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CONSULTING GEOLOGICAL ENGINEERS

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RAM CREEK
TUCHODI LAKE

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June 30, 1971

Mr. L. St. Laurent
President
Alberta Copper & Resources Ltd.
1502 Cambridge Building
10024 - Jasper Avenue
EDMONTON, Alberta

Dear Mr. St. Laurent:

I briefly examined Alberta Copper & Resources Ltd. copper prospect at Ram Creek, British Columbia on June 25, 1971. This report presents my assessment of the prospect.

SUMMARY

Chalcopyrite mineralization exists intermittently in northeast striking quartz and quartz breccia veins along a strike length of at least 3200 feet and through a vertical range of at least 1100 feet on Alberta Copper & Resources Ltd. and Copper Keays Mines Ltd. properties.

Veins and breccia zones are spatially related to northeast striking diabase dikes and faults. Northwest striking faults offset the veins which may form a branching system.

A systematic and progressive exploration program should be implemented to evaluate the veins. A program of geological and topographical mapping, trenching, prospecting and some road construction estimated at \$40,000 should precede 2500 feet of diamond drilling which will probably be required and is estimated at \$55,000.

INTRODUCTION

On June 25, 1971, in company with Mr. L. St. Laurent and Mr. R. Erickson, I examined copper occurrences on the Bob 1 to Bob 4

mineral claims, Ram Creek, Liard Mining Division, British Columbia. The Mad and Rim mineral claims were not examined. A possible new road route, which would branch from the Davis-Keays Mining Co. Ltd.'s road, southeast of the existing Alberta Copper & Resources Ltd. tote road branch, then parallel the existing tote road to a junction with the tote road at Ram Creek, was examined from a helicopter.

We arrived at the property by helicopter at about 12:45 p.m. The examination was hindered by blowing snow; about one inch of new snow and old snow in trenches obscured some geologic features. Bulldozer operations and blasting performed in 1970 have obscured the exposures of the breccia zone and the vein about seventy-five feet north of the breccia zone which were sampled by Halferdahl in 1969. The breccia zone, however, is well exposed in a southwest facing cliff about thirty feet southwest of where it was sampled by Halferdahl. Part of the breccia zone exposed in the cliff face was examined; non-icy conditions and a rope would be required to completely examine the exposure.

We left the property about 5:30 p.m. after examining most exposures on the Bob 1 to Bob 4 mineral claims and two trenches on Copper Keays Mines Ltd. property.

No samples were taken because of incomplete exposures and unfavourable conditions.

DATA

The information contained in this section summarizes notes made at each exposure. The notes are keyed by number to drawings 1AC-1 and 1AC-2 which are attached.

1. Breccia Zone

The breccia zone was partially examined on a southwest facing cliff. The southeast part of the breccia is about eight feet wide, strikes 065°, dips 75°SE and consists of quartz, black breccia fragments and chalcopryrite. Late cockscomb quartz veinlets cross earlier more massive quartz. Malachite coats much of the exposure. Copper content is estimated at 4 per cent. The northwest part of the breccia is also about eight feet wide and consists of stromatolitic dolomite fragments up to 4 inches in diameter in a silicified matrix; cockscomb quartz often surrounds dolomite fragments and fills narrow veins. Disseminated chalcopryrite exists in the silicified matrix; malachite coating is common. Copper content is estimated at 1 per cent.

A sheared zone about two feet wide borders the breccia zone to the southeast; a diabase dike, at least 10 feet wide, exists southeast of the sheared zone. The shear zone and the dike may strike more northerly than the breccia zone.

The breccia zone continues on strike down the cliff face to the southwest where it is obscured by talus. On strike to the northeast the breccia zone is obscured by talus and bulldozer rubble. The exposure sampled by Halferdahl in 1969 (4.8 per cent copper across 23.3 feet) probably existed about thirty feet northeast of the cliff exposure.

When viewed from three hundred feet to the southwest the breccia zone seems to become narrower down the cliff face.

2. Site of Halferdahl's 1.1% Cu across 14.0' Sample

Several large malachite-coated blocks of quartz-veined stromatolitic dolomite containing some disseminated chalcopyrite and pyrite exist near the site of a vein sampled by Halferdahl in 1969 (1.1 per cent copper across 14.0 feet). Bulldozer and trenching rubble now obscure the vein.

3. Near northwest end trench 1

A quartz vein, eight feet wide, is exposed in the southwest wall of trench 1. The vein contains small breccia fragments, a few specks of chalcopyrite and is locally coated with malachite. A diabase dike, at least two feet wide, is exposed in the trench to the southeast of the quartz vein. Snow filled most of the trench.

4. Ridge crest

Large, angular blocks of quartz, containing chalcopyrite exist on the ridge crest between trench 1 and the breccia zone. Some of the quartz blocks contain up to 4 per cent copper. About seventy-five feet south there are several large, unmineralized blocks of quartz containing black breccia fragments. Fragments of serpentinized diabase exist at two locations on the ridge crest; two or more diabase dikes probably cross the ridge.

5. 1969 trench

On the northwest side of the southwest spur about thirty-five feet northeast of the 1969 trench large blocks of quartz containing some chalcopyrite exist across a width of four feet. The blocks are at their source and the vein from which they were derived probably trends $055^{\circ}/75^{\circ}\text{NW}$. Chalcopyrite-bearing talus blocks exist downslope to the northwest. Masses of chalcopyrite up to four inches wide and several inches long exist in many of the talus blocks.

A diabase dike, about thirty feet wide, borders the vein to the southeast. The dike is fractured and serpentinized; the fracturing strikes 135° (across the dike and vein direction).

Along strike and about thirty feet southwest of the vein a barren quartz vein, about one foot wide, is exposed in the 1969 trench.

6. Copper Keays Mines Ltd. (trench 1?)

A trench at the Alberta Copper & Resources Ltd. boundary (as defined by Copper Keays Mines Ltd.) and about nine hundred feet below the ridge crest exposes a quartz vein nine feet wide containing large black fragments. Malachite coating is abundant. The central four feet of the vein is well mineralized with chalcopyrite and contains about 3 per cent copper.

A fault trending $075^{\circ}/75^{\circ}\text{NW}$ exists along the southeast side of the vein. The vein is brecciated for two feet beside the fault; two inches of light green plastic gouge forms the fault plane on its hanging wall side. Black, cleaved shale is upturned against the southeast side of the fault.

A diabase dike is exposed in a road cut about fifteen feet northwest of the vein.

7. Copper Keays Mines Ltd. (trench 2?)

A trench about eleven hundred feet below the ridge crest exposes chalcopyrite-bearing quartz fragments in shale in the hanging wall of a fault trending $155^{\circ}/65^{\circ}\text{SW}$. The shale and the chalcopyrite-bearing quartz fragments terminate at the fault; diabase is exposed in the footwall of the fault.

8. Southwest side of Ram Creek

Two steep dipping fault traces and one shallower dipping fault trace are visible on the mountainside southwest of Ram Creek. The northwesterly of the two steep dipping faults is the one along which the Alberta Copper and Copper Keays veins exist; the southwesterly vein may cross the Mad claims and, although it dips northwesterly, it may also be the loci for vein development. The two steep dipping faults form the limits of a graben.

LOGISTICAL PROBLEMS

Road

The Alberta Copper & Resources Ltd. tote road is being utilized by Copper Keays personnel. The tote road is passable only by tract vehicles; travel time to Mile 442 on the Alaska Highway is reported to be six hours. A new route, generally paralleling but up slope from the existing tote road has been selected by R. Erickson. This new route may entail steep grades near Yedhe Creek where the new route would branch from the Davis-Keays road. The remainder of the route will possess reasonable grades; some muskeg areas may exist along the route.

Camp

A bunkhouse unit complete with cooking facilities would be advantageous because of inclement weather. Two or three tents will be necessary for storage and extra sleeping accommodation. A transeiver radio with a connection to the Canadian National Telecommunications station at Fort Nelson, B.C. is required. A portable gas-driven electric plant is necessary.

Vehicles

A four-wheel drive truck capable of hauling several barrels of fuel should be acquired. A bulldozer with ripper is needed for trenching, drill setup preparation and road construction. A vehicle capable of negotiating the steep roads to the ridge crest is needed.

Supplies

Fuel, basic food supplies and camp requirements should be positioned at the beginning of the program.

Water

If diamond drilling is implemented it will be necessary to either haul water or prepare storage basins for multiple stage pumping.

DISCUSSION

Chalcopyrite mineralization exists intermittently in quartz veins along a strike length of at least 3200 feet and through a vertical range of at least 1100 feet on Alberta Copper & Resources Ltd. and Copper Keays Mines Ltd. properties.

A quartz breccia zone (at least 16 feet wide) with a chalcopyrite rich zone containing about four per cent copper across eight feet exists on a steep cliff near the northeast boundary of the Alberta Copper property. The breccia zone may terminate to the northeast against a fault which exists on the southeast side of the breccia zone. The breccia zone may become narrower down the cliff face; it is talus covered to the southwest below the cliff.

Several weakly chalcopyrite mineralized or barren quartz veins exist along the ridge crest near the northeast boundary of the Alberta Copper property. These veins may represent branches of the quartz breccia zone, faulted portions of the quartz breccia zone, extensions of veins encountered along the southwest trending spur, or veins which have not been identified elsewhere.

Quartz veins which exist on the southwest trending spur are spatially related to diabase dikes and range from about one foot to at least four feet wide. They may be barren or contain abundant chalcopyrite. The veins do not line up along strike; they may represent more than one vein, branching veins or the faulted portions of one or more veins.

A chalcopyrite mineralized quartz vein on Copper Keays property exists along a fault near a diabase dike. Further southwest and downslope chalcopyrite-bearing quartz breccia fragments terminate against a fault which trends across the vein strike.

CONCLUSIONS

Northeast trending quartz veins and breccia zones on Alberta Copper & Resources Ltd. and Copper Keays Mines Ltd. properties exist in shale and stromatolitic dolomite. The veins and breccia zones are intermittently mineralized with chalcopyrite, they are spatially related to a northeast trending fault and northeast trending diabase dikes. The veins which may form a branching system, are known to be offset by northwest striking faults.

The relationship and distribution of veins, diabase dikes, faults and mineralization is similar to those at Churchill Copper Corporation Ltd.'s Magnum deposit.

Exploration is required to:

- (a) Evaluate the breccia zone which is wide and well mineralized; relatively large reserves could be developed if lateral and vertical continuity could be established.
- (b) Determine the continuity or lack of continuity of the veins both laterally and vertically.
- (c) Determine the continuity or lack of continuity of mineralization both laterally and vertically on the veins.

A systematic and progressive exploration program should be implemented to evaluate the property. Each stage of the program should be implemented only if each preceding stage provides sufficient evidence to warrant increased expenditures.

The vein pattern, vein distribution and faulting are insufficiently known to permit well planned underground exploration. Furthermore, the probability of the prospect being developed to production is not sufficiently high at the present state of knowledge to warrant the expenditures required for underground exploration.

A program of geological and topographical mapping and trenching is required to determine as completely as possible vein, dike and fault distribution and relationships. A limited diamond drilling program will probably be warranted but should nonetheless await the results of the mapping and trenching.

The same vein zone is being explored on Alberta Copper and Copper Keays properties; if possible, a consistent method of exploration should be employed on both properties.

The Mad and Rim mineral claims require prospecting. A northeast trending, northwest dipping fault may exist on the Mad claims.

The selected route for the proposed new road has been incompletely appraised.

RECOMMENDATIONS

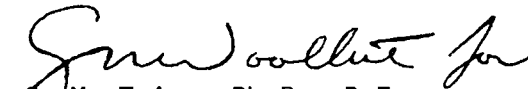
The exploration program should be so designed that most of the expenditures are committed to exploration of the veins. The exploration should include:

- (a) Geological and topographical mapping to establish the relative position of outcrops, veins, dikes, faults and rock types. Trenches, roads and claim boundaries should be accurately located. A planimetric map prepared from airphotos could serve as a base. Bulldozer trenching should be instituted only after geological mapping has been initiated; a geologist should direct the trenching. The cost of this program, including prospecting of the Mad and Rim claims, camp and new road construction is estimated at \$40,000 and would require between five and six weeks to complete.
- (b) About 2500 feet of BQ diamond drilling will probably be required. Drilling could commence immediately upon completion of the mapping and trenching. The drilling should be designed to explore the breccia zone and attempt to establish vein continuity. Expenditures are estimated at \$55,000; between five and six weeks would be required for completion.

An exchange of data should be encouraged with Copper Keays Mines Ltd. If underground exploration or development should ever be warranted on either or both properties, then it may eventually be necessary to utilize adits collared on Copper Keays property to develop the deeper parts of the Alberta Copper portion of the vein(s).

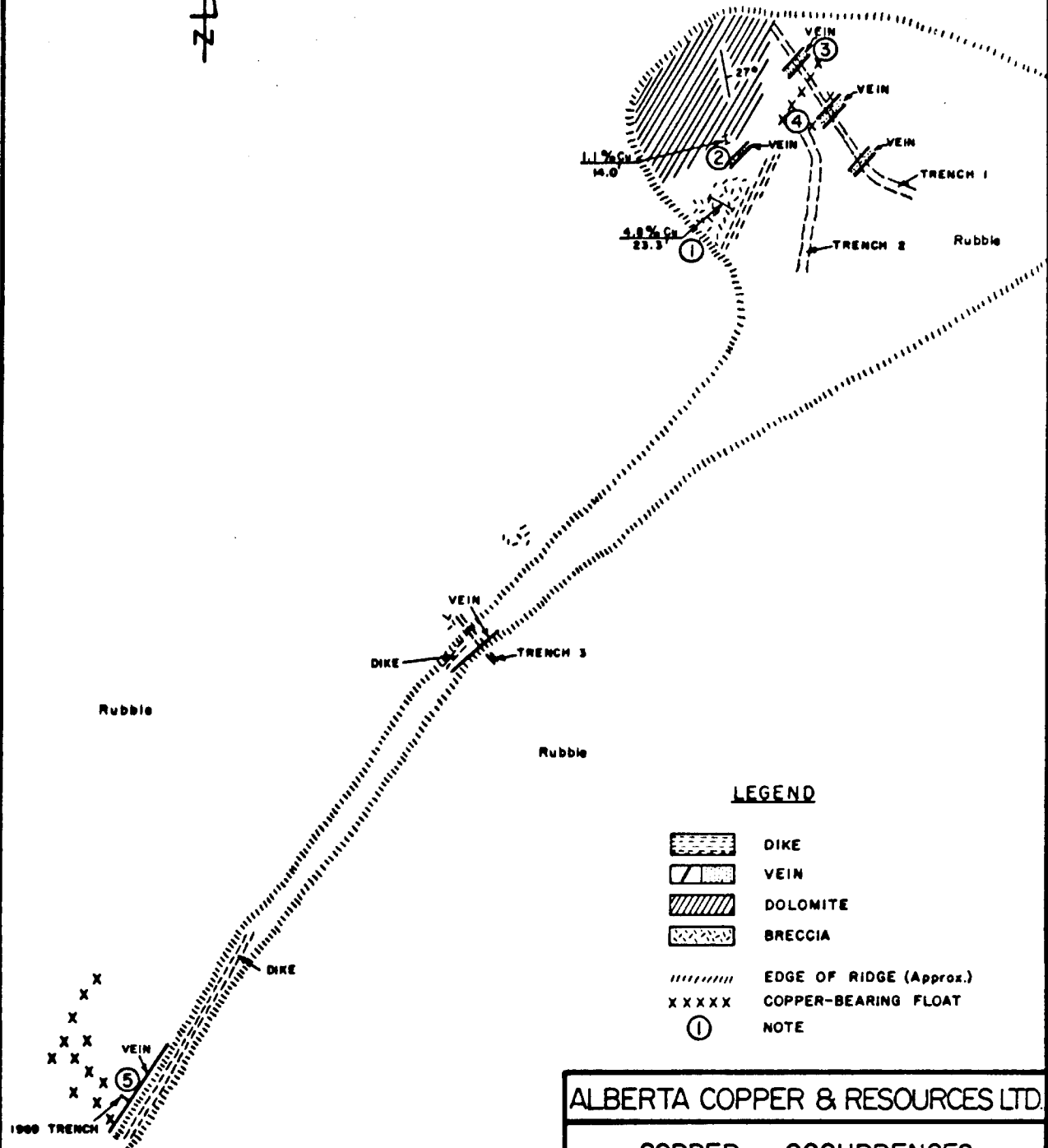
The selected route for the new road should be thoroughly scouted prior to construction; grades and terrain should be such that, if required, the road could be improved to highway standards.

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




C. M. Trigg, Ph.D., P.Eng.

CMT/fw

Enclosures



LEGEND

-  DIKE
-  VEIN
-  DOLOMITE
-  BRECCIA
-  EDGE OF RIDGE (Approx.)
-  COPPER-BEARING FLOAT
-  NOTE

ALBERTA COPPER & RESOURCES LTD.

COPPER OCCURRENCES

BOB MINERAL CLAIMS

RAM CREEK, B.C.

SCALE 0 100 200 400 FEET

TRIGG, WOOLLETT & ASSOCIATES LTD.

After L.B. Halferdahl EDMONTON, ALBERTA JULY, 1971

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