ARCHER, CATHRO
AND ASSOCIATES LTD.
CONSULTING GEOLOGICAL ENGINEERS

BOX 4127, WHITEHORSE, Y.T. 667-4415 BENTALL CENTRE, VANCOUVER, B.C. 688-2568

685
1435 TWO BENTALL CENTRE
555 BURRARD ST.
VANCOUVER 1, B.C.

Office Of The Superintendent Of Mines
FEB 15 1973
WHITEHORSE
Yukon Territory

ASSESSMENT REPORT

Geology, Geophysics and Geochemistry

MUNG 1-16 (Y55389-Y55404) inclusive
17-20 (Y64666-Y64669) inclusive

105-B-12

Watson Lake Mining District

Wolf Lake Joint Venture

This report has been examined by the Geological Evaluation Unit and is recommended to the Commissioner to be considered as representation work in the amount of $11,133.20

Resident Geologist or
Resident Mining Engineer

Considered as representation work under Section 53 (4) Yukon Quartz Mining Act.

Commissioner of Yukon Territory

R.J. Cathro, P.Eng.

November 30, 1972

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Report on Induced Polarization Survey, Mung Claims, by P.E. Walcott, P.Eng. September ,1972

SUMMARY AND RECOMMENDATIONS

During the periods June 12 to July 2 and August 15 to September 1, 1972 the Wolf Lake Joint Venture (WLJV) continued exploration begun the previous year on the Mung claims, just west of Wolf Lake, under the sponsorship of Rayrock Mines Ltd.; Ashland Oil Canada Ltd., and Caltor Syndicate. Detailed mapping, hand-pitting, geophysical surveys and a preliminary petrographic study were done to complete the surface evaluation of the claims. Three minor occurrences of copper and molybdenum were found in the intrusive dike or stock, and as well , an anomalous geochemical rock assay was obtained from the leached breccia zone, which has the strongest hydrothermal alteration seen on the claims. An induced polarization survey outlined two distinct anomalies along the east contact of the intrusion. The larger of the two is almost entirely covered by deep overburden and occurs within 300 feet of the breccia. It could be caused either by graphite in the quartzite wallrocks or by a mineralized porphyry deposit. Two 500 foot vertical core holes are recommended to explain the anomaly at an estimated cost of $30,000.

INTRODUCTION

The Mung 1-16 claims were staked in June, 1971 to protect an area underlain by altered intrusive rocks with traces of copper-molybdenum mineralization. Only limited geological and geochemical work was done during 1971 and this work was described in a previous report by the writer dated June 20, 1972. The 1972 program consisted of prospecting ,geological mapping, pitting, geochemical sampling, line cutting, magnetometer and I.P. surveys and a preliminary

petrographic study by H.T. Carswell. An additional four claims (Mung 17-20) were staked to protect ground covered by the I.P. survey. The work was managed by Archer, Cathro & Associates Ltd.

LOCATION AND ACCESS

The Mung claims group is located approximately 1/2 mile west of Wolf Lake on the north bank of the Wolf River. The nearest all weather road is the Alaska Highway, 70 miles southwest of the claim group. A winter road, which connects to the Alaska Highway, passes through the claim group on the north side of the Wolf River. The nearest important settlement is Whitehorse, 112 miles to the west. Watson Lake is situated approximately the same distance southeast of the claim group. The claim group is accessible by float equipped fixed wing aircraft landing on Wolf Lake. During the 1972 program, the crew camped there in a cabin owned by Bob Grant, and avoided helicopter costs by using a trail bike on the old winter road and a rubber canoe for crossing Wolf River. During the I.P. survey in late August, water flow had dropped to the point where the crew was able to wade across Wolf River.

CLAIM DATA

The property consists of a single block of twenty contiguous Mung claims, as follows:

Claims	Grant Numbers	Expiry Dates
Mung 1-4	Y55389-Y55392	21 June, 1975
5-10	Y55393-Y55398	21 June, 1976
11-16	Y55399-Y55404	21 June, 1975
17-20	Y64666-Y64669	23 Aug., 1973

The claims are held by Archer, Cathro & Associates Ltd. on behalf of the Wolf

Lake Joint Venture (Rayrock Mines Ltd., Ashland Oil, Incorporated, and Caltor Syndicate).

HISTORY

The claims were located on July 7, 1971 by the Wolf Lake Joint Venture to cover a weakly gossaned intrusive outcrop discovered during reconnaissance exploration. An old cut grid, which is visible on air photos taken between 1949 and 1952, can still be seen about two miles southwest of the Mung claim block. No record exists of this or any previous exploration in the area. During the winter of 1961-62, Conwest built a winter road to the Tintina Silver Mines Ltd. property and this road crosses the Mung claims.

GEOLOGY AND MINERALIZATION (Figure 23B)

The Mung claims are underlain by a stock or dike of G.S.C. Unit 15d biotite granodiorite cutting Unit 7a Devonian-Mississippian chloritic schists and greenstone. Leached and altered intrusive rocks form a low bluff on the north bank of Wolf River for a length of 2000 feet. These outcrops are weakly gossaned and first drew attention to the area in 1971. One mile further downstream, outcrops of unaltered biotite granodiorite occur on both sides of Wolf River. Within the Mung claims, the intrusion is about 2500 feet wide and is bounded by fine grained phyllitic quartzite which strikes northwest and dips to the northeast at 45°. Only a few outcrops of quartzite are found on the claim group. One outcrop on the winter road, near the contact, exhibited migration of quartz through thermal metamorphism and weak graphitic development in the phyllite.

Traces of molybdenite were found in a flat dipping, dark grey quartz vein in the outcrop along the river bank (Showing No. 3). The outcrop exhibits moderate alteration and leaching with limonite staining present along fractures. Fracturing is intense and this has been interpreted by various geologists as both crackle breccia and fault shearing. There is no evidence on leached surfaces that any sulfide other than pyrite was present. Three representative specimens of intrusive rock geochemically assayed between 31 and 120 ppm Cu. Two of these assayed less than 3 ppm Mo while the third assayed 180 ppm. These specimens were studied in thin sections by H.T. Carswell and all exhibit tectonic brecciation, sericitization of plagioclase and abundant limonite staining. Two of the rocks were described by him as altered sedimentary breccias although field relationships do not verify this. Alteration and shearing are so severe in some outcrops that the rocks consist of equidimensional deformed quartz "grains" in a white, soft, clay matrix. The overall texture of the rock is still granitic. In outcrop, highly sheared and altered sections can be traced to weakly altered, chloritic intrusive rock. On the basis of field evidence, these rocks were interpreted as an altered, coarse breccia containing fragments of both igneous and metasedimentary origin.

Showing No. 1 is situated at the western contact of the stock. Angular granodiorite float occurs in a shallow swamp and a few pieces are cut by narrow, molybdenite-bearing white quartz veins. Minor amounts of chalcopyrite was also found in a few hornblende-rimmed fractures. An adjacent outcrop of biotite granodiorite was carefully prospected but no mineralization was

found. Two specimens of veined and mineralized rock were examined in thin sections and were identified as quartz diorite, with alteration of biotite to chlorite, plagioclase to kaolin and minor epidote, carbonate and unidentified clays. Assays of fragments from these specimens containing no visible sulfides assayed 54 and 78 ppm Cu and less than 1 ppm Mo.

Showing No. 2 is southeast of Showing No. 1 , near Wolf River, in an area containing 40 per cent unaltered hornblende and biotite granodiorite outcrop. Individual outcrops are separated by small shears and fault zones and are highly jointed and sheared, especially near the river. In a few places, minor amounts of chalcopyrite occur along the fractures. Two specimens of typical rock were identified in thin sections as weakly altered albite granite and granodiorite. Plagioclase grains contain patches of white mica, biotite is mostly altered to chlorite and minor epidote is also present. A trace of chalcopyrite, chalcocite, pyrite and hematite was seen in minor fractures and assays of a portion of the two specimens returned 255 and 1330 ppm Cu and less than 1 ppm Mo.

A fourth area of importance is a series of small outcrops of leached intrusive breccia occurring over an area of 600 feet by 400 feet just north of Moon Lake. The breccia contains fragments of altered and metamorphosed sedimentary and intrusive rocks in a light coloured , bleached matrix. No mineralization was found in the breccia but one typical specimen assayed 285 ppm Cu and less than 1 ppm Mo, while a second assayed only 44 ppm Cu and less than 1 ppm Mo. These specimens and one other were studied in thin section and were identified as altered sedimentary breccias. However, field evidence strongly suggests that the breccia is of plutonic origin and could

be a breccia pipe. Most of the fragments consist of sedimentary rock but highly altered intrusive fragments are also present. The matrix is primarily composed of igneous rock fragments. Most fragments are quite angular although some of the larger ones are more rounded. Argillic alteration is strong throughout. Feldspars in rounded remnants of igneous rock contain abundant sericite and almost all the biotite has altered to chlorite. Quartz is the most abundant coarse grained mineral in the breccia, occurring as euhedral fragments in a soft, white clay matrix.

Shallow test pits were dug at widely scattered points for both geochemical and geological information. All pits dug away from outcrop failed to reach bedrock and, in these, overburden was mapped and sampled. The results of this work indicate that there are two types of sediments on the claim group and that overburden thickness is highly variable. Some areas on the property are underlain by thick wet clays. Pits dug near Moon Lake exposed well to medium sorted sands and gravels, indicating that Moon Lake is situated in an old meander of the Wolf River. No new bedrock information was gained from the pit digging, although the outcrop boundaries were extended in several cases. The existence of faults was confirmed in several pits by the presence of clay and talc-rich fault gouge. Geochemical assays usually showed an increase in copper content with depth, from 10 or 20 ppm Cu near surface to 30 or 40 ppm at depths of two or three feet.

GEOPHYSICS

Most of the stock was surveyed in a semi-reconnaissance fashion using magnetic and induced polarization (IP) techniques. The electromagnetic

(EM) method was not tested because of the low sulfide content usually associated with this type of deposit. The I.P. survey was contracted to Peter E. Walcott & Associates Ltd. of Vancouver and was supervised by geophysical operator Gary MacMillan. The results are described in a report by Peter E. Walcott, P.Eng. dated September, 1972, which forms Appendix I to this report. The magnetic survey was performed by the WLJV crew under the direction of Gary MacMillan, using a Sharpe Model 321 magnetometer which was rented from Walcott.

The I.P. equipment employed was a pulse-type system manufactured by Huntec Ltd., in which measurements are made in the time domain and recorded as apparent chargeability in milliseconds and apparent resistivity in ohm-meters. The survey was carried out using a "pole-dipole array" with a 300 foot dipole and first and second separation measurements. These results, which reflect electrode separations of 300 and 600 feet between current electrode C' and potential electrode P', are plotted in plan view for both chargeability and resistivity in Walcott's report, together with profiles on individual lines.

The survey showed that most of the property has an anomalously high chargeability (greater than 5 milliseconds) that could be caused by weak hydrothermal alteration. Within this area of response, two distinct anomalies are located, a smaller one to the southeast with peak chargeabilities of 22.2 on both the 300 and 600 foot electrode separations, and a larger one to the northwest with peak readings of 20.5 and 17.8, respectively, on the 300 and 600 foot separations. Both anomalies lie along the northeast contact of the stock, with a southeasterly one near the main river outcrop and the other

slightly north of the breccia zone. In the southeastern anomaly, the area exceeding 15 milliseconds measures about 600 feet by 400 feet with the 300 foot electrode separation and 800 feet by 400 feet with the 600 foot separation. The northwestern anomaly is much larger in extent, measuring 2000 feet by 700 feet with the 300 foot separation and 1600 feet by 900 feet with the 600 foot separation. In addition, an extension appears with the larger separation that lies on the northwestern edge of the survey grid and is open to the northwest. Additional detail was obtained through the southeastern anomaly on line 0 North, using a 100 foot dipole and electrode separations of 100 feet and 200 feet. This showed an apparent double peak effect, suggesting that the possible causative source could be a series of narrow conducting shears. The detailed line also crosses the edge of the larger anomaly and suggests it has a deeper source.

The resistivity survey did little except indicate overburden thickness and conductivity, and bedrock conductivity. The magnetic survey shows gentle fluctuation around 1400 to 1500 gammas over the stock, with a narrow linear high which exceeds 2700 gammas along the northeast edge of the stock. The magnetics show little relationship to observed mineralization or fracturing.

CONCLUSIONS

Walcott recommends one hole on line 0 North at a 60° dip to test the smaller but more intense southeasterly I.P. anomaly. Three small outcrops of altered quartzite that appear to lie quite close to the contact of the intrusion were mapped in a swamp over the anomaly. The nearest intrusive

outcrops, 800 feet southwest, are weakly altered and brecciated or sheared and appear to have contained no sulfides other than pyrite. More important, though, the geometry of the anomaly is too small for it to have economic significance by itself, even if it is well mineralized.

The northwestern anomaly, in addition to having much larger dimensions, also occurs within 300 feet of the breccia outcrops, which contain the strongest hydrothermal alteration found on the claims. No mineralization has been seen in the breccia but one leached rock sample returned an anomalous assay of 285 ppm Cu. A single small outcrop of graphitic and phyllitic quartzite occurs near the south end of the anomaly and is thought to occur near the intrusive contact . The remainder of the anomaly is covered by thick glacial till. Although the possibility exists that this anomaly is caused by a little graphite developed near the brecciated contact of the stock or dike, the high background in the leached breccia and scattered traces of copper-molybdenum mineralization found elsewhere on the claims confirm that this I.P. anomaly could well represent a mineralized porphyry deposit.

The northwestern anomaly should be tested first with two 500 foot vertical holes drilled about 1000 feet apart, near the ends of the anomaly. Two possible locations are at 3 North on the baseline, which is about 200 feet from the winter road, and at 11 West on Line 5 North, which is in the floor of a wide, 100 foot deep, abandoned stream channel. The hole recommended by Walcott should not be drilled unless the first two holes encounter mineralization. The initial drilling can be done most economically during early summer, mobilizing to Wolf Lake by float plane and to the drill site by helicopter.

The crew can camp at Wolf Lake and walk to the drill sites. An additional eight protection claims should be staked to protect the open northwest end of the I.P. Anomaly before drilling starts. If the initial two holes are encouraging, the I.P. survey should be extended to the northwest and a bulldozer should be brought in on the old winter road with fuel and supplies for a larger program, including the hole recommended by Walcott. The initial drilling will cost approximately $30,000 and can be deferred until 1980, if necessary.

Respectfully submitted,

ARCHER, CATHRO & ASSOCIATES LTD.

R.J. Cathro, P.Eng.

Association of Professional Engineers of the Yukon Territory
R. J. CATHRO
GEOLOGICAL
ENGINEER

RJC:st

GEOLOGY

JURASSIC and/or CRETACEOUS	15	Intrusive breccia
	15d	Granodiorite, quartz 10% - 30% biotite hornblende
PERMIAN to JURASSIC	12a	Quartzite-phyllitic very fine grained, medium to dark grey, thin bedded, minor quartz veins.

LEGEND

- (2) Mineral Showing
- Old stream channel
- Swamp
- Claim post
- Joint intersection
- Joint inclined
- Joint vertical
- Fault assumed
- Foliation

FIG 23B

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GEOLOGY

MUNG PROPERTY

WOLF LAKE JOINT VENTURE

SCALE IN FEET

400 0 400 800 1200

LEGEND

(2) Mineral Showing

Old stream channel

Swamp

Claim post

1972 1971

X Silt

• Soil Cu, Mo (Mo assays not shown assayed<2)

• Rock

□ Hand pit

FIG 23C

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PIT LOCATIONS & GEOCHEMISTRY

MUNG PROPERTY

WOLF LAKE JOINT VENTURE

SCALE IN FEET

400 0 400 800 1200

To accompany report dated Nov. 1971

MUNG CLAIM GROUP
1-20
WOLF LAKE
MOON LAKE
WOLF
RIVER
CAMP
RIVER ROAD
LINE 30 E
LINE 40 E
LINE 50 E
LINE 60 E
LINE 70 E
LINE 80 E
LINE 90 E
LINE 100 E
LINE 110 E
LINE 120 E
LINE 130 E
LINE 140 E
LINE 150 E
LINE