

porosity is a function of the OH ion content, and assuming kaolinite and illite to be the most common clays, an attempt was made to differentiate low G response with high neutron porosity (i.e. kaolinite), and vice versa for illite.

This method suggested that not only the mudstones, but also the siltstone and sandstone had varying clay mineral contents. The quartz sandstones (Sequence 3), are seldom seen to be "clean" quartz arenites, and commonly contain feldspar, mica and clays; this feature was discernable in the G and NN logs, as was ? diagenetic cementation. The most smectite rich rock encountered in the drilling was a tuff in hole PD 83 PT-02.

3.2.5.6. Thermal Alteration

Although Jurassic dolerite sills are a common feature of the Midlands, the thermal effects of these bodies on the adjacent Triassic sediments are usually seen to extend <10m above the sills (LSD logs).

An exception to this observation was seen in hole PT-05 where alteration (pervasive rather than cindering) extends >25m above a dolerite body.

The effect on the sediments was to render the LSD and G logs almost valueless, due to recrystallization and dehydration processes. The sediment density has been increased by 16%, associated with a 75% reduction in the neutron porosity, and ≈ 50% decrease in the natural gamma radiation.

However, despite the absolute values in the NN and BRD logs, the relative responses of the rock units (and in the R log ), in conjunction with the rock chip log, allowed recognition of several coal seams.