MEMO

883626

AMOCO MINING

To: J. M. Anderson Date: February 2, 1973

From: T. Schroeter

Subject: TOUR OF GRANISLE COPPER - DECEMBER 8, 1972

On December 8, 1972 Harlan Meade and myself had a personalized tour of the Granisle Copper Mine with the chief geologist, Kim Hun. The main purpose of the tour was to compare the geologic environment of Granisle with that of the Saturday Lake property as envisaged from recent drilling on the property.

We discussed the geology thoroughly in the office before touring the open pit. I became especially interested in the type, location, and intensity of alteration with respect to ore zones. With this in mind, I tried to collect representative samples from the pit.

The following is a brief summary of discussions concerning Granisle:

1. Two main hypotheses exist regarding the zone of rock between a fresh plug of biotite-feldspar porphyry and host rocks (volcanic and sedimentary rocks). This zone appears to have the best mineralization.

a. Intrusive)
) 'Diorite'
b. Volcanic (hypabyssal))

Kim stated he has seen inclusions of 'diorite' in biotite-feldspar porphyry and vice versa. However, he hasn't seen inclusions of volcanic rocks (andesite) or tuffs in biotite-feldspar porphyry. There is a good intrusive contact between 'diorite' and biotite-feldspar porphyry.

Kim stated that in thin sections of both the biotite-feldspar porphyry and the 'diorite', the matrix has a dark color resulting from fine-grained broken-up biotite (possibly pseudomorphic after hornblende). In comparing thin sections of both rock types, Kim noted that the plagioclase in the 'diorite' had been corroded; whereas, in the biotite-feldspar porphyry the plagioclase was fresh - well zoned and twinned.

2. Alteration

The classic type of alteration appears to exist here and includes:

a. kaolinization

b. biotitization

c. potash feldspar

d. chloritization

e. epidotization

f. silicification

The existence of an outermost epidotized zone was recognized only recently by Kim.

Kim refers to a 'bleached' rock = kaolin rather than silica

3. Breccia zones exist within the 'diorite' zone. These are not truly hydrothermal, explosion breccias and refer to rocks with greater than 50% fragments.

4. Soil geochemistry over the orebody assayed 0.03% Cu.

5. Mineralization - chalcopyrite mainly. Two main bornite-rich pipes approximately 40 to 50 feet wide exist.

Waste "A" - 0.22 - 0.3 stockpiled
Waste "B" - <.22 waste

6. Reserves - 86 million tons

Average 0.5% Cu - cut off at 0.25%

Milling approximately 14,000 tons per day (wet)

% Cu averaged approximately 32 (but approximately 40 with higher bornite)

Mill heads now approximately 0.6 - 0.7% Cu

Ore grade cut off right now 0.3% Cu

7. Progress

Mining on bench 10 and started on bench 11. Total benches planned equal 33 (i.e., approximately 20 years left).

Other points to note:

- lack of pyrite in the mineralized rock
- the concept of multiple intrusion is important!

In conclusion, the geological environment in the Saturday Lake area is the same as that on Newman Peninsula and thus remains a favorable target for exploration.

Tom Schaefer

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