

Ph.D. Student - Craig Leitch

Advisor - C. I. Godwin

# BRALORNE VEIN Au DEPOSIT: AN UPDATE

## Field work:

Revisions were made to the surface and underground geology by further logging of Mascot Gold Mines core drilled from surface in 1980-84. The area of drilling is covered entirely by glacial overburden, and was mapped previously as Cadwallader Group sediments. However, it is actually underlain by a large dyke-like mass (3000 m x 200 m) of soda granite and many intra to post-mineral dykes.

The attitudes of all the structural features (dykes, veins, intrusives) were evaluated from these angle holes, and found to be remarkably consistent (strike 115°, dip 65°N). Core from deep levels of the mine, stored outside, has been summarily bulldozed by Mascot and is no longer available for study.

## Petrography:

Petrographic study of all the dyke types combined with re-logging of all dyke intersections in core, suggests that rather than two distinct dyke sets (albite and green hornblende porphyry) there may be overlap between the two, and the latter may not be entirely post-mineral as previously thought.

## Geochronology:

Two K-Ar dates obtained on fresh coarse hornblendes indicate a very large gap between the intrusion of the diorite ( $284 \pm 10$  Ma) and the largely post-mineral green hornblende porphyry dyke ( $85.7 \pm 3$  Ma). The latter date is firm, but the extremely low K in the diorite hornblende ( $<0.10$ ) means that it is certainly too old; this is confirmed by fossil dating of conodonts in the Cadwallader Group (225 Ma) which the diorite intrudes. Clear, unzoned zircon separates have been recovered from the diorite, soda granite, and albite; these are awaiting analysis.

*Zircon dates - Jan. '87*  
*- diorite*  
*- albite granite*

## Petrology:

Preliminary chemical analyses have been obtained for the major rock units and a section across a strong alteration envelope. Points of interest are:  $K_2O$  is very low in all rocks (0.08 - 0.69%);  $Na_2O$  is quite high, reflecting the ubiquitous albite in all igneous rocks (perhaps due to lower green schist facies metamorphism, also attested to by widespread chlorite and actinolite).

There does not appear to be strong hydrothermal albite alteration associated with the vein system. Instead, the chemical and petrographic data indicate feldspar-destructive alteration (epidote, chlorite, carbonate, sericite, and quartz increasing toward the vein).

Ph.D. Student - Craig Leitch

Advisor - C. I. Godwin

BRALORNE VEIN Au DEPOSIT: AN UPDATE

Page 2

It now seems clear that the serpentized ultramafics of the Cadwallader Fault are intruded and assimilated by the diorite, making them older (at least Triassic).

Field and petrographic evidence further suggests that the soda granite has an intrusive relationship to the diorite, albeit migmatites are often developed at the contact.

Sulfide Mineralogy:

Total sulfide in the veins is only 1-3%; altered wallrocks adjacent commonly contain more, 5-10%. The assemblage is the same in both cases (arsenopyrite, lesser pyrite, occasional pyrrhotite and chalcopyrite). Rarely, richer assemblages in the vein also have galena, sphalerite, tetrahedrite and bournonite (?); plus native gold. Gold occurs as 1-10  $\mu\text{m}$  blebs, particularly in pyrite, tetrahedrite, gangue, or arsenopyrite; less commonly as 15-50  $\mu\text{m}$  blebs in galena. Fuchsite has a close association with chromite in alteration haloes surrounding veins.

Fluid Inclusions:

Very preliminary data from primary inclusions at 15 and 44 levels in the mine (500 and 1750 m below surface, respectively) suggest an increase in temperature of homogenization (uncorrected for pressure) from 260° to 315°C with depth. Salinity, as evidenced by temperature of melting in these H<sub>2</sub>O-rich inclusions, also appear to rise slightly from -3.5°C to -5°C.

Output:

1987: A short update of Fieldwork 1985 article on Bralorne is in preparation for BCMOM Fieldwork 1986 (no figures are to be presented).

- Company bulldozed core! Too bad!  
(all n/g level by level)

/rm  
G:1/48

Pierre Malheur  
- n of TF Benta  
→ CONGRESS  
(sb)