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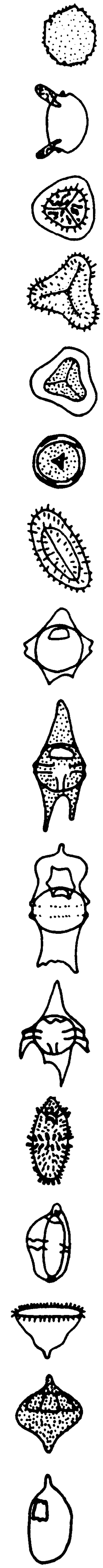

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NEW PALYNOLOGY OF MUSSEL-1

OTWAY BASIN, AUSTRALIA

BY

ROGER MORGAN

for BHP PETROLEUM

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REF:OTW.MUSSEL1

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CONTENTS

I SUMMARY

New examination (including grain counts of 20 existing core and swc preparations plus 25 new cuttings preparations) has produced a high resolution breakdown. It is expressed below in formal zones, but is also discussed in the text in terms of fifteen major horizons and twenty three minor horizons. These produced a much tighter correlation web to nearby wells when plotted on logs. Likely maximum flooding surfaces and sequence boundaries can also be located using the dinoflagellate content and diversity as a index of marine influence.

1245m(swc) - 1265m(swc) : indeterminate (barren)

1265m(cutts) - 1283m(swc) : upper diversus Zone : Early Eocene : intermediate marine

1289m(cutts) : balmei Zone : Paleocene : marine

1315m(swc) - 1360m(swc) : longus Zone (druggii dino Zone 1315-1360m) : Maastrichtian : nearshore at the base passing to offshore at the top ; marine maximum at 1315m

1385m(swc) - 1479m(swc) : lillei Zone (korojonense dino Zone 1419-1479m) : Campanian : nearshore to marginal marine

1550m(swc) - 1847m(swc) : upper senectus Zone (upper australis dino Zone 1550-1652m, lower australis 1701-1801m, aceras Zone 1801-1966m) : Campanian: marginal marine to intermediate marine; marine maxima at 1801m and 1701m

?1850m(cutts) - 1966m(cutts) : lower senectus Zone (aceras dino Zone 1801-1966m) : Campanian : intermediate marine to nearshore; marine maximum, at 1999m

1999m(cutts) - 2030m(cutts) : upper apoxyexinus Zone (cretacea dino Zone 1999-2030m) : Santonian : intermediate to offshore marine, maximum at 1999m and 2030m,

middle apoxyexinus Zone not seen : probably condensed or lost

2051m(cutts) : lower apoxyexinus Zone (?porifera dino Zone 2051m) : Santonian : apparently offshore marine but may be caved

2076m(cutts) : indeterminate : possibly upper mawsonii Zone

2100m(core) - 2243m(swc) or ?deeper : mawsonii Zone : Coniacian-Turonian : probably all marginal marine to nearshore with marine maximum at 2240m

2254m(swc) - 2441m(cutts): apparently distocarinatus Zone : Cenomanian : probably all nearshore to marginal marine but heavy caving obscured this.

II INTRODUCTION

Paul Carroll and David Pickavance of BHP Petroleum initiated palynological review of several wells pertinent to their acreage. In Mussel-1, they sought definitive age dating at the base of the well (especially whether Eumeralla Formation had been penetrated) and improved resolution throughout the late Cretaceous to facilitate sequence stratigraphic analaysis. Restudy of the existing preparations to produce new data from a modern view point, including specimen counts, was clearly worthwhile. Some large sample gaps existed however, and new cuttings were selected to infill to around 30m spacing.

Extensive cuttings study has two main advantages but also two main disadvantages. The first advantage is that the data becomes semicontinuous and key horizons can be seen in the cavings and not missed because they occur between the point sampling of swcs or due to unfavourable facies at the swc depth. An example is the flood of X. australis (horizon 6 herein) which is quite thin but is clearly seen in cuttings and caves to the bottom of the hole. The second advantage is that a downhole or extinction based zonation can be developed which works in cuttings and therefore provides a powerful tool to monitor drilling and enable cost efficient drilling and engineering decisions especially early TD. Quite accurate predictions ahead of swcs, logs and the bit are possible.

The first major disadvantage is that potential caving renders all oldest occurrences (or inceptions in time) of doubtful value. Thus the established zonations which particularly in Australia are based on oldest occurrences from extensive swc suites, do not work well. Youngest occurrence or extinction events in close proximity to the established zone boundaries need to be established to continue to use the established zonation. Alternatively, the existing zonation can be abandoned and a new one erected based on extinction events.

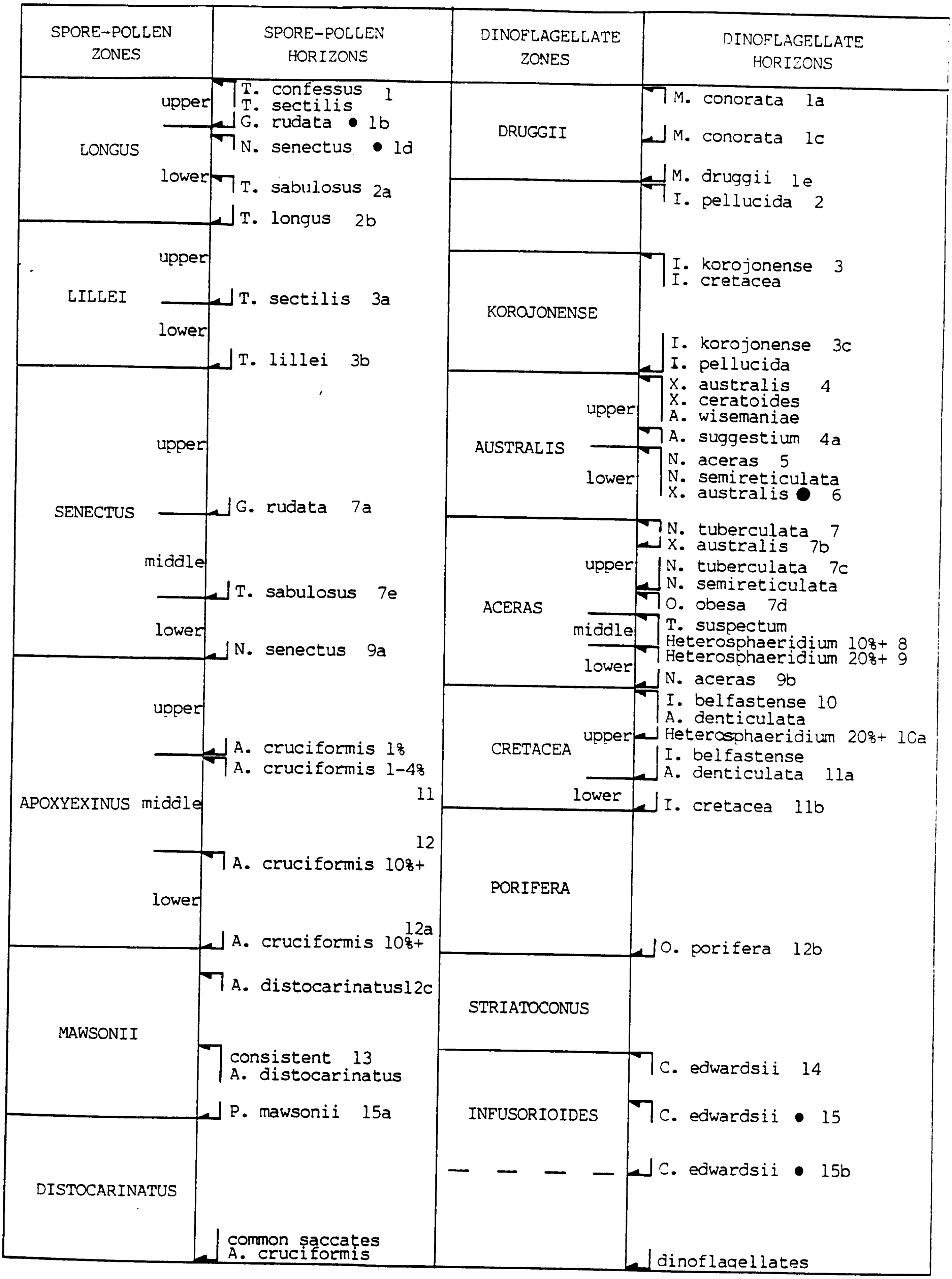

FIGURE 1 ZONATION USED HEREIN SHOWING THE NUMBERED HORIZONS AGAINST THE EXISTING FORMAL ZONATION.

● = frequent (4–10%) ⬤ = common (11–30%)

I have tried to do both herein, working within the established zonaton of Helby, Morgan and Partridge (1987), but initiating a set of 38 numbered horizons. The most obvious (and therefore most reliable) bear the whole numbers 1 to 15 from youngest to oldest and are all extinction or major acme events reliably identifiable from cuttings. The other twenty three horizons bear a number and a lower case letter to show their lower level of confidence and their usual stratigraphic location. For example, horizons 7a, 7b, 7c and 7d occur from youngest to oldest, between major horizons 7 and 8, but are less reliable and therefore may crosscut the major horizons. They comprise mostly oldest occurrences in cuttings or youngest occurrences of rare species. The relationship of the two schemes are shown in figure 1 and the discussions herein is within the existing zonal framework.

The second major disadvantage to extensive cuttings study is that heavy caving can obscure subtle events due to dilution. Inspection of a caliper log can indicate the extent of caving, but even small quantities of a richly fossiliferous rock can obscure subtle horizons in a sparsely fossiliferous rock beneath. In Mussel-1, heavy caving of the dinoflagellate rich Campanian and Santonian occurs into the dinoflagellate poor Cenomanian. Caving of this sort will clearly distort statistical counts. In Mussel-1, high dinoflagellate contents in the Cenomanian are plainly caved, so identification of marine maxima and maximum flooding surfaces must be tempered with caution.

The best of both alternatives can be achieved by a mix of swcs and cuttings. Downhole monitoring can be readily achieved by 50 to 100m cuttings, followed up by extensive swc suites to close sampling gaps to around 30m.

Detailed correlation is possible using the data herein and is the subject of a separate report. Raw data are presented in Appendix I.

III PALYNOSTRATIGRAPHY

A 1245m(swc) - 1265m(swc) : indeterminate

These swcs are almost barren and lack age diagnostic taxa.

B 1265m(Esso cuttings) - 1283m(swc) : upper diversus Zone

Assignment to the upper Malvacipollis diversus Zone of Early Eocene age is indicated by oldest Proteacidites pachypolus without younger indicators. The Esso cuttings could not be re-examined : the microscope slides are not available, but the assemblages are consistent with the one examined here (1283m). The swc at the base is dominated by Halorogacidites harrisii with common Podosporites microsaccatus and Malvacipollis diversus. Other age significant pollen include Anacolosidites acutullus and Polycolpites esobalteus. Amongst the dinoflagellates are common Homotriblium tasmaniense, confirming the spore-pollen assignment.

Intermediate marine environments are indicated by the dinoflagellate content (24%) but their low diversity might favour a more nearshore situation.

C 1289m(new cutts) : balmei Zone

Assignment to the Lygistepollenites balmei Zone of Paleocene age is indicated by the presence of L. balmei in an extremely lean almost barren assemblage. Only about 20 palynomorphs were seen with Proteacidites spp the most common. Rare dinoflagellates were seen but are not age diagnostic and could be caved. They are much less frequent than the spore pollen and suggest nearshore environments.

D 1315m(swc)-1360m(swc) : longus Zone (druggii dino Zone)

Assignment to the Tricolpites longus Zone of Maastrichtian age is indicated at the top by youngest T. longus, Tricolpites confessus, Tricolpites waipawaensis, Tricolporites lillei, without younger indicators (horizon 1). Overall, Proteacidites spp dominate with common to frequent G. rudata and subordinate rare to frequent N. endurus. The marker species for the upper longus Zone (Tripunctisporis punctatus) was not seen even in cavings, but the dominance of G. rudata over N. endurus indicates the upper part of the zone. Oldest common G. rudata at 1360m(swc) is horizon 1b. The cuttings sample at 1338m is extremely lean. At the base, oldest T. longus (horizon 2b) is diagnostic.

The dinoflagellates are also age diagnostic, and include Manumiella conorata, indicating the Manumiella druggii dinoflagellate zone and therefore the middle or upper point of the longus Zone. Oldest M. conorata is horizon 1c. Areoligera spp are abundant with rare Alterbia acutula and M. conorata. At 1360m(swc), M. conorata is the only common dinoflagellate.

Environments appear to deepen in time from nearshore to marginal marine at the base (6% microplankton at 1360m) to offshore to intermediate marine at the top (42% microplankton at 1315m = potential maximum flooding surface).

E 1385m(swc) - 1479m(swc) : lillei Zone (korojonense dino Zone 1419-1479m)

Assignment to the Tricolporites lillei Zone of Campanian age is indicated at the top by the absence of younger indicators, but confirmed by dinoflagellate data, and at the base by oldest T. lillei (horizon 3b). Within the interval, Proteacidites spp are consistently dominant (20-40%) with Cyathidites and Nothofagidites spp (6-17%) frequent to common. Within the interval, youngest Tricolpites sabulosus (horizon 2a) occurs at 1419m(swc) and oldest Triporopollenites sectilis occurs at 1419m(swc) (horizon 3a). Tricolporites apoxyexinus is fairly consistent.

Amongst the dinoflagellates, youngest Chatangiella spp (1385m swc) youngest Isabelidinium pellucidum (horizon 2), I. korojonense (horizon 3) and Odontochitina spp (1419m swc), youngest Isabelidinium cretaceum (1443m swc) (horizon 3) and oldest I. pellucidum (horizon 3c at 1479m new cutts) are all useful. Youngest I. korojonense at the top (horizon 3) and oldest I. pellucidum at the base (horizon 3c) without older markers, indicates the Isabelidinium korojonense dinoflagellate zone. Dinoflagellate contents are low, with Isabelidinium spp the most frequent.

Environments are nearshore to marginal marine with dinoflagellate content mostly 3-5% and diversity low. No obvious shallowing or deepening trend is visible.

F 1550m(swc) - 1847m(swc) : upper-middle senectus Zone (upper australis Zone 1550-1652m, lower australis Zone 1701-1801m, aceras Zone 1801-1966m cutts)

Assignment to the upper part of the Nothofagidites senectus Zone of Campanian age is indicated at the top by the absence of younger indicators and confirmed by horizon 4 (youngest Xenikoon australis, here supported by youngest Xenascus ceratoides). Odontochinina spp are very rare above this point, and youngest Anthosphaeridium wisemaniae occurs here in some wells. The base of the interval is defined by oldest Tricolpites sabulosus (horizon 7e) taken on its base in swcs at 1847m although it caves much deeper. This pick may be slightly too high, as oldest G. rudata (horizon 7a) occurs in the same swc (and caves only to 1902m). More reliable are the top horizons in these cuttings including the major horizons youngest Nelsoniella aceras and N. semireticulata (horizon 5 at 1701m cutts), youngest common X. australis (horizon 6 at 1701m cutts), youngest Nelsoniella tuberculata (horizon 7 at 1801m cutts) and the minor horizons youngest Areosphaeridium suggestium (horizon 4a at 1652m cutts) and oldest X. australis in swcs (horizon 7b at 1847m swc).

The dinoflagellates enable recognition of the upper australis Zone (interval from youngest X. australis to sample above youngest N. semireticulata), lower australis Zone (interval from youngest N. semireticulata to sample above youngest Nelsoniella tuberculata, the latter known to be close to, but slightly above, oldest X. australis) and the aceras Zone (interval from youngest N. tuberculata to sample above youngest Isabelidinium belfastense).

Within the interval, Proteacidites spp generally dominate with frequent to common N. endurus and Cyathidites. Towards the base however (1801-1847m), Nothofagidites become minor with Falcisporites, Cyathidites and Proteacidites all common. Amongst the subordinate dinoflagellates, X. australis is the most common form especially at its acme at 1701m and caved beneath.

Environments are variable, from marginal marine to intermediate marine with dinoflagellate content variable from 1% with low diversity to 34% with moderate diversity. Many samples are cuttings however, so may be altered by caving. Dinoflagellate maxima occur at 1801m and 1701m and may be close beneath maximum flooding surfaces while minima occur at 1847m, 1757m and 1550m and may be close beneath sequence boundaries. Dinoflagellate content grades between these points, suggesting two full transgression/regression cycles.

G ?1850m(cutts)-1966m(cutts) : lower senectus Zone (aceras Zone 1801-1966m)

Assignment to the lower part of the N. senectus Zone of Campanian age is indicated at the top by the absence of younger indicators "in place" and at the base by oldest in place N. senectus (horizon 9a at 1966m cutts) confirmed by the dinoflagellates beneath. The zone top may therefore be picked slightly too high, if some specimens considered caved are actually in place. Within the interval, G. rudata and T. sabulosus occur but are considered caved. Reliable datums include youngest Odontochitina obesa (horizon 7d at 1932m cutts), and youngest common Heterosphaeridium spp (>10%) and youngest Trithyrodinium cf suspectum (horizon 8 at 1966m cutts), oldest consistent N. senectus in cuttings (horizon 9a at 1902m) and oldest Nelsoniella tuberculata (horizon 7c at 1932m in cutts).

Within the interval based entirely on cuttings, the dominant spore pollen include common Proteacidites, Falcisporites and Cyathidites. The subordinate dinoflagellates include frequent X. australis presumed caved and consistent Heterosphaeridium (around 5%). Rare but consistent are Odontochitina spp, Nelsoniella spp, I. cretaceum and Eucladinium madurense, all considered in place.

Environments are intermediate marine to nearshore (14% to 22%) but these are all cuttings and no obvious trend is visible. In the sample below (1999m) a dinoflagellate maximum occurs and in the sample above (1847m) a dinoflagellate minimum occurs. The section assigned here may therefore represent a regressive period.

H 1999m(cutts) - 2030m(cutts) : upper apoxyexinus Zone (cretacea dino Zone 1999-2030m)

Assignment to the upper Tricolporites apoxyexinus Zone (= T. pachyexinus Zone of previous usage) of Santonian age is indicated at the top by the absence of N. senectus above, confirmed by youngest Isabelidinium belfastense and I. victoriensis (horizon 10 at 1999m). At the base, oldest rare Amosopollis cruciformus (1% or less) is diagnostic. Within the interval, youngest abundant Heterosphaeridium (20% or more) occurs (horizon 9 at 1999m) but is probably caved slightly, as it usually occurs above horizon 10. Horizon 9 therefore probably occurs somewhere in the sample gap 1966m to 1999m. Other useful events include oldest N. aceras possibly in place (horizon 9b at 1999m although it may be slightly caved in these cuttings) and oldest I. cretacea (horizon 11b in cuttings at 1999m, absent from all swcs beneath) and oldest I. belfastense (horizon 11a in cuttings at 1999m, absent from all swcs beneath) and oldest common Heterosphaeridium (20%+ = horizon 10a in swc at 2030m). Clearly section is severely condensed or absent near this point, as many horizons converge. Notably Appendicisporites distocarinatus has a isolated occurrence at 2030m, perhaps correlable with a similar one in Triton-1 at 2975m. Oldest Tricolpites gillii at 2030m (swc) is consistent with a mid apoxyexinus Zone or younger.

Within the interval, Cyathidites, Gleicheniidites, and Microcachryidites are frequent, with Proteacidites relatively minor from this point down. Amongst the subordinate dinoflagellates, Heterosphaeridium dominate.

Environments are apparently intermediate to offshore marine, with 44% dinoflagellates at 1999m (although diversity may be enhanced by caving) and 33% at 2030m (with low diversity in this swc). Clearly a marine maximum occurs at or slightly above 1999m and represents a major correlable maximum flooding surface near base aceras or top cretacea dinoflagellate zones.

I 2051m(cutts) : lower apoxyexinus Zone (?porifera dino Zone)

Assignment to the lower T. apoxyexinus Zone of Santonian age is indicated at top and base by common A. cruciformis (top 10%+ = horizon 12 at 2051m), base 10%+ = horizon 12a at 2051m). The middle T. apoxyexinus Zone is characterised by having A. cruciformis, comprising 1 to 5% of the assemblage but is not identified here either due to condensation or hiatus. Odontochitina porifera occurs here but so do many other caved taxa and so it is not possible to place oldest O. porifera (horizons 12b) with any confidence.

In the assemblage, A. cruciformis is dominant (15%) with Falcisporites common. Of the subordinate dinoflagellates, Heterosphaeridium dominate but the assemblage is clearly largely caved.

Environment appears to be offshore marine (37% dinoflagellates) but this may be largely caved.

J 2076m(cutts) : indeterminate

This sample contains too few A. cruciformis to be included in lower apoxyexinus yet lacks A. distocarinatus seen below which characterised the mawsonii Zone. The dinoflagellates indicate that caving is very heavy and so the sample is considered unreliable. It may belong to the topmost P. mawsonii

Zone above youngest A. distocarinatus. Dinoflagellates include markers for all the overlying zones and are dominated by Heterospshaeridium. They are considered caved and unreliable.

K 2100m(core) - 2243m or ?deeper : mawsonii Zone

Assignment to the Phyllocladidites mawsonii Zone (equivalent to the Clavifera triplex Zone of previous usage) of Coniacian-Turonian age is indicated at the top by the absence of younger indicators and youngest Appendicisporites distocarinatus (horizon 12c at 2100m core). At the base, oldest P. mawsonii in swc (horizon 15a at 2243m) is diagnostic. Within the zone, youngest consistent A. distocarinatus (horizon 13 at 2185m cutts youngest Cribroperidinium edwardsii (horizon 14 at 2236m core) and youngest frequent C. edwardsii (horizon 15 at 2240m swc) all occur. A downhole influx of angiosperms including Liliacidites kaitangataensis and Senectotetradites fistulosus and S. varireticulatus occur at 2238m in core, but cannot be seen in the cuttings below. Their correlative value is doubtful in cuttings. Other horizons that may prove useful in the future include youngest common Dilwynites granulatus (10%+ at 2170m and below), youngest consistent Cyclonephelium compactum (2185m cutts) and oldest common D. granulatus (10%+ at 2240m and above in swc).

Within the interval, Cyathidites, Falcisporites, Gleicheniidites and M. antarcticus are intermittently common. In addition, D. granulatus is common (10%+) in the interval 2170 to 2240m cuttings and Laevigatosphorites ovatus is very common at 2236 to 2238m in core. Dinoflagellates are rare in most samples and heavily caved in most cuttings. Amongst the taxa in place, C. edwardsii, Odontochitina operculata and Circulodinium deflandrei are the most common.

Environments appear to be nearshore to marginal marine but the cuttings assemblages are clearly unreliable with common caving from strongly marine section above. Amongst the cores and swcs, a marine maximum at 2240m swc (19% dinoflagellates) may indicate a maximum flooding surface while most of the other core and swc samples have dinoflagellate contents of 5% or less.

L 2254m(swc) - 2441m(cutts) : apparently distocarinatus Zone

Assignment to the A. distocarinatus Zone of Cenomanian age is indicated at the top by the absence of younger indicators and at the base by the absence of older indicators. Clearly it is not well dated. Infact, P. mawsonii is absent only from one swc (2254m) and is present (presumed caved) in most of the picked cuttings beneath. Clearly the cuttings are not clean and most of the Campanian and Santonian marker species are seen. However, the proximity to top common C. edwardsii (horizon 15 at 2240m) is consistent with a top distocarinatus Zone near here. At the base, none of the Eumeralla markers were seen, especially the gross shift of the assemblage from wind blown saccate pollen dominance with dinoflagellates of the Sherbrook group, to the fluvial borne spore dominance without dinoflagellates of the Eumeralla Formation. In the absence of any older indications, the section is presumed distocarinatus Zone to the base. Within the interval, oldest common C. edwardsii (horizon 15b at 2320m) occurs.

Assemblages are dominated by common to abundant Falcisporites similis with common Cyathidites throughout and common to abundant M. antarcticus at the top (2243-2320m). Minor Permian reworking was seen. The dinoflagellates are mostly caved from the Santonian and

Campanian but in situ taxa include C. edwardsii and O. operculata.

Environments are probably all nearshore to marginal marine as in situ dinoflagellate content is 10% or less with low to moderate diversity.

IV CONCLUSIONS

A This new study using extensive new cuttings sampling has vastly improved resolution and confidence in this section providing for tighter correlation.

B It has also produced a new cuttings based biostratigraphy for the area which can be used for fast turnaround downhole palynological monitoring to aid engineering and drilling decisions particulcarly concerning prediction ahead of the bit for casing points and early TD.

C It has produced statistically valid quantitative data to identify likely maximum flooding surfaces and lowstand deposits, therefore facilitating sequence stratigraphic analysis. Although it is clearly interpretative, likely major sequence boundaries might be 68my at 1297m, 71my at 1373m, 75my at 1407m, 80my at 1482m, 85my at 2008m, 87.5my at 2064m and 90my at 2232m. Maximum flooding surfaces might be 69.5my at 1315m, 73.5my at 1385m, 79.5my at 1479m, 83.75my at 1988m, 86my at 2033m and 89my at 2212m.

D Deposition below 2100m is slow, contains significant sands, and shows extreme condensation in parts, especially the apoxyexinus Zone. Above this point, deposition is faster with almost solid shale, and with thicknesses very similar to nearby wells. This change is at the base of the senectus Zone and may be related to the events associated with Tasman Sea rifting described by Lowry and Longley (1991).

V REFERENCES

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Sample	45 CHATANGIELLA TRIPARTITA	46 ODONTOCHITINA SOLIDA	47 OLIGOSPHAERIDIUM COMPLEX	48 APTEODINIUM GRANULATUM	49 EUCLADINIUM MADURENSE	50 NELSONIELLA ACERAS	51 NELSONIELLA SEMIRETICULATA	52 ODONTOCHITINA PORIFERA	53 SENONIASPHAERA LORDII	54 XIPHOPHORIDIUM ALATUM	55 CANNINGIA GIANT	56 CHATANGIELLA SP	57 MADURADINIUM PENTAGONUM	58 NELSONIELLA PSILATA	59 ANTHOSPHAERIDIUM BULLATUM	60 CADDASPHAERA HALOSA	61 ODONTOCHITINA OPERCULATA	62 COMPOSITOSPHAERIDIUM PARACOSTATUM	63 HESLERTONIA SP	64 HETEROSPHAERIDIUM HETEROCANTHUM	65 COMETOSPHAERIDIUM WHITEI	66 HETEROSPHAERIDIUM PENTAGONUM
1245 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1265 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1283 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1289 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1315 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1338 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1360 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1385 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1419 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1443 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1466 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1479 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1550 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1600 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1652 CUTTS	X	X	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1701 CUTTS	.	.	.	X	1	X	X	X	2	1	.	.	.	.	.	.	.	.	.	.	.	.
1707 SWC	.	.	.	.	.	4	X	1	.	.	X	X	X	5	.	.	.	.	.	.	.	.
1753 CUTTS	.	.	X	X	.	X	X	X	1	.	X	.	X	X	X	X	X	.	.	.	.	.
1757 SWC	.	.	.	.	.	1	.	.	.	.	.	.	X	.	.	.	.	X	X	1	.	.
1801 SWC	.	.	.	.	X	1	.	1	.	.	F	.	1	.	.	.	1	.	.	2	X	X
1801 CUTTS	.	.	.	.	.	X	X	1	.	.	3	.	X	.	.	.	.	.	.	3	.	.
1847 SWC	.	.	.	.	X	X	.	.	.	.	.	.	X	.	.	.	X	.	.	2	.	X
1850 CUTTS	.	.	.	.	X	X	.	X	.	.	.	.	.	.	.	.	.	.	.	3	.	.
1902 CUTTS	.	.	.	.	X	X	.	X	X	X	X	.	X	X	.	.	.	.	.	5	.	.
1932 CUTTS	.	.	.	.	X	X	.	X	.	.	X	.	.	1	.	.	X	.	.	5	.	.
1966 CUTTS	.	.	.	.	X	X	.	2	.	.	X	.	.	.	.	.	.	.	.	4	.	.
1999 CUTTS	.	.	X	.	2	X	.	X	.	.	X	.	2	.	.	.	1	.	.	11	.	.
2030 SWC	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	20	.	.
2051 CUTTS	.	.	X	.	.	1	.	X	.	.	.	.	.	.	.	.	1	.	.	18	.	.
2076 CUTTS	X	.	.	.	X	1	X	X	.	.	1	.	.	.	.	.	5	.	.	10	.	.
2100 CORE	X	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.
2115 CUTTS	.	.	X	.	.	.	X	X	.	.	.	.	.	.	.	.	1	.	.	2	.	.
2149 CUTTS	.	.	1	.	X	2	.	X	.	.	X	.	X	.	.	.	2	X	.	4	.	.
2170 CUTTS	X	.	.	.	.	.	X	X	.	.	.	.	X	X	.	.	1	.	.	4	.	.
2185 CUTTS	.	.	1	.	X	.	X	.	.	.	.	.	1	.	.	.	X	.	.	5	.	.
2207 CUTTS	.	.	.	.	.	1	.	5	.	1	.	.	.	1	.	.	.	.	.	13	.	.
2236 CORE	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.
2238 CORE	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.
2240 SWC	.	.	1	X	.	.	.	.	.	.	.	.	.	.	.	.	6	.	.	.	.	.
2243 SWC	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.
2254 SWC	.	.	X	X	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.
2320 CUTTS	.	.	X	.	.	1	X	.	.	.	.	.	.	.	.	.	2	.	.	4	.	.
2338 CUTTS	.	.	X	.	.	1	.	X	.	.	.	.	.	.	.	.	X	.	.	4	.	.
2380 CUTTS	.	.	1	.	.	1	X	X	.	.	1	.	1	X	.	.	2	.	.	2	.	.
2414 CUTTS	.	.	.	1	.	2	X	.	.	.	.	.	.	.	.	.	.	.	.	3	.	.
2441 CUTTS	1	.	X	.	.	X	.	X	.	.	X	.	X	.	.	.	X	.	.	10	.	.

Depth	Type	89 MILLIOUDODINIUM SP	90 SENONIASPHAERA ABSCONDITA	91 TRITHYRODINIUM CF SUSPECTUM	92 CHATANGIELLA VICTORIENSIS	93 CIRCULODINIUM DEFLANDREI	94 ISABELIDINIUM BELFASTENSE	95 ISABELIDINIUM ELONGATA	96 ISABELIDINIUM GLABRUM	97 ISABELIDINIUM LATUM	98 ISABELIDINIUM SP	99 TRITHYRODINIUM THICK PSILATE	100 TRITHYRODINIUM THICK VERRUCATE	101 DINOPTERYGIUM MEDUSOIDES	102 ODONTOCHITINA COSTATA	103 CANNINGIA RETICULATA	104 VERYHACHINM	105 CYCLONEPHELIUM COMPACTUM	106 AMPHIDIADEMA DENTICULATA	107 ASCODINIUM ACROPHORUM	108 ASCODINIUM PARVUM	109 FROMEA FRAGILIS	110 KIOKANSIUM RECURATUM
1245	SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1265	SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1283	SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1289	CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1315	SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1338	CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1360	SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1385	SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1419	SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1443	SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1466	CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1479	CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1550	SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1600	CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1652	CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1701	CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1707	SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1753	CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1757	SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1801	SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1801	CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1847	SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1850	CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1902	CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1932	CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1966	CUTTS	1	X	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1999	CUTTS	X	.	1	X	2	3	X	?	?	1	X	2	.	.	.	.	.	.	.	.	.	.
2030	SWC	.	.	.	.	3	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.
2051	CUTTS	X	.	X	?	4	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.
2076	CUTTS	.	.	1	.	X	X	.	.	.	.	.	.	.	1	X	1	.	.	.	.	.	.
2100	CORE	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.
2115	CUTTS	1	.	.	.	1	.	.	.	X	.	X	.	.	.	.	.	.	X	?	?	1	1
2149	CUTTS	.	.	2	.	1	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.
2170	CUTTS	.	.	X	.	.	X	.	.	.	X	1	.	.	X	.	.	.	X	.	.	.	.
2185	CUTTS	.	.	X	X	.	.	.	.	.	.	X	.	.	1	.	.	1	.	.	.	.	.
2207	CUTTS	.	.	1	.	1	4	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2236	CORE	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.
2238	CORE	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2240	SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.
2243	SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5	.	.	.	.	.
2254	SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.	.	.	.	.
2320	CUTTS	.	.	X	.	1	.	.	.	.	.	.	.	.	.	.	.	X	.	1	.	.	.
2338	CUTTS	.	.	X	.	1	.	.	.	.	.	.	1	.	X	.	.	.	.	.	.	.	.
2380	CUTTS	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.
2414	CUTTS	.	.	.	.	1	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.
2441	CUTTS	.	.	7	.	.	.	.	.	.	.	3	.	.	X	.	.	1	.	.	.	.	.

	111 ODONTOCHITINA PROTOPORIFERA	112 DICONODINIUM PELLIFERUM	113 GILLINIA HYMENOPHORA	114 SENONIASPHAERA MAGNIOR	115 ODONTOCHITINA NUDA	116 SENEGALINIUM MACROCYSTUM	117 AMPHIDIADEMA NUCULA	118 CHATANGIELLA MICROCANTHA	119 CYMATIOSPHAERA	120 MICRODINIUM VELIGERUM	121 TRITHYRODINIUM THIN PSILATE	122 CRIBROPERIDINIUM EDWARDSII	123 CHLAMYDOPHORELLA NYEI	124 CLEISTOSPHAERIDIUM CF POLYPES	125 CYCLONEPHELIUM MEMBRANIPHORUM	126 FLORENTINIA STELLATA	127 OLIGOSPHAERIDIUM DIASTEMA	128 DINOPTERYGIUM CLADOIDES	129 PALAEOPERIDINIUM CRETACEUM	130 SCHIZOSPORIS PSILATUS	131 ISABELIDINIUM RETANGULARE	132 TRITHYRODINIUM THICK SMOOTH
1245 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1265 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1283 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1289 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1315 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1338 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1360 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1385 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1419 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1443 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1466 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1479 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1550 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1600 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1652 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1701 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1707 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1753 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1757 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1801 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1801 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1847 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1850 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1902 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1932 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1966 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1999 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2030 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2051 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2076 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2100 CORE	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2115 CUTTS	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2149 CUTTS	.	X	1	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2170 CUTTS	X	.	.	.	X	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2185 CUTTS	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2207 CUTTS	.	.	.	.	.	.	.	1	1	X	X	.	.	.	.	.	.	.	.	.	.	.
2236 CORE	.	.	.	.	.	.	.	.	1	.	.	X	.	.	.	.	.	.	.	.	.	.
2238 CORE	.	.	.	.	.	.	.	.	X	.	.	2	X	.	.	.	.	.	.	.	.	.
2240 SWC	.	.	.	.	.	.	.	.	.	.	.	7	1	2	?	X	X	.	.	.	.	.
2243 SWC	.	.	.	.	.	.	.	.	.	.	.	6	.	X	.	.	.	?	X	X	.	.
2254 SWC	.	.	.	.	.	.	.	.	.	.	.	2	1	.	.	.	.	.	.	.	.	.
2320 CUTTS	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	X	.	X	X
2338 CUTTS	.	.	.	.	.	.	.	.	.	.	.	R	.	.	.	.	.	.	.	.	.	.
2380 CUTTS	.	.	.	.	.	.	.	.	.	X	.	1	X	.	.	.	.	.	.	.	.	.
2414 CUTTS	.	.	.	.	.	.	.	.	.	.	.	1	1	.	X	.	.	.	.	.	.	X
2441 CUTTS	.	.	.	.	.	.	.	.	.	.	1	X	.	.	.	.	.	.	.	.	.	.

		HYSTRI 133	ISABEL 134	DICONO 135	DINOGY 136	ODONTO 137	DILWYN 138	FALCIS 139	ANACOL 140	CYATHI 141	DACRYC 142	ERICIP 143	HALORA 144	LAEVIG 145	LYGIST 146	MALVAC 147	MALVAC 148	MICROC 149	MYRTAC 150	NOTHOF 151	PERIPC 152	PODOSF 153	POLYCC 154
1245	SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1265	SWC	.	.	.	.	.	2	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1283	SWC	.	.	.	.	.	5	.	1	5	1	1	24	2	2	2	11	X	2	1	X	1	2
1289	CUTTS	.	.	.	.	.	2	2	.	.	.	1	.	.	.	.	.	.	.	.	.	1	.
1315	SWC	.	.	.	.	.	2	1	.	.	.	.	.	.	X	.	.	1	.	.	1	3	.
1338	CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1360	SWC	.	.	.	.	.	2	5	.	.	.	X	.	.	.	.	.	2	.	.	1	3	.
1385	SWC	.	.	.	.	.	5	10	.	.	.	1	.	.	1	.	.	7	.	.	1	6	.
1419	SWC	.	.	.	.	.	3	7	.	.	X	1	.	.	1	.	.	6	.	.	3	1	.
1443	SWC	.	.	.	.	.	2	6	.	.	X	.	.	.	.	.	.	3	.	.	X	3	.
1466	CUTTS	.	.	.	.	.	.	2	.	.	1	.	.	.	1	.	.	3	.	.	X	3	.
1479	CUTTS	.	.	.	.	.	4	10	.	.	1	X	.	.	1	.	.	1	.	.	2	1	.
1550	SWC	.	.	.	.	.	1	6	.	.	.	X	.	.	X	.	.	X	.	.	1	X	.
1600	CUTTS	.	.	.	.	.	4	8	.	.	.	.	.	.	X	.	.	2	.	.	.	.	.
1652	CUTTS	.	.	.	.	.	8	11	.	.	.	.	.	.	.	.	.	6	.	.	1	2	.
1701	CUTTS	.	.	.	.	.	7	2	.	.	.	.	.	.	.	.	.	5	.	.	.	3	.
1707	SWC	.	.	.	.	.	7	8	.	.	.	.	.	.	.	.	.	1	.	.	.	8	.
1753	CUTTS	.	.	.	.	.	7	8	.	.	.	.	.	.	.	.	.	2	.	.	.	4	.
1757	SWC	.	.	.	.	.	5	7	.	.	.	.	.	.	.	.	.	4	.	.	.	.	.
1801	SWC	.	.	.	.	.	6	11	.	.	.	.	.	.	.	.	.	7	.	.	X	3	.
1801	CUTTS	.	.	.	.	.	2	15	.	.	.	.	.	.	1	.	.	3	.	.	1	.	.
1847	SWC	.	.	.	.	.	5	18	.	.	.	.	.	.	.	.	.	6	.	.	.	4	.
1850	CUTTS	.	.	.	.	.	3	10	.	.	.	.	.	.	.	.	.	10	.	.	1	2	.
1902	CUTTS	.	.	.	.	.	8	11	.	.	.	.	.	.	1	.	.	3	.	.	.	2	.
1932	CUTTS	.	.	.	.	.	6	9	.	.	.	.	.	.	.	.	.	7	.	.	.	2	.
1966	CUTTS	.	.	.	.	.	6	8	.	.	.	.	.	.	.	.	.	9	.	.	.	1	.
1999	CUTTS	.	.	.	.	.	6	6	.	.	.	.	.	.	.	.	.	6	.	.	.	1	.
2030	SWC	.	.	.	.	.	1	7	.	.	.	.	.	.	.	.	.	8	.	.	.	2	.
2051	CUTTS	.	.	.	.	.	7	12	.	.	.	.	.	.	.	.	.	6	.	.	.	2	.
2076	CUTTS	.	.	.	.	.	5	11	.	.	.	.	.	.	.	.	.	5	.	.	.	1	.
2100	CORE	.	.	.	.	.	3	11	.	.	.	.	.	.	.	.	.	12	.	.	.	3	.
2115	CUTTS	.	.	.	.	.	6	12	.	.	.	.	.	.	.	.	.	4	.	.	.	4	.
2149	CUTTS	.	.	.	.	.	6	2	.	.	.	.	.	.	.	.	.	7	.	.	.	2	.
2170	CUTTS	.	.	.	.	.	10	8	.	.	.	.	.	.	.	.	.	10	.	.	.	2	.
2185	CUTTS	.	.	.	.	.	10	8	.	.	.	.	.	.	.	.	.	5	.	.	.	3	.
2207	CUTTS	.	.	.	.	.	8	6	.	.	.	.	.	.	1	.	.	4	.	.	.	1	.
2236	CORE	.	.	.	.	.	.	13	.	.	.	.	.	X	.	.	.	14	.	.	.	2	.
2238	CORE	.	.	.	.	.	13	3	.	.	.	.	.	.	.	.	.	7	.	.	.	.	.
2240	SWC	.	.	.	.	.	9	7	.	.	.	.	.	1	.	.	.	6	.	.	.	5	.
2243	SWC	.	.	.	.	.	.	10	.	.	.	.	.	.	.	.	.	21	.	.	.	5	.
2254	SWC	.	.	.	.	.	2	13	.	.	.	.	.	.	.	.	.	22	.	.	.	5	.
2320	CUTTS	.	.	.	.	.	X	20	.	.	.	.	.	1	.	.	.	11	.	.	.	.	.
2338	CUTTS	X	X	.	.	.	9	19	.	.	.	.	.	1	.	.	.	6	.	.	.	5	.
2380	CUTTS	.	.	X	X	.	4	11	.	.	.	.	.	.	1	.	.	4	.	.	.	.	.
2414	CUTTS	.	.	.	.	.	2	22	.	.	.	.	.	1	.	.	.	4	.	.	.	2	.
2441	CUTTS	.	.	.	.	1	3	12	.	.	.	.	.	.	2	.	.	6	.	.	.	.	.

		PROTEA	PROTEA	PROTEA	RETITR	CYATHI	CYATHI	CYCADO	GLEICH	LYGIST	ARAUCA	CAMERO	CERATO	COROLL	ERICIP	FALCIS	GAMBIE	LILIAC	NOTHOF	OSMUDA	PHYLLO	STEREI	STEREI
		155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176
1245	SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1265	SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1283	SWC	X	2	12	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1289	CUTTS	.	.	10	1	1	1	2	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.
1315	SWC	.	.	18	1	1	3	1	.	1	X	1	1	X	X	X	8	1	3	1	4	1	1
1338	CUTTS	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.
1360	SWC	.	.	22	7	1	1	1	4	1	.	.	.	.	.	.	15	.	12	1	6	2	X
1385	SWC	.	.	26	.	1	7	.	1	1	1	.	.	1	.	.	X	.	2	1	4	2	.
1419	SWC	.	.	24	3	4	9	X	X	4	2	X	X	X	.	X	.	.	4	.	4	2	.
1443	SWC	.	.	16	2	2	6	.	1	4	2	X	1	X	.	X	3	.	10	2	9	4	.
1466	CUTTS	.	.	37	1	6	8	.	1	.	1	1	3	X	.	X	3	.	6	3	2	5	.
1479	CUTTS	.	.	30	2	1	2	X	3	X	X	1	.	X	X	X	4	.	6	.	3	6	1
1550	SWC	.	.	.	X	4	4	X	2	?	2	X	4	1	.	X	X	.	12	1	5	1	X
1600	CUTTS	.	.	15	3	3	14	1	2	1	5	1	3	1	.	.	1	.	3	2	8	5	.
1652	CUTTS	.	.	15	6	1	8	2	1	X	5	1	.	.	.	X	X	.	11	4	7	1	.
1701	CUTTS	.	.	14	2	1	7	.	3	.	3	2	2	X	.	.	1	.	6	1	2	.	.
1707	SWC	.	.	11	X	X	7	X	4	1	2	2	2	X	.	X	.	.	3	X	8	1	.
1753	CUTTS	.	.	14	4	2	6	.	1	X	5	3	2	1	.	X	.	.	11	1	8	X	.
1757	SWC	.	.	.	X	3	11	X	1	.	1	.	4	1	.	1	X	.	10	1	5	5	.
1801	SWC	.	.	.	1	7	7	2	4	.	2	1	1	1	.	1	X	.	.	2	5	2	.
1801	CUTTS	.	.	16	2	4	9	.	3	.	2	X	.	.	.	.	X	.	2	4	9	1	.
1847	SWC	.	.	.	1	5	10	2	5	.	3	1	X	X	.	X	X	.	.	2	7	3	.
1850	CUTTS	.	.	9	2	4	7	1	1	.	8	X	4	X	.	.	X	.	.	1	7	6	.
1902	CUTTS	.	.	15	.	3	1	.	3	.	2	3	.	.	.	.	2	.	2	1	5	5	.
1932	CUTTS	.	.	11	X	5	8	1	9	.	3	X	.	.	.	.	.	.	.	3	5	5	.
1966	CUTTS	.	.	14	6	2	8	4	4	.	3	?	.	.	.	.	.	.	2	.	2	3	.
1999	CUTTS	.	.	5	3	6	6	1	7	.	3	.	.	.	.	1	.	.	.	2	X	1	.
2030	SWC	.	.	2	1	3	9	1	6	.	3	.	X	2	.	X	.	.	.	4	.	4	.
2051	CUTTS	.	.	4	.	1	6	1	1	.	2	.	X	X	.	.	.	.	1	2	2	1	.
2076	CUTTS	.	.	5	3	1	5	.	4	.	.	X	1	.	.	.	.	X	3	4	7	3	.
2100	CORE	.	.	.	.	12	15	1	8	.	4	.	X	X	.	1	.	.	X	4	X	4	.
2115	CUTTS	.	.	3	4	7	9	4	4	.	5	.	1	.	.	.	.	.	1	.	5	1	.
2149	CUTTS	.	.	13	1	4	10	.	9	.	2	X	3	.	.	.	2	.	1	3	5	.	.
2170	CUTTS	.	.	8	.	2	6	.	9	.	2	.	1	1	.	.	.	.	3	.	4	1	.
2185	CUTTS	.	.	10	3	5	12	.	2	.	6	1	3	X	.	.	.	.	1	1	3	1	.
2207	CUTTS	.	.	1	1	2	7	.	6	.	4	.	.	.	.	.	.	.	.	1	1	1	.
2236	CORE	.	.	X	3	4	15	1	6	.	15	.	.	.	.	.	.	.	.	2	X	.	.
2238	CORE	.	.	.	2	6	24	.	5	.	3	.	.	X	.	1	.	.	.	2	.	1	.
2240	SWC	.	.	.	.	5	20	1	4	.	3	.	3	2	.	.	.	.	.	3	.	2	.
2243	SWC	.	.	.	1	4	27	1	5	.	X	.	.	X	.	1	.	.	.	3	X	8	.
2254	SWC	.	.	.	X	X	21	3	8	.	2	.	1	.	.	.	.	.	.	2	.	3	.
2320	CUTTS	.	.	3	1	5	11	2	2	.	5	X	2	6	.	.	.	.	.	7	1	4	.
2338	CUTTS	.	.	7	6	1	10	.	5	.	2	1	1	.	.	X	.	.	2	3	2	2	.
2380	CUTTS	.	.	9	2	7	9	.	3	.	9	.	.	.	.	.	.	.	1	4	3	.	.
2414	CUTTS	.	.	X	5	4	14	2	2	.	12	.	2	2	.	X	.	.	.	5	1	5	.
2441	CUTTS	.	.	7	1	1	11	1	4	.	2	1	.	X	.	.	.	.	1	1	7	1	.

		TRICOLPITES CONFESSUS	TRICOLPITES LONGUS	TRICOLPITES WAIPARAENSIS	TRICOLPORITES LILLIEI	TRIPOROPOLLENITES SECTILIS	CAMEROZONOSPORITES	LAEVIGATOSPORITES OVATUS	NOTHOFAGIDITES SENECTUS	TRICOLPITES GILLII	TRICOLPORITES	TRICOLPORITES APOXYEXINUS	VITREISPORITES PALLIDUS	AUSTRALOPOLLIS OBSCURUS	GAMBIERINA EDWARDSII	CLAVIFERA TRIPLEX	CRYBELOSPORITES SP	KUYLISPORITES ZIPPERI	LEPTOLEPIDITES VERRUCATUS	ORNAMENTIFERA SENTOSA	PENTACOLPORITES PACHYEXINUS	PHIMOPOLLENITES PANNOSUS	PHYLLOCLADIDITES VERRUCOSUS
		177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198
1245	SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1265	SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1283	SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1289	CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1315	SWC	X	1	3	X	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1338	CUTTS	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1360	SWC	2	X	.	1	X	X	2	4	X	1	X	X	.	.	.	.	.	.	.	.	.	.
1385	SWC	4	.	.	.	X	.	5	1	1	.	.	.	1	X	.	.	.	.	.	.	.	.
1419	SWC	4	.	1	2	X	.	2	2	3	.	1	.	X	.	1	X	X	X	X	X	X	X
1443	SWC	1	.	.	.	.	.	X	7	2	1	X	1	.	.	X	.	.	.	.	.	4	.
1466	CUTTS	5	.	.	.	.	X	1	1	1	1	2	.	1	.	.	.	.	.	.	.	.	X
1479	CUTTS	3	.	X	X	.	.	.	9	1	X	X	.	X	.	1	.	.	.	.	.	.	.
1550	SWC	4	.	.	.	.	.	.	9	3	X	.	.	.	.	X	.	.	.	.	.	.	.
1600	CUTTS	1	.	.	.	.	.	.	3	1	X	.	.	.	.	1	.	.	.	.	.	.	.
1652	CUTTS	.	.	.	.	.	.	.	3	1	.	1	.	1	X	X	.	.	X	.	.	.	.
1701	CUTTS	.	.	.	.	.	.	1	3	1	.	.	.	1	.	X	.	.	.	.	.	.	.
1707	SWC	X	.	.	.	.	.	.	1	1	.	X	X	.	.	X	.	.	X	.	X	.	X
1753	CUTTS	.	.	.	.	.	.	.	4	.	.	.	.	.	X	1	.	.	.	.	.	.	1
1757	SWC	3	.	.	.	.	.	.	5	1	.	1	.	X	.	.	.	.	.	.	.	.	.
1801	SWC	2	?	.	X	X	.	2	.	1	.	.	1	.	.	1	.	.	X	.	.	.	.
1801	CUTTS	.	.	.	.	.	.	.	X	.	.	.	.	1	.	1	.	1	.	.	.	.	.
1847	SWC	X	.	.	.	.	X	.	.	1	.	.	.	X	.	1	.	.	.	1	.	1	.
1850	CUTTS	1	.	.	.	.	.	.	X	1	.	.	.	2	.	.	.	.	.	.	.	.	.
1902	CUTTS	.	.	.	.	.	.	2	3	.	.	.	.	.	.	1	.	.	.	.	.	.	.
1932	CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	X	.	2	.	.	.	.	.	.	.
1966	CUTTS	X	.	.	.	.	.	.	2	2	.	.	.	1	.	2	.	.	.	.	.	.	1
1999	CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	.	.	.	.	.	.	.
2030	SWC	.	.	.	.	.	X	.	.	X	.	.	.	X	.	1	.	.	.	.	.	.	.
2051	CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2076	CUTTS	.	.	.	.	.	.	.	.	1	.	.	.	X	.	2	.	.	.	X	.	.	1
2100	CORE	.	.	.	.	.	.	6	.	.	.	.	.	.	.	X	X	X	.	.	.	.	.
2115	CUTTS	1	.	.	.	.	.	.	.	.	.	?	.	.	.	X	.	.	.	.	.	.	.
2149	CUTTS	1	.	.	.	.	.	1	.	.	.	.	.	1	.	1	.	.	.	.	.	1	.
2170	CUTTS	.	.	.	.	.	.	3	1	1	.	X	.	X	.	4	.	.	.	X	.	.	1
2185	CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	1	.	X	.	.	.	1	.	1	.
2207	CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.
2236	CORE	.	.	.	.	.	.	20	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2238	CORE	.	.	.	.	.	.	17	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.
2240	SWC	.	.	.	.	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.
2243	SWC	.	.	.	.	.	.	.	.	.	.	.	.	?	.	.	.	.	.	.	.	.	.
2254	SWC	.	.	.	.	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2320	CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2338	CUTTS	.	.	.	.	.	.	.	.	.	.	1	.	.	.	1	.	.	1	.	.	X	.
2380	CUTTS	.	.	.	.	.	.	X	.	2	.	.	X	X	.	1	.	.	.	.	.	.	.
2414	CUTTS	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.
2441	CUTTS	.	.	.	.	.	.	5	2	.	.	.	.	.	.	1	.	.	.	.	.	.	.

	TETRACOLPORITES OAMARUENSIS	TRICOLPITES SABULOSUS	CINGUTRILETES CLAVUS	COPTOSPORA PARADOXA	GEPHRAPOLLENITES WAHOOENSIS	ISCHYOSPORITES PUNCTATUS	LEPTOLEPIDITES MAJOR	LILIACIDITES	PROTEACIDITES LARGE	PROTEACIDITES LARGE RETICULATUS	RETITRILETES FACETUS	TETRACOLPORITES VERRUCOSUS	TRICOLPITES SP	CICATRICOSISPORITES LUDBROOKIAE	AMOSOPOLLIS CRUCIFORMIS	CALLIALASPORITES DAMPIERI	CICATRICOSISPORITES AUSTRALIENSIS	DENSOISPORITES VELATUS	LYCOPODIACIDITES ASPERATUS	SESTROSPORITES PSEUDOALVEOLATUS	TRICOLPORITES RETICULATUS	KLUKISPORITES SCABERIS
	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220
1245 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1265 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1283 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1289 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1315 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1338 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1360 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1385 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1419 SWC	X	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1443 SWC	.	X	X	X	X	X	X	X	2	X	X	1	1	.	.	.	.	.	.	.	.	.
1466 CUTTS	.	X	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.
1479 CUTTS	.	.	.	.	X	X	.	.	.	.	.	.	.	1	X	X	X	X	X	1	X	.
1550 SWC	.	2	X	.	.	X	.	.	1	X	.	.	.	X	X	.	X	X	X	.	.	X
1600 CUTTS	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	2	.	.	.	.	.	.
1652 CUTTS	X	.	.	.	.	.	.	.	X	.	.	.	.	.	.	1	1	.	.	.	.	.
1701 CUTTS	.	.	X	.	.	.	.	.	.	.	.	.	.	.	1	.	X	.	X	.	.	.
1707 SWC	.	8	X	.	.	X	.	.	.	.	.	.	.	.	2	.	.	.	X	.	.	.
1753 CUTTS	.	2	.	.	.	.	.	.	X	.	.	.	.	X	.	.	X	.	.	.	.	X
1757 SWC	.	1	1	.	.	.	.	.	2	.	.	.	.	.	X	.	.	X	X	.	X	.
1801 SWC	.	3	X	.	.	.	.	.	1	.	.	.	.	X	2	.	.	.	.	.	.	.
1801 CUTTS	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1847 SWC	X	X	.	.	.	.	.	.	X	.	.	.	.	2	X	.	X	.	1	.	.	X
1850 CUTTS	.	X	1	.	.	.	.	.	X	.	.	.	.	.	.	.	X	.	.	.	.	.
1902 CUTTS	.	2	.	.	.	.	.	.	.	.	.	.	.	.	X	.	X	.	.	.	.	.
1932 CUTTS	.	X	.	.	.	.	.	.	.	.	.	.	.	.	X	.	1	.	.	.	.	.
1966 CUTTS	.	1	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.
1999 CUTTS	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.
2030 SWC	.	.	.	.	.	.	.	.	.	.	.	.	X	4	1	.	.	.	X	X	.	X
2051 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	15	.	.	.	.	.	.	.
2076 CUTTS	.	1	.	.	.	.	.	.	.	.	.	.	.	.	2	2	1	.	1	.	.	X
2100 CORE	.	.	X	.	.	.	.	.	.	.	.	.	.	X	.	.	X	.	2	.	.	.
2115 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	1	1	.	.	.	.	.
2149 CUTTS	.	2	1	.	.	.	.	.	.	.	.	.	.	.	5	.	.	.	.	.	.	.
2170 CUTTS	.	3	.	.	.	.	.	.	.	.	.	.	.	.	4	.	1	X	X	.	.	1
2185 CUTTS	.	X	.	.	.	.	.	.	.	.	.	.	.	.	3	.	.	.	X	.	.	X
2207 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	1	.	.	.	.	.	.
2236 CORE	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	X	.	.	.	.	.	.
2238 CORE	.	.	.	.	.	.	.	.	.	.	.	.	.	X	X	.	X	X	1	.	.	.
2240 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.	X	X	X	.	.	.
2243 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	X	2	.	X	X	X	.	.	.
2254 SWC	.	.	.	X	.	X	.	.	.	.	.	.	.	1	.	.	1	.	1	.	.	.
2320 CUTTS	.	X	.	.	.	.	.	.	.	.	.	.	.	.	X	2	1	.	1	.	.	.
2338 CUTTS	.	1	.	X	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.
2380 CUTTS	.	2	.	.	.	.	.	.	.	1	.	.	.	1	.	.	.	.	1	.	.	.
2414 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	.	X	X	.	.	.
2441 CUTTS	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.

	PEROTRILETES JUBATUS/MORGANII	PROTEACIDITES CF GRANDIS	PROTEACIDITES SMALL	TETRACOLPORITES RETICULATUS	AEQUITRIRADITES SPINULOSUS	CALLIALASPORITES TURBATUS	PEROTRILETES MAJUS	CAMEROZONOSPORITES BULLATUS	COUPERISPORITES TABULATUS	DICTYOTOSPORITES SPECIOSUS	FORAMINISPORIS DAILYI	CONTIGNISPORITES COOKSONIAE	RETITRILETES NODOSUS	ASTEROPOLLIS ASTEROIDES	FORAMINISPORIS WONTHAGGIENSIS	MUROSPORA FLORIDA	TRIPOROLETES RADIATUS	CYATHEACIDITES TECTIFERA	FORAMINISPORIS ASYMMETRICUS	NEORAISTRICKIA	PROTEACIDITES SPARSIGEMMATUS	TRICOLPITES TWISTED
	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242
1245 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1265 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1283 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1289 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1315 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1338 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1360 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1385 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1419 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1443 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1466 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1479 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1550 SWC	X	X	37	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1600 CUTTS	1	.	.	.	X	2	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1652 CUTTS	.	.	.	.	.	.	.	X	X	.	.	.	.	.	.	.	.	.	.	.	.	.
1701 CUTTS	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.
1707 SWC	.	.	.	.	X	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.
1753 CUTTS	1	.	.	X	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.
1757 SWC	X	.	18	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.
1801 SWC	.	.	13	.	.	.	.	.	.	.	.	.	.	X	X	1	.	.	.	.	.	.
1801 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.
1847 SWC	.	.	10	.	.	.	.	.	.	.	.	.	.	.	X	.	.	X	X	2	X	X
1850 CUTTS	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1902 CUTTS	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1932 CUTTS	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.
1966 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1999 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2030 SWC	X	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.
2051 CUTTS	X	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.
2076 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2100 CORE	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.
2115 CUTTS	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	?	.	.	.	.
2149 CUTTS	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2170 CUTTS	X	.	.	.	.	.	.	.	.	X	.	.	X	.	.	.	.	.	.	.	.	.
2185 CUTTS	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.
2207 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2236 CORE	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2238 CORE	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.
2240 SWC	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2243 SWC	X	.	.	.	ML	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.
2254 SWC	1	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	X	.	.	.	.
2320 CUTTS	X	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.
2338 CUTTS	.	.	.	.	.	.	.	.	.	X	.	.	.	.	X	.	.	.	.	.	.	.
2380 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	X	.	.	.	.	.
2414 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2441 CUTTS	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

	TETRACOLPORITES OAMARUENSIS	TRICOLPITES SABULOSUS	CINGUTRILETES CLAVUS	COPTOSPORA PARADOXA	GEPHRAPOLLENITES WAHOOENSIS	ISCHYOSPORITES PUNCTATUS	LEPTOLEPIDITES MAJOR	LILIACIDITES	PROTEACIDITES LARGE	PROTEACIDITES LARGE RETICULATUS	RETITRILETES FACETUS	TETRACOLPORITES VERRUCOSUS	TRICOLPITES SP	CICATRICOSISPORITES LUDBROOKIAE	AMOSOPOLLIS CRUCIFORMIS	CALLIALASPORITES DAMPIERI	CICATRICOSISPORITES AUSTRALIENSIS	DENSOISPORITES VELATUS	LYCOPODIACIDITES ASPERATUS	SESTROSPORITES PSEUDOALVEOLATUS	TRICOLPORITES RETICULATUS	KLUKISPORITES SCABERIS
	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220
1245 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1265 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1283 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1289 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1315 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1338 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1360 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1385 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1419 SWC	X	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1443 SWC	.	X	X	X	X	X	X	X	2	X	X	1	1	.	.	.	.	.	.	.	.	.
1466 CUTTS	.	X	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.
1479 CUTTS	.	.	.	.	X	X	.	.	.	.	.	.	.	1	X	X	X	X	X	1	X	.
1550 SWC	.	2	X	.	.	X	.	.	1	X	.	.	.	X	X	.	X	X	X	.	.	X
1600 CUTTS	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	2	.	.	.	.	.	.
1652 CUTTS	X	.	.	.	.	.	.	.	X	.	.	.	.	.	.	1	1	.	.	.	.	.
1701 CUTTS	.	.	X	.	.	.	.	.	.	.	.	.	.	.	1	.	X	.	X	.	.	.
1707 SWC	.	8	X	.	.	X	.	.	.	.	.	.	.	.	2	.	.	.	X	.	.	.
1753 CUTTS	.	2	.	.	.	.	.	.	X	.	.	.	.	X	.	.	X	.	.	.	.	X
1757 SWC	.	1	1	.	.	.	.	.	2	.	.	.	.	.	X	.	.	X	X	.	X	.
1801 SWC	.	3	X	.	.	.	.	.	1	.	.	.	.	X	2	.	.	.	.	.	.	.
1801 CUTTS	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1847 SWC	X	X	.	.	.	.	.	.	X	.	.	.	.	2	X	.	X	.	1	.	.	X
1850 CUTTS	.	X	1	.	.	.	.	.	X	.	.	.	.	.	.	.	X	.	.	.	.	.
1902 CUTTS	.	2	.	.	.	.	.	.	.	.	.	.	.	.	X	.	X	.	.	.	.	.
1932 CUTTS	.	X	.	.	.	.	.	.	.	.	.	.	.	.	X	.	1	.	.	.	.	.
1966 CUTTS	.	1	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.
1999 CUTTS	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.
2030 SWC	.	.	.	.	.	.	.	.	.	.	.	.	X	4	1	.	.	.	X	X	.	X
2051 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	15	.	.	.	.	.	.	.
2076 CUTTS	.	1	.	.	.	.	.	.	.	.	.	.	.	.	2	2	1	.	1	.	.	X
2100 CORE	.	.	X	.	.	.	.	.	.	.	.	.	.	X	.	.	X	.	2	.	.	.
2115 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	1	1	.	.	.	.	.
2149 CUTTS	.	2	1	.	.	.	.	.	.	.	.	.	.	.	5	.	.	.	.	.	.	.
2170 CUTTS	.	3	.	.	.	.	.	.	.	.	.	.	.	.	4	.	1	X	X	.	.	1
2185 CUTTS	.	X	.	.	.	.	.	.	.	.	.	.	.	.	3	.	.	.	X	.	.	X
2207 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	1	.	.	.	.	.	.
2236 CORE	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	X	.	.	.	.	.	.
2238 CORE	.	.	.	.	.	.	.	.	.	.	.	.	.	X	X	.	X	X	1	.	.	.
2240 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.	X	X	X	.	.	.
2243 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	X	2	.	X	X	X	.	.	.
2254 SWC	.	.	.	X	.	X	.	.	.	.	.	.	.	1	.	.	1	.	1	.	.	.
2320 CUTTS	.	X	.	.	.	.	.	.	.	.	.	.	.	.	X	2	1	.	1	.	.	.
2338 CUTTS	.	1	.	X	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.
2380 CUTTS	.	2	.	.	.	.	.	.	.	1	.	.	.	1	.	.	.	.	1	.	.	.
2414 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	.	X	X	.	.	.
2441 CUTTS	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.

	PEROTRILETES JUBATUS/MORGANII	PROTEACIDITES CF GRANDIS	PROTEACIDITES SMALL	TETRACOLPORITES RETICULATUS	AEQUITRIRADITES SPINULOSUS	CALLIALASPORITES TURBATUS	PEROTRILETES MAJUS	CAMEROZONOSPORITES BULLATUS	COUPERISPORITES TABULATUS	DICTYOTOSPORITES SPECIOSUS	FORAMINISPORIS DAILYI	CONTIGNISPORITES COOKSONIAE	RETITRILETES NODOSUS	ASTEROPOLLIS ASTEROIDES	FORAMINISPORIS WONTHAGGIENSIS	MUROSPORA FLORIDA	TRIPOROLETES RADIATUS	CYATHEACIDITES TECTIFERA	FORAMINISPORIS ASYMMETRICUS	NEORAISTRICKIA	PROTEACIDITES SPARSIGEMMATUS	TRICOLPITES TWISTED
	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242
1245 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1265 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1283 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1289 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1315 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1338 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1360 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1385 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1419 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1443 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1466 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1479 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1550 SWC	X	X	37	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1600 CUTTS	1	.	.	.	X	2	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1652 CUTTS	.	.	.	.	.	.	.	X	X	.	.	.	.	.	.	.	.	.	.	.	.	.
1701 CUTTS	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.
1707 SWC	.	.	.	.	X	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.
1753 CUTTS	1	.	.	X	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.
1757 SWC	X	.	18	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.
1801 SWC	.	.	13	.	.	.	.	.	.	.	.	.	.	X	X	1	.	.	.	.	.	.
1801 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.
1847 SWC	.	.	10	.	.	.	.	.	.	.	.	.	.	.	X	.	.	X	X	2	X	X
1850 CUTTS	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1902 CUTTS	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1932 CUTTS	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.
1966 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1999 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2030 SWC	X	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.
2051 CUTTS	X	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.
2076 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2100 CORE	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.
2115 CUTTS	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	?	.	.	.	.
2149 CUTTS	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2170 CUTTS	X	.	.	.	.	.	.	.	.	X	.	.	X	.	.	.	.	.	.	.	.	.
2185 CUTTS	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.
2207 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2236 CORE	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2238 CORE	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.
2240 SWC	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2243 SWC	X	.	.	.	ML	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.
2254 SWC	1	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	X	.	.	.	.
2320 CUTTS	X	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.
2338 CUTTS	.	.	.	.	.	.	.	.	.	X	.	.	.	.	X	.	.	.	.	.	.	.
2380 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	X	.	.	.	.	.
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1443 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1466 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
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1850 CUTTS	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1902 CUTTS	.	X	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1932 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
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2115 CUTTS	.	.	.	.	.	?	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2149 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2170 CUTTS	X	.	X	.	.	X	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.
2185 CUTTS	.	.	.	.	X	.	.	.	.	X	.	.	.	.	.	.	.	.	X	.	.	.
2207 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2236 CORE	.	.	.	.	1	1	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.
2238 CORE	.	.	.	.	X	2	.	.	.	.	.	.	X	.	.	1	X	.	.	X	X	X
2240 SWC	.	.	X	.	X	X	X	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.
2243 SWC	.	.	X	.	X	X	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2254 SWC	.	.	.	.	X	X	.	X	1	.	.	.	.	.	.	.	.	.	.	.	.	.
2320 CUTTS	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2338 CUTTS	.	X	X	.	X	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.
2380 CUTTS	.	.	.	.	1	X	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.
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	LILIACIDITES KAITANGATAENSIS	PHIMOPOLLENITES GIANT VERRUCATE	APPENDICISPORITES TRICORNITATUS	FOVEOGLEICHENIIDITES	TRILOBOSPORITES TRIBOTRYS	ANTULSPORITES CF INTRA VERRUCATUS	CADARGASPORITES GRANULATUS	COPTOSPORA PILEOSA	NEVESISPORITES	TRIPOROLETES SIMPLEX	RETITRILETES EMINULUS	AEQUITRIRADITES VERRUCOSUS	FORCIPITES TWISTED SP A.	RETICULATISPORITES PUDENS	BOTRYOCOCUS	
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1283 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1283 SWC
1289 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1289 CUTTS
1315 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1315 SWC
1338 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1338 CUTTS
1360 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1360 SWC
1385 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1385 SWC
1419 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1419 SWC
1443 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1443 SWC
1466 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1466 CUTTS
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1652 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1652 CUTTS
1701 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1701 CUTTS
1707 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1707 SWC
1753 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1753 CUTTS
1757 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1757 SWC
1801 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1801 SWC
1801 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1801 CUTTS
1847 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1847 SWC
1850 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1850 CUTTS
1902 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1902 CUTTS
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1999 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1999 CUTTS
2030 SWC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2030 SWC
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2076 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2076 CUTTS
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2115 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2115 CUTTS
2149 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2149 CUTTS
2170 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2170 CUTTS
2185 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2185 CUTTS
2207 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2207 CUTTS
2236 CORE	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2236 CORE
2238 CORE	X	X	.	.	.	.	.	.	.	.	.	.	.	.	.	2238 CORE
2240 SWC	X	.	X	X	X	.	.	.	.	.	.	.	.	.	.	2240 SWC
2243 SWC	.	.	X	.	.	X	X	X	.	.	.	.	.	.	.	2243 SWC
2254 SWC	.	.	.	.	.	X	.	.	X	X	.	.	.	.	.	2254 SWC
2320 CUTTS	X	.	.	.	.	.	.	.	.	.	1	.	.	.	1	2320 CUTTS
2338 CUTTS	.	.	.	.	.	.	.	.	.	.	.	X	X	X	.	2338 CUTTS
2380 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2380 CUTTS
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207	PROTEACIDITES LARGE
208	PROTEACIDITES LARGE RETICULATUS
156	PROTEACIDITES PACHYPOLUS
223	PROTEACIDITES SMALL
157	PROTEACIDITES SP
241	PROTEACIDITES SPARSIGEMMATUS
28	PTEROSPERMELLA AUREOLATA
278	RETICULATISPORITES PUDENS
158	RETITRILETES AUSTROCLAVATIDITES
275	RETITRILETES EMINULUS
209	RETITRILETES FACETUS

233	RETITRILETES NODOSUS
130	SCHIZOSPORIS PSILATUS
258	SENECTOTETRADITES FISTULOSUS
259	SENECTOTETRADITES VARIRETICULATUS
116	SENEGALINIUM MACROCYSTUM
90	SENONIASPHAERA ABSCONDITA
53	SENONIASPHAERA LORDII
114	SENONIASPHAERA MAGNIOR
77	SENONIASPHAERA SP
218	SESTROSPORITES PSEUDOALVEOLATUS
85	SPINIDINIUM BALMEI
22	SPINIDINIUM ECHINOIDEA
23	SPINIFERITES FURCATUS/RAMOSUS
3	SPINIFERITES RAMOSUS
252	STAPLINISPORITES MANIFESTUS
175	STEREISPORITES ANTIQUISPORITES
176	STEREISPORITES REGIUM
10	SYSTEMATOPHORA PLACACANTHA
199	TETRACOLPORITES OAMARUENSIS
224	TETRACOLPORITES RETICULATUS
210	TETRACOLPORITES VERRUCOSUS
1	TOTAL DINOFLAGELLATE CONTENT
38	TRICHODINIUM
11	TRICHODINIUM HIRSUTUM
177	TRICOLPITES CONFESSUS
185	TRICOLPITES GILLII
178	TRICOLPITES LONGUS
200	TRICOLPITES SABULOSUS
211	TRICOLPITES SP
242	TRICOLPITES TWISTED
250	TRICOLPITES VARIVERRUCATUS
179	TRICOLPITES WAIPARAENSIS
186	TRICOLPORITES
187	TRICOLPORITES APOXYEXINUS
180	TRICOLPORITES LILLIEI
219	TRICOLPORITES RETICULATUS
251	TRILETES TUBERCULIFORMIS
269	TRILOBOSPORITES TRIBOTRYS
237	TRIPOROLETES RADIATUS
245	TRIPOROLETES RETICULATUS
274	TRIPOROLETES SIMPLEX
181	TRIPOROPOLLENITES SECTILIS
34	TRITHYRODINIUM
91	TRITHYRODINIUM CF SUSPECTUM
86	TRITHYRODINIUM PUNCTATE
13	TRITHYRODINIUM SESPECTUM
99	TRITHYRODINIUM THICK PSILATE
132	TRITHYRODINIUM THICK SMOOTH
100	TRITHYRODINIUM THICK VERRUCATE
121	TRITHYRODINIUM THIN PSILATE
104	VERYHACHINM
188	VITREISPORITES PALLIDUS
69	VOZZHENNIKOVIA ECHINOIDEA
41	XENASCUS CERATOIDES
42	XENIKOON AUSTRALIS
54	XIPHOPHORIDIUM ALATUM

BASIN: OTWAY SPORE-POLLEN ZONES — ELEVATION: KB: ______ GL: ______

WELL NAME: MUSSEL-1 — TOTAL DEPTH: ______

AGE		PALYNOLOGICAL ZONES	HIGHEST DATA Preferred Depth	Rtg	HIGHEST DATA Alternate Depth	Rtg	LOWEST DATA Preferred Depth	Rtg	LOWEST DATA Alternate Depth	Rtg
NEOGENE	Plei	T. pleistocenicus								
	Plio	M. lipsus								
	Mio	C. bifurcatus								
		T. bellus								
		P. tuberculatus								
	Olig	upper N. asperus								
PALEOGENE	L.Eo	mid N. asperus								
	Mid Eo	lower N. asperus								
		P. asperopolus								
	Earl Eo	upper M. diversus	1265	3			1283	0		
		mid M. diversus								
		lower M. diversus								
	Pale	upper L. balmei ?	1289	3						
		lower L. balmei					1289	4		
LATE CRETACEOUS	Maas	upper T. longus	1315	0			1360	1		
		lower T. longus								
	Camp	T. lillei	1385	2			1479	0		
		N. senectus	1550	2			1966	1		
	Sant	up T. apoxyexinus	1999	3			2030	4		
		mid T. apoxyexinus								
	Con	low T. apoxyexinus	2051	3			2051	4		
	Tur	P. mawsonii	2100	2			2243	0		
	Ceno	A. distocarinatus	2254	2			2441	4		
EARLY CRETACEOUS	Alb	P. pannosus								
		upper C. paradoxa								
		lower C. paradoxa								
		C. striatus								
	Apt	upper C. hughesi								
		lower C. hughesi								
	l.Ne	F. wonthaggiensis								
	e.Ne	up C. australiensis								

Environments :

- O lacustrine (algal acritarchs).
- non-marine (no or very few 5% algal acritarchs).
- brackish (spiny acritarch, no or very few dinoflagellates 1%).
- marginal marine (1-5% very low diversity dinoflagellates).
- nearshore marine (6-30% low to medium diversity dinoflagellates).
- intermediate marine (31-60% medium diversity dinoflagellates).
- offshore marine (61%-80% medium to high diversity dinoflagellates).
- far offshore marine/oceanic (81%-100% high diversity dinoflagellates and/or planktonic forams).

Confidence Ratings :

0 : good to excellent with numerous zone fossils in core/swc.
1 : fair with rare zone fossils in core/swc.
2 : poor with non-diagnostic assemblage in core/swc. Often occurs next to a distinctive 0 to 1 rating, lacking the zone fossil seen adjacent.
3 : good with extinction event (top range) in cuttings.
4 : poor to fair with inception event (base range) in cuttings and therefore may be picked too low if caved or too high if swamped by cavings.
5 : poor with non-diagnostic assemblage in cuttings. Usually seen adjacent to a higher rating and picked on the absence of key zone fossil.
? : no confidence. Picked as a best guess in very poor data.

Data recorded by : Roger Morgan Feb 1992

Data revised by : Roger Morgan Feb 1992

PALYNOLOGICAL DATA SHEET

BASIN: OTWAY DINOFLAGELLATE ZONES   ELEVATION: KB: ________ GL: ________

WELL NAME: MUSSEL-1   TOTAL DEPTH: ________

AGE		PALYNOLOGICAL ZONES	HIGHEST DATA Preferred Depth	Rtg	Alternate Depth	Rtg	LOWEST DATA Preferred Depth	Rtg	Alternate Depth	Rtg
LATE CRETACEOUS	Maas	M. druggii	1315	0			1360	0		
	Camp	I. korojonense	1419	0			1479	0		
		upper X. australis	1550	3			1652	4		
		lower X. australis	1701	3			1801	4		
	Sant	N. aceras	1801	3			1966	4		
		I. cretaceum	1999	3			2030	4		
	Con	O. porifera								
	Turo	C. striatoconus								
	Ceno	P. infusorioides	2238	3			2441	?		

Environments :

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