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BARITIC MASSIVE SULPHIDES

The baritic sulphides consist of porphyroblastic pyrite in an interstitial matrix of barite, galena, and sphalerite. Magnetite typically occurs in minor amounts. This ore type commonly grades 10-20 wt % (Pb + Zn).

The coarse-grained samples are from the Faro deposit. The fine-grained sample is from the Vangorda deposit. The difference in grain size is caused by differences in metamorphic grade between the two deposits.

Compositional banding in the Vangorda sample is parallel to the dominant S2 foliation surface. Compositional banding in the Faro sample is not readily visible.

PYRITIC MASSIVE SULPHIDES

The pyritic sulphides contain porphyroblastic pyrite in a dark brown interstitial matrix of galena and sphalerite. Quartz is the other significant gangue mineral. Proportions of pyrite and lead-zinc sulphides vary widely. Pb+Zn grades range from less than 1 wt % to greater than 20 wt %.

The coarse grained samples are from the Faro deposit. The two samples show the wide range in Pb+Zn amounts within this ore type. The compositional banding in the more pyritic sample is parallel to the dominant S2 foliation in the surrounding host rocks.

The fine grained sample is from the Grum deposit. The Grum sample contains large porphyroclasts of dolomite-quartz. Quartz is present as a gangue mineral in this sample. Quartz content increases gradually towards one edge of the sample to where it would be classified as a sulphide-rich quartzite.

PYRITIC QUARTZITES

The pyritic quartzites consist of medium to pale grey quartzite with thin bands and laminae of pyrite, sphalerite, and galena. Muscovite is generally present in small amounts on the S2 foliation surfaces.

Both samples are from the Faro deposit. The dominant foliation is S2. Note that one sample contains an isoclinal D2 fold hinge. Within this fold sulphides have been remobilized into the S2 axial plane schistosity.

Compositional banding within the sample lacking folds shows the range of Pb+Zn grades possible for this rock type. This coarser banding is common within the deposits.

Note also that the samples are locally slightly carbonaceous, grading towards the carbonaceous quartzites.

The gradational change downward in the Vangorda deposit from these quartzites to only slightly altered pelites of the Mount Mye formation suggest that this rock type is a silicified and sulphidized footwall pelite.

RIBBON-BANDED, PYRITIC, CARBONACEOUS QUARTZITES

The carbonaceous quartzites consist of medium to pale grey, medium-grained quartz, pyrite, sphalerite, and galena interbanded with dark grey, fine-grained carbonaceous quartz. Banding ranges on a scale from millimetres to centimetres. Pb+Zn grade ranges from less than 1 wt % to greater than 10 wt % but is typically less than 8 wt %.

This sample is from the Grum deposit. The dominant schistosity in this sample is S2. Sulphides have been remobilized into the S2 surfaces and into late crosscutting fractures.

This lithology grades laterally into carbonaceous, siliceous phyllites (away from a deposit) and into noncarbonaceous, pyritic quartzites (toward the core of the deposit). Locally the change to pyritic quartzites is caused by hornfelsing adjacent to greenstone dykes within the ore deposits.

MASSIVE PYRRHOTITIC SULPHIDES

Pyrrhotitic sulphides have a much more localized and irregular distribution within the Anvil District deposits than other ore types. They consist of fine-grained pyrrhotite, sphalerite, and galena with minor pyrite. Typically they contain porphyroclasts of vein quartz and dolomite. This rock type displays a well developed S2 ductile flow foliation. Pyrrhotitic ores are characteristically finer grained than other ore types in all of the deposits.

In the Faro deposit the pyrrhotitic ores are localized dominantly in the southwest portion of the deposit. They are most common where the deposit "necks" down to the thin southwest dipping extension. They also occurred in greater amounts at the northeast end of the Faro orebody where the deposit was intruded by a diorite dyke.

In the Vangorda and Grum deposits, the pyrrhotitic ores occur mainly as thin bands adjacent to the margins of the deposit. They show strong ductile flow banding textures.

The concentration of pyrrhotitic ores near the diorite dyke in the Faro deposit is a contact metamorphic effect. Other occurrences of this rock type may be strain-related.

MOUNT MYE PELITES

The Faro and Vangorda deposits are hosted entirely by the noncalcareous Mount Mye formation. At least some of the mineralized horizons within the Grum and Dy deposits occur within the Mount Mye pelites.

The schistose sample is from the Faro deposit. The dominant foliation is S2. Dark grey porphyroblasts elongate in the S2 foliation are intergrown biotite-andalusite clots. The S2 foliation is pervasive and earlier surfaces have been transposed into near parallelism with it.

The lower metamorphic grade phyllitic sample is from the Vangorda deposit. The mineral assemblage is muscovite-chlorite-quartz. The S2 foliation is present as a fine, nearly pervasive crenulation cleavage.

The rusty brown weathering with both samples is typical for the Mount Mye pelites.

Chemically the Mount Mye pelites are very similar to the average shale in whole rock composition.

VANGORDA CALCAREOUS PELITES

The drill core is an example of the greenschist facies Vangorda formation. It contains the assemblage muscovite-chlorite-quartz-calcite. Texturally the rock consists of a silvery grey pelite with numerous thin quartzose siltstone interbands. Most of the calcite occurs within the siltstone bands. The dominant foliation is the S2 crenulation cleavage. The quartzose siltstone bands within the pelite typically form a well developed microlithon structure.

At higher temperatures this calcareous pelite is metamorphosed to a hard, thinly banded, pale green and dark brown calc-silicate. The dark brown bands correspond to the pelite component of the phyllite, and the pale green bands correspond to the quartzose siltstone interlayers. The banding defines the S2 foliation as the earlier planar fabrics are transposed into the S2 axial plane foliation formed during the D2 deformation.

GREENSTONE

The Vangorda and Mount Mye formations contain intervals of dark green chlorite phyllite/schist or amphibolite. These units range in thickness from a few centimetres to several tens of metres. Whole rock analyses indicate these units have a basaltic composition. Primary textures where the unit is not strongly foliated are diabasic. These units are considered to be the subvolcanic feeder dykes and sills for the overlying Ordovician Menzie Creek formation.

The rusty sample is from the area of the Vangorda deposit. On the sawn surface one can see a relict igneous texture. Former plagioclase grains are surrounded by an anastamosing network of dark green chlorite.

The highly altered sample consists of the same rock type collected from within the Faro deposit. This strong alteration is typical for the metabasites within the sulphides and quartzites. The bright green mineral is a chromium-rich clay or serpentine (?). Within the deposits, the metabasites commonly form large blocks as they have been boudinaged during the D1 and D2 folding deformations.

VANGORDA CARBONACEOUS PELITE

The thickest and most laterally extensive carbonaceous pelite occurs at the base of the Vangorda formation. This basal carbonaceous member can be traced throughout the Anvil District and beyond. It is laterally correlative with at least three of the mineralized horizons and also overlies them. Southwest of the deposits it thickens substantially. Portions of this unit are very siliceous, and locally it contains quartz-pyrite ribbon banding. These different features suggest that ore formation is related to the development of reduced subbasins formed through syn-sedimentary faulting.

This sample is an example of the basal carbonaceous pelite from the Vangorda deposit area. The strong orange staining results from the weathering of abundant fine pyrite contained within the sample.