

THE TERTIARY MARINE SEQUENCE  
IN NORTH SEASPRAY NO.2 WELL

by

J. Barry Hooking.

INTRODUCTION

This account is basically that presented in the Woodside (Lakes Entrance) Oil Co. North Seaspray No.2 Well Completion Report (1965), although in addition a summary lithologic log is provided and also a corrected stratigraphic depth chart (based on e-logs).

WELL INFORMATION

Location: 38° 18'07" S., 147° 12'20" E.  
Parish: Wulla Wullock  
Elevation: 89 ft. (K.B.)  
Total Depth: 5358 ft.

SUMMARY LITHOLOGIC LOG

The log is based on the examination of 10 ft. cuttings samples:

0 - 40	:	no samples
40 - 80	:	yellow quartz sand, medium-grained, partially iron-stained
80 - 110	:	no samples; "grey-black clay gumbo, not washable", according to the well-site log
110 - 150	:	light grey sand, medium to coarse-grained, well-rounded and polished, with fragments of grey carbonaceous clay, and chips of blackish 'coal'
150 - 190	:	fine sand to coarse gravel; also chips of grey sandstone, fine-grained, with small carbonaceous chips
190 - 260	:	poorly-sorted sand and gravel, coarser grains well-rounded, occasional carbonaceous chips
260 - 280	:	as above, but also some chips of hard brown calcareous sandstone with traces of glauconite
280 - 320	:	brown to greyish green calcareous sand with mollusca, brachiopods, bryozoa, <u>Ditrupe</u> and foraminifera; and occasional carbonaceous chips
320 - 430	:	hard (partially recrystallised) light grey (often with greenish tinge) sandy marly limestone, and possibly some marly sandstone; <u>Ditrupe</u> more common, and mollusca less so, than above
430 - 510	:	yellowish grey bryozoal limestone and marly limestone, often partially sandy, and with traces of glauconite; bryozoal are abundant and <u>Ditrupe</u> common
510 - 560	:	as above, but more sandy
560 - 620	:	yellow sandy limestone, and probably some calcareous sand, iron-stained, appreciably recrystallised; <u>Ditrupe</u> relatively common
620 - 630	:	grey, partially glauconitic, sandy marly limestone
630 - 700 (approx)	:	yellow-brown quartz sand, fine to medium-grained, partially rounded, brown coloration due to iron-staining; presumably partially calcareous; some <u>Ditrupe</u>
700 - 820	:	light grey bryozoal recrystallised sandy marly limestone with glauconite traces; also <u>Ditrupe</u>
820 - 880	:	yellowish white bryozoal limestone, highly recrystallised with <u>Ditrupe</u> and common <u>Operculina victoriensis</u> , also some molluscan fragments

- 880 - 1250 : light grey bryozoal marly limestone with glauconite traces; relatively common Amphistegina lessonii and some Lepidocyclina Howchinii
- 1250 - 1320 : as above, but with traces of grey clay (or ?marl)
- 1320 - 1380 : darker grey, partially pyritic, marly limestone, and loose grains of pyrite
- 1380 - 1630 : dense brownish grey marly limestone, sometimes glauconitic, and also grey clayey marl, often pyritic; recrystallisation common, including the bryozoa
- 1630 - 1690 : dense yellowish white limestone/ marly limestone, very fine-grained, with specks of both pyrite and glauconite; also yellowish grey marl with traces of worm bryozoa
- 1690 - 2100 : yellowish grey puggy foraminiferal marl, with greenish tinge appearing at about 1800 ft; chips of hard glauconitic marl below approx. 2060 ft.
- 2100 - 2120 : quartz sand, fine to coarse, and minor gravel, with relatively common glauconite and pyrite; also chips of brown sucrosic glauconitic sandy 'dolomite'; also traces of brown ligneous clay; traces of mollusca and fish fragments
- 2120 - : lignite, ligneous clay, etc.

STRATIGRAPHIC SEQUENCE.

0 - 280 feet: Haunted Hill Gravels/ Baisdale Beds.

The Haunted Hill Gravels might occur above 40 ft., but were not observed in the samples taken.

The Baisdale Beds (Jenkin, 1967) occur down to 280 feet. The lower unit of these, which contains carbonaceous material, appears to be represented below approximately 110 feet. The basal 20 feet contains fragments of hard brown calcareous sandstone which have probably been derived from the underlying Jemmys Point Formation.

All samples examined in this interval are unfossiliferous.

280-320 feet: Jemmys Point Formation.

85.31 - 97.54

The top of the Jemmys Point Formation in this well marks the highest occurrence of mollusca (which are very common in this unit) and also of brachiopods, bryozoa, the calcareous worm tube Ditrupe, and foraminifera. The latter are limited in number, and consist of Elphidium sp. including E. imperatrix, Triloculina sp. and Nonion victoriense. These species typify shallow water conditions.

320-430 feet: Tambo River Formation.

97.54 - 131.06

The lithologies conform to what is being referred to as the Tambo River Formation (Hocking, 1965). Mollusca are typically less common than above. The microfauna is very poor, and the only species recorded are Astrononion australe and Elphidium imperatrix. Ostracods occur also.

430-1690 feet: Gippsland Limestone.

131.06 - 515.11

An approximate stage subdivision is as follows:

430-880 ft: Bairnsdalian and Balcombian.

As Orbulina universa was not observed, the boundary between these two stages could not be selected. Microfaunas are very poor throughout, although the larger species Operculina victoriensis occurs

commonly below 820 feet. On the basis of earlier work by the author (Hocking, loc.cit), it would appear that the top of the Balcombian is only 20-odd feet above this depth of 820 feet. Elphidium parri is noted in samples of sandy limestone below 560 feet.

The sandy sediments in particular are characterised by shallow water bryozoa, such as Cellaria, and also by common Ditrupea.

880-1250 ft: 'Batesfordian'.

880 feet marks the highest occurrence of both Amphistegina lessonii and Lepidocyclina howchini. Both are common throughout this interval, the latter being restricted to it. Lepidocyclina is most common between 990 and 1080 feet. Gypsina howchini, Cycloclypeus victoriensis, Notorotalia miocenica, and Calcarina cf. verriculata occur to a lesser extent.

Below 1250 feet Lepidocyclina howchini occurs only in some samples, and is thus assumed to be contamination.

1250-1690 ft: Longfordian.

Samples below approximately 1400 feet contain definite Longfordian microfaunas which include Globigerina woodi, Astrononion centroplax, Gibicides perforatus and Gyroldina zealandica. Faunas are generally poor in both quality and quantity, however, due to recrystallisation effects.

1690-approx. 2120 feet: Lakes Entrance Formation.

The top of the yellowish grey foraminiferal (non-bryozoal) puggy marls (1690 feet) also represents the top of the Janjukian. The relatively abundant microfauna of these marls consists of such calcareous species as Globigerina ampliapertura euapertura, Globorotalia extans, Astrononion centroplax, Gibicides brevoralis, C.perforatus, Elphidium crespinae, Gyroldina zealandica, Notorotalia crassimura and Triloculina sp. The Janjukian in this well is also characterised by a good arenaceous fauna which includes Ammodiacus sp, Clavulinoides sp, Haplophragmoides incisa H. cf. paupera, H. rotundata, Pseudoclavulina sp, Reophax sp., Textularia sp. and Trochammina sp. Molluscan and fish fragments occur also.

All microfaunas in this interval belong to Carter's Faunal Unit 5 - no Faunal Unit 4 was observed (refer Hocking and Taylor, 1964).

The formation can be split (Hocking, 1965) into:

- (a) 'marly unit' : 1690-2100 feet, and
- (b) 'sandy unit' : 2100-approx. 2120 feet.

approx. 2120-4000 feet: Latrobe Valley Coal Measures:

This interval contains sands, lignites, ligneous clays, and a basal siliceous conglomerate.

No foraminifera, other than those due to contamination, were found below approximately 2120 feet.

CORRECTED STRATIGRAPHIC TABLE.

Minor adjustments have been made to some of the stratigraphic boundaries given above as a result of checking the e-logs (refer Hocking, 1965):

Rock Unit.	Depths (ft.)	Faunal Unit and Local Tertiary Stage (after <u>Carter, 1964</u> ).
Haunted Hill Gravels and Boisdale Beds	280	.....
Jemmys Point Formation	320	Kalimnan
Tambo River Formation	430	Mitchellian
Gippsland Limestone	880	F.U. Bairnsdalian & 11 & 10 Balcombian
	1250	F.U. 9 'Batesfordian'
	1740	F.U. 8-6 Longfordian
	2127	F.U. 5 Janjukian
Lakes Entrance Formation	2142	'Marly unit' 'Sandy unit'
Latrobe Valley Coal Measures	4000	.....

**Strzelecki Group**

LOWER CRETACEOUS.

REFERENCES.

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*Barry Hocking*

J.B. HOCKING.

Geologist.

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