

We conclude that these and other bitumens visible in cuttings from Pelican-5 (Watson, 1986) are not indigenous to the Eastern View Coal Measures, but rather are artefacts of the mud system.

Residual Oil (2169-2178 and 2961-2970 metres)

The C_{12+} alkane patterns of two of the cuttings extracts illustrated in Figure 13A, C are typical of immature to marginally mature terrestrial geolipids. Notice, in particular, the high pristane/ n -heptadecane ($pr/n-C_{17} \gg 1$) and pristane/phytane ($pr/ph = 7-10$) ratios, and the high proportion of waxy (C_{23+}) n -alkanes with a marked odd/even carbon number predominance. The first of these patterns (Fig. 13A) is not oil-like, whereas the second (Fig. 13C) bears some similarity to that of the RFT 3 condensate (Fig. 11).

The one hour extract of the Eocene coal cuttings from 2961-2970 metres depth (Table 9) has a more oil-like C_{12+} alkane distribution (Fig. 13B) characterised by a lower pristane/ n -heptadecane ratio ($pr/n-C_{17} = 0.86$) and a much reduced proportion of C_{23+} n -alkanes. This extract is likely to be more representative of any residual oil observed in these cuttings (Watson, 1986) than is the subsequent 5 hour extract. A combination of these two C_{12+} alkane patterns (Fig. 13B, C), without the major (but as yet unidentified) component eluting immediately before $n-C_{20}$, would produce a chromatogram which closely resembles that of the RFT 3 condensate (Fig. 11).

5.3 Maturity and Migration

Gasoline-range maturity parameters (Table 7, Fig. 9) and a high pristane/ n -heptadecane ratio ($pr/n-C_{17} > 1$; Tables 9, 10) suggest that the RFT 3 condensate is relatively immature. This is confirmed by its triaromatic hydrocarbon distribution (Fig. 22). The crude's methylphenanthrene index (MPI = 0.49; Table 7) converts to a calculated source maturity of VR = 0.69%.

This maturity coincides exactly with the maturation level of the Eocene reservoir sand which hosts the condensate (VR = 0.70%; Appendix 2). An *in situ* origin from Eocene coal is implied.

Biomarker-based maturation indices (parameters 4-6, 8-12; Table 10) demonstrate that sterane and triterpane isomerisation is complete in the condensate, although its trisnorhopane isomeric ratio ($Tm/Ts = 2$) is still greater than unity. These same biomarker ratios suggest that the condensate is substantially more mature than the bitumen/gilsonite (Table 10).

6. CONCLUSIONS

1. Non-marine sediments of the Eastern View Coal Measures above 1900 metres depth in Pelican-5 are thermally immature (VR < 0.5%). Nevertheless the presence of abundant resinite and suberinite in low rank Eocene coals (VR = 0.45-0.85%) imparts potential for the generation of light oil.