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## MAJOR AUSTRALIAN SEDIMENTARY BASINS

### Abstract

This report is a resume of information from published and unpublished sources on the principal Australian Sedimentary Basins. It includes their approximate size, the age and estimated thickness of the sediments, reported shows of oil or gas, productive areas, and remarks on current activity in the basins.

Oil exploration in Australia has been accelerated since the discovery of Moonie in late 1961. Activity followed by subsequent discoveries of oil or gas in West Australia, Central and Eastern Australia, occurred during 1963 and 1964. Currently interest remains high. In land size, Australia and the U. S. (excluding Alaska) are nearly the same. Australia is strategically situated in the Pacific area, and is stable politically. Their oil imports are a heavy burden on the country's economy. Import of crude oil and refined petroleum products at present account for at least ten percent of Australia's total imports, costing the country approximately \$250 million annually in foreign exchange. About one quarter of their crude imports are currently from Indonesia, a source which could be denied Australia at any time.

Almost half of the land area of Australia and Papua-New Guinea is occupied or underlain by sedimentary rocks. The 28 major basins that have been mapped cover an area of about 1.9 million square miles.

A huge part of the Australian continent has exposures of rocks which are Pre-Cambrian in age. These Archean rocks are mainly granites, and high grade metamorphics, with minor belts of sediments showing little or no metamorphism. Proterozoic sediments and metamorphic rocks are also wide spread over parts of the continent.

During Paleozoic time the Tasman geosyncline, a composite structural belt was developed on the Eastern side of the present continent. This geosyncline served as a focus for marine deposition in Eastern Australia, and underwent various orogenies. The last great orogeny being known as the Hunter-Bowen phase occurring during the late Permian time. Some minor vulcanism and mild folding has occurred during late Permian time, but no deformation.

Carboniferous and older sediments of the Tasman geosyncline are usually regarded as basement. The intensity of deformation, degree of metamorphism and the presence of plutonic intrusions make them unattractive as targets for the drill. Despite this it should be noted that in areas where the intensity of metamorphism and deformation is less severe, these sediments could prove to be petroliferous.

The post-Proterozoic sedimentary basins described in this report are filled with unmetamorphosed sediments showing only mild deformation. On the eastern side of the Australian continent, these basins contain Permian and younger sediments, overlying older sedimentary, metamorphic and intrusive rocks of the Tasman geosyncline. Outside the area of this geosyncline the basins contain Cambrian and younger sediments resting on Pre-Cambrian basement rocks. In Western Australia Tertiary and Mesozoic sediments overlie older Paleozoics.

No important oil or gas seepages are known in Australia. The lower Cambrian basalts outcropping in the Ord basin contain vesicles of asphaltite. A similar show of bitumen is reported from the Cambrian of the Georgina basin. Offshore seeps are reported from various areas along the Victorian and South Australian coast, with a thick asphaltic stranding along the beaches after winter storms. Similar occurrences are reported from the Gulf of Carpentaria.