

A plot of total hydrocarbon content, SATS plus AROM against TOC gives a better rating of source-rock potential, Figure 25. The higher hydrocarbon to TOC ratios observed in the three categories - fair, good, very good - is suggestive of a more oil-prone than gas-prone source. Overall, the results indicate that the lower Eastern View Coal Measure contains rocks with good to very good source potential. The Early Cretaceous Otway group has been rated as having fair to good source potential.

Maturation of Organic Matter

Vitrinite reflectance measurements in the range of 0.6 to 0.7 percent indicate close approach to maturation, or maturation levels at which point hydrocarbons may be generated, Figure 26,27.

A later study, Figure 28,29, indicate that mature, above 0.6 percent, source rock are present and capable of hydrocarbon generation.

Microscopic examination of kerogen color in transmitted light are in broad agreement with those indicated by vitrinite reflectance data, showing that the lower Eastern View Coal Measures have reached marginal maturity, and are within the hydrocarbon generation zone at the deepest levels tested.

Geothermal Gradient

Reported geothermal gradients in the Bass Basin tend to be relatively lower in the central parts of the basin than on the flanks. The northeast flank having higher gradient than the southwest.

Initial gradients are determined between the surface and the bottom of each well. The underlying assumption is that the logged temperature is equivalent to the formation temperature after correction for time since drilling mud circulation stopped.

The geothermal gradients in the Bass Basin vary between 29°C/km and 37°C/km. The average geothermal gradient in the basin is approximately 35°C/km or 1.92°F/100 feet to 2.9°F/100 feet, Figure 31.

High values of vitrinite reflectance at depths of 3 kilometers are consistent with localized heating. It can be concluded that laterally intensive sources of heat within the basin basement locally affected the deeper basin sediments. Sediments shallower than 2 kilometers remain unaffected.