

**PETROGRAPHIC REPORT ON A DRILL CORE SAMPLE
FROM WESTERN TASMANIA**

For

Andrew Habets, on behalf of
Saracen Mineral Holdings Limited

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SUMMARY

A short interval of sawn diamond drill, labelled H133913, was submitted for petrographic preparation, description and interpretation. The sample was from the Cambrian age Farrell Group sediments. It was suggested to represent a sandstone/greywacke from a position below the Farrell shales and slates. A polished thin section was prepared from the sample as it contained a little disseminated pyrite. The section was examined microscopically under transmitted and reflected light. The section offcut was tested with dilute HCl for carbonate speciation and the core sample measured for magnetic susceptibility.

A summary description of the sample is:

H133913 PTS

Summary: Fine grained quartz-sericite-albite-carbonate schist, with minor chlorite and pyrite, representing a low grade metamorphosed and strongly deformed porphyritic felsic volcanic or volcanoclastic rock. There is some preservation of original phenocrystal grains of quartz and altered plagioclase, with the remainder (groundmass or matrix) having been finely recrystallised and replaced by a moderately to strongly foliated aggregate of quartz, sericite, albite, carbonate (dolomite) and minor chlorite and pyrite. There is a tendency for metamorphic differentiation into schlieren richer in sericite versus those richer in quartz-albite-carbonate.

It is interpreted that the sample represents a rather strongly deformed, altered and low grade metamorphosed rock that was formerly a porphyritic felsic volcanic or derived volcanoclastic sedimentary rock (i.e. epiclastic sediment derived from a felsic volcanic provenance). Although now a schist, the rock retains relict phenocrystal grains of quartz and altered phenocrysts of plagioclase. These phases reside in a fine grained, foliated and completely recrystallised groundmass. The fine grained recrystallised assemblage has some tendency to have developed metamorphic differentiation, with thin foliae rich in sericite (plus minor chlorite and trace rutile) interspersed with foliae rich in quartz, albite and carbonate (dolomite). Alteration to form the dominant quartz-sericite-albite-carbonate (-minor chlorite-pyrite) assemblage may have occurred during metamorphism or could reflect some type of hydrothermal influence imposed prior to deformation and metamorphism. Alteration has presumably introduced CO₂ and minor S into the original rock. Deformation effects are manifest in the strong, sericite-defined foliation and in local "pressure shadow" development about relict quartz grains and small pyrite porphyroblasts.

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Handspecimen: The drill core sample is composed of a rather strongly foliated, fine to medium grained green-grey coloured schist. It is evidently rather rich in quartz and sericite, with considerable chlorite and possible aggregates (porphyroblasts) of carbonate up to 1-2 mm across. There is also a little finely disseminated pyrite. Foliation is defined by preferred orientation of sericite and chlorite and is at ~60° to the core axis. Testing of the section offcut with dilute HCl did not produce any significant reaction, suggesting that the carbonate is dolomite. The rock is essentially non-magnetic, with susceptibility of $<20 \times 10^{-5}$ SI units.

Petrographic Section:

a) Primary mineralogy and textures: In the section, it is obvious that the original rock has been rather strongly deformed and finely recrystallised. However, there is preservation of scattered relict grains of quartz up to 3 mm across that are interpreted to represent original phenocrystal grains and there are less common grains of altered plagioclase up to 1.5 mm across that could also represent the sites of former phenocrysts. The remainder of the rock has been finely recrystallised to a foliated aggregate; it may represent former groundmass in a volcanic rock or matrix in a sedimentary (volcanoclastic) rock. However, there are rare small relict grains of zircon enclosed in this fine grained recrystallised aggregate. From the relict characteristics and the bulk composition, it is interpreted that the rock represents a former porphyritic felsic volcanic (e.g. tuff) or derived volcanoclastic sedimentary rock (i.e. epiclastic).

b) Alteration and structure: It is interpreted that the original rock was strongly deformed so as to develop a moderate to strong foliation, as well as being hydrothermally altered and metamorphosed to low grade (e.g. lower greenschist facies). Original phenocrystal grains of quartz are preserved, although they are commonly strained; they are locally associated with development of fine grained "pressure shadow" aggregates of quartz, sericite and carbonate. Rarely, cracks in relict quartz contain tiny traces of sphalerite and galena. Former phenocrystal grains of plagioclase have been altered to albite and minor carbonate and sericite. The groundmass/matrix of the rock has been recrystallised to a foliated fine grained aggregate dominated by quartz and sericite, with subordinate amounts of albite, carbonate (commonly in elongate aggregates), minor chlorite (associated with sericite), disseminated pyrite and traces of rutile. The latter mineral forms grains up to 0.1 mm across concentrated into sericite-rich schlieren. There is a tendency in the sample for development of metamorphic differentiation, with formation of sericite-rich schlieren up to 1 mm wide, interspersed with schlieren rich in quartz, albite and carbonate. Sparsely disseminated pyrite grains up to 1 mm across, and elongate pyrite aggregates, occur throughout. Pyrite is locally fringed by "pressure shadows" of semi-fibrous quartz, evidently grown syn-tectonically. The rock contains rare veinlike aggregates of quartz and carbonate, perhaps emplaced syn-tectonically. The prominent foliation in the sample is mainly defined by preferred orientation of sericite.

c) Mineragraphy and paragenesis: The altered and deformed rock contains a little disseminated pyrite in isolated subhedral to anhedral grains up to 1 mm across, as well as in a few elongate aggregates. There is also a tiny trace of fine grained sphalerite and galena, emplace into fractures in relict quartz grains.

Mineral Mode: Approximate modal proportions are: sericite 40%, quartz 30%, albite 20%, carbonate (dolomite) 5%, chlorite 3%, pyrite 1% and traces of rutile, zircon, sphalerite and galena.

Interpretation and Comments: It is interpreted that the sample represents a former porphyritic felsic volcanic rock (e.g. tuff) or derived clastic sedimentary rock (epiclastic with relict quartz and plagioclase grains) that has undergone rather strong deformation and recrystallisation. The rock is now a fine grained quartz-sericite-albite-carbonate schist, with minor chlorite and pyrite, with some preservation of original phenocrystal grains of quartz and altered plagioclase. There is a tendency for metamorphic differentiation into schlieren richer in sericite versus those richer in quartz-albite-carbonate.