

CHAPTER 11 Late Palaeozoic basins

PA Rogers

LATE PALAEOZOIC BASINS SUMMARY	2
Age	2
Prospective commodities	2
Geology	2
ARCKARINGA BASIN.....	2
Structure and setting.....	2
Stratigraphy	5
Economic geology.....	5
Coal.....	5
Diamonds	5
SPRINGFIELD BASIN	5
Summary geology	5
REFERENCE.....	6



LATE PALAEOZOIC BASINS SUMMARY

Age

Latest Carboniferous to Permian.

Prospective commodities

Coal, placer diamonds.

Geology

Late Carboniferous to Permian sedimentation is preserved mainly in six intracratonic basins — Arckaringa, Pedirka, Cooper, Denman, Troubridge and Nadda Basins (Fig. 11.1). Sediments, largely of continental origin but with a characteristic shallow-marine to fluvial glaciogenic unit at the base, rarely exceed 1000 m in total thickness: yet they extend more or less continuously over very large areas within the basins and sometimes beyond their margins. Each of the principal Permo-Carboniferous basins contain fault-bounded troughs in which sedimentary units thicken locally. There are also a number of small subsidiary late Palaeozoic basins that are similarly narrow and fault-bounded (Mulgathing Trough, Polda Basin). In addition, Permian sediments occur in two small intramontane basins in the Flinders Ranges — near Blinman and in the Springfield Basin.

Large coal deposits occur in the Arckaringa, Pedirka and Cooper Basins, and are source rocks for hydrocarbons in the Cooper Basin.

ARCKARINGA BASIN

Structure and setting

The Arckaringa Basin covers an area of 80 000 km² and is mostly restricted to the subsurface (Fig. 11.2). Outcropping Officer Basin, Gawler Craton and Stuart Shelf rocks mark approximately its western, southern and southeastern limits. However, drillhole samples indicate that scattered subcrops of late Palaeozoic sediment extend well beyond the western margin of the basin. The eastern margin is formed in part by the Peake and Denison Inliers, whereas the northern and northeastern margins are not readily defined due to lack of outcrop and subsurface data.

Structurally, the Arckaringa Basin is an intracratonic feature comprising a central platform of gently undulating shallow basement surrounded by depressions. Major depocentres such as the Boorthanna and Phillipson Troughs, developed principally along northwest trends, contain more than 1000 m of Permian sediments.

