of the anticline observed on Line # 3. Investigation of this anomaly is to await the outcome of drilling anomaly "D" (see contour plan).

Line # 5

The south-westerly dipping anomaly at 6W is the best enclosed anomaly on the property. There is a very good M_a and ρ_a coincidence at N = 2 and N = 3. The dike-like structure appears to be related to another sub-parallel anticlinal (or synclinal) feature whose south-west limb is cut off at depth by a fault. The axis of this anticline crosses this line at about 1E.

Line # 6

A very tightly folded structure is suggested on this line. A non-mineralized syncline has an axis passing through 2W, and to the east is another anticlinal pattern with axis at 3E. The NE limb of the anticline observed on the above lines is seen at the south-west end of this line as well. Resistivity correlation is poor here, however.

Line # 7

There seems to be a weak synclinal pattern at Station 0, but is of no economic interest. The north-easterly dipping feature still exists at the south-west end of the line. There is good resistivity correlation and the trend should be observed very near surface at 22W.

Line # 8 — As there was no apparent resistivity data available on this line, adjacent lines were used to interpolate necessary values. These can be seen in the contour plan. Another anticlinal pattern is seen on the SW end of the line with high chargeability values (three times estimated background) occurring along both flanks. Its axis crosses the line at 31 + 50W and the axial plane has an apparent dip of 45° NE. A vertical fault appears to be seen at 20W.

Line # 9 — A near surface anomaly of 39 msecs. is centered at 14W. There is good ρ_a correlation but lateral and depth extent is limited.

Line # 10 — A synclinal pattern is evidenced here with chargeability values in excess of 25 msecs. appearing to be structurally controlled around the periphery of the feature. Poor resistivity correlation.

Line # 11 — A small anomaly of 36 msecs. is observed at the SW end of the line but as it is represented by only one field value there is little that can be said about it. However, a definite syncline is observed with possible mineralization along the outer horizons.

CONTOUR PLANS

Although the survey lines did not completely delineate the main anomalous trend called the Western Zone, along the south-west edge of the grid it appears there is a particular rock unit within an anticlinal structure which is a favourable host to the deposition of metallically conducting material. This structure has a vertical axial plane striking about 300 degrees in the extreme western corner of the grid but appears to have been dragged or faulted into a southerly strike as it approaches a north-south trending linear

believed to be a wrench fault which is roughly situated in the centre of the map. As the anticline approaches or is affected by this fault, its axial plane dips more to the east.

The totally enclosed Anomaly "A" appears to be related to another fold feature sub-parallel to that discussed above but on the north-east side of the hypothesized north-south fault. The causative body is approximately 800 feet long by 400 feet wide and is dipping 45° south-westerly where it could be cut off by the fault at considerable depth.

Generally, all chargeability contours greater than 25 milliseconds are considered anomalous in this report. The 15 msec. contour outlines Anomaly "A", however, due to the excellent low resistivity correlation, Anomaly "B" is not enclosed but is thought to be due to a mineralized fault and/or a mineralized synclinal structure cut off by a north-south fault. This feature also appears at depth at line # 10, Stn. 2W and is illustrated on the pseudo-section for that line.

Anomaly "C" is part of the aforementioned western zone but could be partially due to the fault on its eastern flank.

Anomaly "D" has been discussed above.

Anomalies B, C & D are anomalous peaks within the "Western Zone" as outlined on the Chargeability Contour plan maps.

CONCLUSIONS AND RECOMMENDATIONS

In analyzing Induced Polarization depth sections of the "pseudo-section" type there is the possibility that the anticlinal or inverted "V" patterns observed in the chargeability sections can be due to a shallow, flat-lying source centered approximately mid-way between the limbs of the "V" and having a lateral extent less than the electrode spacing of n (a + b).

On this property, however, the geological evidence strongly suggests that this is not the case and that the synclinal and anticlinal chargeability patterns observed represent folded rock structures with stratigraphically controlled mineralization being affected by cross-cutting faults.

These "pseudo-sections" represent apparent dip only and lose their accuracy with depth due to the diffused picture caused by the integration of effects over larger volumes with depth.

Some of the Induced Polarization anomalies have correlated very well with the mineralization observed on known showings on the property and strongly suggest that this mineralization continues to some depth. The aerial extent, numerical value and general configuration of the anomalies indicates that a large tonnage mineral deposit of possible economic significance could be found.

The mineralization could be massive and/or disseminated within limestone horizons but also in the Tertiary monzonite porphyry rocks supposed to underlie these folded sedimentary units. Both these rock units are favourable host rocks in the Arizona metallogenic province.

The anomalous areas which vary from two to in excess of three times background chargeability suggest a causitive source of greater than 1%

by volume sulphides or equivalent oxides. The likelihood that these responses are due to such metallically conducting material as magnetite or graphite is minimal and, therefore, of extreme interest. This is supported by overlapping, coincident geochemical anomalies and favourable rock units.

It is strongly recommended that this property be further explored and developed in the light of existing investigations.

In particular, the Western Zone I. P. anomaly should be closed off by extending existing lines to the south-west. Intermediate, 300 feet spaced lines should be run in high chargeability areas for more accurate drilling of the anomalies. All anomalies should be drilled, not on the basis of the I. P. survey alone but in conjunction with geology and geochemistry.

The drill holes should be over 800 feet deep (vertical vector distance) and should sample the monzonite porphyry rock unit supposed to underlie the folded sediments.

APPENDIX "C"

AUTHOR'S CERTIFICATE

I, PHILIP P. NIELSEN, of North Vancouver, British Columbia, HEREBY CERTIFY that:

1. I am a geophysicist residing at 785 Premier Street, North Vancouver, British Columbia.

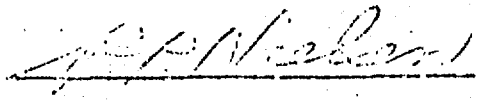
2. I am a graduate of the University of British Columbia, and received the Bachelor of Science degree in the Department of Geophysics.

3. I am a member of the Society of Exploration Geophysicists and the Canadian Institute of Mining & Metallurgy.

4. I have actively engaged in mineral exploration in British Columbia, Yukon Territory and Alaska for the past five years.

5. I am the author of this report.

DATED at North Vancouver, British Columbia, this 21st day of 1970.



APPENDIX "B"

Breakdown of Mine Production

MINE PRODUCTION

The following is a breakdown of Tonnage, Trade and Smelter returns at today's prices. This will give a reasonable idea of the dollar value of the ore, on the Burney Property. These computations are made on the following: Au., $42.00 per/oz., Ag. $2.00 per/oz., Cu. $.44 per/lbs., Pb. $.13 per/lbs Zn $.14 per/lbs.

LEAD REEF:

Smelter Liquidation	Tonnage	Au	Ag	Cu	Pb	Zn
Nov. 3, 1948	47.46	.05	1.95	3.80	15.95	.00
Nov. 23, 1948	41.40	.04	1.70	2.00	11.80	.2
Feb. 15, 1949	22.71	.04	14.75	.82	27 00	--
Mar. 16, 1951	31.69	.01	3.70	1.12	12.20	1.3
Total Tonnage Shipped	143.26					
Weighted Avge Grade of Ore Shipped		.036	4.29	2.21	15.67	1.30
Value		$1.51	$8.58	$19.44	$40.74	$3.64

Total Dollar Value per/ton $73.91

BIRTHDAY

Smelter Liquidation	Tonnage	Au	Ag	Cu	Pb	Zn
Oct. 8, 1948	42.95	.105	38.08	.02	--	
Oct. 28, 1948	44.16	.165	49.20	.20	13.00	
Oct. 30, 1948	41.93	.071	24.18	.02	--	
Nov. 18, 1948	47.55	.090	17.98	.28	.5.6	
Nov. 30, 1948	47.27	.055	11.89	.35	--	
Dec. 15, 1948	47.40	.045	10.95	.02	--	
Jan. 14, 1949	35.08	.040	25.30	2.97	15.40	
Jan. 28, 1949	35.84	.040	13.40	.55	3.20	
Mar. 18, 1949	40.97	.040	18.40	.85	5.60	
Mar. 18, 1949	46.29	.040	17.20	1.82	5.00	

BIRTHDAY MINE (continued)

Smelter Liquidation	Tonnage	Au	Ag	Cu	Pb	Zn
Apri. 13, 1949	47.86	.030	9.70	.70	6.70	
Apr. 20, 1949	35.55	.030	7.20	1.10	4.80	
Dec. 5, 1966	37.92	.035	25.60	1.85	10.10	
May 2, 1967	26.50	.105	32.50	3.45	8.90	
Total Tonnage Shipped	577.27					
Weighted Avg. Grade of Ore Shipped		.063	21.54	1.01	7.83	
Value		$2.64	$43.08	$8.88	$20.35	
Total Dollar Value per/ton		$74.95				

STOVE LID

Smelter Liquidation	Tonnage	Au	Ag	Cu	Pb	Zn
Apr. 8, 1947	50.53	---	3.30	.05	9.90	3.2
June 25, 1947	50.89	.020	1.60	.05	8.15	5.0
May 1947	50.79	---	2.40	.10	10.20	4.4
March 1948	54.33	.013	2.40	.07	10.00	5.3
June, 1948	86.60	---	2.00	.07	7.30	5.4
Aug. 1948	61.96	.002	1.50	.22	5.59	4.5
Sept. 1948	12.52	.005	1.50	.05	4.90	5.9
June 13, 1949	51.89	.010	1.40	.05	5.00	3.0
Feb. 24, 1949	43.11	.010	1.80	.07	6.40	4.3
Mar. 18, 1949	44.43	.010	1.60	.09	6.05	
Total Tonnage Shipped	507.05					
Weighted Avg. Grade of Ore Shipped		.006	1.98	.08	7.53	4.57
Value		$.25	$3.96	--	$19.57	$12.79
Total Dollar Value per/ton		$36.57				

COPPER ROSE :

Smelter Liquidation	Tonnage	Au	Ag	Cu	Pb	Zn
July 29, 1948	59.75		1.31	3.17		
Aug. 7, 1948	60.83	1.	1.49	3.28		
Aug. 16, 1948	49.01		1.21	4.12		
Aug. 23, 1948	62.23		.71	1.96		
Aug. 23, 1948	60.90		.69	1.53		
Sept. 2, 1948	59.91		.77	1.76		
Sept. 11, 1948	32.82		7.45	3.96		
Sept. 11, 1948	43.49		.92	2.02		
Sept. 16, 1948	40.20		1.15	1.94		
Nov. 24, 1948	39.75		8.81	2.00		
Aug. 29, 1952	48.46		2.47	3.88		
Oct. 15, 1952	40.45		2.13	3.23		
Jan. 22, 1953	43.51		2.81	3.28		
Total Tonnage Shipped	651.30					
Weighted Avg. Grade of Ore Shipped			2.10	2.68		
Value			$4.20	$23.58		
Total Dollar Value per/ton			$27.78			

BREAKDOWN OF TOTAL SHIPMENTS

Mine	Tons	Dollar Value per/ton	Value
Lead King	143.26	$73.91	$10,588.34
Birthday	577.27	74.95	43,269.56
Stove Lid	507.05	36.57	18,542.81
Copper Rose	651.30	27.78	18,093.11
Totals	1,878.88		$90,490.64

Overall Average for all Ore Shipped $48.16 per/ton

APPENDIX "D"

Assay Results

SOUTHWESTERN ASSAYERS & CHEMISTS, Inc.

REGISTERED ASSAYERS

FELIX K. DURAZO
WIL WRIGHT
ARIZONA REG. NO. 5675

P. O. BOX 7517
TUCSON, ARIZONA 85713

710 E. EVANS BLVD.
PHONE [illegible]-294-5311

[illegible] Page 2

JOB # [illegible]
RECEIVED
REPORTED

SAMPLE NUMBER	GOLD OZ.*	SILVER OZ.*	LEAD %	COPPER %	ZINC %		MOLYBDENUM %
[illegible]			[illegible]	32			
4[illegible]			[illegible]	32			
4[illegible]			[illegible]	32			
[illegible]			500	[illegible]			
[illegible]							
0+00			10[illegible]0	32			
400[illegible]							
2			11[illegible]	[illegible]			
[illegible]			[illegible]	3[illegible]			
6			120	3[illegible]			
[illegible]			[illegible]	[illegible]			
10			2[illegible]	5[illegible]			
12			3[illegible]	104			
14			[illegible]	32			
1[illegible]			250	20			
1[illegible]			5[illegible]	20			
20			7[illegible]	20			
22			[illegible]	32			
24			1220	4[illegible]			
2[illegible]			2320	116			
2[illegible]			[illegible]00	2[illegible]			
30			300	40			
32			12[illegible]	2[illegible]			
34			[illegible]	32			
36			200	32			
3[illegible]			10[illegible]	32			
40			12[illegible]	[illegible]			
42			[illegible]	40			
44			1[illegible]	36			
46			400	52			

CHARGE

* Gold and Silver reported in troy oz. per 2,000 lb. ton.

INVOICE

SOUTHWESTERN ASSAYERS & [illegible], Inc.

REGISTERED ASSAYERS

FELIX K. DURAZO
W.L. WRIGHT
ARIZONA REG. NO. 6675

P. O. BOX 7517
TUCSON, ARIZONA 85713

710 E. EVANS BLVD.
PHONE 602-294-5311

[illegible] Page 3

JOB # [illegible]
RECEIVED [illegible]
REPORTED

SAMPLE NUMBER	GOLD OZ.*	SILVER OZ.*	LEAD %	COPPER %	ZINC %		MOLYBDENUM %
[illegible]			20	[illegible]			
[illegible]							
[illegible]			2320				
[illegible]							
2			360	32			
4			1320	24			
6			240	32			
[illegible]			1120	60			
10			1520	132			
12			1140	100			
14			840	56			
16			1400	36			
18			40	24			
20			200	12			
22			300	24			
24			300	20			
26			700	[illegible]			
28			200	32			
30			1500	232			
32			700	30			
34			1500	76			
36			40	24			
38			80	40			
40			120	60			
[illegible]							
[illegible]							
4			12.0	60			
6			[illegible]	44			
8			4.20	16			
10			.42	20			

CHARGE ______________

* Gold and Silver reported in troy oz. per 2,000 lb. tons

INVOICE

SOUTHWESTERN ASSAYERS & CHEMISTS, Inc.

REGISTERED ASSAYERS

FELIX K. DURAZO
WIL WRIGHT
ARIZONA REG. NO. [illegible]

P. O. BOX 7517
TUCSON, ARIZONA [illegible]

710 E. EVANS BLVD.
PHONE 602-[illegible]

[illegible] Page [illegible]

JOB [illegible]
RECEIVED [illegible]
REPORTED [illegible]

SAMPLE NUMBER	GOLD OZ.*	SILVER OZ.*	LEAD %	COPPER %	ZINC %	%	MOLYBDENUM
[illegible]				[illegible]			
[illegible]			2.7	[illegible]			
16			[illegible]	32			
[illegible]			[illegible]	[illegible]			
20			[illegible]	[illegible]			
22			[illegible]	[illegible] ✓			
24			[illegible]	[illegible]			
26			[illegible]	[illegible]			
[illegible]			2420	[illegible]			
30			[illegible]	[illegible]			
32			[illegible]	[illegible]			
34			[illegible]	[illegible]			
36			[illegible]	[illegible]			
40			320	40			
0			[illegible]	[illegible]			
24 foil			[illegible]	[illegible]			

REGISTERED [illegible] ARIZONA U.S.A.

[illegible]

CHARGE [illegible]

* Gold and Silver reported in troy oz. per 2,000 lb. ton.

INVOICE

SOUTHWESTERN ASSAYERS & CHEMISTS, INC.

REGISTERED ASSAYERS

FELIX K. DURAZO
WIL WRIGHT
ARIZONA REG. NO. 6375

P. O. BOX 7517
TUCSON, ARIZONA 85717

710 E. EVANS BLVD.
PHONE [illegible]

Mr. James Glass
3130 East Grant Road
Tucson, Arizona

JOB # 002676
RECEIVED 7-25-6[illegible]
REPORTED 8-4-6[illegible]

SAMPLE NUMBER	GOLD OZ.*	SILVER OZ.*	LEAD %	COPPER	ZINC %		
O.S:							
130		.04	.19	.025	Sol-Dine		
131		Trace	.11	.030			
132		Trace	.10	.020			
133		Trace	<.10	.015			
134		2.64	1.40	.120			
135		Trace		.015			
136		Trace		.025			
137		Trace		.009			
138		Trace		.011			
139		Trace		.018			
140		Trace		.012			
141		2.58	6.20	.075			
142		.03	.55	.025			
143		Trace	.30	.010			
144		Trace	< .10	.015			
145		Trace	.15	.020			
146		Trace	.12	.015			
401		1.34	.10				

REGISTERED ASSAYER
[illegible]
ARIZONA U. S. A.

CHARGE $ 94.00

[illegible]

INVOICE

SOUTHWESTERN ASSAYERS & CHEMISTS, Inc.

REGISTERED ASSAYERS

FELIX K. DURAZO
W.L. WRIGHT
ARIZONA REG. NO. 0275

P. O. BOX 7517
TUCSON, ARIZONA 85713

716 E. EVANS BLVD.
PHONE [illegible]

Mister James Glass
3130 East Grant Road
Tucson, Arizona

JOB # 002407
RECEIVED 4-13-[illegible]
REPORTED 4-15-[illegible]

SAMPLE NUMBER	GOLD OZ.*	SILVER OZ.*	LEAD %	COPPER %	ZINC %		MOLYBD. %
Burney Mine: Copper Rose:							
# 1	.005	2.76	50' wide Some	4.10	8' cut	Main showing	
2	Trace	1.58		2.64	12' cut		
3	.005	4.36		4.72	15' cut		
4	.010	7.01		7.92	5' cut - showing		
Birthday open pit:	.035	9.45	12.8	2.96	4' in bottom of open pit		
StoveLid Surface Cut:	.005	4.14	6.9		3' surface showing		
Lead Prop:	.030	1.15	19.1	.84	30' in main adit of silver lead		

$ 47.75

SOUTHWESTERN ASSAYERS & CHEMISTS, INC.

REGISTERED ASSAYERS

FELIX K. DURAZO
W.L. WRIGHT
ARIZONA REG. NO. [illegible]

P. O. BOX 7517
TUCSON, ARIZONA 85715

710 E. EVANS BLVD.
PHONE [illegible]

Mr. James Glass
3130 East Grant Road
Tucson, Arizona

JOB: 002361
RECEIVED: 7-[illegible]
REPORTED: 7-[illegible]

SAMPLE NUMBER	GOLD OZ.*	SILVER OZ.*	LEAD %	COPPER %	ZINC %		[illegible]
623	Nil	1.90	4.10	– Tunnel	containing	water	reservoir
Lead Roof Extension	.040	.46	3.10	.04 –	8' Surface		
402	Nil	4.14	1.20	.06	} Soldier Claims		
403	Nil	.20	.55	.03			

REGISTERED ASSAYER
CERTIFICATE NO. [illegible]
WILBUR H. WRIGHT
Date Signed
Arizona U. S. A.

No charge for Au on 623 and 402- not requested

CHARGE $ 26.00

SOUTHWESTERN ASSAYERS & CHEMISTS, INC.

REGISTERED ASSAYERS

FELIX K. DURAZO
WIL WRIGHT
ARIZONA REG. NO. 0075

P. O. BOX 7517
TUCSON, ARIZONA 85713

710 E. EVANS BLVD.
PHONE 623-[illegible]

Mr. James Glass
3130 East Grant Road
Tucson, Arizona

JOB # 003122
RECEIVED 9-16-63
REPORTED 9-18-63

SAMPLE NUMBER	GOLD OZ.*	SILVER OZ.*	LEAD %	COPPER %	ZINC %		MOLYBDENUM %
Soldine:							
# 1	.003	1.50	3.7	.05			
2	Trace	.20	2.1	.08			
3	.003	1.60	4.2	.07			
Pretty							
Pair # 1	Trace	1.50	.20	5.25			
2	Trace	Trace	.10	.08			

REGISTERED ASSAYER
CERTIFICATE
ARIZONA U. S. A.

$ 40.00

SOUTHWESTERN ASSAYERS & CHEMISTS, INC.

REGISTERED ASSAYERS

FELIX K. DURAZO
WM. WRIGHT
ARIZONA REG. NO. [illegible]

P. O. BOX 7517
TUCSON, ARIZONA 85713

710 E. EVANS [illegible]
PHONE [illegible]

Mister Jim Gloss
3130 East Grant Road
Tucson, Arizona

JOB # 002404
RECEIVED [illegible]
REPORTED [illegible]

SAMPLE NUMBER	GOLD OZ.*	SILVER OZ.*	LEAD %	COPPER %	ZINC %		[illegible] %
Burney Mine:							
# 1	.140	21.34		.07	Birthday -	18" wide [illegible]	
2	.320	22.54	15.0		Birthday -	surface 6'	
3	.030	58.19	50.5	.39	Birthday -	12" face of [illegible]	
4	.040	23.28	14.8	2.72	Birthday	4' face of main [illegible]	
5	.040	71.68	41.8	4.19	Birthday	2' Rock sample	15' [illegible]
Stovepipe	EXTENSION						
1	.010	19.86		.15	3' wide	[illegible] of [illegible]	
2	.004	6.60	.80	.11	5' wide	[illegible] of [illegible]	

CHARGE $ 50.75

INVOICE

TELEPHONE 681-7493

MacDONALD CONSULTANTS LTD.

SUITE 12 - 425 HOWE STREET, VANCOUVER 1, B.C.

PROGRESS REPORT

on the

ARIZONA PROJECT

BURNEY MINES PROPERTY

for

SABINA INDUSTRIES LTD.

by

MACDONALD CONSULTANTS LTD.

H. WOBER, P. ENG.

Vancouver, B. C.

June 2, 1972

TABLE OF CONTENTS

ENCLOSURES

GENERAL

Following the completion of the first diamond drill hole on October 24, 1971, which we reported on in our Progress Report, dated November 17, 1971, exploration work was resumed in December 1971 and lasted to the end of March 1972.

The study of the rock types and alteration encountered in the first hole confirmed the initial interpretation. A thin section study was carried out by P. M. McAndless and Associates. A copy of their report is attached, together with a list of sample numbers and locations.

Field supervision was under G. B. Phelps, P.Eng. from the beginning of December to January 10th, and under C. V. Dyson, P.Eng. from January 7th to March 31st. Both Mr. Phelps and Mr. Dyson were employees of MacDonald Consultants. The writer laid out the program and visited the property in December and January. Geological mapping and core logging were carried out by both Phelps and Dyson during their respective periods of work. The writer guided and supervised their work and the findings were discussed and correlated jointly in the field.

DIAMOND DRILLING

Diamond Drill Hole #2 was located 600 feet east of the Birthday workings, as shown on the attached geological map. The location of the drill hole was based on the following considerations:

The thin section study indicated an increase in hydrothermal alteration intensity and a trend from propylitic to argillic alteration features from the north (Diamond Drill Hole #1) towards the Birthday workings and Red Hill.

At Red Hill, the Troy Quartzite is intensely fractured due to its position between major N.S. fault - and breccia - zones and their intersection with cross faults. Malachite on fracture planes and in smaller shear zones together with some chalcopyrite occur more frequently in this area than elsewhere on the property. The breccia zones, which are up to 50 feet wide, are cemented by a red hematitic siliceous matrix.

The pyritization of the feldspar porphyry dikes is most intense at the Birthday mine. A zone of intense pyritization on fracture planes, and in the rock, also occurs between two faults at the Soldine Mine south of Red Hill. The attached generalized section of Drill Hole #2 shows a structural and stratigraphic interpretation based also on information obtained in Drill Hole #1 and on surface mapping.

The hypogene hydrothermal alteration in intrusive rocks intersected in Diamond Drill Hole #2 is more intense and of a higher temperature than in Diamond Drill Hole #1. Argillic and phyllic alteration features are much more prominent than propylitic assemblages, and pyritization is more intense and pervasive.

... 3

Diamond Drill Hole #2 did not reach the target depth of 3000 to 3500 feet. The hole had to be abandoned at a depth of 1909.5 feet when the drillrods got stuck and broke off at 1450 feet depth. Prolonged attempts at cementing and setting a wedge to deflect the hole all failed because of badly caving ground and artesian water which prevented the cement from settling. The drill hole section shows that the hole was between two major fault zones; this caused the intense fracturing and, in part, brecciation of the rocks lying between them.

GEOLOGICAL MAPPING

Detailed geological mapping was carried further to the south and southwest. A sizeable outcrop of Oracle granite, which to date had not been known in the area, was discovered east of the Soldine Mine. Several small copper showings which had not been mapped by J. Glass were found on the west facing slope of Red Hill and at its foot in Canyon del Oro.

It was noted that the amount of younger "feldspar porphyry" (andesite porphyry) dikes decreases markedly towards the south, especially south of Red Hill. The major faults, however, are continuous to the south.

... 4

RESULTS AND INTERPRETATION

Combining all information from surface mapping, diamond drilling and petrographic studies to determine the kind and intensity of hypogene hydrothermal alteration, a picture has developed which has a certain resemblance to the structural, stratigraphic and lithological conditions at the Ray Copper Deposit, Ray, Arizona. The age relationship between the intrusive Oracle Granite, diabase sills, later porphyry dikes and the intruded sediments is the same.

At Ray, diabase sills which have intruded Pinal Schists are the most important primary host to the copper mineralization. However, nearly all of the initial production at Ray has been from supergene enriched ore in the Pinal Schist.

At the Burney property, major sills of diabase were found in the Apache Group (Mescal Limestone, Dripping Spring Quartzite, Barnes Conglomerate and Pioneer Shale). Diamond Drill Hole #1 intersected a basic dike (or sill?) from 1256.0 to 1258.5 feet, consisting mainly of epidote. (See McAndless Report #49781.) Although similar dikes and/or sills have been intersected with similar intense propylitic alteration and an abundance of magnetite, the section on hand contains disseminated pyrite, chalcopyrite, galena and sphalerite. The following assays were obtained from the split core of the intersection:

Cu%	Pb%	Zn%	Ag ozs/ton	Au ozs/ton
0.32	.20	.38	.35	< .003

... 5

Even though the intersection is only over 2.5 feet and of low grade, it is the only one of its kind encountered. It could well be a freak off-shoot of a larger body of similar composition and mineralization. Without further drillhole information it is difficult to point in any direction. The general alteration pattern has to be accepted as the best guide at this time. This, as stated earlier, points towards the area between two major fault - breccia zones at Red Hill where Diamond Drill Hole #2 was drilled.

Highly altered dark green diabase to gabbroic dikes containing abundant magnetite and sometimes disseminated pyrite were intersected at greater depth (2095' - 2431') in Drill Hole #1 but also in Drill Hole #2 (667' - 889' and 1170' - 1451'). However, little or no copper, lead or zinc mineralization of the nature described above was observed.

The Pinal Schist into which the diabase sills hosting the mineralization intruded at Ray was just touched in the last 12 feet of Diamond Drill Hole #1. Diamond Drill Hole #2 had not yet penetrated the Pioneer Shale at the depth at which it had to be abandoned.

A cross-section through the Ray deposit, taken from the "Geology of the Porphyry Copper Deposits Southwestern North America", Titley & Hicks, is attached for comparison.

Apart from the above consideration, the possibility of a breccia pipe or dome at depth in the Red Hill area should not be disregarded. Signs of this possibility are:

... 6

1. The almost radiating swarm of tertiary feldspar-porphyry and latite-porphyry dikes linked to the main fault structures;
2. the hematitic fault breccia in the faults around Red Hill;
3. the intense fracturing of the Troy Quartzite at Red Hill; and
4. the increased number of copper showings coincident with the features 1. to 3.

RECOMMENDATION AND COST ESTIMATE

It is recommended that at least one more deep hole be drilled at the base of the south-facing slope of Red Hill, halfway between the two faults east and west of Red Hill. The hole should be drilled until the first diabase sills intruding Pinal Schist are encountered, since the hanging wall portion of the Pinal Schist may well have acted as a dam preventing mineralization from reaching higher into the stratigraphic column. The second possibility of a breccia-pipe-like structure with the Pinal Schist missing and being replaced by a younger intrusive, would be proven or disproven at the same time. Estimated target depth for this hold is 3500 feet.

The above program is estimated to cost $60,000, including

... 7

supervision, road rehabilitation, diamond drilling, assaying and engineering.

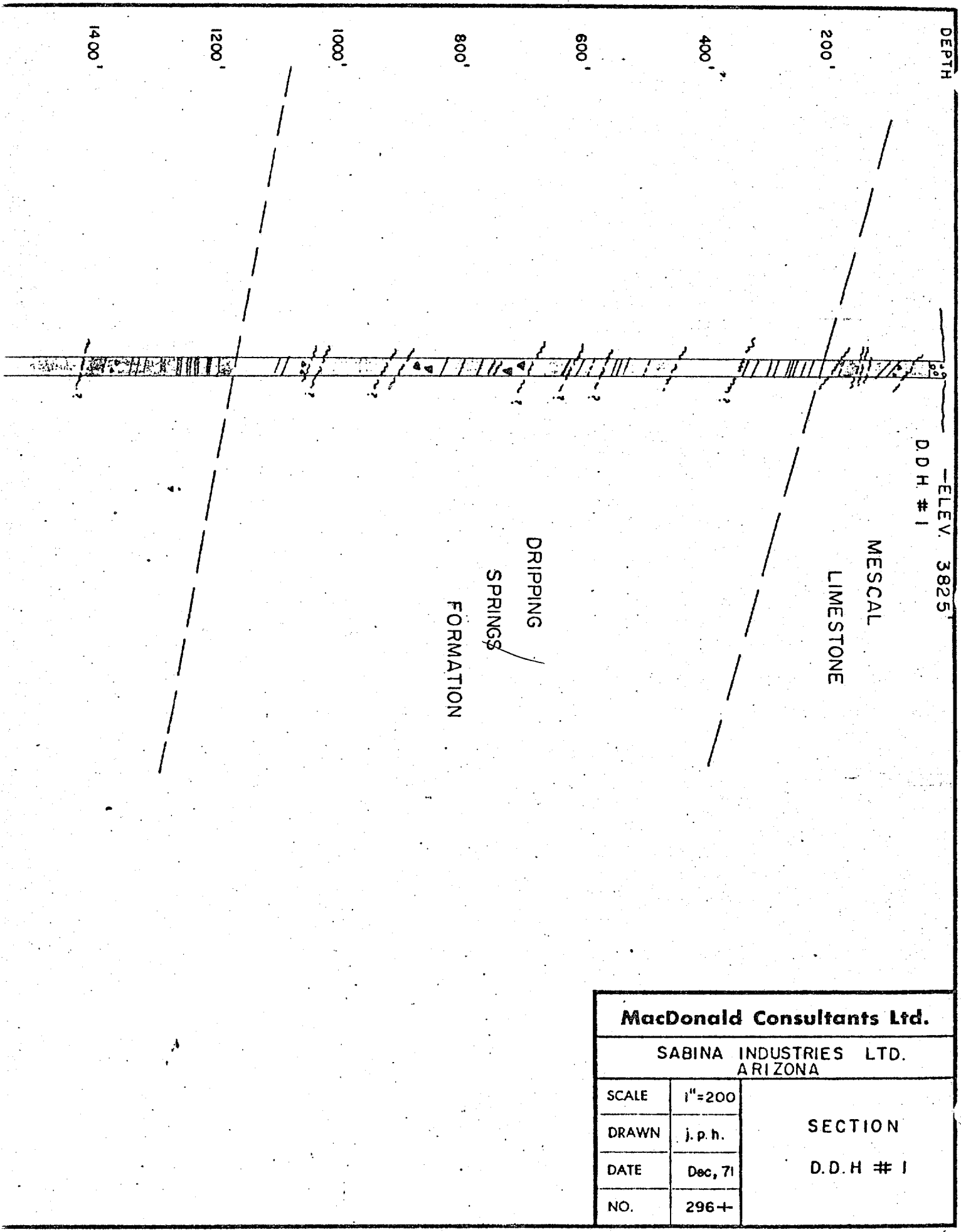
Respectfully submitted,

MACDONALD CONSULTANTS, LTD.

H. Wober, P.Eng.

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA H. WOBER

HW/ml



MacDonald Consultants Ltd.		
SABINA INDUSTRIES LTD. ARIZONA		
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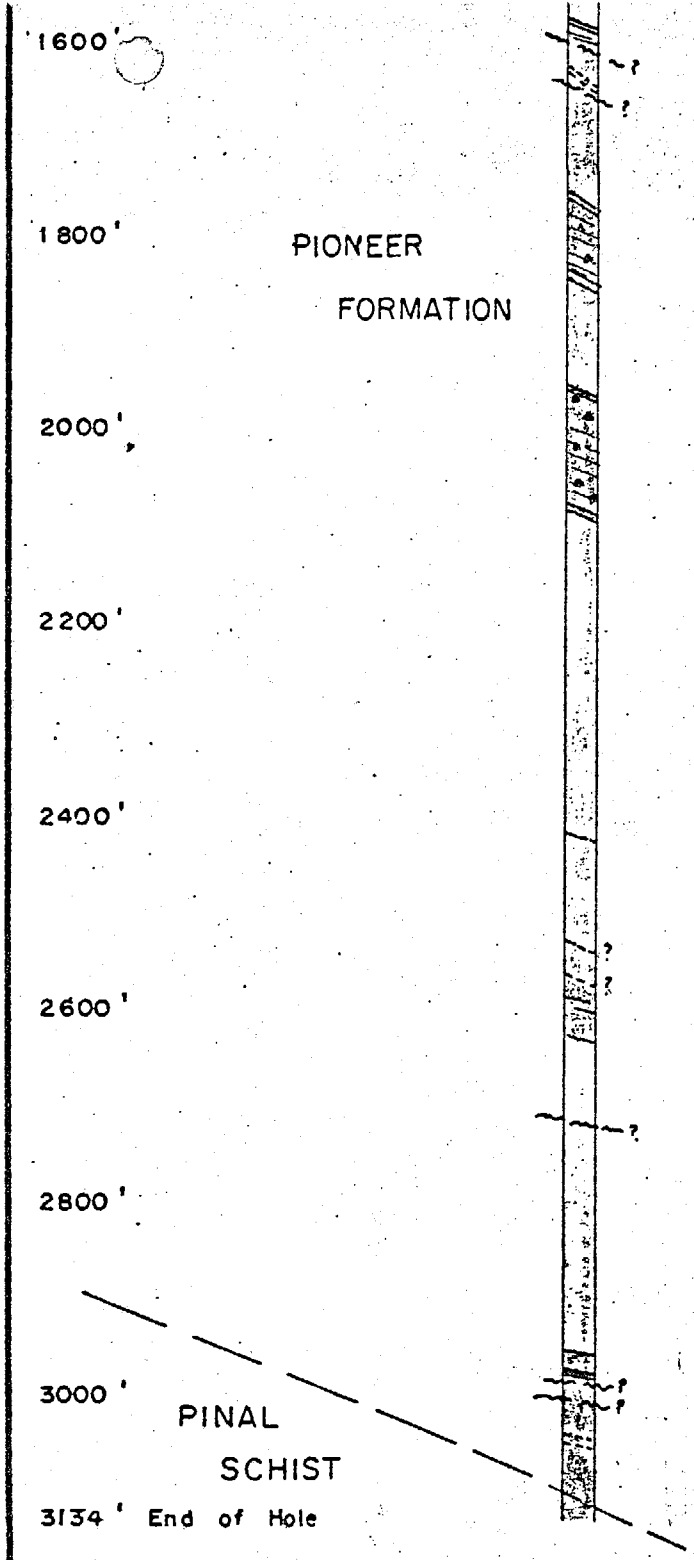
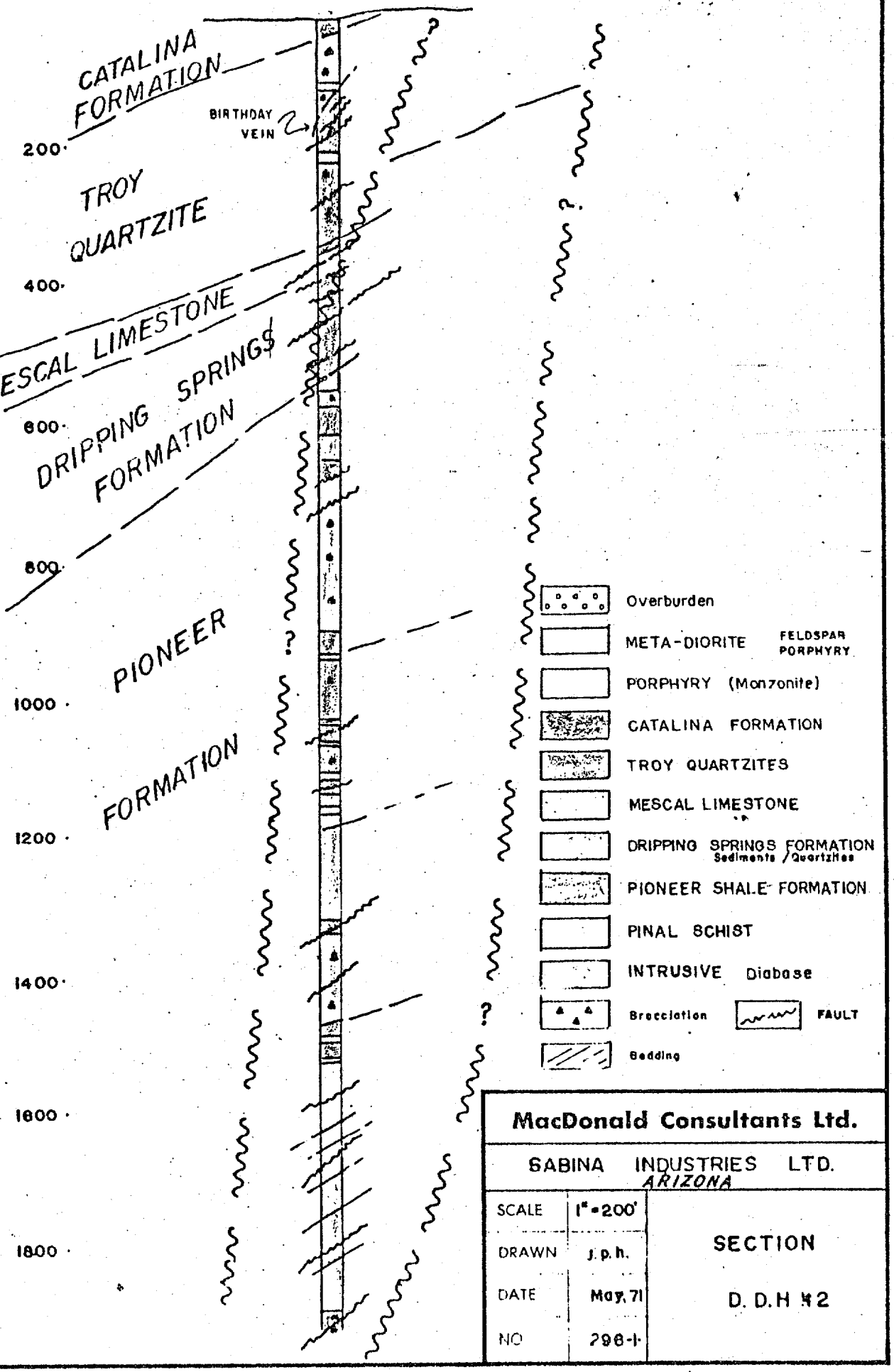
DRAWN	j. p. h.	D.D.H # 1
DATE	Dec, 71	
NO.	296+	



LEGEND

- Overburden
- META-DIORITE Felspar Porphyry
- PORPHYRY (Monzonite)
- INTRUSIVE Diabase
- MESCAL LIMESTONE
- DRIPPING SPRINGS FORMATION Sediments / Quartzites
- PIONEER SHALE FORMATION
- PINAL SCHIST
- Fault
- Brecciation
- Bedding



MacDonald Consultants Ltd.

SABINA INDUSTRIES LTD.
ARIZONA

SCALE	1" = 200'
DRAWN	J. P. H.
DATE	May, 71
NO	298-1

SECTION

D. D. H #2

GEOLOGY OF THE COPPER FLAT STOCKWORK BRECCIA HILLSBORO, NEW MEXICO

Dunn, Peter G., Quintana Minerals Corporation, 1892 W. Grant Road, Tucson, Arizona 85705

The Copper Flat porphyry copper deposit, about four miles northeast of Hillsboro, New Mexico, is presently under development by Quintana Minerals Corporation. The deposit occurs entirely within the Copper Flat quartz monzonite porphyry, which has intruded an andesite sequence at least 2700 feet thick. Latite dikes and gold-bearing quartz veins radiate from the center of the stock and extend across the volcanic terrain.

The central half of the mineable deposit consists of a large stockwork breccia that is almost completely covered by alluvium. The center is a breccia pipe consisting of rotated fragments in a matrix of quartz, phlogopite, potash feldspar, pyrite, and chalcopyrite with minor magnetite and molybdenite, but no tourmaline. The minerals are commonly quite coarse and show well-developed crystal structure, but open vugs are rare. The fragments consist primarily of quartz monzonite, but fragments of the dikes are locally common. The fragments generally show quartz-sericite alteration with minor secondary biotite, and contain disseminated pyrite and chalcopyrite.

The pipe is surrounded by a broad stockwork of irregular veins consisting of the same minerals as the breccia matrix. Because the breccia pipe and the stockwork are known only through drill core, it is impossible to determine the limit of rotated fragments. Close-spaced drilling has shown that this is a single breccia pipe which, together with the stockwork, is 1200-1500 feet long, 700 feet wide, and at least 1200 feet measured vertically. It is elongated N60W and plunges steeply to the west. It is one of the largest mineralized breccia pipes known.

The primary copper grade within the breccia is erratic, but averages twice the grade of the adjacent stock. There are significant intervals within the breccia with a primary grade five to ten times that of the overall deposit. Some abrupt changes in grade have been caused by near-vertical postmineral faults with well-developed horizontal slickensides.

Mineralization is apparently the last of the igneous events at Copper Flat. It is undoubtedly related to the quartz monzonite porphyry but has been separated from it in time by the intrusion of the latite dikes and the subsequent formation of the breccia pipe.

MINERALIZATION AND ALTERATION AT THE LITTLE HILL MINES AREA, PINAL COUNTY, ARIZONA

Durning, W. P., AMAX Exploration, Inc., Babbitt, Minnesota 55706

The Little Hill Mines area is about 25 miles north-northeast of Tucson, Arizona on the northwest flank of the Santa Catalina Mountains. The principal rock types are Precambrian schist, gneiss, quartz monzonite and an alaskite of unknown age. These rocks are intruded by Teritiary latite, monzonite and rhyolite dikes.

The west-northwest trending Mogul fault is the dominant structural feature and shows both lateral and vertical displacement. Other faults, foliation, mineralized joints and veins often have a strike parallel or subparallel to the Mogul fault.

Propylitic alteration and weak sericitic alteration of plagioclase as well as minor secondary K-feldspar and magnetite cover an area of roughly 1-3/4 square miles. These alterations correlate with Lowell and Guilberts deep level alteration zone at the San Manuel-Kalamazoo porphyry copper deposit. They do not increase in intensity with depth. Stronger alteration in the form of intense sericitic alteration of all feldspars and quartz veining is locally present.

Low grade copper and molybdenum mineralization cover an area which generally coincides with the zone of weak sericitic alteration. The mineralized area has been defined by geological mapping, goechemical surveys, I.P. surveys and drilling. The mineralization at Little Hills is of three types 1) disseminated pyrite and chalcopyrite, averaging 1-2% combined, in weakly altered Precambrian rocks 2) pyrite, chalcopyrite, molybdenite and magnetite in quartz veins 3) three to 10% disseminated pyrite and chalcopyrite in intense sericitic alteration envelopes adjacent to some quartz veins. Rotary and core drilling have delineated a couple hundred million tons of near surface low grade copper-molybdenum mineralization. The copper grade averages about 0.20% and does not increase with depth. Mineralization is truncated to the south by the Mogul fault, and gradually diminishes in grade in all other directions.

The alteration and mineralization at Little Hills is unique along the Mogul fault and may represent the root zone of a porphyry copper system. Evidence for this root zone interpretation is: 1) deep level alteration suite, 2) chalcopyrite, pyrite, molybdenite magnetite bearing quartz veins, 3) bleb like nature of the disseminated and vein sulfides, 4) low total sulfide core with high total sulfide rim, 5) no increase in copper grade or alteration intensity with depth, 6) limited ground preparation, 7) vertical uplift followed by subsequent erosion north of the Mogul fault zone.

GEOLOGY AND HISTORY OF THE SAN XAVIER MINE, ARIZONA

Eastlick, J. T., Inspiration Consolidated Copper Company, Inspiration, Arizona 85537 and Irwin, G. W., Arizona Department Mineral Resources, Room 206 State Office Building, 415 W. Congress, Tucson, Arizona 85701

The San Xavier Mine is located in the Pima Mining District approximately 18 miles south of Tucson. It is reported that this mine was worked for lead and silver by the Spaniards and the Mexicans in the 1700's.

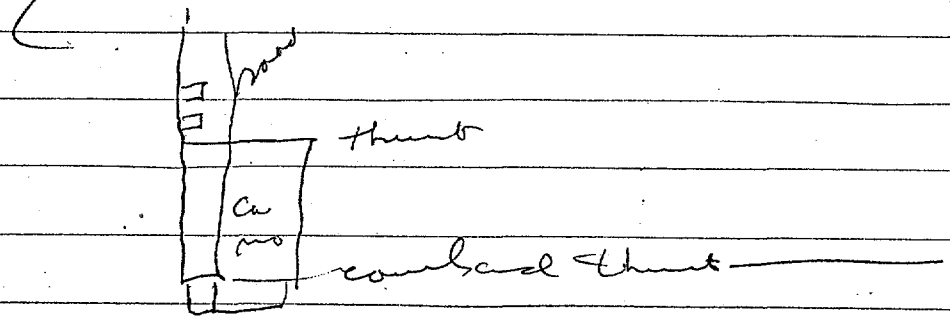
The original San Xavier Claim is the first recorded surveyed claim in Arizona according to the Surveyor General's files. This was in the year 1872. At the

Gordon Lister
Courtland Gleason

Laramide ?

Glean qtz 172 mg — many pos Copper Bell
Surface leaf gleba early tert

Later Cret thrust
4042 deepest hole (13 deep in all)



Cretaceous thrusting
Cmin after thrusting —
Cmin related to Copper Belle as post Bisbee —

Perry Deming — Little Hells — Mogul
Bar qtz mon 1000 × 4000
cut duke NW + NE
13 drill holes
Anomal fl — 1500 L dat monzonite
dip 55° SE.
2000 mel tons .2 Cu
exotic Cu in fl + fluv
May represent root pos cop zone
(Envelop to deepest all min at Kalamazoo

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona
January 24, 1964

MEMORANDUM FOR J. H. COURTRIGHT

3-C Ranch in
Oracle area, Arizona
Old Hat District

Introduction

The 3-C Ranch is an operating cattle ranch on the north slopes of the Santa Catalina Mts., about 20 miles airline distance northwest of Tucson. The northern edge of the ranch is about seven miles due south of the San Manuel mine.

Mr. Courtright was initially informed, by agents of the Tucson Realty and Trust Co., that a number of diamond drill holes were sunk on the property in recent years, but that the location of these holes was not known. Because I have recently started a detailed reconnaissance of the San Manuel area, principally in search of geologic information which could lead to the faulted hanging wall block of the San Manuel ore deposit, it seemed advisable to find out just what drilling had been done, and to evaluate the potential of certain mineral deposits containing gold and base metals, which were alleged to be recently developed and to offer the promise of large tonnages.

The attached map summarizes land status as well as geology, and may be referred to when necessary to supplement the following comments. My conclusions are based upon a brief field examination, Company files, some reports written to a former owner of prospects on the ranch, and general acquaintance with the district.

I feel positive in stating that there are no prospects or mineralized areas exposed on the 3-C which would warrant consideration by ASARCO. The region covered by alluvium and older conglomerates lies some 7 or more miles from San Manuel, and on the basis of distance alone, would seem to offer little prospective mineral value; it <u>might</u> become of interest after my regional mapping is completed, however I cannot predict the outcome of this program in advance.

As a final comment, I take note that the area which extends from about Campo Bonito southward through the Mary West prospects contains numerous small diggings which change ownership as time passes, and thus are presented to ASARCO over and over. I cannot but conclude that this area should be "written off" in its entirety.

3-C Land

According to maps prepared for the owners, Mr. and Mrs. Theodore Vaits, and which were furnished to me by their representatives, the 3-C covers some 55 sections. About 12 of these sections are deeded or controlled by patented mining

claims. The remainder are held under various grazing rights or leases. Unpatented mining claims are filed over much of the grazing land as "protection".

The land is now used an an operating cattle ranch, managed by Mr. Virgil Mercer. The owners wish to sell out, and have placed the property through the Tucson Realty and Trust Company. The realty agents who are handling the proposition are Mr. Jim May and Mr. George Gardner.

Mr. Gardner, who has been the principal promoter, states the "asking price" to be 1.8 million dollars. He also advises that the old Southern Bell-Campo Bonito group of patented claims can be delivered in a package -- price not stated.

Field Examination

December, 1963 -- one day. Guided by Mr. Virgil Mercer and accompanied by Messrs. May and Gardner. I was accompanied by Mr. Jim Sell of ASARCO. This party of five covered most of the 3-C land in a general reconnaissance.

January, 1964 -- Half day. Mr. Wojcik and I examined drill core and some technical reports then made available. Mr. George Gardner was present, and I advised him that I did not wish to pursue the examination further, as I felt the size of the deposits would be too small.

Mr. Gardner's Position

Mr. Gardner is well aware that many small mines have been worked for more than 60 years in this vicinity. He has talked with Miss Mary West, who attempted to develop lead ore in the past decade, and has possession of two reports on her property by men with some knowledge of mining. He remains convinced that the region must contain a large ore deposit somewhere and was very unhappy that I did not seem interested in making a detailed examination of the West prospects.

It is unfortunate that the report by a consulting geologist was largely one of descriptive geology unrelated to actual potential for production, and by omission implied an endorsement of the property; whereas the other report by Miss West's mill superintendent, was written by an assayer whose ability to judge the prospective value of a property is obviously rather limited, as attested by his own statements in writing. Mr. Gardner's unfamiliarity with mining and exploration methods and risks has led him to rely on these various statements and thereby to some very wrong conclusions.

He states his intention now is to submit the property through Mr. Helmle or Mr. Herman in New York.

Mineral Deposits

The 3-C covers two very different geologic environments, as shown on the attached map. North of the Mogul fault the rock is pre-Cambrian granite, which

passes beneath a cover of middle to late Tertiary conglomerate. This northern block may be considered as the southernmost portion of the San Manuel geologic environment. I have already commented upon this in the Introduction.

South of the Mogul fault lie the Catalina Mts. proper, composed in the 3-C area of sediments and Tertiary diorite.

Mr. Blucher has mapped this area in a reconnaissance fashion. Some ten years ago I examined briefly the Southern Bell mine, and Mr. Sell and I observed the West prospects and some of the granite north of the Mogul fault. It is the conclusion of all of us that no large zone of mineralization is exposed, nor is there any clue to suggest the presence of one at depth.

The Southern Bell area contains narrow veins of gold-quartz and lead oxides, more or less parallel to the dip of the enclosing sediments. Production has been small, and has come from small shoots within the veins -- which are fairly persistent on strike. Most were mined from the grass roots down until values dropped. During WW II scheelite was produced from a few small shoots containing .5 to 1.5% WO_3. Our files suggest gold ores of about $15, but little other information is available.

Mary West developed her properties during the 1950's, and constructed a small gravity mill (about 7 tons per hour capacity). The production from her diggings have been trivial, amounting to less than 1,500 tons combined crude ore shipments and mill feed (Att. B). "Ore" contained about 5% Pb with a little Ag. The surface outcrop on her workings appears less promising to me than the Southern Bell veins. The core Mr. Wojcik and I saw confirms that quartz-galena veins are present, but are generally but 3 or 4 feet thick and not of very good grade in Pb or Ag.

Company files show that at various times the veins of the Southern Bell-Campo Bonito groups have been rejected, as follows:

Turned down by: J. Kruttschnitt, 1915
B. Hatcher, 1933
F. Stevens, 1942
K. Wilson, 1949
K. Wilson, 1951
K. Richard, 1961

ORIGINAL SIGNED BY
JOHN E. KINNISON

JOHN E. KINNISON

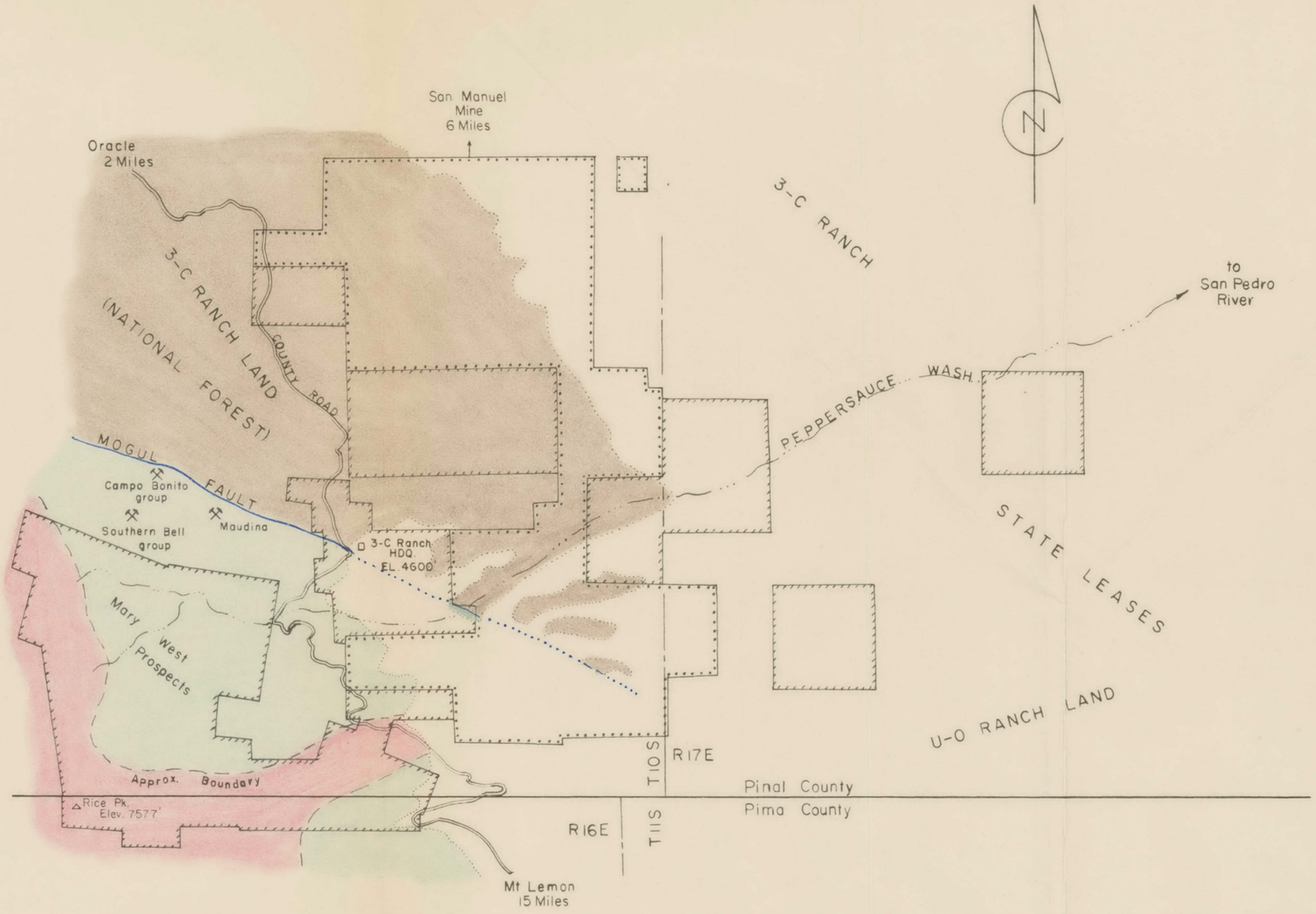
JEK/jk
Attachments
cc: JEKinnison - w/atts.
3 extra - w/atts.

ATTACHMENT B

Mary West, 3-C Ranch Mines production
El Paso Smelter (From Tucson files, R. Welch)

	Tons	Au. Oz.	Ag. Oz.	Pb. %	Au. %
1957					
Crude Ore	359	.002	1.1	6.5	.30
" "	40	.01	.7	4.0	.52
Mill Conc.	21	.433	17.5	47.60	7.04
1958, Conc.	16	.231	15.6	24.2	.64
" "	7	1.085	20.0	42.0	6.25
" "	6	.348	15.8	35.3	5.92
" "	12	.258	11.3	20.25	3.46
1959, Conc.	15	.190	7.5	40.50	2.82
1960, Conc. (Cleanup)	6	.400	10.5	43.95	3.05

Total Tons, Crude: 399
" " , Conc.: 83 (from an estimated 800-1000 tons mill feed)



Land Status *

* Adapted from 3-C Land Maps

Mining Claims

Patented Mining Claims and Deeded Land

Rocks

Alluvium, Gila cgl, and older post-ore cgl.

Tertiary diorite

Sediments (Mostly Apache group)

Pre-Cambrian granite

Geology modified from field sheets by A.G. Blucher and U of A thesis (Wallace)

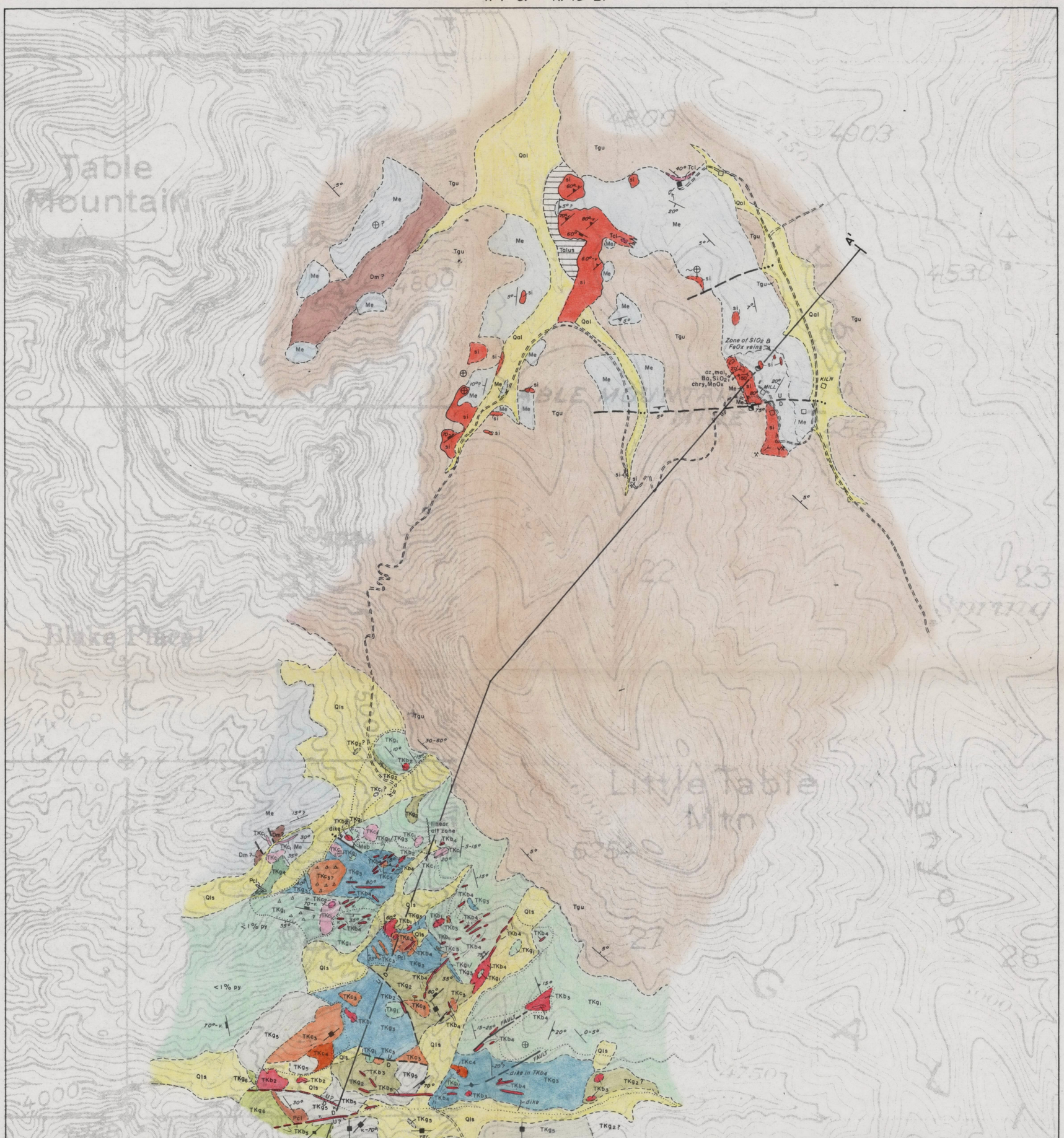
GEOLOGY & LAND MAP
3-C RANCH
Pinal County, Arizona

SCALE 1" = 1 mile

J. Kinnison Jan. 1964

1611

T. 7 S. R. 18 E.



Base: U.S.G.S. 15' Topographic Quadrangles – Holy Joe Peak, Ariz. (1949) Klondike, Ariz. (1938)
Geology: P.G. Vikre, (1978)

EXPLANATION

CENOZOIC — QUATERNARY

- Qal / Qls — Surficial deposis; alluvium & landslides

— UNCONFORMITY —

CENOZOIC — TERTIARY

- Tgu — Galiuro volcanic rocks, undivided
- Tcl — Pre-Galiuro clastic rocks (Pinkard Formation?)

— UNCONFORMITY —

MESOZOIC — LOWER TERTIARY

BRECCIAS IN GLORY HOLE VOLCANICS

- TKb_1 — Imbricated / rotated clasts indicative of strong movement; FeOx, quartz, sericite matrix
- TKb_2 — Subordinate disrupted clasts indicative of partial movement; much fracturing in place; FeOx, quartz, sericite matrix
- TKb_3 — Country rock fractured in place, little or no evidence for clast movement; FeOx, quartz, sericite, clay matrix
- TKb_4 — Siliceous, occasionally flow-banded dikes; centers may consist of rotated fragments; includes linear zones of resistant country rock fractured, cemented in place; quartz ± sericite ± FeOx matrix
- TKb_5 — Siliceous, hematitic, brecciated, high-angle fault zones
- si — Siliceous, deposits; massive chalcedonic quartz, partly brecciated and cemented by silica ± FeOx; locally contains barite, MnOx & copper minerals (Table Mtn. Mine); both conformable & unconformable masses restricted to Escabrosa Limestone

GLORY HOLE VOLCANICS

- TKg_1 — Porous, partly welded lithic tuff
- TKg_2 — Predominantly andesite breccia & tuff
- TKg_3 / TKg_1/TKg_3 — Porphyritic andesite, subordinate tuff & breccias
- TKg_4 — Porphyritic, amygdaloidal andesite
- TKg_5 — Predomantly porphyritic andesite
- TKg_6 — Dense, siliceous lithic tuff & breccia

MESOZOIC — UPPER CRETACEOUS

COPPER CREEK GRANODIORITE FACIES

- TKc_1 — Quartz monzonite & granodiorite, slightly porphyritic & miarolitic
- TKc_2 — Granite
- TKc_3 — Hornblende granodiorite (?)
- TKc_4 — Composite cupolas of TKc_1, TKc_3, & various, intrusive porphyritic rocks
- TKc_5 — Diorite (?) & andesite

— UNCONFORMITY —

PALEOZOIC — MISSISSIPPIAN

- Me / Meb — Escabrosa limestone; limestone breccia

— DISCONFORMITY —

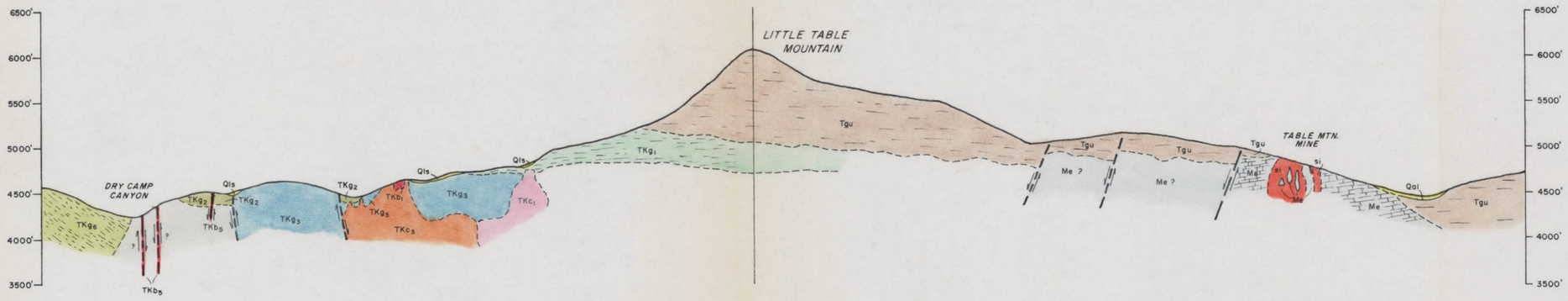
PALEOZOIC — DEVONIAN

- Dm — Martin Formation shale

— UNCONFORMITY —

- Pcl — Chaotic blocks of Lower Paleozoic arkosic sandstone, quartzite & lithic tuff

- Quartz vein, showing dip
- Fault, showing relative displacement
- Strike & dip of bedding; vertical; horizontal
- Strike & dip of foliation; vertical
- Strike & dip of jointing; vertical
- Encloses rocks containing 1–3 % FeOx pseudomorphous after pyrite



NORTH

TO ACCOMPANY Report
DATED July 17, 1978
BY P.G. Vikre

Geologic Plan & Cross Section
OF THE
LITTLE TABLE MOUNTAIN AREA
PINAL COUNTY, ARIZONA
SCALE: 1"=1000'

P.G. Vikre — July, 1978

MVK-5006

File: Aa-16A.15.15

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

December 9, 1963

FILE MEMORANDUM:

LITTLE HILL MINES
Old Hat District
Pinal County, Arizona

On December 5 Mr. Dave McGee, who operates the Little Hill mine which ships fluxing ore to Hayden, showed me the core from a diamond drill hole recently dug.

Location: Exact location by Township and Range not known. Drill is reached by going east up the Canada Del Oro on the road to Burney's mine, about a mile from the Little Hill's main shaft. Here the Canada swings south and a main tributary drains in from the north. This large tributary has no name, but is, I believe, the same one where the old man lives in an abandoned adit. Proceeding north up the canyon perhaps a quarter-mile, a little canyon intersects it acutely from a northerly direction. The Mogul fault passes through the talus covered intersection of these two canyons. In the sheared footwall of the main fault zone, McGee collared the hole in bedrock.

Direction: Hole strikes NNE across fault shears, and dips NNE at (-) 45°, which approximately cross-cuts fault-shear lineation.

Geologic Log:

AX Size Core. Recovery good, probably over 90%. Drilled by Thatcher of Tucson.

0-15' - Stored up at shaft. Did not see.

15-34' - Grad. bottom. Schistose, biotite gneiss. Diss. py vy fine. Some other sulfide (?) vy fine gr. Tr cpy. Lineation perpendicular across core.

34-71' - Biotite augen gneiss. Tr lim w/native Cu. Py as above, a little more cpy. Bottom cut grad.

71-100' - Gneiss but more shistose. Below 80'± cpy more visible, in strgs. along lineation and repl. biotite.

100-105' - (100-105) - assayed .29 Cu, No Au, Ag. Ore specimen saved - shows less cpy than above.

105-201.5' - Augen gneiss.

108-113' - Oxidized. Vuggy w/cuprite (chalcotrichite) and limonite. Sericitic alt.
About 120± several feet vy fine MoS_2 (?).
Scattered limonite 135-150' - yellow brown, but sulphides still present, mostly py, about 2% total (vol. est.)
Cpy notable around 160'.

180' - Tiny grains sooty Cc(?).
Oxidized w/yellow lim. below 195'.

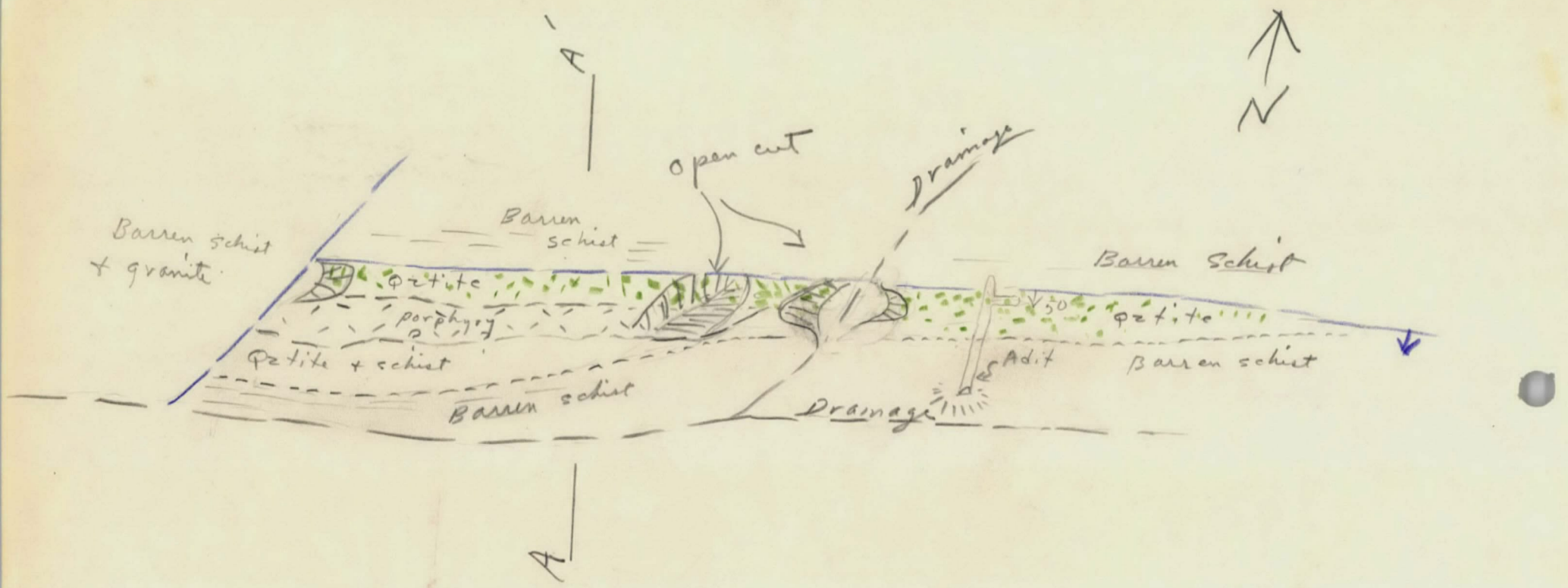
201.5' - TD.

Comments: The canyon above the drill hole is steep walled and cuts into sulphides, showing about the same type of mineralization as I saw in the core. No alteration is visible, except very locally. The rock consists of alternating bands of sheared schist and gneiss, which gradually merges into the pre-Cambrian Oracle granite to the north. The mineralized zone is a hundred or more feet wide, estimated, as measured across the dip of structure planes. I did not make a surface measure with a tape to determine if the drill penetrated the entire metallized zone, but I believe it did not. Because of the compactness of the host rock of this footwall mineralization, and the low sulphide content, I doubt that it ever yielded much Cu to surface or ground water, and so I doubt if it could be the source of the Little Hill silicate Cu lenses (exotic). The strike length of Cu oxides and iron staining as developed by prospect pits is about 2 miles. It is still my opinion, despite the lack of boxwork or any other indication of former sulphides in the main fault zone, that the silicate fluxing ore is underlain, at least in places, by fine-grained, low-grade sulphides of copper.

Mr. McGee confirmed Mr. Welch's statement that San Manuel Corp. is preparing to drill the property, in search of a commercial vein deposit. McGee states that they anticipate chalcocite beneath his workings.

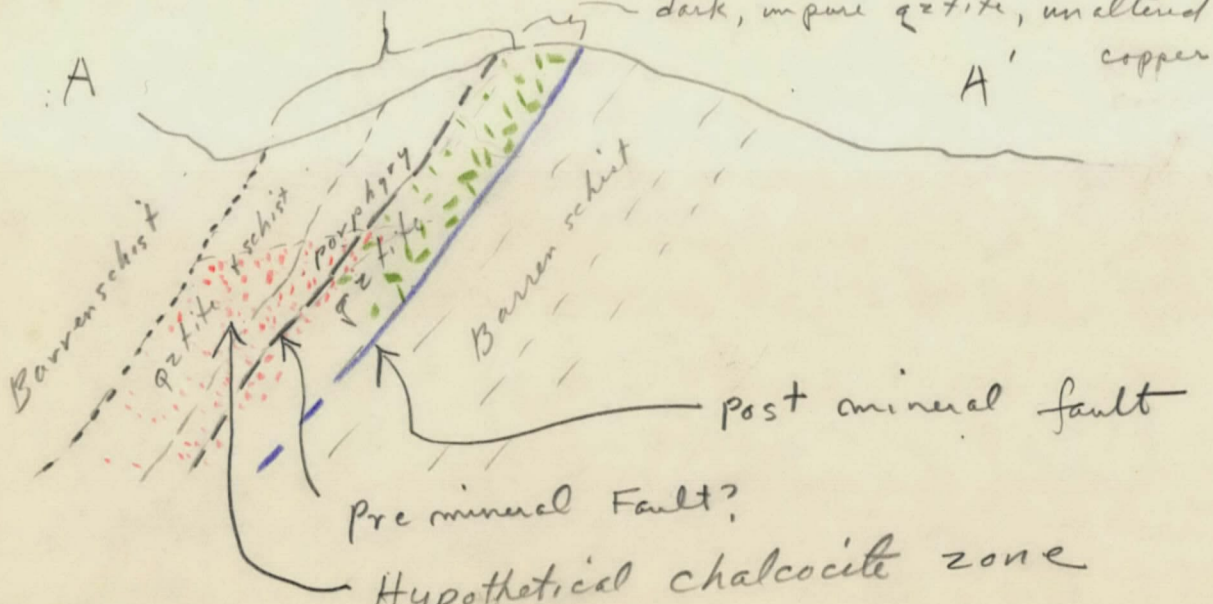
J. E. KINNISON

JEK/jk
cc: JHCourtright
RFWelch
JEKinnison



strong altered, leached zone – finely disseminated limonite – some after chalcocite

dark, impure qz tite, unaltered, but strongly brecciated – contains copper silicate as fracture fillings –



Section A-A'

Dave McGee Prospect

Little Hills Mine

Copper Queen Claim

Canyon Del Oro