

A zone of mature and overmature sediments occur above and below the sill (1600-2250m).

3) *Igneous Intrusion - Its effect on maturity*

At Flinders 1 a dolerite igneous sill was encountered at 2208-2275 metres depth. Maturity data (TMAX and Vitrinite Reflectance values) show unusually high and relatively constant values throughout the upper EVCM (thickness in excess of 500 metres) down to the top of the igneous intrusion.

Normally it would be expected that the high maturity profile above the intrusive would be quite similar to that observed below it (approximately 50 metres either side of the sill), as evident with the igneous sill at Koorkah 1. However at Flinders 1, from near top EVCM to immediately below the igneous intrusive TMAX ( $> 460^{\circ}\text{C}$ ) and Ro values\* are consistently overmature whilst the lower part of the EVCM below approximately 2400 metres has TMAX and Ro values in the oil mature window ( $430-460^{\circ}\text{C}$ ) consistent with a regional maturity profile unaffected by the intrusion (Figure 10.4).

The Pipipa 1 well, believed to be in the vicinity of an igneous intrusive also shows a marked zone of elevated maturity near the TD of the well (Figure 10.2).

The reason for this unusual profile is not clear, however two hypotheses have been postulated;

- 1) *Fault acting as a conduit for igneous activity* (Figure 10.5): The nearby NW-SE trending fault bounding the Flinders structure, acted as a conduit for igneous activity inducing a high heat flow within the sediments in the upper part of the EVCM. Seismic data (Line TNK4-79) shows evidence of a possible (Miocene ?) sequence of extrusive igneous rocks to the SW of the

\* NOTE: TMAX values in these samples are unreliable because of the small, ill-defined S2 peaks in their Rock-Eval pyrograms.