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1984/63. Igneous rocks from Squid #1.

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*Abstract*

Thin igneous bodies encountered during the drilling Squid 1 are interpreted as cooled hypabyssal sills of magma associated with Tertiary (Late Eocene-Miocene) alkali olivine basalt.

## INTRODUCTION

Squid #1, a hydrocarbon exploration well, was drilled in the Bass Basin on behalf of a consortium headed by Weaver Oil and Gas. The well was located at 40°11'53.344"S, 146°18'27.340"E and penetrated 2822 m of the Tertiary sequence before being plugged and abandoned.

The presence below about 2000 m of dark green rock fragments presented problems for both the well-site geologist and the mud-loggers. Subsequent analysis of a single wireline logging run indicated the presence of three thin horizons of high resistivity, suggestive of either volcanic or hypabyssal rocks.

Samples were collected from the shale shaker and subjected to XRD and petrographic analysis.

## RESULTS

The largest chip collected (diameter 15 mm) is from a fine to medium-grained (1.0-1.5 mm) crystalline igneous rock. The original mineralogy consisted of euhedral to subhedral and embayed olivine, elongate orthopyroxene, minor anhedral clinopyroxene and plagioclase, and accessory anhedral to skeletal magnetite/ilmenite.

The rock has a granular texture with olivine and orthopyroxene being the first minerals to crystallise, with later plagioclase. Augite poikiolitically encloses small olivine crystals and also infills irregular voids between larger olivine and orthopyroxene crystals.

Alteration products include serpentine group minerals, chlorite, biotite, other fine-grained micas and clay minerals.

X-ray diffraction of a smaller chip indicated the presence of montmorillonite, kaolinite, and calcite. The presence of montmorillonite is responsible for the changes of colour, noted by the mud-loggers, which occurred when ditch cuttings were dried by heating at low (<125°C) temperatures.

## DISCUSSION

The mineral assemblage, texture, and alteration style in the samples from Squid #1 is similar to that observed in a specimen from Core #11 (2469-2474 m) obtained from the Cormorant #1 well which was drilled by Esso in 1970 and located at 39°34'22.8"S, 145°31'35.7"E. The Cormorant specimen is interpreted by one of us (AVB) as being a cooled hypabyssal sill of magma associated with Tertiary alkali olivine basalt similar to that found on the Tasmanian mainland. This interpretation is based on comparison of microprobe analyses of minerals from the Cormorant sample with glomeroporphyritic clusters in alkali olivine basalts from the Burnie-Waratah

area, together with numerous thin section observations.

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