

PART I - SANDSTONE FROM CORE #1 AND IGNEOUS ROCK PETROGRAPHY

SEDIMENTARY ROCKS

Seven core chip samples were analysed from Core #1 of Yolla-1. The depths are as follows (m):

1845.7 m	1846.2 m
1846.5 m	1846.8 m
1847.1 m	1847.4 m
1848.0 m	

Thin sections (TSC 45540-45546) were cut from each sample. Brief examination of the sections showed that the rocks are essentially the same and hence one overall description is given.

The section represents a remarkably well-sorted siltstone in which the average grain size is 0.05-0.07 mm and detrital grains in this size range comprise about 75% of the volume of the rock. Quartz is by far the most abundant detrital mineral and there is less than 5% (altogether) of lithic fragments, mica and heavy minerals. Feldspar is absent. Grains of quartz are angular (mostly) to subangular in shape and they fit closely together. Contacts are, however, mainly of the tangential type, rarely long and curved; hence the angularity is an integral feature of the detritus and not a result of diagenetic modifications. There are no quartz overgrowths. As far as can be determined, the quartz is of the common or plutonic variety, although the sorting suggests an immediate sedimentary provenance.

Small (~0.05 mm) patches of birefringent, heterogeneous clay are relics of lithic fragments deposited with the quartz. The rocks contain about 1% of clean detrital muscovite. Most of the flakes are distorted (due to compaction effects) and are not more than 0.1 mm in length.

Finally, the samples contain traces of tourmaline. As far as can be determined from the thin sections this mineral is decidedly rare at 1845.7 m but somewhat more abundant, for example at 1847.4 m. Tourmaline grains are subangular in shape and similar in size to adjacent quartz grains. Most show pale straw to yellow colours with a few also showing pale green tints. Zircon and opaques were occasionally noted among the terrigenous component.

The two other main components of these rocks are clay and carbonate and these together comprise about 20% of the samples. Carbonate is most abundant by far at 1845.7 m (15% carbonate) and 1846.8 m (7-10% carbonate); there are traces at 1847.1 m and none in the other sections. Brown clay represents 15-20% of all the thin sections.

At 1845.7 m the carbonate is siderite and it occurs about equally as widely disseminated crystals up to 0.1 mm in size and as large, monomineralic aggregates up to 0.5 mm in size. The disseminated material is patently authigenic, has partly replaced quartz and, in some instances, forms subidiomorphic crystals. In the large aggregates, the siderite has a notably granular texture and small individual crystals often have a dark core. This appears most likely to be siderite derived from alteration of original pyrite concentrations. At 1846.8 m most of the carbonate occurs in equant to lensoid concentrations similar to those at 1845.7 m.