3.2 Method

3.2.1 Data Loading

The digital data were loaded onto a Geoquest workstation system for interpretation. The final filtered and scaled Migrated versions were selected and all primary in-lines (35-899) were loaded as 16-bit data, rather than 8-bit, in order to preserve more of the amplitude character.

From these 865 in-lines, cross-lines were constructed between shotpoints 110 and 1680 at every 10th shotpoint. Time slices were constructed at 8 millisecond intervals between 400 and 2500 milliseconds two way time, except between 1500 and 2000 milliseconds where they were constructed at 4 millisecond intervals.

A further 73 randomly oriented lines (reconstruction cuts) were constructed at different times throughout the interpretation process, to address specific local problems, usually associated with narrow fault corridors and particularly complex difficulties with the seismic correlations.

Within IES (Geoquest interpretation system), a 16-segment colour bar was used. This allowed 14 interpretation colours. A 32 segment colour bar would add definition, but then the colours able to be used for interpretation are restricted to 6. To unravel the complex structural picture the 14 colours were necessary to distinguish between the multiple horizons and faults. A red-white-blue colour table with ends enhanced by orange and cyan was used extensively, and is illustrated in Figure 3.

3.2.2 Data interpretation style, and limitations

Where the data quality was excellent, with strong continuous events throughout the data set, the IES autopick facility was used extensively. The Seafloor, Mid-Miocene and Lower Mid-Miocene events were very simply interpreted using the autopicker.

Interpretation at deeper levels required that the fault architecture was first established. Faults were identified on the individual section displays, and time slices were used to aid in the correlation of the fault traces, and to identify fault trends not easily recognisable on the sections, eg Figure 4. Where the data quality lessened below the thick coaly package of the Mid M.diversus zone, and when combined with more intense faulting in this zone, the time slices became less useful and not as indicative at identifying fault traces.

Below the Early Eocene marker (Figure 5) the detail picking of a seismic event was first done in a 2D sense, with every 5th line being interpreted, ie at 125 metre line spacing, prior to any autopicking. In localised areas, particularly beneath the Miocene extrusives, the poorer data quality and high signal variability significantly reduced the accuracy of the autopick function, and the data had to be manually interpreted in greater density. This had later implications during the mapping and contouring phase, particularly with the generation of Dip Azimuth, Dip Magnitude and Amplitude attributes. Attribute maps created from the 125 metre grid (every 5th line) were too smoothed and featureless to identify any trends not already detected on the data. To attain more information from the attribute data, the following data manipulation sequence was performed:-