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WYRALLAH-1
ATTACHMENT 6 to WCR

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THE STRATIGRAPHIC PALYNOLOGY

OF

WYRALLAH NO. 1

VIC/P17

BY: HELENE MARTIN.

THE STRATIGRAPHIC PALYNOLOGY OF WYRALLAH # 1, GIPPSLAND BASIN.

for: AUSTRALIAN AQUITAINE PETROLEUM PTY. LTD.

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WYRALLAH # 1 - SUMMARY OF STRATIGRAPHIC PALYNOLOGY.

Depth (m)	SPORE POLLEN ZONE	DINOFLAGELLATE ZONE	AGE	PALAEOENVIRONMENT
870 - 880	indeterminate	-	-	-
887	?Middle *N.asperus*		? Late Eocene	non marine
918	Middle *N.asperus*		Late Eocene	
936.5-1020		*C.incompositum*		Marginal marine
1040 - 1093	Lower *N.asperus*	-	Mid Eocene	non marine
1139	BARREN			
1151	Upper *L. balmei*	-	Late Paleocene	non marine

SPORES and POLLEN

The spores and pollen identified are listed in Table 1 and the ranges of diagnostic species are shown on Figure 1. The species in Table 1 are grouped into three categories: -

1) Spores, mostly from ferns and their allies.
2) Gymnosperm pollen: pines e.g. hoop pine, Huon pine etc. These would have been mostly forest trees. Their relatives are found today in forests of Tasmania, New Zealand, New Caledonia and New Guinea. Only a few grow on the Australian Mainland and they are restricted to rainforests and the wetter climates.
3) Angiosperm pollen: flowering plants. These may have been trees or shrubs.

An assessment of the abundance of plant tissue debris is included in Table 1. Plant tissue debris is abundant in non marine swamps but less so in fresh water lakes. Plant tissue debris is not abundant in marine environments unless the location is close to a river outlet. However, other factors are involved with the abundance of plant tissue debris, e.g. preservation. Poor preservation may destroy or render unrecognisable much of the plant tissue debris.

Spore pollen zonation follows Stover & Partridge (1973). Partridge (1976) modified the ages of the zones somewhat and subdivided some of the zones. The Lower *N. asperus* Zone of Stover & Partridge (1973) is subdivided into an older Lower and a younger Middle *N. asperus* Zone, without diagnosis or description (Partridge 1976). A discussion of the Middle *N. asperus* Zone in Stover & Partridge (1982) shows that it is based on the species which first appear in the upper part of the Lower *N. asperus* Zone (in Stover & Partridge, 1973), e.g. *Triorites magnificus*. This discussion in Stover & Partridge (1982) is used as a diagnosis of the Middle *N. asperus* Zone. The subdivision of the *L. balmei* Zone has not been described either, but the same procedure is followed, i.e. those species which first appear in the upper part of the *L. balmei* Zone (in Stover & Partridge, 1973) indicate the Upper *L. balmei* Zone, e.g. *Malvacipollis subtilis*.

1. 1151m, Upper *L. balmei* Zone, Late Paleocene.
Lygistepollenites ellipticus, which is confined to the *L. balmei* Zone is present. *Proteacidites adenanthoides, P. incurvatus* and *Malvacipollenites subtilis* which all first appear in the upper part of the *L. balmei* Zone are present also. Other features of the assemblage are quite distinctive, e.g. the diversity of spores.

2. 1139m, Barren.

3. 1040-1093m, Lower *N. asperus* Zone, Mid Eocene.
The first appearance of *Nothofagidites vansteenisii* and *Tricolporites angurium* in 1093m indicates the Lower *N. asperus* Zone. These assemblages are distinctive with their abundance of *Nothofagidites* spp.

4. 918-1020m, Middle *N. asperus* Zone, Late Eocene.
The distinctive *Triorites magnificus* is restricted to this zone. It is not present in the lower two assemblages but the dinoflagellate *Vozzhennikovia extensa*, which is also restricted to this zone (see Fig. 2) is present, thus indicating the Middle *N. asperus* Zone.

5. 887m, ? Middle *N. asperus* Zone, ? Late Eocene.
This assemblage lacks both *T. magnificus* and *V. extensa* so there is no positive evidence to indicate the Middle *N. asperus* Zone. It does not contain any evidence of the Upper *N. asperus* Zone. The overall characteristics are very like the assemblages below it, so it is probably the Middle *N. asperus* Zone, although the evidence is weak. It would require some other independant evidence for a more definite determination.

6. 870-880m, Indeterminate.
Very little pollen is present and there are no diagnostic species. These assemblages could be Late Eocene or Oligocene in age.

DINOFLAGELLATES.

The dinoflagellate identified are listed on Table 1, and the range of the one diagnostic species is shown on Figure 2. The other two species listed on Table 1 are both long ranging.

1. 936.5-1020m, *C. incompositum* Zone, Late Eocene.
Vozzhennikovia extensa is restricted to this Zone.

PALAEOENVIRONMENT

There is one marginal marine interval at 936.5-1020m. The rest of the well is non marine, except perhaps for the indeterminate interval, 870-880m, where there are trace occurrences of dinoflagellates. The indeterminate interval contains so little evidence, however, that it cannot be assessed further.

REFERENCES

COOKSON, I.C. & PIKE, K.M., 1953 - The Tertiary occurrence and distribution of *Podocarpus* (section *Dacrycarpus*) in Australia and Tasmania. *Aust. J. Bot.-1;* 71-82.

DETTMANN, M.E., 1963 - Upper Mesozoic Microfloras from South-eastern Australia. *Proc. Roy. Soc. Vict. 77;* 1-40.

LENTIN, J.K. & WILLIAMS, G.L., 1977 - Fossil Dinoflagellates: Index to Genera and Species. *Bedford Institute of Oceanography Report Series/Bl-R-77-8 July, 1977.*

MARTIN, H.A., 1973 - The Palynology of some Tertiary Pleistocene Deposits, Lachlan River Valley, New South Wales. *Aust. J. Bot. Suppl. Ser. 6;* 1-57.

PARTRIDGE, A.D., 1976 - The Geological Expression of Eustacy in the Early Tertiary of the Gippsland Basin. *APEA Jl, 16;* 73-79.

STOVER, L.E., HELBY, R.J. & PARTRIDGE, A.D., 1979 - Introduction to Dinoflagellates. *Earth Resources Foundation, University of Sydney,* Aug. 13-17, 1979.

STOVER, L.E. & PARTRIDGE, A.D., 1973 - Tertiary and Late Cretaceous Spores and Pollen from the Gippsland Basin, Southeastern Australia. *Roy. Soc. Vict. Proc., 85;* 237-286.

STOVER, L.E. & PARTRIDGE, A.D., 1982 - Eocene spore-pollen from the Werillup Formation, Western Australia. *Palynology 6:* 69-95.

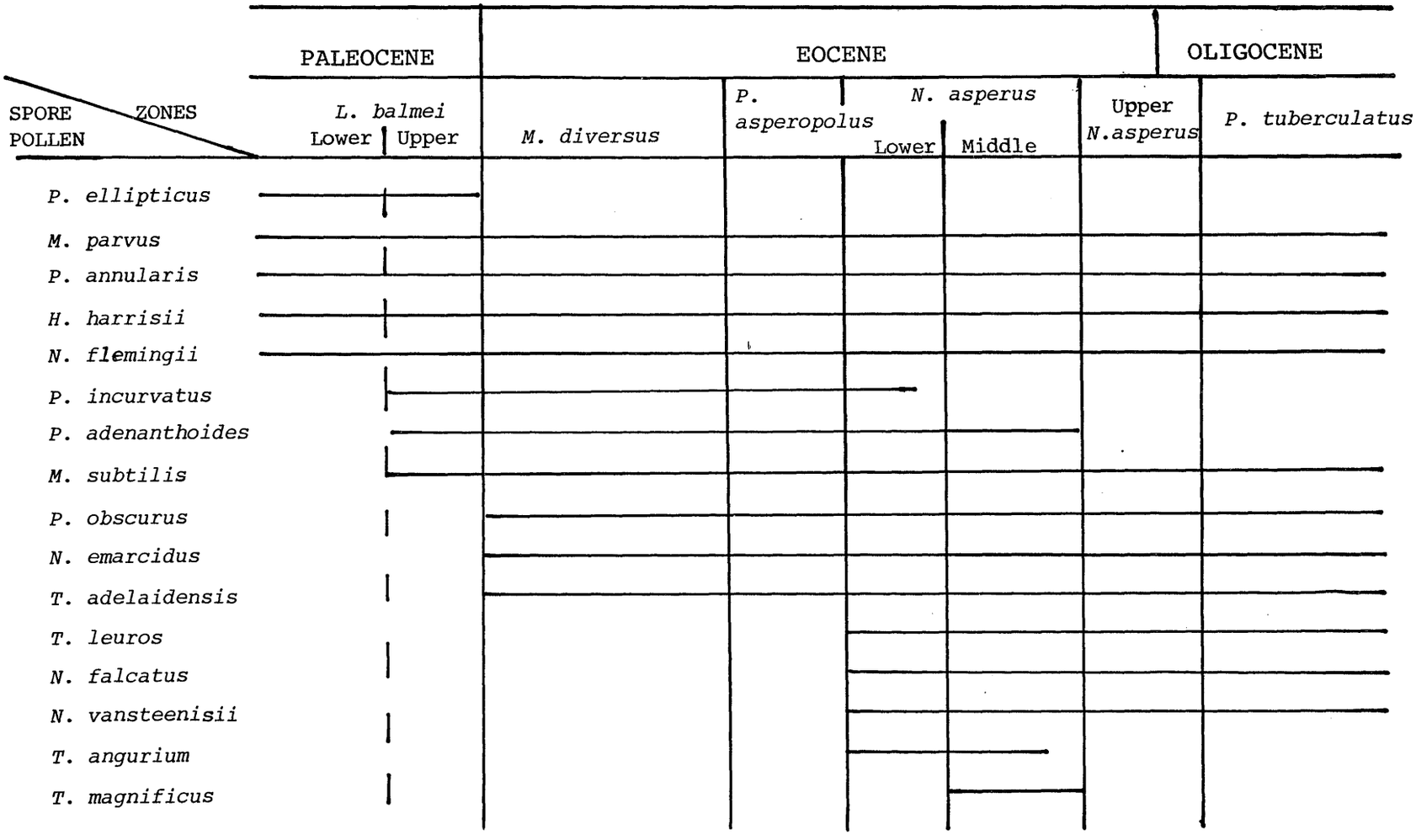

FIGURE 1: SPORE POLLEN RANGE CHART. From Stover & Partridge (1973) and Partridge (1976).

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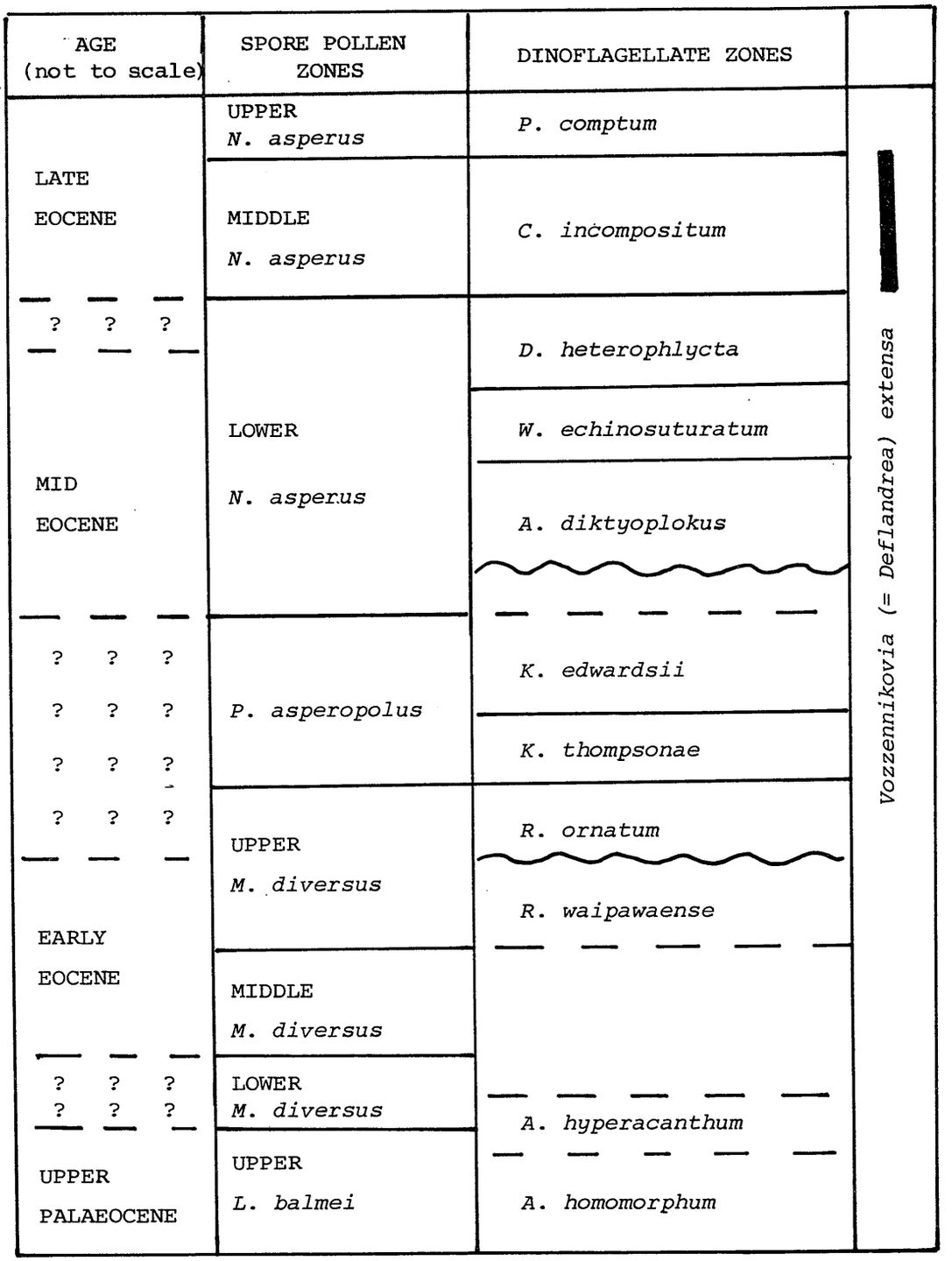

FIGURE 2: DINOFLAGELLATE RANGE CHART.
From Stover, Helby & Partridge, 1979.

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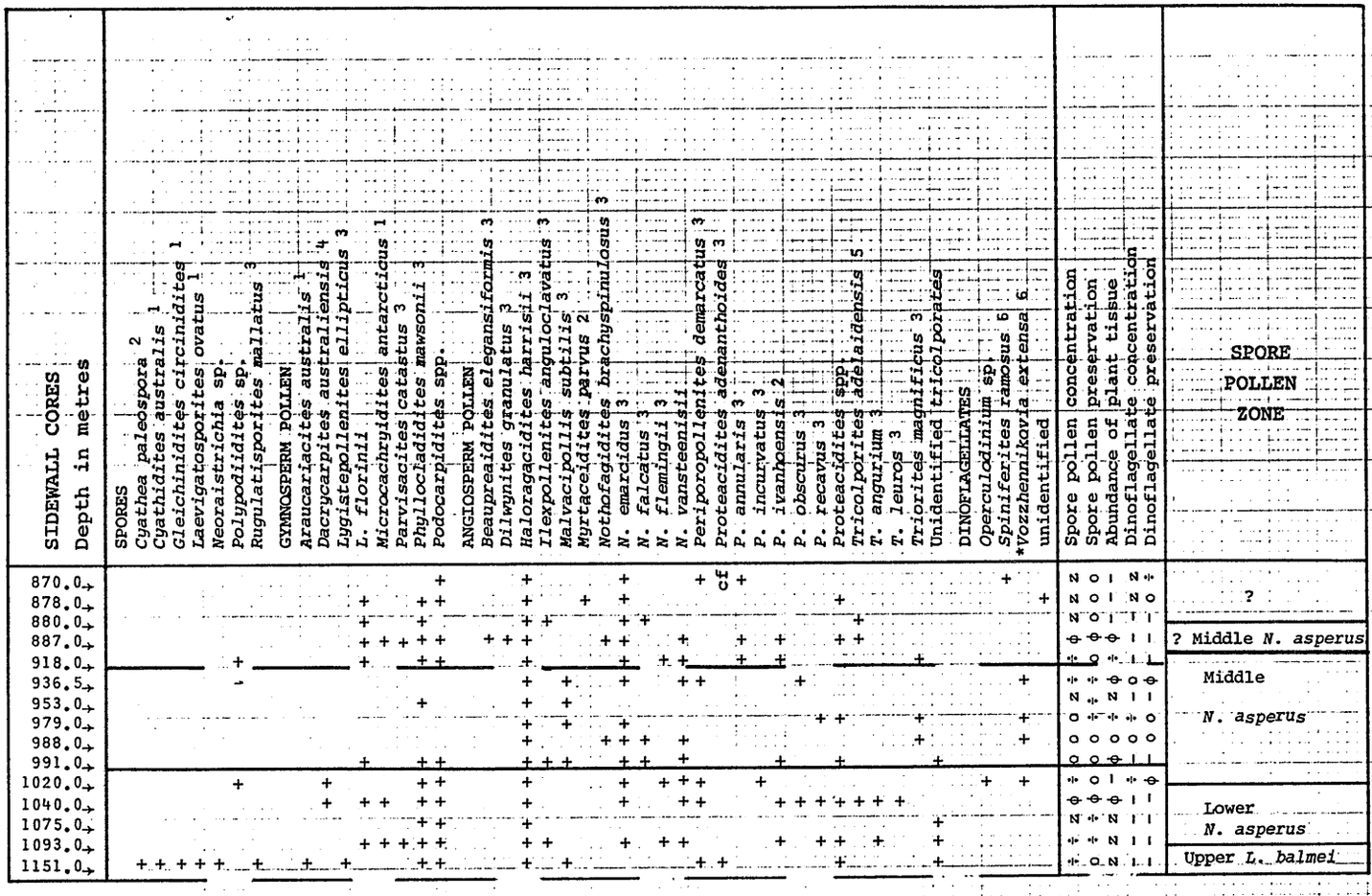

TABLE 1: SPORES, POLLEN AND DINOFLAGELLATES IDENTIFIED IN AUSTRALIAN AQUITAINE PETROLEUM WYRALLAH # 1.

Barren Samples: 1139A
1139B

References:
1 Dettmann, 1963
2 Martin, 1973
3 Stover & Partridge, 1973
4 Cookson & Pike, 1953
5 Stover & Partridge, 1982
6 Lentin & Williams, 1977

Symbols:
ϕ good, above average
o average
÷ poor, below average
z exceedingly poor, trace occurrence
* Formerly *Deflandrea*

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