Talk by Vic P[illegible]to on May 2/73
47 m. tons of .7% Cu
31 m. tons of 1.3% Cu
continuous 'block-type' faulting southwards

New Afton
886015

Notes

THE AFTON DEPOSIT

From a talk by
Chester Millar

- To west of dry lake, greater than 300 feet of Tertiary cover.

- Drilling to June, 1972:
  Percussion = 28,778 feet
  Rotary = 17,475 feet
  Diamond = 24,854 feet
  Maximum depth of any hole = 1500 feet
  All but three holes were vertical

- Deposit extensions are closed to the north and east, but still open downdip to the south and along strike to the west.

- Mineable ore reserves for open pit:
  1. Estimated 47 million tons of 0.79% Cu
     214 million tons waste
     0.25% Cu cut-off grade

  or

  2. Estimated 31 million tons of 1.06% Cu
     103 million tons waste
     0.25% Cu cut-off grade

  Plus
  An undetermined underground tonnage at depth

- Alteration is propylitic, i.e. calcite, epidote, albite, chlorite; some K-spar; magnetite altering to hematite

- Brecciated, shattered, sheared, and faulted zones are loci of mineralization; northwest trends are favourable

- Alteration and economic mineral assemblages are not characteristic of porphyry copper situations, according to David Lowell. Native copper, chalcocite, bornite, chalcopyrite, magnetite, and hematite occur, the best mineralization (native Cu and chalcocite) primarily in fractures and in brecciated zones.

- Vertical mineral zoning is evident in many drill holes, as follows:
  1. Native Cu
  2. Native Cu + chalcocite
  3. Chalcocite + bornite
  4. Bornite + chalcopyrite
  5. Magnetite

  Grade decreases through 1 to 5 as depth increases

  Zones have gradational boundaries and are transected and displaced by considerable post-ore faulted.

- 70% of the deposit's Cu content is as native copper
  30% of the deposit's Cu content is as sulphides, primarily chalcocite

- The deposit is the result of supergene enrichment. Chalcocite was derived by oxidation from bornite and chalcopyrite, and native copper was derived by oxidation of chalcocite. The native copper and chalcocite were probably preserved from removal by glaciation by down-faulting.

- Metallurgy:
  Two concentrates will be obtained:
  1. The higher grade concentrate will run greater than 90% Cu and be derived from the +65 mesh fraction by screening.
  2. The lower grade concentrate will run greater than 50% Cu and be derived from the -65 mesh fraction by flotation.

  Combined concentrate grade will run approximately 70% Cu; 88 - 90% of the copper in the ore will be recovered.

- Diamond drilling assays were higher in % Cu than percussion drilling assays by a factor of about 5 - 10%.
  Rotary drilling assays were higher in % Cu than diamond drilling assays by a larger factor.

- A thin leached capping may exist above the native copper zone, but is less than 20 feet thick.

- No molybdenum or gold, and only 0.01 oz./ton silver is detectible in assays.

Vancouver, B.C.
January 25, 1973

S. L. Putter

AFTON

Native copper fills fine grained irregular fractures. These fractures are associated with intensive epidotization and carbonatization of host rock. Native copper is granular to dendritic in form. Fracture fillings of native copper may terminate in chalcocite blebs, or may rim chalcocite grains. Native copper may also occur as minute inclusions in chalcocite. These textural criteria suggest that native copper is supergene in origin.

Chalcocite occurs as grains and exsolved blebs in bornite. Lamellar chalcocite was not observed. Chalcocite may contain fine grained inclusions of native copper. Chalcocite inclusions in bornite form spindles that are a ligned to crystallographic directions. Bornite has smooth irregular grain boundaries with gangue and chalcocite. Bornite in chalcocite may become weakly dendritic. Covellite occurs as fine exsolved grai ns in bornite. Bornite appears to be primary, as indicated by exsolution textures with chalcocite. Chalcocite is also primary; but, chalcocite associated with native copper is void of exsolution textures and associated bornite, suggesting that this fine grained chalcocite is supergene in origin.

The main oxide and alteration minerals are hematite, epidote, clay minerals, chlorite, albite and carbonate minerals, with minor quartz.

Five polished sections were made from core samples obtained from Hole 71-2 between the depths of 250 and 550 feet. From these polished sections, bornite, covellite, and some of the chalcocite are observed to show exsolution textures, and, therefore, to be hypogene in origin. Native copper and some of the chalcocite is supergene in origin.

H. Meade

Harlan Meade

May 19, 1972

/mel