

**Palynological Analysis  
of Sidewall Cores between  
3012.1m to 3057.1m  
in Gudgeon-1  
Gippsland Basin**

by

**Alan D. Partridge**

**Biostrata Pty Ltd**  
A.C.N. 053 800 945

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## INTERPRETATIVE DATA

### Introduction

Nine sidewall cores between 3012.1m to 3057.1m from across the top of Latrobe in Gudgeon-1 have been analysed to compliment the results obtained from a cuttings sample at 3045-55m and core samples between 3064m to 3078m reported on by Partridge (1995). The following table summarises both sets of analyses.

### Palynological Summary of Gudgeon-1

| AGE                        | UNIT/FACIES                            | SPORE-POLLEN ZONES<br>(DINOFLAGELLATE ZONES)                          | DEPTHS<br>mKB                       |
|----------------------------|--|---|-------------------------------------|
| MIOCENE<br>TO<br>OLIGOCENE | SEASPRAY GROUP                         | <i>P. tuberculatus</i><br><i>(F. leos)</i>                            | 3012.1-3036.1<br>(3036.1)           |
| EOCENE?<br>TO<br>PALEOCENE | LATROBE GROUP<br>Glaucinitic sandstone | Indeterminate sample<br><i>(T. evttiti)</i>                           | 3053.6<br>(3055.0)                  |
| MAASTRICHTIAN              | LATROBE GROUP<br>Undifferentiated      | Indeterminate sample<br>Upper <i>T. longus</i><br><i>(M. druggii)</i> | 3057.1<br>3064.0-3078.0<br>(3072.0) |

An average of 10 grams of the sidewall cores were split, cleaned where practical, then forwarded to Laola Pty Ltd in Perth for processing to prepare the palynological slides for analysis. The material was forwarded to Laola Pty Ltd on 10 May, returned on 18 May and the provisional report on results provided on 22 May. The interpretative data with zone identification and Confidence Ratings are recorded in Table 1 and basic data on residue yields, preservation and diversity are recorded on Tables 2 and 3.

Overall the residue yields on the samples were low from the Seaspray Group and very low to barren from Latrobe Group. Palynomorph concentration in productive samples was moderate to high. Preservation of palynomorphs varied from poor to good. From the Seaspray Group total spore-pollen diversity was 42+ species with an average diversity of 17+ species per sample, whilst total microplankton diversity was 24+ species with an average of 14+ species per sample. Diversity of the samples from the Latrobe Groups is much lower because of the lower recoveries. All species which have been identified with binomial names are

tabulated in the text or on Table 4. The relinquishment list for palynological slides is provided at the end of the report. No palynological residues remained after preparation of the slides.

## Geological Comments

1. Of the nine samples analysed six are from the Seaspray Group. These are Early Oligocene in age and are referred to the *P. tuberculatus* Zone and *Operculodinium* Superzone. The other three samples are from the underlying Latrobe Group but only the middle sample contained a diagnostic assemblage assigned to the *T. evittii* microplankton Zone giving an Early Paleocene (Danian) age.
2. The *Fromea leos* microplankton Zone originally erected in Blackback-3 has been found in the deepest available sidewall sample from the Seaspray Group indicating the presence of the "Early Oligocene wedge" in Gudgeon-1. The sample at 3036.1m also contains the spore *Cyatheacidites annulatus* indicative of the *P. tuberculatus* Zone which suggests a position high in the *F. leos* Zone. As previously discussed by Partridge (1994) *Fromea leos* is considered to characterises a part of the Early Oligocene which appears to be only rarely preserved in the offshore portion of the Gippsland Basin.
3. Of the two samples of glauconitic sandstone supplied from the top of the Latrobe Group at 3053.6m and 3055m only the deeper sample contained an assemblage which is both *in situ* and datable. The *T. evittii* Zone assemblage recorded from this sample can be correlated to the Cretaceous/Tertiary boundary shale which forms the seal to the Flounder field reservoirs. In the adjacent Pilotfish-1A well the upper part of the this shale between approximately 2915m to 2935m becomes significantly glauconitic and contains both the *T. evittii* and the younger *P. pyrophorum* microplankton Zones (Macphail 1983, and subsequent analysis).
4. Although the shallower glauconitic sandstone at 3053.6m did not yield a reliable assemblage it shows greater lithological similarity to the Gurnard Formation than the deeper sample. Considering that a few typical Eocene dinoflagellates were recorded from the cuttings analysed over the interval 3045-55m (Partridge 1995, table 4) it is possible that a thin sliver (<2 metres) of Eocene may have been deposited at the Gudgeon-1 location.
5. The new age datings on the sidewall cores now leave an undated gap of only 9 metres between the *T. evittii* Zone top of the Upper *T. longus* zone identified in the cores from 3064m.

## Biostratigraphy

Zone and age determinations are based on the spore-pollen zonation scheme proposed by Stover & Partridge (1973), subsequently modified by Helby, Morgan & Partridge (1987), and a dinoflagellate zonation scheme which has only been published in outline by Partridge (1975, 1976).

Author citations for most spore-pollen species can be sourced from Stover & Partridge (1973, 1982), Helby, Morgan & Partridge (1987) or other references cited herein. Author citations for dinoflagellates can be found in the index of Lentin & Williams (1993) or other references cited herein. Species names followed by "ms" are unpublished manuscript names.

***Proteacidites tuberculatus* Spore-Pollen Zone:                    3012.1-3036.1 metres  
Early Oligocene.**

The six samples assigned to the zone all contain the key index species *Cyatheacidites annulatus*. Other index species are rare but include an as yet undescribed species of *Densoisporites* and *Foveotriletes lacunosus* at 3020m. This latter species suggests a generally younger Late Oligocene age but is interpreted as a contaminant as the sample also contains the notably younger dinoflagellate *Tuberculodinium vancampoae*. Overall the assemblages are of moderate diversity dominated by long ranging spores and pollen. *Nothofagidites* spp. dominates most counts with *Araucariacites australis* and *Podocarpidites* spp. the next most frequent types.

***Operculodinium* Microplankton Superzone:                    3012.1-3036.1 metres  
Oligocene-Miocene.**

All samples analysed from the Seaspray Group are dominated by dinoflagellates characteristic of the *Operculodinium* Superzone which has a broad Oligocene to Miocene age range. Total microplankton abundance ranges from 60% to 82% with an average of 74% indicating an open marine environment. The assemblages are all dominated by *Spiniferites* spp. and *Operculodinium centrocarpum* (Table 4). Unfortunately most of the key species in the microflora are still undocumented and are identified by manuscript names. Currently only two zones have been formally defined from the base of the superzone and of these only the *F. leos* Zone is recorded in Gudgeon-1.

**Fromea leos Microplankton Zone:****3036.1 metres  
Early Oligocene.**

This is a new zone defined by Partridge (1994) as the interval above the acme of *Phthanoperidinium comatum* to the Last Appearance Datum (LAD) of *Fromea leos* ms. The assemblages recorded is similar compositionally to those in Blackback-3 with abundant *Spiniferites* spp. (55%) and *Operculodinium centrocarpum* (21%) but only frequent *Fromea leos* (4%). The assemblages is distinguished from the more usual *Operculodinium* Superzone microfloras found in the basal Seaspray Group in lacking the consistent and often common occurrence of the species *Dapsilodinium pseudocolligerum*, *Protoellipsoidinium simplex* ms and *Pyxidinosia pontus* ms. Additional taxonomic descriptive work needs to be done to fully document the microplankton assemblages in this zone.

**SWC 24 at 3053.6 metres.**

Residue recovery from this glauconitic sandstone was sufficient to make only one kerogen slide and one half coverslip oxidised slide. The kerogen slide contained what was interpreted as poorly preserved biodegraded terrestrially derived kerogen whilst the oxidised slide contained what appeared to be the indeterminate reaction product from the chemical processing. The recorded assemblage listed below was very limited and considering the sample was originally poorly cleaned and mud penetrated it is not believed the assemblage is either zone or age diagnostic.

**Spore-Pollen**

|  |             |
|--|-------------|
| <i>Araucariacites australis</i>                | 1 specimen  |
| <i>Foraminisporis</i> sp. cf. <i>F. dallyi</i> | (reworked?) |

**Microplankton**

|                                    |              |
|------------------------------------|--------------|
| <i>Cyclopstella vieta</i>          | 1 specimen   |
| <i>Operculodinium centrocarpum</i> | 1 specimen   |
| <i>Spiniferites</i> spp.           | 3+ specimens |

**Trithyrodinium evittii Microplankton Zone:**3055.0 metres  
Early Paleocene.

Only sufficient residue was recovered from the sample to prepare small filtered and unfiltered fractions of the residue for a single kerogen slide.

The assemblage contained the following species:

**Spore-Pollen**

|                                       |                             |
|---------------------------------------|-----------------------------|
| <i>Araucariacites australis</i>       | 1 specimen                  |
| <i>Cupressacites pollen</i>           | 3 specimens (contaminants?) |
| <i>Dilwynites granulatus</i>          | 2+ specimens                |
| <i>Gleicheniidites circinidites</i>   | 1 specimen                  |
| <i>Latrobosporites amplus</i>         | 1 specimen                  |
| <i>Lygistepollenites florinii</i>     | 1 specimen                  |
| <i>Nothofagidites emarcidus</i>       | 1 specimen                  |
| <i>Nothofagidites endurus</i>         | 1 specimen                  |
| <i>Phyllocladidites mawsonii</i>      | 2+ specimens                |
| <i>Podocarpidites</i> spp.            | 3+ specimens                |
| <i>Proteacidites</i> spp.             | 3+ specimens                |
| <i>Steretsporites antiquisporites</i> | 1 specimen                  |

**Microplankton**

|  |                        |
|--|------------------------|
| <i>Areoligera senonensis</i>                         | 4 fragmented specimens |
| <i>Deflandrea speciosus</i>                          | 1 fragmented specimen  |
| <i>Histiocysta</i> sp.                               | 2 specimens            |
| <i>Operculodinium</i> sp. cf. <i>O. centrocarpum</i> | 1 specimen             |
| <i>Palaeoperidinium pyrophorum</i>                   | 1 specimen             |
| <i>Palambages</i> sp.                                | 1 specimen             |
| <i>Spinidinium</i> sp.                               | 1 specimen             |
| <i>Spiniferites ramosus</i>                          | 1 specimen             |
| <i>Trithyrodinium evittii</i>                        | 12+ specimens          |

This limited assemblage of between 50-60 specimens can be assigned to the *T. evittii* Zone on the abundance of the eponymous species (>20% of assemblage) supported by the occurrence of a single specimen of *Palaeoperidinium pyrophorum*. The associated spore-pollen assemblage is not zone diagnostic.

**SWC 22 at 3057.1 metres.**

The 6.2 grams of the sidewall core processed gave a meagre yield sufficient to prepare only a single 1/2 coverslip kerogen slide. The slide contained mainly large (50-200 $\mu$ m diameter) irregular black opaque to semitranslucent kerogen mixed with fine (<10 $\mu$ m diameter) irregular blebs which looked like chemical reaction product, together with very minor (<5% of total kerogen on slide)

terrestrial kerogen including palynomorphs. The following limited assemblage was recorded:

#### Spore-Pollen

|                                       |            |
|---------------------------------------|------------|
| <i>Araucariacites australis</i>       | 1 specimen |
| <i>Haloragacidites harrisii</i>       | 1 specimen |
| <i>Lygistepollenites balmei</i>       | 1 specimen |
| <i>Proteacidites clinei</i> ms        | 1 specimen |
| <i>Steretsporites antiquisporites</i> | 1 specimen |

#### Microplankton

|  |            |
|--|------------|
| <i>Operculodinium</i> sp. cf. <i>O. centrocarpum</i> | 1 specimen |
| <i>Spiniferites</i> sp.                              | 1 specimen |

As this assemblage is a mixture of typical Oligocene, Eocene, Paleocene and Maastrichtian species it is very likely most, if not all, specimens are introduced contaminants from the mud penetrating the friable and poorly cleaned sample. No reliable age determination is possible based on this assemblage.

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**Table 1: Interpretative Palynomorph Data for Gudgeon-1.**

| Sample | Depth<br>Metres | Spore-Pollen Zone<br>(Microplankton Zone)                    | *CR | Comments and Key Species Present   |
|--------|-----------------|--|-----|--|
| SWC 59 | 3012.1          | <i>P. tuberculatus</i><br>( <i>Operculodinium</i> Superzone) | B2  | Microplankton 76%. Several specimens of spore <i>Cyatheacidites annulatus</i> recorded.                                    |
| SWC 57 | 3014.0          | <i>P. tuberculatus</i><br>( <i>Operculodinium</i> Superzone) | B2  | Microplankton 78%.   |
| SWC 52 | 3020.0          | <i>P. tuberculatus</i><br>( <i>Operculodinium</i> Superzone) | B2  | Microplankton 66%. <i>Foveotriletes lacunosus</i> and <i>Tuberculodinium vancampoae</i> present but possible contaminants. |
| SWC 48 | 3024.1          | <i>P. tuberculatus</i><br>( <i>Operculodinium</i> Superzone) | B2  | Microplankton 82%.<br><i>Protoellipsoidinium simplex</i> 4%.   |
| SWC 44 | 3030.1          | <i>P. tuberculatus</i><br>( <i>Operculodinium</i> Superzone) | B2  | Microplankton 82%. <i>Pyxidinospsis pontus</i> ms recorded with <i>P. simplex</i> at 3%.                                   |
| SWC 39 | 3036.1          | <i>P. tuberculatus</i><br>( <i>Fromea leos</i> )             | B2  | Microplankton 60%.<br><i>Cyatheacidites annulatus</i> still present.   |
| SWC 24 | 3053.6          | Indeterminate  |     | Very low yield sample with all recorded palynomorphs being derived from drilling mud contamination.                        |
| SWC 23 | 3055.0          | ( <i>T. evittii</i> )  | B2  | Common <i>Trithyrodinium evittii</i> with very rare <i>Palaeoperidinium pyrophorum</i> in very low recovery sample.        |
| SWC 22 | 3057.1          | Indeterminate  |     | Very low yield sample with only seven fossils recorded and all are likely contaminants.                                    |

**\*Confidence Ratings**

Alpha codes: Linked to sample type

|          |                       |
|----------|-----------------------|
| <b>A</b> | Core                  |
| <b>B</b> | Sidewall core         |
| <b>C</b> | Coal cuttings         |
| <b>D</b> | Ditch cuttings        |
| <b>E</b> | Junk basket           |
| <b>F</b> | Miscellaneous/unknown |
| <b>G</b> | Outcrop               |

Numeric codes: Linked to fossil assemblage

|          |                              |  |
|----------|------------------------------|--|
| <b>1</b> | <b>Excellent confidence:</b> | High diversity assemblage recorded with key zone species.                |
| <b>2</b> | <b>Good confidence:</b>      | Moderately diverse assemblage recorded with key zone species.            |
| <b>3</b> | <b>Fair confidence:</b>      | Low diversity assemblage recorded with key zone species.                 |
| <b>4</b> | <b>Poor confidence:</b>      | Moderate to high diversity assemblage recorded without key zone species. |
| <b>5</b> | <b>Very low confidence:</b>  | Low diversity assemblage recorded without key zone species.              |

## BASIC DATA

**Table 2: Basic Sample Data for Gudgeon-1, Gippsland Basin.**

| Sample Type | Depth (Metres) | Rec (cm) | Lithology   | Sample Wt (g) | Residue Yield |
|-------------|----------------|----------|---|---------------|---------------|
| SWC 59      | 3012.1         | 4.5      | Medium grey claystone. Sample badly broken with salt efflorescence and some mud penetration. Approx. 15mm split off, poorly cleaned.                                  | 8.4           | Low           |
| SWC 57      | 3104.0         | 4.0      | Light grey brittle claystone with white flecks (foraminifera?). Sample broken, approx. 10mm of sample split, moderately well cleaned.                                 | 9.5           | Low           |
| SWC 52      | 3020.0         | 4.0      | Medium grey claystone. Sample broken into small pieces and powder, which could not be cleaned. Approx. 1/3 split for processing.                                      | 11.9          | Low           |
| SWC 48      | 3024.1         | 5.0      | Medium grey brittle claystone. Sample partially broken and mud penetrated, poorly cleaned. Approx. 20mm split for processing.   | 12.9          | Moderate      |
| SWC 44      | 3030.1         | <4.0     | Light-medium grey soft claystone. Sample partially broken, minor mud penetration, moderately well cleaned. Approx. 20mm of mainly broken pieces split for processing. | 10.8          | Very low      |
| SWC 39      | 3036.1         | <4.0     | Medium grey claystone. Sample broken, could not be cleaned. Approx. 1/3 split for processing.   | 8.8           | Low           |
| SWC 24      | 3053.6         | >2.5     | Glaucconitic sandstone with approx. 50% glauconite and 5-10% disseminated pyrite including pyrite nodules. Approx. 1/2 sample split, avoiding pyrite - well cleaned.  | 7.8           | Very low      |
| SWC 23      | 3055.0         | <4.0     | Friable glauconitic sandstone with <20% glauconite. Sample all broken-up and could not be cleaned. Approx. 1/3 taken for processing.                                  | 13.2          | Very low      |
| SWC 22      | 3057.1         | <2.5     | Light-medium grey sandstone with clay matrix. Most of sample broken, poorly cleaned. Approx 1/2 taken for processing.   | 6.2           | Very low      |

**Table 3: Basic Palynomorph Data for Gudgeon-1, Gippsland Basin.**

| Sample Type | Depth (Metres) | Palynomorph Concentration | Palynomorph Preservation | Number S-P Species | Microplankton Abundance | Number MP Species |
|-------------|----------------|---------------------------|--------------------------|--------------------|-------------------------|-------------------|
| SWC 59      | 3012.1         | High                      | Poor-good                | 16+                | Abundant                | 14+               |
| SWC 57      | 3104.0         | Moderate                  | Poor-fair                | 17+                | Abundant                | 13+               |
| SWC 52      | 3020.0         | High                      | Poor-good                | 19+                | Abundant                | 14+               |
| SWC 48      | 3024.1         | High                      | Poor-fair                | 15+                | Abundant                | 15+               |
| SWC 44      | 3030.1         | Moderate                  | Poor                     | 12+                | Abundant                | 13+               |
| SWC 39      | 3036.1         | High                      | Poor-good                | 25+                | Abundant                | 14+               |
| SWC 24      | 3053.6         | Very low                  | Poor                     | 1+                 | Rare                    | 3+                |
| SWC 23      | 3055.0         | Low                       | Very poor-fair           | 12+                | Moderate                | 9+                |
| SWC 22      | 3057.1         | Very low                  | Poor-good                | 5+                 | Rare                    | 2+                |

**Table 4: Species List for Gudgeon-1, Gippsland Basin.**

|   | SWC 59 | SWC 57 | SWC 52 | SWC 48 | SWC 44 | SWC 39 |
|---|--------|--------|--------|--------|--------|--------|
| Species                                 | 3012.1 | 3014.0 | 3020.0 | 3024.1 | 3030.1 | 3036.1 |
| <b>SPORE-POLLEN</b>                     |        |        |        |        |        |        |
| <i>Araucariacites australis</i>         | C      | >15%   | <5%    | F      | >10%   | 10%    |
| <i>Baculatisporites</i> spp.            | X      | X      |        | X      |        | X      |
| <i>Cyatheacidites annulatus</i>         | X      | X      | X      | X      | X      | 8%     |
| <i>Cyathidites paleospora</i>           | F      | X      | >5%    | X      | 15%    | 8%     |
| <i>Dacrycarpites australiensis</i>      |        |        |        |        | X      |        |
| <i>Densosporites</i> n.sp.              |        | X      |        |        |        | X      |
| <i>Dictyophyllidites arcuatus</i>       |        |        | X      |        |        |        |
| <i>Didictriletes ericlanus</i> RW       |        | X      |        |        |        |        |
| <i>Dilwynites granulatus</i>            | F      | <10%   | <5%    | F      | X      | 6%     |
| <i>Dilwynites tuberculatus</i>          |        |        |        | X      |        |        |
| <i>Ericipites crasslexinus</i>          |        |        | X      |        |        |        |
| <i>Foveotriletes lacunosus</i>          |        |        | X      |        |        |        |
| <i>Gleicheniidites circinidites</i>     | X      |        | X      | X      | >10%   | X      |
| <i>Granulatisporites trisinus</i> RW    |        |        |        |        |        | X      |
| <i>Haloragacidites harrisii</i>         |        | 5%     | >5%    | X      |        | 2%     |
| <i>Ischyosporites irregularis</i> ms    | X      | X      |        | X      | X      |        |
| <i>Laevigatosporites ovatus</i>         | X      |        |        |        |        | 4%     |
| <i>Lycopodiumsporites</i> spp.          |        | X      |        |        |        |        |
| <i>Lygistepollenites florinii</i>       | X      | X      | >20%   | X      |        | 4%     |
| <i>Malvactpollis subtilis</i>           |        |        | X      |        |        | X      |
| <i>Matonisporites ornamentalis</i>      |        | X      | X      | X      |        | X      |
| <i>Microcachryidites antacticus</i>     | X      |        |        |        |        |        |
| <i>Milfordia homeopunctatus</i>         |        |        | X      |        |        |        |
| <i>Myrtaceidites parvus/mesonesus</i>   | X      |        |        |        |        |        |
| <i>Nothofagidites asperus</i>           |        |        |        |        |        | X      |
| <i>Nothofagidites brachyspinulosus</i>  |        |        |        | X      |        | 4%     |
| <i>Nothofagidites deminutus</i>         | X      |        | X      |        |        |        |
| <i>Nothofagidites emarcidus/heturus</i> | A      | X      | >10%   | >30%   | >10%   | 33%    |
| <i>Nothofagidites falcatus</i>          | X      |        |        |        |        | X      |
| <i>Nothofagidites flemingii</i>         |        |        |        | X      |        |        |
| <i>Periporopollenites polyoratus</i>    |        |        |        |        |        | X      |
| <i>Peromonolites vellosus</i>           |        |        |        |        |        | X      |
| <i>Phyllocladidites mawsonii</i>        | C      | <10%   | X      |        | X      |        |
| <i>Podocarpidites</i> spp.              | C      | >15%   | >15%   |        | X      | 6%     |
| <i>Podosporites microsaccatus</i>       |        |        |        |        |        | X      |
| <i>Proteacidites</i> spp.               |        | 5%     | >5%    |        |        |        |
| <i>Pseudowinterapollis coupert</i>      |        |        |        |        | X      |        |

**Table 4: Species List for Gudgeon-1, Gippsland Basin cont...**

|  | SWC 59     | SWC 57     | SWC 52     | SWC 48     | SWC 44     | SWC 39     |
|--|------------|------------|------------|------------|------------|------------|
| Species                                  | 3012.1     | 3014.0     | 3020.0     | 3024.1     | 3030.1     | 3036.1     |
| <i>Steretsporites antiquisporites</i>    |            | X          | >5%        |            |            | X          |
| <i>Steretsporites australis</i>          |            |            |            |            |            | X          |
| <i>Tricolpites</i> spp.                  |            |            |            |            |            | 4%         |
| <i>Triletes tuberculiformis</i>          |            |            |            | X          |            | X          |
| <b>TOTAL SPORE-POLLEN COUNT</b>          | <b>27</b>  | <b>24</b>  | <b>42</b>  | <b>24</b>  | <b>26</b>  | <b>52</b>  |
|  |            |            |            |            |            |            |
| <b>MICROPLANKTON undiff.</b>             | 4%         | 3%         | <2%        | 9%         | <3%        | 5%         |
| <i>Achomosphaera alvicornu</i>           |            |            |            |            |            | X          |
| <i>Achomosphaera ramulifera</i>          | 2%         | 4%         | <2%        | 2%         | X          | 6%         |
| <i>Apteodinium australlense</i>          | 11%        | X          |            |            | X          |            |
| <i>Botryococcus</i> sp.                  |            |            | X          |            |            | X          |
| <i>Crassosphaera concinna</i>            | X          |            |            | <1%        |            | X          |
| <i>Cyclonephelum</i> n.sp.               |            | X          |            | 11%        | X          | X          |
| <i>Dapsilodinium pseudocolligerum</i>    | 5%         | 11%        | 7%         | 9%         | >1%        |            |
| <i>Fromea leos</i> ms                    |            |            |            |            |            | 4%         |
| <i>Hystriocholpoma rigaudae</i>          | 12%        |            | 3%         | <1%        | 2%         |            |
| <i>Impagidinium</i> spp.                 |            | X          |            | X          | 1%         |            |
| <i>Lejeunecysta</i> sp.                  |            |            |            |            |            | X          |
| <i>Lingulodinium machaerophorum</i>      | <1%        | X          | 3%         | <1%        | 6%         | <2%        |
| <i>Lingulodinium solarum</i>             |            |            | X          | X          | X          |            |
| <i>Nematosphaeropsis balcombiana</i>     | X          | 1.5%       | 4%         | 1%         |            | X          |
| <i>Nematosphaeropsis rhizoma</i> ms      | 4%         | 6%         | X          | 1%         |            | <2%        |
| <i>Operculodinium centrocarpum</i>       | 11%        | 11%        | 16%        | 6%         | 62%        | 21%        |
| <i>Protoellipsodinium clavatus</i> ms    | X          |            |            |            |            |            |
| <i>Protoellipsodinium simplex</i> ms.    | <3%        |            |            | 4%         | 3%         |            |
| <i>Pyxidnopsis pontus</i> ms             |            |            |            |            | X          |            |
| <i>Selemophemphix nephroides</i>         |            |            |            |            |            | X          |
| <i>Spiniferites</i> spp.                 | 46%        | 59%        | 62%        | 54%        | 21%        | 55%        |
| <i>Systematophora placacantha</i>        |            |            |            | <1%        |            |            |
| <i>Tectatodinium scabroellipticus</i> ms | <3%        | X          | X          |            |            |            |
| <i>Tectatodinium</i> spp.                |            | X          | X          |            |            | X          |
| <i>Tuberculodinium vancampoae</i>        |            |            | X          |            |            |            |
| <b>TOTAL MICROPLANKTON COUNT</b>         | <b>114</b> | <b>123</b> | <b>128</b> | <b>139</b> | <b>162</b> | <b>108</b> |
| <b>OTHER PALYNOMORPHS</b>                |            |            |            |            |            |            |
| Fungal spores & hyphae                   | 1%         |            | 3%         |            |            |            |
| Microforaminiferal liners                | 5%         |            | 8%         |            |            | X          |
| Scolecodonts                             | 1%         |            | <1%        |            | X          |            |
| <b>TOTAL COUNT</b>                       | <b>149</b> | <b>157</b> | <b>192</b> | <b>169</b> | <b>198</b> | <b>179</b> |

## RELINQUISHMENT LIST - PALYNOLOGY SLIDES

WELL NAME &amp; NO: GUDGEON-1

PREPARED BY: A.D. PARTRIDGE

DATE: 30 MAY 1995

Sheet 1 of 1

| SAMPLE TYPE | DEPTH (M) | CATALOGUE NUMBER | DESCRIPTION                                      |
|-------------|-----------|------------------|--|
| SWC 59      | 3012.1    | P196688          | Kerogen slide filtered/unfiltered fractions      |
| SWC 59      | 3012.1    | P196689          | Oxidised slide 2 - 1/2 cover slip                |
| SWC 57      | 3014.0    | P196690          | Kerogen slide filtered/unfiltered fractions      |
| SWC 57      | 3014.0    | P196691          | Oxidised slide 2 - 1/2 cover slip                |
| SWC 52      | 3020.0    | P196692          | Kerogen slide filtered/unfiltered fractions      |
| SWC 52      | 3020.0    | P196693          | Oxidised slide 2 - 1/2 cover slip                |
| SWC 48      | 3024.1    | P196694          | Kerogen slide filtered/unfiltered fractions      |
| SWC 48      | 3024.1    | P196695          | Oxidised slide 2                                 |
| SWC 48      | 3024.1    | P196696          | Oxidised slide 3                                 |
| SWC 44      | 3030.1    | P196697          | Kerogen slide filtered/unfiltered fractions      |
| SWC 39      | 3036.1    | P196698          | Kerogen slide filtered/unfiltered fractions      |
| SWC 39      | 3036.1    | P196699          | Oxidised slide 2                                 |
| SWC 24      | 3053.6    | P196700          | Kerogen slide filtered/unfiltered fractions      |
| SWC 24      | 3053.6    | P196701          | Oxidised slide 2 - 1/2 cover slip                |
| SWC 23      | 3055.0    | P196702          | Kerogen slide filtered/unfiltered fractions      |
| SWC 22      | 3057.1    | P196703          | Kerogen slide filtered fraction - 1/2 cover slip |