General features of the mineralization, alteration and controls are discussed in the following.

8.1.1 Mineralization

The mode of mineralization remains essentially as described by Durgin (1981). Pyrite, chalcopyrite and varying amounts of pyrrhotite with the gold and silver occur as small disseminations or patchy replacements and as stringers in the three zones. The patchy or blebby replacement, most commonly of more mafically altered rock flour or the matrix between fragments, is in many if not most cases on or from fine fractures. Stringer mineralization is well developed in augite porphyry and siltstones in surface outcrops in Aylwin Creek and in augite porphyry in the intersection in hole 80-4. It is developed in crackle breccia on the margins of the pipe or large fragments. The high-grade mineralization in 82-24 is largely of the stringer-type with replacements by sulphide occurring as seams of often almost massive replacement from fractures up to 5cm wide.

In all occurrences mineralization appears related to brittle fracturing that seems to post-date solidification of the breccia.

No gold has been seen except under the microscope. Here it is seen to be free gold occuring as fine grains on sulphide grain-boundaries. No silver-bearing minerals have been seen or detected by X-ray in several attempts. The nature of its occurrence remains unknown.

With only minor exception outside the main mineralized trends, all the copper mineralization is accompanied by gold and silver in moderately consistent ratios for the Willa Zone.

Au/Au + Cu - 53-83%
Ag/Ag + (Cu X 10) - 50-80%
Au/Au + Ag - 3-33%

8.1.2 Alteration

Alteration associated with mineralization remains as described earlier by Durgin (1981) though it is now believed that the sequence of events is simpler, with variations due to zoning, depth or position in or between zones. The main important aspect of alteration that is clearly related to mineralization is the intensity of the development of a green silicate assemblage of;

epidote (with pyrite)
actinolite
black amphibole

with garnet and magnetite. Such alteration develops in and as a selvedge to mineralization or, in the case of epidote and pyrite, as a more pervasive dissemination. This alteration with bleached selvedges that possibly reflects silification overprints the biotite. The epidote-pyrite-magnetite etc. assemblage may develop in all rocks but variations are noted. In the Willa Zone garnet appears as the most diagnostic associate of mineralization especially in the northern part where grades of gold are higher and the mineralization is more intense. The development of purple anhydrite, other than that in late veins, may also reflect more intense mineralization and better gold tenor. cf. Kemess

Despite a generally wide distribution of pyrite in the breccia it appears in greater amounts in the mineralized trends. The abundant pyrite in holes 81-14, -16, and -17 may be important. These holes intersect projections of the Willa Zone at significantly higher elevations than to the north. The pyrite may represent an overlying halo or cap to other mineralization. The pyrite here demonstrates that augite porphyry is readily replaced and may be favorable as a host. cf. Baker

8.2 ZONES OF MINERALIZATION

8.2.1 Willa Zone (Main Zone)

The 1982 programme resulted in no major changes to grades of dimensions of this zone. Drilling aimed to probe its downward extension was not successful. As described, 82-23 remained in quartz latite porphyry on the projection of the zone. Garnet and pyrite with weak green silicate was noted from 350-420m and considered as the possible reflection of the zone. Assays from this section yielded only below detectable gold and silver, while copper was below the adjacent sections (see Section Dwg. D-8955). The Willa Zone thus does not continue to 10,200 N unless the hole, as seems likely, has deviated to the north.

A postulated dyke remnant accounts for lack of the zone in hole 82-24. This dyke would interrupt the zone. Mineralization is known to occur south of the dyke in holes 80-2, -3, and -4. The southern limit of the zone at depth has thus not been defined.