1986/52. Mineralogy/petrology of some Dan Rivulet Bore Hole 1 samples.

R. S. Bottrill

Abstract

Two samples of drill core and one pan-concentrated sludge sample from this borehole were examined and found to be mineralised. The pan concentrate is preponderately cassiterite with minor pyrite, while the drill core samples exhibit minor sulphides (pyrite, chalcopyrite, marcasite, sphalerite, galena, bornite and covellite). These sulphides principally occur in quartz-carbonate veins, but are also disseminated in phyllitic Mathinna Beds. The cassiterite is presumed to derive from Cainozoic alluvium, while the sulphides may be polygenetic, perhaps representing syngenetic sulphides overprinted or remobilised by Devonian hydrothermal fluids.

INTRODUCTION

Two samples of sulphide-bearing drill core from this borehole were submitted for examination by V. M. Threader. The samples, from the 89.0 m and 94.2 m levels, are of the Mathinna Beds.

Sludge samples collected from this borehole over the interval 76.62-85.62 m were pan concentrated at the Department's Launceston laboratories. This product, of about 0.2-2.0 mm grain size, was submitted for mineral identification.

DESCRIPTIONS

BH1 (89.0 m)

This rock is a contorted, quartz-rich phyllite with a foliation defined by phengitic muscovite and lesser chlorite. Bedding is poorly defined but is probably approximately parallel to the tectonic foliation. Rutile is very abundant as stringers and disseminations of very fine grains. Graphite flakes, zircon and pyrite are rare, while blebs of chalcopyrite-sphalerite-galena (up to 40 μm) are very rare.

Numerous veins, of several generations and orientations, cut this rock and are often contorted and disjointed by shearing. Quartz is predominant but a carbonate is sporadically present and sulphides are sporadic but minor. Pyrite occurs as crystals and aggregates up to a few hundred micrometres, sometimes intergrown with marcasite. Chalcopyrite is relatively abundant as blebs to about 100 μm, or as fine veinlets a few micrometres wide. The blebs often contain sphalerite, galena, bornite and covellite, and these sulphides are practically always associated with chalcopyrite in these rocks. Chalcopyrite may replace the galena and sphalerite in places.

BH1 (94.2 m)

This rock has a similar mineralogy to the above, but is less contorted and quartzose. Rutile and sulphides (as above) seem less common, while graphite may be more abundant. A large proportion of the sulphides occur as blebs in the phyllite, and a pyrite vein is present, parallel to the cleavage. A mawsonite-like mineral and other unidentified minerals are present.

BH1 (76.62-85.62 m - sludge)

Cassiterite comprises about 70-80% of the sample, as subangular to rounded grains, rarely subhedral. The colour varies from deep red to brown and yellow and inclusions of quartz, pyrite, mica, tourmaline and rutile are present.

Pyrite comprises about 5% of the sample, it is anhedral and often intergrown with quartz.

Hematite comprises about 5% of the sample, as reticulated aggregates probably pseudomorphous after magnetite.

Rock fragments comprise about 10-20% of the sample, and are dominantly dolerite and hornfels, often weathered.

Goethite, tourmaline, pyroxene, rutile, and an unidentified metal contaminant are all trace constituents.

CONCLUSIONS

Base metal sulphides are minor but widespread phases within both the phyllite and the quartz-carbonate veins. The veins (probably Devonian) may have only remobilised the sulphides locally, by lateral secretion. Alternatively, metals may have migrated from the veins into the phyllite (this seems less likely). The pyrite and chalcopyrite veins are probably due to late stage remobilisation. No gold was detected microscopically; some seemed visible in the original core, but was lost during preparation.

The coarse, subangular to rounded nature of the cassiterite indicates an alluvial source, probably close to the original (Devonian) tin-bearing vein or greisen, of Cainozoic age.

[2 September 1986]