# BASIC DATA.
# Palynological analysis of cuttings from 1317 to 1452 metres in Wombat-3, onshore Gippsland Basin.

**by**

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## Introduction

The eight cuttings samples analysed from the Wombat-3 well drilled by Lakes Oil N.L. were submitted in two batches of four samples each between 6th and 22nd October 2004. All samples were processed in the palynological laboratory facilities of Core Laboratories Australia Pty Ltd in Perth (formerly operated by Laola Pty Ltd).

The first batch of samples, submitted as unwashed cuttings, were given routine palynological processing without any special pre-treatment, and unfortunately yielded unworkable palynological slides, largely due to contamination by caved coaly material. The second batch of samples, were submitted as washed cuttings, and were also pre-treated in an attempt to remove some of the obvious caved lithologies, and this approach gave much better results. At the same time the first batch of cuttings were given additional oxidation and better slides were obtained.

Basic sample data on lithologies and weights of sample processed, and organic yields obtained are provided on Table 1. The visual organic residues yields from the samples varies from very low to moderate, with the concentration of palynomorph on most slides only moderate, while the preservation of the fossils is mostly poor (Table 2). The recorded spore-pollen diversity varies from very low to high, whereas the recorded microplankton diversity is typically low (Table 2).

The distribution of the palynomorphs identified in the samples are displayed on the accompanying StrataBugs™ range chart. Author citations for most of the recorded spore-pollen species can be sourced from the papers by Dettmann (1963), Helby *et al.* (1987) or Stover & Partridge (1973), while the author citations for the microplankton species can be sourced from the indexes for dinocysts and other organic-walled microplankton prepared by Fensome *et al.* (1990) and Williams *et al.* (1998). Manuscript species names and combinations are indicated by “sp. nov.” or “comb. nov.” on the range chart.

## References

DETTMANN, M.E., 1963. Upper Mesozoic microfloras from southeastern Australia. *Proceedings Royal Society Victoria 77*, p.1-148.

FENSOME, R.A., WILLIAMS, G.L., BARSS, M.S., FREEMAN, J.M. & HILL, J.M., 1990. Acritarchs and fossil Prasinophytes: An index to genera, species and infraspecific taxa. *AASP Contribution Series No. 25*, p.1-771.

HELBY, R., MORGAN, R. & PARTRIDGE, A.D., 1987. A palynological zonation of the Australian Mesozoic. **In** *Studies in Australian Mesozoic Palynology*, P.A. Jell, editor, *Memoir Association Australasian Palaeontologists 4*, p.1-94.

STOVER, L.E. & PARTRIDGE, A.D., 1973. Tertiary and late Cretaceous spores and pollen from the Gippsland Basin, southeastern Australia. *Proceedings Royal Society of Victoria, vol.85*, pt.2, p.237-286.

WILLIAMS, G.L., LENTIN, J.K. & FENSOME, R.A., 1998. The Lentin and Williams index of fossil dinoflagellates 1998 edition. *American Association of Stratigraphic Palynologists, Contributions Series, no. 34*, p.1-817.

# BASIC DATA

**Table 1: Basic sample data for Wombat-2, onshore Gippsland Basin.**

| Sample Type | Depth | Lithology | Wt gms | VOM | Org. Yield |
|---|---|---|---|---|---|
| Cuttings[1] | 1317m | Unwashed cutting — lithology not recorded. | 12.2 | 0.4 | 0.03 |
| Cuttings[2] | 1320m | Light grey marl >75%, coal >10%, remaining lithologies indeterminate in unwashed clumps. | 10.7 | 0.5 | 0.05 |
| Cuttings[1] | 1332m | Unwashed cutting — lithology not recorded. | 13.1 | 0.5 | 0.04 |
| Cuttings[2] | 1338m | Light grey marl >30%, coal >30%, other lithologies include cemented quartz sandstone with white clay matrix. | 10.7 | 0.4 | 0.04 |
| Cuttings[2] | 1356m | Medium grey mudstone >50%, coal mostly in large caved pieces >30%; remaining lithologies mostly indeterminate but includes some sandstone | 10.5 | 0.4 | 0.04 |
| Cuttings[1] | 1358m | Unwashed cutting — lithology not recorded. | 13.5 | 0.9 | 0.07 |
| Cuttings[1] | 1376m | Unwashed cutting — lithology not recorded. | 13.2 | 0.2 | 0.02 |
| Cuttings[2] | 1452m | Medium grey lithic sandstone 90%, and medium grey shale mostly in large shards 5-15 mm long | 13.0 | 0.4 | 0.03 |

Cuttings[1] = First set processed
Cuttings[2] = Second set processed
Wt = Weight of sample processed in grams.
VOM = Volume of wet organic residues in cubic centimetres.
Org. Yield = Organic Yield — VOM divided by Wt.

**Table 2: Basic assemblage data for Wombat-2, onshore Gippsland Basin.**

| Sample Type | Depth | Visual Yield | Palynomorph Concentration | Preservation | No. SP Species | No. MP Species |
|---|---|---|---|---|---|---|
| Cuttings[1] | 1317m | Moderate | Moderate | Poor-Fair | 25+ | 2+ |
| Cuttings[2] | 1320m | Moderate | Moderate | Poor-Fair | 24+ | 3+ |
| Cuttings[1] | 1332m | Low | Moderate | Poor-Fair | 28+ | 3+ |
| Cuttings[2] | 1338m | Low | Moderate | Poor | 29+ | 2+ |
| Cuttings[2] | 1356m | Low | Moderate | Poor | 30+ | 5+ |
| Cuttings[1] | 1358m | Moderate | Moderate | Poor | 41+ | 4+ |
| Cuttings[1] | 1376m | Very Low | Very Low | Poor | 2+ | |
| Cuttings[2] | 1452m | Low | Very Low | Poor | 21+ | |
| | | | | **Averages:** | **25+** | **2+** |

Cuttings[1] = First set processed
Cuttings[2] = Second set processed

**Well Name : Wombat-3**

Operator : Lakes Oil NL — Spudded : 23 September 2004

Completed: 28 October 2004

Lat/Long : 38°21' 28.00"S 147° 8' 57.00"E

Interval : 1200m - 1700m — Palynological Range Chart

Scale : 1:2500 — Sample Interval 1317 to 1452m

Chart date: 22 December 2004 — Microscope analysis by Alan D. Partridge

# Wombat-3

**Biostrata Pty Ltd**
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Attachment to Biostrata Report 2004/13A

Depth

Samples (metres)

**Spores** — Absolute abundance (30mm=100 counts)

Baculatisporites spp.
Cyathidites spendens
Cyathidites spp. (large species)
Cyathidites spp. (small species)
Gleicheniidites circinidites
Herkosporites elliottii
Laevigatosporites ovatus
Latrobosporites crassus
Stereisporites antiquasporites
Tripunctisporis maastrichtiensis
Clavifera triplex
Peromonolites densus
Retitriletes spp.
Trilete spores undiff.
Polypodiisporites spp.
Ceratosporites equalis
Dictyotosporites speciosus
Osmundacidites wellmanii
Perotriletes jubatus
Verrucosisporites admirabilis sp. nov.
Annulispora folliculosa
Coptospora pileolus sp. nov.
Crybelosporites striatus
Dictyophyllidites spp.
Foveosporites moretonensis
Klukisporites scaberis
Leptolepidites verrucatus
Polycingulatisporites reduncus
Triporoletes reticulatus
Cicatricosisporites & Ruffordiaspora spp.
Ruffordiaspora australiensis

**Gymnosperms** — Absolute abundance (30mm=100 counts)

Lygistepollenites balmei
Phyllocladidites mawsonii
Podocarpidites spp.
Cupressacites sp.
Lygistepollenites florinii
Microcachryidites antarcticus
Trichotomosulcites subgranulatus
Araucariacites australis
Corollina torosa
Dilwynites granulatus
Dilwynites pusillus sp. nov.
Hoegisporis trinalis sp. nov.

**Angiosperms** — % of KT = S + G + A (30mm=100%)

Cupanieidites orthoteichus
Gambierina rudata
Haloragacidites harrisii
Nothofagidites deminutus
Nothofagidites emarcidus/heterus
Nothofagidites flemingii
Proteacidites (Propylipollis) annularis
Proteacidites crassus
Proteacidites obscurus
Proteacidites spp.
Tricolp(or)ites spp. (multiple species)
Tricolporites adelaidensis
Australopollis obscurus
Malvacipollis subtilis
Nothofagidites falcatus
Periporopollenites polyoratus
Ericipites scabratus
Myrtaceidites tenuis
Periporopollenites demarcatus
Periporopollenites spp.
Polycolporopollenites esobalteus
Proteacidites pachypolus
Triorites magnificus
Battenipollis sectilis
Nothofagidites brachyspinulosus
Tetracolporites verrucosus
Integricorpus antipodus sp. nov.
Ilexpollenites spp.

**Caved** — % of Caved + In_Situ: Caved (0 – 100)

**Microplankton** — *1

Gippslandica extensa
Spiniferites spp.
Operculodinium centrocarpum
Lingulodinium machaerophorum
Amosopollis cruciformis
Micrhystridium sp. A
Rimosicysta spp.
Schizosporis reticulatus
Sigmopollis hispidus

**Other** — *1

Fungal spores & hyphae
Indeterminate palynomorphs

**RW** — *2

Reworked palynomorphs
Didecitriletes ericianus
Plicatipollenites spp.
Pseudoreticulatispora pseudoreticulata

Depth: 1200m, 1250m, 1300m, 1350m, 1400m, 1450m, 1500m, 1550m, 1600m, 1650m, 1700m

Samples: 1317, 1320, 1332, 1338, 1356, 1358, 1376, 1452