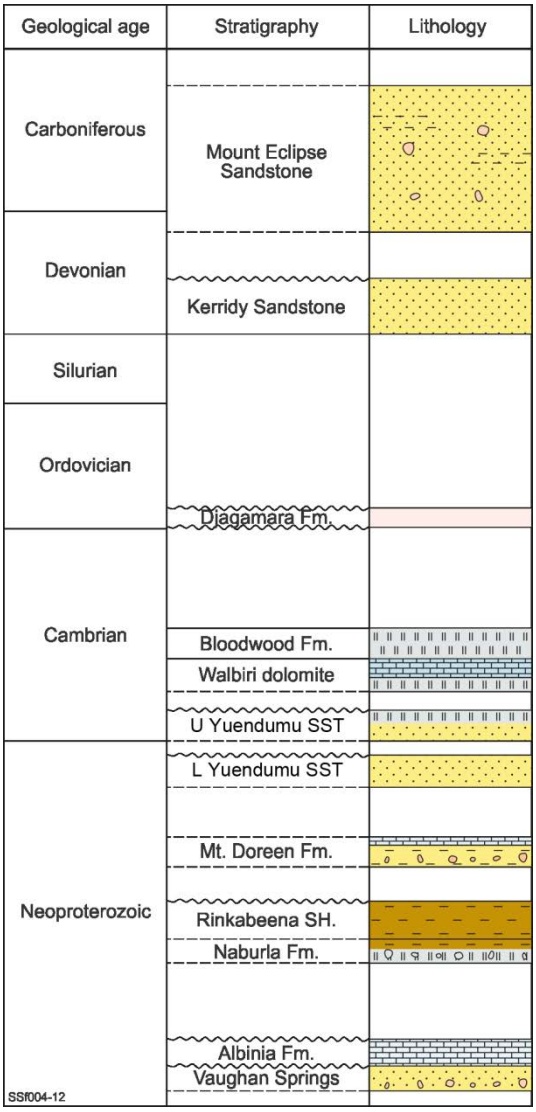
2.2.2 Structure of the Ngalia Basin

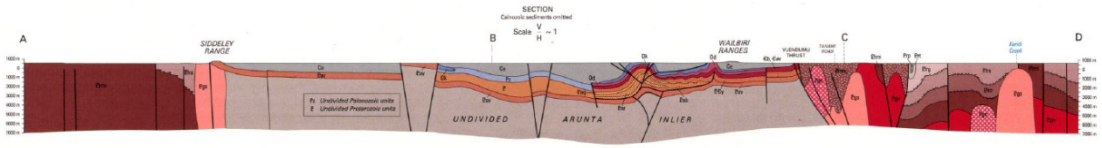


The structure of the Ngalia Basin is described in detail by Wells and Moss (1983); the structure is also addressed by Lipski (2000) in relation to petroleum play potential. They noted the following characteristics in the structure of the basin:

The basin is a faulted asymmetrical syncline. Complex structures are due to multiple episodes of deformation. Intensity of folding and faulting increases northwards and with depth. Unconformities between each formation suggest frequent episodes of tectonic activity during basin infill (Fig. 4). Magnetic data indicates two sub-basins (east and west); the west basin is a half graben and the east basin is a narrow graben (Fig. 5). Trends in gravity data (parallel the basin margins) delineate fault blocks, especially near the southern margin of the basin. The Davis Thrust Nappe structural province is an allochthonous block of basement and folded sediments near northern margin of the western basin; it lies above (and north of) the Yuendumu Thrust. The Treuer fault zone separates sedimentary component of the Davis Thrust Nappe from the basement.

Figure 4. Stratigraphy of the Ngalia Basin.

Figure 5. Cross section of the Ngalia Basin (Mt Doreen 250k map sheet).



2.2.3 Development of Basin Geometry

Since the formation of the initial Superbasin during sag phase tectonism, the Central Australian Basins and underlying basement have undergone several episodes of compression. They include: the Areyonga Event, South Ranges Movement, Petermann Ranges Orogeny, the Delamarian Orogeny and, finally, the Alice Springs Orogeny (Lindsay, 2002). Lindsay (2002) indicates that the architecture of the central Australian basins is typical of foreland basins; i.e. elongate basin parallel to thrusts and asymmetric in depth.