DISCUSSION OF THE RESULTS

A. Thermal Maturity of Sediments

Two (2) vitrinite reflectance measurements at 1341m and 1374m suggest sediments at these depths are thermally mature and oil generative. However, organic matter appears to be contact altered in these two samples (coal maceral descriptions, Table 4), suggesting these sediments have been affected by igneous intrusives. Consequently, more advanced levels of thermal maturity may have been attained adjacent to these igneous bodies while sediments further removed from the influence of these intrusives may have experienced a milder thermal history.

Tmax temperatures in excess of 440°C were recorded in almost all of the sidewall cores submitted to Rock-Eval pyrolysis analysis. This confirms that sediments from the interval analysed are probably mature and oil generative.

B. Hydrocarbon Source Character

The majority of the sidewall cores submitted to total organic carbon determination show moderately good to excellent organic richness (Table 1). Hydrogen indices suggest organic matter is predominantly gas prone; although a minor but significant oil prone component may also be present (particularly around 1340m where a hydrogen index of 240 was recorded).

Volatile hydrocarbon yields (S_1) suggest that quantities of hydrocarbon may have been sourced from the richer intervals analysed between 1206.5m and 1340m. Two (2) samples from these shaley intervals were extracted (SWC 19, SWC 20). C_{12}+ saturate gas chromatograms from these sidewall cores show a predominance of high molecular weight n-alkanes, and are thought to be typical of mature terrestrially sourced extracts. Both appear to be rich in aromatic compounds (Table 2), which may reflect either the coaly nature of these sediments or the fact that quantities of saturated hydrocarbons have already been expelled from these source rocks.

C. Reservoir Hydrocarbon-Source Rock Correlation

Two (2) sandstone sidewall cores (SWC 16, SWC 18), were extracted in an endeavour to characterise any reservoir hydrocarbon present. Both gave poor total extract yields which made separation by liquid chromatography impracticable. C_{12}+ whole extract chromatograms from these two samples (Figure 3-3, 3-4), indicate that if any reservoir hydrocarbon is present in these sandstones it must be in very minor amounts (reservoir hydrocarbon usually shows an abundance of n-alkanes. These compounds occur in very low concentrations in both samples). In addition, the character of this hydrocarbon is probably masked by small quantities of extractable organic matter derived from indigenous material. Contamination from invading mud filtrate is also a problem, particularly in sidewall core 18 (Figure 3-3).