

DEPARTMENT OF MINES AND ENERGY

GEOLOGICAL SURVEY

SOUTH AUSTRALIA

REPORT BOOK 93/3

**EVIDENCE OF LATE JURASSIC TO  
EARLIEST CRETACEOUS SEDIMENTATION  
FROM MARALINGA 6 WELL,  
NORTHERNMOST BIGHT BASIN**

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Biostratigraphy Branch

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EVIDENCE OF LATE JURASSIC TO EARLIEST CRETACEOUS SEDIMENTATION FROM  
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NEVILLE F ALLEY

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BOREHOLE:	Maralinga 6 Well	
SAMPLE DATA:	Branch No.:	S6176
	Depth:	529-531 feet
	Type of sample:	Cuttings
	Lithology:	
	Submitter:	M.C. Benbow, Regional Geology Branch
LOCATION:	General location:	Crest of Ooldea Range, Maralinga area.
	Mapsheet:	OOLDEA 1 : 250 000
STRATIGRAPHIC INFORMATION:	Stratigraphic unit:	Thought to be Eocene Pidinga Formation at the time of submission, but palynological dating indicates a Late Jurassic to earliest Cretaceous age.
	Geological Province:	Bight Basin
	Rock sample (RS) no.:	5237/279
ANALYTICAL DATA:	Laboratory technique:	Standard with a 7 min. Schulze Solution, a wash in 5% K <sub>2</sub> CO <sub>3</sub> solution and a 10 µ sieve.
	Microscope used:	Zeiss Photomicroscope III
	Palynomorphs counted:	341

## RESULTS:

### Main components of microfossil assemblage (% in brackets):

#### Pollen/spores:

*Cyathidites minor* (13), *Retitriletes austroclavatidites* (13), *Baculatisporites comaumensis* (10), *Araucariacites australis* (9), *Osmundacidites wellmanii* (8), *Ceratosporites equalis* (6), *Microcachryidites antarcticus* (6), and *Classopollis chateaunovi* (5).

#### Microplankton:

None recorded

#### Recycled spores:

One Early Permian spore, *Pseudoreticulatispora pseudoreticulatus*, was recorded.

### Zonation:

Lowermost *Cicatricosisporites australiensis* Zone of Helby *et al.* (1987).

### Zonal Species:

This designation is made on the basis of the presence of a few specimens of *Cicatricosisporites ludbrookiae* in the absence of *Foraminisporis wonthaggiensis*. The conclusion is supported by the common occurrence of bisaccate, trisaccate and *Araucariacites* pollen and the consistent presence of *Classopollis chateaunovi*, *Crybelosporites stylosus*, *Retitriletes watherooensis* and *Callialasporites* spp.

### Age:

Latest Jurassic to basal Valanginian (early Neocomian).

### Palaeoenvironment:

Nonmarine fluvial and swamp setting.

### Correlation:

The sample comes from a sandy carbonaceous horizon in an otherwise coarse to medium sandstone, in total measuring 10 m in thickness. It is overlain by Late Eocene Pidinga Formation and underlain by Cambrian rocks of the Officer Basin.

The age and lithology of the Early Cretaceous unit suggests a correlation with an unnamed basal succession in Jerboa 1 Well in the Eyre Sub-basin of the Bight Basin. This basal unit was originally dated as Late Jurassic to Neocomian (Powis & Partridge, 1980) and later as Berriasian to Valanginian (Morgan, 1990). The unit may have close affinities with the Loongana Formation (Hill, 1991) and represent an earlier phase of deposition of the latter.

This Early Cretaceous nonmarine unit has been recognised onshore in Outback Oil Mallabie 1 near the coast of the Great Australian Bight (Hill, 1991). The presence of the unit in Maralinga 6 represents a significant extension onshore, extending the limits of the Bight Basin several hundred kilometres northwards.

A number of other wells were drilled in the Maralinga area as part of a groundwater exploration programme (Barnes, 1956). Similar sediments occur in wells adjacent to Maralinga 6 but correlation is difficult (Ludbrook, 1961). These other sediments may be Early Cretaceous but also early Tertiary, Permian or even Precambrian.

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