

BELL COPPER VISIT - 16 MAY 1974

On May 16th I spent the day with Peter Ogryzlo, Geologist, at the Bell mine site. After a 20 minute ferry ride we proceeded to the mine office and from there into the pit. The 6th level of the pit was under construction. Most of the secondary enriched (chalcocite) zone has been mined out. (approx. 200 feet deep). A total of 220 DDH have been completed for a total footage of just over 100,000 feet. All holes have been average assayed and fed into a computer program (Noranda-Toronto) for many purposes - one of which is to enlarge reserves. In this regard, mineable reserves, at present, are quoted as being 50 million tons grading 0.5% Cu. The geological reserves (postulated) are estimated at 120 million tons of the same grade. Cut-off grade (low stockpile) is .25% Cu and mineable grade is ~.3% Cu. Recovery apparently varies from 65-95%. Problems with oxide feed are the main cause. An abundance of oxide and sulphate minerals apparently are present. These include chalcantite, hematite, magnetite, gypsum and anhydrite.

The core of the deposit is barren.

The deepest drill hole in the pit is 2000 feet and geology and grade remain constant. Therefore, underground mining potential exists at a later date when the open pit has been mined. The best extension of the orebody at present is towards the southeast. The problem of mining will be excessive waste (2.5:1 stripping ratio) (overburden up to 200 feet deep).

Contrary to the well recognized rock units at the Granisle mine, the rocks in the Bell pit appear very uniform. Alteration is the key word here. The quartz sericite zone which consists of a white coloured rock which lacks mafics and exhibits a most profound stockwork of silica (quartz-amethyst). Grade appears to be best in this rock type. The ratio of pyrite to chalcopyrite is about 10:1. Going outwards across a section, Peter showed me a distinct intrusive rock with excellent hydrothermal diotite. Apparently the grade drops off to about .15% Cu and the ratio of chalcopyrite to pyrite increases to about 2:1. The next rock type observed showed good saussuritization of the feldspar. The grade dropped off also.

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The alteration halo is about 10,000 feet by 8,000 feet. Going outwards from the core recognition of a halo becomes subtle but can be determined by the presence of pyrite (approx. 1%) and epidote i.e. propylitic zone. Maximum quantity of pyrite occurs in the core (up to 15%). Peter feels that the best grade of copper probably exists in the quartz veins of the stockwork. The striking thing of the rock is the almost complete lack of visible chalcopyrite. It and much rarer bornite are apparently very fine grained.

Gold is also recovered from the ore. Silver is not. The Ag at the heads is 0.3 oz. and in the tailings it is 0.2 oz. Samples have been sent to the EMR in Ottawa to try and determine the size and location of the gold (i.e. they have no idea how it occurs and what size it is and therefore are probably losing some valuable dollars on the present recovery system).

A most interesting rock type which Peter pointed out is a breccia and conglomerate which may occur at boundaries of alteration zones. More specifically Peter feels from mapping (pit and drill core) that there may have been local pipes or hot spots within the pit area which now are occupied by these breccia-conglomerates. I think this is an interesting idea and will try to do some reading on fluid breccias. The fragments are mainly ore host rocks and the matrix is either silica or more commonly pyrite. Peter showed me a sample in which the pyrite was coated by chalcocite.

Wall rocks or host rocks within the pit area included Hazelton volcanics (highly altered), and sedimentary rocks (siltstones). Peter (and I agree) feels that the biotitization observed within the siltstones should be termed hornfelsic. Tom Richards dug a fossil out of a shale unit and has correlated the unit with Sustut Group.

The old adit (Pb-Zn) down by the shore was discovered in the early 1900's by a man named Newman.

Carson believes that much of the biotite has been obliterated by the quartz-sericite alteration. Nevertheless, hydrothermal biotite is present throughout the ore zone and is of good quality.

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The 1966 soil geochem map for both cold extractible and total copper showed no significant anomaly at all. Background values averaged 1 ppm. Right over the orebody, the highest value obtained was 400 ppm with others being in the range of 100 to 200 ppm. Certainly then, this was not a classic geochemical discovery. The present geochem. 'high' right over the orebody may reflect the secondary enrichment zone. The deposit was really found with the use of EM (or JEM). Three distinct anomalies were picked up in the area. The first two were drilled and found to contain abundant pyrite (present halo). The third hole hit the present ore zone.

Airborne mag failed to outline any positive targets.

Initial production was 10,000 tons/day. The average now is 12,500 tons/day. Apparently their recovery system (mill) will be increased (unofficially) to handle 15,000 tons/day.

There is a large backlog of concentrates sitting at Topley waiting for rail cars.

Peter says that if we want any core for a core library he would be more than willing to supply us.

Tom Schroeter,
District Geologist,
Smithers, B.C.
17 May 1974