APPENDIX-2

PALYNOLOGICAL ANALYSIS OF LEATHERJACKET-1, GIPPSLAND BASIN

by

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INTERPRETATIVE DATA SECTION

INTRODUCTION

Twenty-nine sidewall core samples were processed and examined for spore-pollen and dinoflagellates, however, only 16 samples contained datable assemblages. Recovered palynomorph yield was noticably variable from very low to high. Preservation, likewise variable, was generally fair to good.

Lithological units and palynological zones from the base of the Lakes Entrance Formation to T.D. are summarised below. Interpretative data with zone identifications and confidence ratings are recorded in Table-1 and basic data on residue yield, preservation and diversity are recorded in Table-3. The occurrence of spore-pollen and dinoflagellate species are tabulated on the accompanying range chart. Counts of key species or species groups from selected samples are given in Table-4. Specific anomalous and unusual occurrence of palynomorphs taxa in Leatherjacket-1 are given in Table-2.

SUMMARY TABLE

LEATHERJACKET-1

AGE	UNIT	SPORE-POLLEN/KEY MICROPLANKTON ZONE	DEPTH (mKB)
Early Miocene	Lakes Entrance Fm.	*P. tuberculatus*	742.1
	log break at 745.0m		
Middle Eocene	Gurnard Fm.	Lower *N. asperus*	750.7
Middle Eocene		Lower *N. asperus*/*T. pandus*	752.4-754.0
Early Eocene		*P. asperopolus*	755.6
Paleocene		Upper *L. balmei*?	757.4
	log break at 758.0m		
Paleocene	Latrobe Group	Upper *L. balmei*/*A. homomorphum*	759.8
Paleocene	coarse clastics	Lower *L. balmei*/*A. homomorphum*	775.9
Paleocene		Lower *L. balmei*/*T. evittii*	800.0-809.9
	log break at 811.0m		
Maastrichtian	Latrobe Group coarse clastics	Barren interval	
	log break at 825.0m		
Coniacian/ Turonian	Latrobe Group coarse clastics	*P. mawsonii*	838.8-849.0
	log break at 857.0m		
Early Cretacous	Strzelecki Group	*C. hughesii*	910.7
	T.D. 951.0m		

GEOLOGICAL COMMENTS

1. The assignment of the interval of lithic sandstones and conglomerates (as per sidewall core descriptions) between 857m to 951m (T.D.) to the Strzelecki Group is supported by the Early Cretaceous (probably Aptian) age obtained for the sidewall core at 910.7m. This relatively old age suggests significant erosion at the top of the Strzelecki Group at Leatherjacket-1.

2. The Late Cretaceous interval in Leatherjacket-1 between 811-857m is represented by quartz sandstones and conglomerates and have proved to be barren except for two samples near the base of the sequence which are assigned to the P. mawsonii Zone. The Coniacian-Turonian age of these samples, the coarse lithologies and thin Late Cretaceous sequence, suggest the presence of one or more unconformities in the lower part of the Latrobe Group. The log break at 825.0m, on the basis of the sequences in adjacent wells, probably represents an unconformity between late Maastrichtian (Upper T. longus Zone) and Coniacian-Turonian (P. mawsonii Zone).

3. The identification of the early Danian Trithyrodinium evittii dinoflagellate Zone between 800m to 809.9m suggests that the log break at 811.0m represents the downlap surfaces at the Cretaceous/Tertiary boundary.

4. The Gurnard Formation is picked on sidewall lithologies as the interval 745m to 758m. The lowest sidewall core from this unit, a pebbly glauconitic sandstone is considered to contain an entirely reworked Upper L. balmei Zone assemblage. The presence of the acritarch Tritonites pandus at 752.4m and 754.0m suggests the bulk of the Gurnard Formation is early Middle Eocene in age. The unconformity identified 758.0m is considered to correlate with the sea level drop at which the Marlin Channel was cut. The P. asperopolus Zone sample in Leatherjacket-1 at 755.6m is thus younger than samples from this zone in the Flounder Formation.

5. On available age dating the top of Latrobe at 745m represents a significant unconformity. The maximum time gap is Early Miocene above, and early Middle Eocene below the unconformity.

BIOSTRATIGRAPHY

The zone boundaries have been established for Tertiary zones using the criteria of Stover & Partridge (1973), and subsequent proprietary revisions, and follows Helby, Morgan & Partridge (in press) for the Cretaceous zones.

Cyclosporites hughesii Zone: 910.7 metres

The single sample assigned to this zone contains a low diversity but characteristic Early Cretaceous spore-pollen assemblage with frequent specimens of the nominated species. The deepest sidewall core at 933.5m also contains Early Cretaceous spore-pollen and may belong to this zone. Unfortunately its exact age is obscured by downhole contamination and common reworked Permo/Triassic spore-pollen.

Phyllocladidites mawsonii Zone: 838.8 - 849.0 metres.

This zone is a new name proposed by Helby, Morgan & Partridge (in press) for the Clavifera triplex Zone of Dettmann & Playford (1969). The zone has been renamed and the original definition modified because the spore C. triplex has not proved to be a reliable indicator species. The zone is defined, and also recognised in this well, by the oldest occurrence of P. mawsonii. The top of the zone is defined by the oldest occurrences of Tricolporites apoxyexinus Partridge (in press) which does not occur in either sample in Leatherjacket-1. Important accessory species for the P. mawsonii Zone are the occurrences of Cyatheacidites tectifera in both samples and Appendicisporites distocarinatus at 849.0m only.

Lower Lygistepollenites balmei Zone: 775.9 - 809.9 metres.

The bottom of the zone is represented by three good samples with moderate diversity of both spore-pollen and dinoflagellates. The spore-pollen assemblages are consistent with a basal Lower L. balmei Zone assignment. This is strongly supported by the frequent occurrence of the dinoflagellate Trithyrodinium evittii which is diagnostic of the early Danian T. evittii Zone of Helby, Morgan & Partridge (in press). Although dinoflagellate diversity is recorded as moderate (last column on Table-3) only those specimens confidently identified to species level are recorded on the range chart. The pollen species Proteacidites otwayensis, Pseudowinteropollis wahooensis and Triporopollenites sectilis which are recorded from 806.0m and 809.9m are generally more typical of the T. longus Zone. Their occurrence in the lowest two samples in this zone is considered as either reworking or slight extensions of their ranges. The shallowest sample from the Lower L. balmei-

Zone at 775.9m is assigned on the absence of any spore-pollen diagnostic of the Upper subdivision. Polycolpites langstonii is the most diagnostic species in this sample. The Apectodinium homomorphum Zone is also indentified from this sample on the basis of the frequent occurrence of the nominate species.

Lygistepollenites balmei Zone (undifferentiated): 761.0-770.5 metres.

Between the Upper and Lower subdivisions are one barren and two low yield samples, which although confidently assigned to the broader L. balmei Zone, cannot be assigned to either subdivision because of the lack of key species.

Upper Lygistepollenite balmei Zone: ?757.4-759.8 metres

The lower sample at 759.8m is confidently assigned to the Upper subdivision of the L. balmei Zone on the presence of Cyathidites gigantis/splendens species complex, Malvacipollis diversus, M. subtilis, Proteacidites adenanthoides and P. annularis. The upper sample at 757.4m contains a good L. balmei Zone assemblage and clearly needs to be assigned to the Upper subdivision on superposition. The lithology of the sidewall core sample however is characteristic of the Gurnard Formation and atypical of the L. balmei Zone sequence; and this has influenced the log pick for the base of the Gurnard Formation. The L. balmei Zone identified from the base of the Gurnard Formation is therefore interpreted as entirely reworked.

Proteacidites asperopolus Zone: 755.6 metres.

The single sample near the base of the Gurnard Formation is assigned to the P. asperopolus Zone on the nearly equal abundance of Haloragacidites harrisii and Nothofagidites spp. and the significant percentages for Conbaculties apiculatus (2.2%) and Myrtaceidites tenuis (1.3%). See Table-4 for details. Proteacidites pachypolus and P. asperopolus are both present but their composite abundance is only 0.8%, which is not significant. Common Deflandrea flounderensis is also supportive of this zone assignment, although the species is not restricted to this zone.

Lower Nothofagidites asperus Zone: 750.7 - 754.0 metres.

The base of the Lower N. asperus Zone within the Gurnard Formation in Leatherjacket-1 is taken at both the increase of Nothofagidites spp. and its increase in abundance relative to Haloragacidites harrisii. The samples at 752.4m and 754.0m meet these criteria based on the pollen counts presented in Table-4. Supporting the gross compositional changes are the oldest

occurrences of Gothanipollis bassensis, Nothofagidites asperus, N. falcatus and Tricolpites simatus in the deepest two samples. In conflict with these Lower N. asperus Zone indicators is the occurrence of Myrtaceidites tenuis at both 752.4m and 754.0m. M. tenuis generally does not overlap with the previous four species. The slightly younger extension of its range in Leatherjacket-1 is interpreted as indicating some reworking (probably caused by burrowing) within the Gurnard Formation. The associated microplankton in the lower two samples are of moderate concentration and diversity. The most diagnostic species is the undescribed acritarch given the manuscript name Tritonites pandus. This small horse-shoe shaped arcritarch appears to be diagnostic of the oldest sediments overlying the unconformity linked with the erosion of the Marlin Channel, and is earliest Middle Eocene in age. A new microplankton zone is informally proposed characterized by this acritarch and it lies in the unzoned interval in the Middle Eocene (see Partridge 1976, fig. 2).

Palynomorph yield and zone confidence is significantly poorer in he highest sample assigned to the Lower N. asperus Zone. The highest two samples in the Gurnard Formation are even poorer, with the lower barren (747.3m) and the higher (745.5m) being contaminated with P. tuberculatus Zone fossils. A progressive decline in palynomorph yields and reliability of zone determinations upwards through the Gurnard Formation is characteristic of many wells in the basin. It is interpreted as reflecting a progressive decline in sedimentation rate, and hence the ability to preserve palynomorphs.

Proteacides tuberculatus Zone: 742.1 metres.

Represented by a poor assemblage, but containing the key spore Cyatheacidites annulatus. The palynomorph assemblage is consistent with the Miocene age reported from foraminifera (Hannah, 1986).

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TABLE 1: SUMMARY OF INTERPRETATIVE PALYNOLOGICAL DATA

LEATHERJACKET-1

SAMPLE NO.	DEPTH (m)	SPORE-POLLEN ZONE	DINOFLAGELLATE ZONE	AGE	CONFIDENCE RATING	COMMENTS
SWC 30	740.3	-	-	-	-	Barren
SWC 29	742.1	P. tuberculatus	-	Early Miocene	2	Zone Hl Forams, reworked Zone K forams
SWC 28	745.5	Indeterminate	-	Late Eocene?	2	N. falcatus; v. abundant pelletal glauconite, ?caved D. mammilatus and P. pontus
SWC 27	747.3	-	-	-	-	Barren
SWC 26	750.7	Lower N. asperus	-	Middle Eocene	2	N. falcatus, D. flounderensis
SWC 25	752.4	Lower N. asperus	T. pandus	Middle Eocene	0	P. asperopolus, T. simatus T. pandus, abund. Nothofagidites
SWC 24	754.0	Lower N. asperus	T. pandus	Middle Eocene	0	T. pandus, Nothofagidites H. harrisii.
SWC 23	755.6	P. asperopolus		Early Eocene	2	M. tenuis, P. plemmelus S. morayensis
SWC 22	757.4	Upper L. balmei	-	Paleocene	2	L. balmei, A. obscurus, G. rudata
SWC 21	759.8	Upper L. balmei	A. homormorphum	Paleocene	1	P. annularis, P. langstonii, M. diversus M. subtilis, abund. L. balmei
SWC 20	761.0	L. balmei	-	Paleocene		L. balmei
SWC 19	765.0	-	-	-	-	Barren
SWC 18	770.5	L. balmei	-	Paleocene	-	L. balmei, A. obscurus
SWC 17	775.9	Lower L. balmei	A. homomorphum	Paleocene	2	H. harrisii, P. langstonii, frequent. P. reticulosaccatus, common L. balmei.

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TABLE 1: SUMMARY OF INTERPRETATIVE PALYNOLOGICAL DATA

LEATHERJACKET-1

SAMPLE NO.	DEPTH (m)	SPORE-POLLEN ZONE	DINOFLAGELLATE ZONE	AGE	CONFIDENCE RATING	COMMENTS
SWC 16	800.0	Lower *L. balmei*	*T. evittii*	Paleocene	0	Frequent *L. florinii*, *T. evittii* freq. *T. giiiii* *D. specious*.
SWC 15	806.0	Lower *L. balmei*	*T. evittii*	Paleocene	0	*L. balmei*, *T. giiiii*, *T. verrucosus*, freq. *T. evittii*, *D. speciosus*, *P. golzowense*.
SWC 14	809.9	Lower *L. balmei*	*T. evittii*	Paleocene	0	*L. balmei*, *T. verrucosus*, freq. *T. giiiii* & *T. evittii*.
SWC 13	813.1	-	-	-	-	Barren
SWC 12	818.6	-	-	-	-	Barren
SWC 11	820.7	-	-	-	-	Barren
SWC 10	827.8	-	-	-	-	Barren
SWC 9	834.2	-	-	-	-	Barren
SWC 8	838.8	*P. mawsonii*	-	Turonian - Coniacian	1	*P. mawsonii*, *P. paleogenicus*.
SWC 7	849.0	*P. mawsonii*	-	Turonian - Coniacian	1	*P. mawsonii*, *C. tectifera*.
SWC 5	863.8	-	-	-	-	Barren
SWC 4	884.8	-	-	-	-	Barren
SWC 3	898.5	Indet.	-	Cretaceous	-	Early Cretaceous spp. caved Late Cretaceous spp.
SWC 2	910.7	*C. hughesii*	-	Early Cretaceous	2	*C. hughesii*,
SWC 1	933.5	Indet.	-	-	-	Long-ranging spores and Permo-Triassic gymnosperms.

PALYNOLOGY DATA SHEET

BASIN: GIPPSLAND ELEVATION: KB: +21.0m GL: 106.0m (MSL)

WELL NAME: LEATHERJACKET-1 TOTAL DEPTH: 951m

AGE	PALYNOLOGICAL ZONES	HIGHEST DATA					LOWEST DATA				
		Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
NEOGENE	*T. pleistocenicus*										
	M. lipsis										
	C. bifurcatus										
	T. bellus										
	P. tuberculatus						742.1	2			
PALEOGENE	Upper *N. asperus*										
	Mid *N. asperus*										
	Lower *N. asperus*	750.7	2	752.4	0		754.0	0			
	P. asperopolus	755.6	2				755.6	2			
	Upper *M. diversus*										
	Mid *M. diversus*										
	Lower *M. diversus*										
	Upper *L. balmei*	757.4	2	759.8	1		759.8	1			
	Lower *L. balmei*	775.9	2	800.0	0		809.9	0			
LATE CRETACEOUS	Upper *T. longus*										
	Lower *T. longus*										
	T. lilliei										
	N. senectus										
	T. apoxyexinus										
	P. mawsonii	838.8	1				849.0	1			
	A. distocarinatus										
EARLY CRET.	*P. pannosus*										
	C. paradoxa										
	C. striatus										
	C. hughesi	910.7	2				910.7	2			
	F. wonthaggiensis										
	C. australiensis										

COMMENTS: All depths in metres. Dinoflagellate Zones: Tritonites pandus 752.4-754.0m A. homomorphum 759.8-775.9m T. evittii 800.0-809.9m

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

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

DATA RECORDED BY: M.K. Macphail/A.D. Partridge DATE: June 1986

DATA REVISED BY: _____ DATE: _____

TABLE 2

ANOMALOUS AND UNUSUAL OCCURRENCES OF PALYNOMORPH TAXA IN LEATHERJACKET-1

SAMPLE NO.	DEPTH(m)	ZONE	TAXON	COMMENTS
SWC 28	745.5	Indeterminate	Phyllocladidites paleogenicus	Uncommon sp.
SWC 26	750.7	Lower N. asperus	Phyllocladidites paleogenicus	Uncommon sp.
SWC 26	750.7	Lower N. asperus	Milfordia homeopunctatus	Rare sp.
SWC 26	750.7	Lower N. asperus	Banksieaeidites lunatus	More typical of Paleocene floras
SWC 26	750.7	Lower N. asperus	Bascopollis otwayensis	More typical of Paleocene floras
SWC 26	750.7	Lower N. asperus	Curpressaceae - type pollen	Modern taxon
SWC 25	752.4	Lower N. asperus/T. pandus	Concolpites leptos	Rare sp.
SWC 25	752.4	Lower N. asperus/T. pandus	Gemmatricolporites divaricatus	Rare sp.
SWC 25	752.4	Lower N. asperus/T. pandus	Kuylisporites waterbolkii	Rare in this zone.
SWC 25	752.4	Lower N. asperus/T. pandus	Phyllocladidites palaeogenicus	See above
SWC 25	752.4	Lower N. asperus/T. pandus	Schizocolpus rarus	Rare sp.
SWC 25	752.4	Lower N. asperus/T. pandus	Gothanipollis bassensis	Rare sp.
SWC 25	752.4	Lower N. asperus/T. pandus	Ornamentifera apiculatus	Rare ms. sp., assoc. with C. apiculatus
SWC 25	752.4	Lower N. asperus/T. pandus	Matonisporites ornamentalis	Rare in this zone
SWC 25	752.4	Lower N. asperus/T. pandus	Aglaoreidia qualumis	Not. prev. recorded below upper Middle N. asperus Zone.
SWC 25	752.4	Lower N. asperus/T. pandus	Myrtaceidites tenuis	V. rare occurrences above. P. asperopolus Zone,
SWC 25	752.4	Lower N. asperus/T. pandus	Bascopollis mutabilis	Top of range of species?
SWC 25	752.4	Lower N. asperus/T. pandus	Milfordia homeopunctatus	Rare sp.
SWC 25	752.4	Lower N. asperus/T. pandus	Triporopollenites spinosus	Rare sp.
SWC 25	752.4	Lower N. asperus/T. pandus	Deflandrea pachyceros	Rare dino, assoc. with T. pandus, S. morayensis, D. flounderensis.

TABLE 2

ANOMALOUS AND UNUSUAL OCCURRENCES OF PALYNOMORPH TAXA IN LEATHERJACKET-1

SAMPLE NO.	DEPTH(m)	ZONE	TAXON	COMMENTS
SWC 24	754.0	Lower N. asperus/T. pandus	Myrtaceidites tenuis	As above; assoc. with T. simatus, common Nothofagidites.
SWC 24	754.0	Lower N. asperus/T. pandus	Anacolosidites rotundus	Rare sp.
SWC 24	754.0	Lower N. asperus/T. pandus	Beaupreaidites trigonalis	Rare sp.
SWC 24	754.0	Lower N. asperus/T. pandus	Cunoniaceae 2-p, 3-p	Modern taxa.
SWC 24	754.0	Lower N. asperus/T. pandus	Gothanipollis bassensis	Rare sp.
SWC 24	754.0	Lower N. asperus/T. pandus	Milfordia homeopunctatus	Rare sp.
SWC 24	754.0	Lower N. asperus/T. pandus	Myrtaceidites parvus/mesonesus	Abundant in sample.
SWC 24	754.0	Lower N. asperus/T. pandus	Phyllocladidites paleogenicus	Frequent; assoc. with Parvisaccites catastus
SWC 24	754.0	Lower N. asperus/T. pandus	Proteacidites ornatus	Not previously recorded in this zone.
SWC 24	754.0	Lower N. asperus/T. pandus	Tricolpites reticulatus Cookson	Rare sp.; assoc. P. asperopolus, T. incisus, S. rotundus, freq. S. cainozoicus.
SWC 24	754.0	Lower N. asperus/T. pandus	Deflandrea flounderensis	Freq., assoc. with T. pandus. S. morayensis.
SWC 24	754.0	Lower N. asperus/T. pandus	D. pachyceros	Freq.,
SWC 24	754.0	Lower N. asperus/T. pandus	Dicotetradites clavatus	Planer tetrad (formerly Simplicepollis meridianus)
SWC 24	754.0	Lower N. asperus/T. pandus	Aglaoreidia qualumis	Not prev. recorded below Middle N. asperus Zone.
SWC 24	754.0	Lower N. asperus/T. pandus	Matonisporites ornamentalis	Rare in this zone.
SWC 24	754.0	Lower N. asperus/T. pandus	Ornamentifera apiculatus ms.	Rare form of C. apiculatus?

TABLE 2

ANOMALOUS AND UNUSUAL OCCURRENCES OF PALYNOMORPH TAXA IN LEATHERJACKET-1

SAMPLE NO.	DEPTH(m)	ZONE	TAXON	COMMENTS
SWC 23	755.6	P. asperopolus	Clavatipollenites glarius	V. rare sp.
SWC 23	755.6	P. asperopolus	Concolpites leptos	Rare sp.
SWC 23	755.6	P. asperopolus	Cunoniaceae 2-p	Modern taxon.
SWC 23	755.6	P. asperopolus	Umbelliferae	Modern taxon
SWC 23	755.6	P. asperopolus	Senoniasphaera morayensis	Uncommon dino?
SWC 21	759.8	Upper L. balmei/A. homormophum	Bysmapollis emaciatus	Not previously recorded in this zone.
SWC 21	759.8	Upper L. balmei/A. homormophum	Dicotetradites clavatus	Planar testrad (formerly Simplicepollis meridianus)
SWC 17	775.9	Lower L. balmei/A. homormophum	Dicotetradites clavatus	Planar testrad (formerly Simplicepollis meridianus)
SWC 17	775.9	Lower L. balmei/A. homormophum	Amosopollis cruciformis	Rare sp.
SWC 17	775.9	Lower L. balmei/A. homormophum	Nothofagidites asperus	V. rare below Upper L. balmei Zone
SWC 17	775.9	Lower L. balmei/A. homormophum	Phyllocladidites reticulosaccatus	Freq. in sample.
SWC 16	800.0	Lower L. balmei/T. evittii	Amosopollis cruciformis	Rare sp. also at 806.0m
SWC 16	800.0	Lower L. balmei/T. evittii	Cunoniaceae 3-p	Modern taxon.
SWC 16	800.0	Lower L. balmei/T. evittii	Palambages	Colonial algal. cyst.
SWC 15	806.0	Lower L. balmei/T. evittii	Proteacidites otwayensis	Typically Late K. species
SWC 15	806.0	Lower L. balmei/T. evittii	Tricolpites vergilius	Typically Late K. species
SWC 15	806.0	Lower L. balmei/T. evittii	Gecphyrapollenites wahooensis	Typically Late K. species

TABLE 2

ANOMALOUS AND UNUSUAL OCCURRENCES OF PALYNOMORPH TAXA IN LEATHERJACKET-1

SAMPLE NO.	DEPTH(m)	ZONE	TAXON	COMMENTS
SWC 14	809.9	Lower *L. balmei/T. evittii*	*Tricolporites balmei*	manuscript sp.
SWC 14	809.9	Lower *L. balmei/T. evittii*	*Palambages*	as for SWC 16
SWC 14	809.9	Lower *L. balmei/T. evittii*	*Apectodinium homomorphum*	*In situ?*
SWC 14	809.9	Lower *L. balmei/T. evittii*	*Eisenackia* sp. nov.	Assoc. with *D. speciosus*
SWC 8	838.8	*P. mawsonii*	*Phyllocladidites palaeogenicus*	Bottom of range?
SWC 8	838.8	*P. mawsonii*	*Cyatheacidites tectifera*	Rare sp.
SWC 8	838.8	*P. mawsonii*	*Cyclosporites hughesii*	Early K. sp.
SWC 7	849.0	*P. mawsonii*	*Appendicisporites distocarinatus*	Rare sp. assoc. with *C. hughesii*
SWC 7	849.0	*P. mawsonii*	Permo-Triassic spp. including striate bisaccates and *Aratisporites* sp.	
SWC 2	910.7	*C. hughesii*	*Lygistepollenites balmei*	Caved?
SWC 2	910.7	*C. hughesii*	Permo-Triassic striate bisaccates	
SWC 1	933.5	Indeterminate	Frequent Permo-Triassic spp.	

BASIC DATA SECTION

TABLE-3: SUMMARY OF BASIC DATA

TABLE-4: COUNTS OF KEY ELEMENTS OF POLLEN SUM

PALYNOMORPH DISTRIBUTION CHART

TABLE 3: SUMMARY OF BASIC PALYNOLOGICAL DATA FOR LEATHERJACKET

SAMPLE TYPE	DEPTH (m)	LITHOLOGY (from SWC desc.)	PRESERVATION	SPORE-POLLEN YIELD	DINOFLAGELLATES YIELD	DINOFLAGELLATES NO. SPECIES
SWC 30	740.3	Calcilutite	NA	Barren	-	
SWC 29	742.1	Calcilutite	Fair	Very low	Low	5+
SWC 28	745.5	Glauc. Siltst.	Good	Very low	Very low	3+
SWC 27	747.3	Pebbly. sst.	NA	Barren	-	
SWC 26	750.7	Argil. sst.	Good	Moderate	Low	
SWC 25	752.4	Glauc. sst.	Fair-good	High	Moderate	6+
SWC 24	754.0	Glauc. sst.	Good	High	Moderate	7+
SWC 23	755.6	Glauc. slst.	Fair-good	High	Moderate	6+
SWC 22	757.4	Glauc. pebbly sst.	Fair	Moderate	Very low	1+
SWC 21	759.8	Carb. sst.	Good	High	High	2
SWC 20	761.0	Argil. sst.	Good	Low	NR	
SWC 19	765.0	Argil. sst.	NA	Barren	-	
SWC 18	770.5	Argil sst.	Poor-fair	Very low	NR	
SWC 17	775.9	Lam. carb. sst.	Good	High	Low	1
SWC 16	800.0	Argil. sst.	Very good	Moderate	Low	9+
SWC 15	806.0	Clean sst.	Good	Moderate	Low	5+
SWC 14	809.9	Silty sst.	Fair-good	Moderate	Low	5
SWC 13	813.1	Pebbly sst.	NA	Barren	-	
SWC 12	818.6	Qtz. sst.	NA	Barren	-	
SWC 11	820.7	Qtzose. sst.	NA	Barren	-	
SWC 10	827.8	Conglomerate	NA	Barren	-	
SWC 9	834.2	Conglomerate	NA	Barren	-	
SWC 8	838.8	Qtz. sst.	Fair-good	High	NR	
SWC 7	849.0	Qtz. sst.	Fair-good	Moderate	NR	
SWC 5	863.8	Pebbly lith. sst.	NA	Barren	-	
SWC 4	884.8	Pebbly lith. sst.	NA	Barren	-	
SWC 3	898.5	Qtzose. sst.	Poor	Low	NR	
SWC 2	910.7	Conglomerate	Fair	Low	NR	
SWC 1	933.5	Conglomerate	Poor	Low	NR	

NA = not applicable NR = none recorded

TABLE 4: COUNTS OF KEY ELEMENTS OF POLLEN SUM FROM SELECTED SAMPLES IN LEATHERJACKET-1

CATEGORIES	SAMPLES		
	752.4 m	754.0 m	755.6 m
% Dinoflagellates relative to spore-pollen	2.7	2.9	8.2
% Fungii relative to spore pollen	5.3	11.3	7.8
Total Spores %	9	4	23
Total gymnosperms %	12	11	15
Total angiosperms %	79	85	61
Cyathidites spp. %	4.5	1.5	7.6
Conbaculites apiculatus %	X	X	2.2
Laevigatosporites spp. %	1.4	1.9	5.4
Podocarpidites spp. %	4.5	3.0	3.6
Lygistepollenites florinii %	1.0	3.7	3.6
Phyllocladidites mawsonii %	4.2	1.9	2.2
Dilwynites spp. & Araucariacites australis %	1.4	X	5.3
H. harrisii (= Casuarina pollen) %	5.6	8.2	9.0
Nothofagidites spp. %	12.9	17.2	11.2
Malvacipollis spp. %	1.4	1.9	1.8
Myrtaceidites spp. %	14.7	13.4	4.9
M. tenuis %	X	X	1.3
Proteacidites spp. %	13.6	15.3	15.2
Tricolporites spp. %	17.1	25.0	10.7
TOTAL COUNT (no. specimens):	310	310	262

X = less than 1%