

- The oil recovered from 1830-1835 m has low maturity GC-MS maturity parameters, while the condensate produced from 2809-2824.5 m exhibits mature GC-MS characteristics. Apart from these maturity differences both hydrocarbons originated from dominantly terrestrial organic matter where conifer and angiosperm resins made contributions to their formation. These source similarities suggest the oils are genetically related, or originated from different rocks which contain a similar organic matter assemblage, and have experienced different geothermal histories. The 1830-1835 m sample may be a more localised product in which the high temperatures associated with the igneous activity in the area have matured the organic matter quickly. Due to this quick heating some of the biomarker compounds have not equilibrated, resulting in the hydrocarbon retaining immature GC-MS characteristics. A possible parent source for this type of hydrocarbon could be the organic-rich early Paleocene sediments below 3000 m, which are above the extrusive igneous rock at 3031 m. The 2809-2824.5 m condensate has probably migrated farther than the shallower crude oil, from an area where the source rock(s) have experienced a more or less normal geothermal history. Here full compound equilibration has occurred.

INTRODUCTION

Organic geochemical analyses have been performed on the following samples from Yolla-1:

Canned cuttings	83
Sidewall cores	3
Oils	2
Waters	1

The purpose of this study has been to evaluate the thermal maturity and source character of the sediments penetrated by this well. Also, the oils recovered were characterised and compared to the sediment analysed from this well.

Analytical

The eighty-three canned cuttings samples were submitted to C₁-C₇ light hydrocarbon headspace gas chromatography. Based on the results of these analyses, three samples were selected for detailed gasoline-range gas chromatography. Thirty-seven cutting samples and three sidewall cores were submitted to % total organic carbon determination, followed by Rock-Eval pyrolysis analysis on those samples containing greater than 1% TOC (34 samples). Detailed geochemical evaluations comprising extraction, liquid chromatography, c₁₂⁺ saturate gas-liquid chromatography and C₁-C₃₁ pyrolysis gas chromatography were carried out on nine cuttings samples and one sidewall core. Vitrinite reflectance measurements were performed by Amdel and are shown on Figures 1, 2, 4 and 5.

The two oils recovered from this well (DST 1 and DST 2) were submitted to C₁-C₃₁ whole oil gas-liquid chromatography, which included a detailed breakdown of the C₄-C₇ gasoline range compounds. The shallow oil from 1830-1835 m of DST 2 was sampled twice with both samples submitted to C₁₂ whole oil gas-liquid chromatography. The sample taken at 5.30 pm was also separated by liquid chromatography. Both oils, from DST 1 and DST 2, and one cuttings sample were analysed by gas chromatography-mass spectrometry. A water sample recovered during DST 2 had a complete water analysis carried out on it.