



PE990420

A PALYNOLOGICAL ANALYSIS OF

FORTESCUE-2, GIPPSLAND BASIN

by

H. E. STACY

Esso Australia Ltd..
Palaeontology Report 1979/4

March 5, 1979

INTRODUCTION

Twenty-one side wall cores and twelve core samples were processed and examined for palynology. Yield ranged from good to very poor, but only one sample was so poor as to be completely indeterminate.

Zones and lithological/facies subdivisions of the basal Lakes Entrance Formation and Latrobe Group is summarized below. All samples examined are summarized in Table-1 and individual species occurrence is noted on the accompanying distribution sheets.

SUMMARY

<u>UNIT/FACIES</u>	<u>ZONE</u>	<u>DEPTH (in metres)</u>
LAKES ENTRANCE FORMATION Marl	<u>P. tuberculatus</u>	2421m-2441m
UNCONFORMITY		
GURNARD FORMATION Glaucinite Sandstone	Lower <u>N. asperus</u>	2442.8m
UNCONFORMITY		
LATROBE GROUP Coarse Clastics	Lower <u>M. diversus</u>	2444.9m-2520.5m
	Upper <u>L. balmei</u>	2553.5m-2636m
2652m T.D.		

GEOLOGICAL COMMENTS

1. A thin layer of Gurnard greensand of less than 4 meters thick is present between the Oligocene Lakes Entrance Formation and the Early Eocene Latrobe coarse clastics. This is demonstrated both by the greensand lithology with glauconite pellets and the presence of Areosphaeridium dictyoplokus, a Middle Eocene (Lower N. asperus) dinoflagellate marker in the palynology residue.

2. Based on the occurrence of Deflandrea dartmooria at the top of Latrobe coarse clastics in this well, it is believed that only Lower M. diversus and Upper L. balmei Zones are represented below the Gurnard Formation and that the Upper and/or Middle M. diversus beds noted in Fortescue-1, West Halibut-1 and other wells in the area are missing.
3. Both Fortescue-1 and West Halibut-1 contain approximately 100 metres (96 and 99.5 respectively) of Lower M. diversus sediments before the overlying Middle M. diversus beds are encountered. In Fortescue-2 approximately 70 metres of Lower M. diversus section is present, the top of which is cut by an unconformity, and no Middle or Upper M. diversus sediments are present.
4. The sidewall core from 2546m sampled a massive sandstone that was almost barren of palynomorphs. Recovery of microfossils was so poor that it is not possible to assign this sample to either the Lower M. diversus or Upper L. balmei Zones. From electric log correlation with other wells in the area, it appears that this massive sand is the basal unit of the Lower M. diversus Zone.
5. The Wetzeliiella hyperacantha Zone once again is found to include the lowermost part of the Lower M. diversus and uppermost Upper L. balmei Zones and extends from 2520.5m to 2566.5m.

DISCUSSION OF ZONES

Upper Lygistepollenites balmei Zone: 2553.5m to 2636m (T.D.)

The occurrence of Lygistepollenites balmei, Australopollis obscurus, Gamberina rudata and G. edwardsii all demonstrate that the enclosing sediments are stratigraphically lower than the Malvacipollis diversus Zone. The scattered occurrence of Cyathidites gigantis, Wetzeliiella homomorpha and Proteacidites incurvatus in the section from 2553.5m to 2603.5m establish that these sediments are no older than the Upper L. balmei Zone. The bottom two samples, 2608.5m and 2636m, do not contain any Upper L. balmei Zone markers, but because of the small size of the flora, this lack very well may be due to sample recovery, rather than stratigraphic position.

As noted in the Geological Comments, the sample from 2546 metres was barren of zone specific fossils, and thus it is not possible to assign a zone age to this point in the well.

Lower Malvacipollis diversus Zone: 2444.9m to 2520.5m.

Lower M. diversus assignment is made to the samples from 2444.9m to 2520.5m, in part, on the basis of negative evidence. That is the lack of any representatives of L. balmei, the marker for the underlying zone and the lack of specimens of Proteacidites tuberculiformis, P. plemmelus, P. xestoformis or Diporites delicatus, any of which are indicative of Middle M. diversus sediments. In addition to this negative evidence, the occurrence of Deflandrea dartmooria, scattered throughout this section, is suggestive that these beds are no younger than Lower M. diversus.

Lower Nothofagidites asperus Zone: 2442.8 metres.

This single sample of Gurnard greensand was almost barren of palynomorphs but did contain several specimens of Areosphaeridium dictyoplokus, which is the dinoflagellate marker for the Lower N. asperus zone.

Proteacidites tuberculatus Zone: 2421m to 2441m.

Good P. tuberculatus flora, including both Cyatheacidites annulatus and Dinospherea simplex was found in this section of the well.

REFERENCES

- Stacy, H.E. and Partridge, A.D., 1978, Paleontological Analysis of Fortescue-1, Gippsland Basin, ESOA Paleo. Rept. 1978/19.
- Stacy, H.E. and Partridge, A.D., 1979, Paleontological Analysis of West Halibut-1, Gippsland Basin, ESOA Paleo. Rept. 1979/3.

PALYNOLOGY DATA SHEET

BASIN: GIPPSLAND
WELL NAME: FORTESCUE-2

ELEVATION: KB: +30m GL: -70m
TOTAL DEPTH: 2652m

AGE	PALYNOLOGICAL ZONES	HIGHEST DATA					LOWEST DATA				
		Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
NEOGENE	<i>T. pleistocenicus</i>										
	<i>M. lipsis</i>										
	<i>C. bifurcatus</i>										
	<i>T. bellus</i>										
PALEOGENE	<i>P. tuberculatus</i>	2421	0				2441	1			
	Upper <i>N. asperus</i>										
	Mid <i>N. asperus</i>										
	Lower <i>N. asperus</i>	2442.8	1				2442.8	1			
	<i>P. asperopolus</i>										
	Upper <i>M. diversus</i>										
	Mid <i>M. diversus</i>										
	Lower <i>M. diversus</i>	2444.9	1				2520.5	1			
	Upper <i>L. balmei</i>	2553.5	0				2636	2	2603.5	1	
	Lower <i>L. balmei</i>										
LATE CRETACEOUS	<i>T. longus</i>										
	<i>T. lilliei</i>										
	<i>N. senectus</i>										
	U. <i>T. pachyexinus</i>										
	L. <i>T. pachyexinus</i>										
	<i>C. triplex</i>										
	<i>A. distocarinatus</i>										
EARLY CRET.	<i>C. paradoxus</i>										
	<i>C. striatus</i>										
	<i>F. asymmetricus</i>										
	<i>F. wonthaggiensis</i>										
	<i>C. australiensis</i>										
PRE-CRETACEOUS											

COMMENTS: Wetzeliella hyperacantha Zone: 2520.5m to 2566m.

All depths in metres.

CONFIDENCE RATING:

- 0: SWC or Core, Excellent Confidence, assemblage with zone species of spores, pollen and microplankton.
- 1: SWC or Core, Good Confidence, assemblage with zone species of spores and pollen or microplankton.
- 2: SWC or Core, Poor Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.
- 3: Cuttings, Fair Confidence, assemblage with zone species of either spores and pollen or microplankton, or both.
- 4: Cuttings, No Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.

NOTE: If an entry is given a 3 or 4 confidence rating, an alternative depth with a better confidence rating should be entered, if possible. If a sample cannot be assigned to one particular zone, then no entry should be made, unless a range of zones is given where the highest possible limit will appear in one zone and the lowest possible limit in another.

DATA RECORDED BY: H.F. Stacy

DATE: March 5, 1979

DATA REVISED BY: _____

DATE: _____

T A B L E - 1

SUMMARY OF PALEONOLOGICAL ANALYSES, FORTESCUE-2, GIPPSLAND

SAMPLE	DEPTH (m)	DEPTH (ft)	ZONE	AGE	CONFIDENCE RATING	YIELD	DIVERSITY	COMMENTS
CORE 1	2421	7943	<u>P. tuberculatus</u>	Oligocene	0	Good	High	Both marine and non-marine, <u>C. annulatus</u>
CORE 1	2423.8	7952	<u>P. tuberculatus</u>	Oligocene	1	Poor	Low	Both marine and non-marine, <u>C. annulatus</u>
CORE 1	2428.7	7968	<u>P. tuberculatus</u>	Oligocene	1	Poor	Low	Both marine and non-marine, <u>C. annulatus</u>
CORE 1	2434	7986	<u>P. tuberculatus</u>	Oligocene	1	Poor	Low	Both marine and non-marine, <u>C. annulatus</u>
CORE 2	2441	8009	<u>P. tuberculatus</u>	Oligocene	1	Fair	Moderate	Both marine and non-marine, <u>C. annulatus</u>
CORE 2	2442.8	8014	Lower <u>N. asperus</u>	Middle Eocene	1	Very poor	Very low	<u>Areosphaeridium dictyoplokus</u> present
CORE 2	2444.9	8021	Lower <u>M. diversus</u>	Early Eocene	1	Fair	Moderate	<u>Deflandrea dartmooria</u> present
CORE 3	2455	8054	Lower <u>M. diversus</u>	Early Eocene	2	Poor	Low	
CORE 3	2459.4	8069	Lower <u>M. diversus</u>	Early Eocene	1	Good	High	
CORE 3	2460.3	8072	Lower <u>M. diversus</u>	Early Eocene	1	Good	High	
CORE 4	2470	8104	Lower <u>M. diversus</u>	Early Eocene	1	Fair	Moderate	
CORE 4	2472.3	8111	Lower <u>M. diversus</u>	Early Eocene	1	Fair	Moderate	
SWC 23	2492.5	8177	Lower <u>M. diversus</u>	Early Eocene	1	Fair	Moderate	
SWC 22	2500	8202	Lower <u>M. diversus</u>	Early Eocene	2	Poor	Low	
SWC 21	2504	8215	Lower <u>M. diversus</u>	Early Eocene	1	Fair	Moderate	
SWC 19	2513.5	8246	Lower <u>M. diversus</u>	Early Eocene	1	Poor	Low	
SWC 18	2516.5	8256	Lower <u>M. diversus</u>	Early Eocene	1	Fair	Moderate	
SWC 17	2520.5	8269	Lower <u>M. diversus</u>	Early Eocene	1	Fair	Moderate	<u>W. hyperacantha</u> present
SWC 16	2546	8353	Indeterminate		1	Very poor	Very low	Dinoflagellate fragments, <u>W. hyperacantha</u>
SWC 15	2553.5	8378	Upper <u>L. balmei</u>	Paleocene	0	Fair	Moderate	Both marine and non-marine
SWC 14	2556.5	8387	Upper <u>L. balmei</u>	Paleocene	2	Fair	Very low	
SWC 13	2566.5	8420	Upper <u>L. balmei</u>	Paleocene	1	Fair	Moderate	<u>W. hyperacantha</u> present
SWC 12	2571	8435	Upper <u>L. balmei</u>	Paleocene	1	Fair	Moderate	
SWC 11	2575.5	8450	Upper <u>L. balmei</u>	Paleocene	1	Fair	Moderate	
SWC 10	2579.5	8463	Upper <u>L. balmei</u>	Paleocene	1	Fair	Moderate	
SWC 9	2585.5	8483	Upper <u>L. balmei</u>	Paleocene	1	Fair	Moderate	
SWC 8	2590	8497	Upper <u>L. balmei</u>	Paleocene	1	Good	High	
SWC 7	2592.5	8506	Upper <u>L. balmei</u>	Paleocene	1	Good	High	
SWC 6	2596	8517	Upper <u>L. balmei</u>	Paleocene	1	Good	High	
SWC 5	2599.5	8529	Upper <u>L. balmei</u>	Paleocene	1	Fair	Moderate	
SWC 4	2603.5	8542	Upper <u>L. balmei</u>	Paleocene	1	Fair	Moderate	
SWC 3	2608.5	8558	Upper <u>L. balmei</u>	Paleocene	2	Poor	Low	
SWC 1	2636	8648	Upper <u>L. balmei</u>	Paleocene	2	Poor	Low	

Page 1 of 8

Sheet No. 1 of 8

*C= core; S= sidewall core; T= cuttings.

*C=core; S=sidewall core; T=cuttings.

*C= core; S= sidewall core; T= cuttings.

*C= core; S= sidewall core; T= cuttings.

*C=core; S=sidewall core; T=cuttings.

Sheet No. 8 of 8

*C = core; C = sidewall core; T = cuttings