PALYNOLOGICAL ANALYSIS

KINGFISH-7, GIPPSLAND BASIN

BY

ALAN D. PARTRIDGE
ESSO AUSTRALIA LTD

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INTRODUCTION

Twenty-eight sidewall core, twenty core samples and one cuttings sample were examined from Kingfish-7. The zones recognised in the well are summarised below while all samples examined are listed on Table-1 and confidence ratings for the zone intervals are given on the accompanying Data Sheet.

SUMMARY

UNIT	SPORE-POLLEN ZONES	DINOFLAGELLATE ZONES
Lakes Entrance Formation	*P. tuberculatus* 7407'-7410'	
Upper Gurnard Facies 7410'-7524'	Upper *N. asperus* 7415'-7420'	*P. coreoides* 7415'
	Middle *N. asperus* 7425'-7440'	*D. extensa* Zone equivalent 7425'-7540'
	Lower *N. asperus* 7445'-7475'	*D. heterophylcta* 7445'-7455'
		W. echinosuturata 7465'
		A. diktyoplokus 7470'-7475'
	P. asperopolus 7480'-7497'	*W. edwardsii* 7497'
Marine Sand 7498'-7524'	*P. asperopolus* 7502'	*W. edwardsii* 7502' (Interval not zoned 7502'-7524')
Lower Gurnard Facies 7524'-7553'	*P. asperopolus* 7526'-7553'	*W. thompsonae* 7526'-7552'
	UNCONFORMITY	
Latrobe Coarse Clastics 7553'-7923'	Lower *M. diversus* 7575'-7797'	
T.D. 7923'		

GEOLOGICAL COMMENTS

Kingfish-7 is the first well to intersect a significant reservoir sand intercalated with greensands which lithologically have to be correlated with the Gurnard Formation. The deposition of "greensand" at Kingfish-7 commenced in the Early Eocene (probably as early as the Wetzeliella waipawaensis Dinoflagellate Zone in the lower part of the Upper M. diversus Zone) and continued throughout the Middle and Late Eocene and ceased in the Early Oligocene (Upper N. asperus Zone). The "greensand" environment was interupted only once by the deposition of 26 feet of fine to coarse sand which is lithologically typical of the Latrobe coarse clastics. The sand was deposited during the P. asperopolus Zone at the boundary between the Wetzeliella thompsonae and W. edwardsii Dinoflagellate Zones (see Partridge 1976, Fig. 2).

Although lithologically the "greensand" in Kingfish-7 is indistinguishable from the Gurnard Formation the "greensand" sampled in Core-2 (from 7524 to 7553 feet on log depths) is older than the main developments of greensand to the west and north of Kingfish-7. In Gurnard-1 the "type locality" the base of the Gurnard Formation lies within the Lower N. asperus Zone. In essence the Gurnard Formation is really a facies and both its base and top are time transgressive.

The lower greensand unit between 7524 to 7553 feet is placed in the W. thompsonae Dinoflagellate Zone on the basis of both spore-pollen and dinoflagellates including the common occurrence of the nominated zone species. The presence of the dinoflagellates Wetzeliella waipawaensis and W. ornata within this section suggests that greensand deposition actually started in the Upper M. diversus Zone. These latter Wetzeliella species are not known to have overlapping ranges with W. thompsonae in the thicker Flounder Formation or in New Zealand where they were originally described (Wilson, 1967). Their presence together with W. thompsonae in Kingfish-7 is interpreted to be insitue recycling or reworking. The lower greensand unit is only represented by 29 feet, and core 2 within this interval displays abundant burrowing. Assuming continuous deposition this 29 feet would have been deposited in a minimum time of one million years (equivalent to W. thompsonae Zone only) or a maximum of three and a half million years (from W. waipawaensis to W. thompsonae Zones assuming recycling). This represents depositional rates from 8.8 mm/1000 years to 3.5 mm/1000 years. These rates are so low that reworking is likely to be the rule rather than the exception! The upper greensand unit between 7410 to 7524 feet has even slower depositional rates of between 1.5 mm/1000 years to 7.3 mm/1000 years.

The intercalated reservoir sand between 7498 to 7524 feet obviously had a much higher rate of deposition. Its stratigraphic position of lying at the boundary between the W. edwardsii and W. thompsonae Dinoflagellate Zones suggests that its deposition may be related to a eustatic change in sea level. Palaeogeographic reconstructions suggest that the lower greensand unit was deposited in water depths of between 600 and 1000 feet.

DISCUSSION OF ZONES

Species identified from the samples examined are given on the eight attached distribution sheets. The basis for choosing the zone intervals is discussed in the following:

Lower Malvacepollis diversus Zone 7575 to 7797 feet

Kingfish-7 appears to have reached total depth while still within the Lower M. diversus Zone, although no age diagnostic samples were obtained

from the final 118 feet intersected in the well. The zone is identified on the common occurrence of Proteacidites grandis and presence of species such as Malvacepollis diversus, Intratriporopollenites notabilis, Tetracolporites multistrixus, Tricolpites gillii and Myrtaceoipollenites australis Harris (the last at 7724 feet only). Most asemblages are of low diversity as is typical of the zone. Likewise the dinoflagellates present are neither diverse nor very age diagnostic.

Proteacidites asperopolus Zone 7480 to 7553 feet

The lower greensand unit which was extensively sampled from Core-2 is placed in the P. asperopolus Zone on the presence of the spore-pollen species Conbaculites apiculatus, Helciporites astrus, Proteacidites asperopolus and Santalumidites cainozoicus, all of which appear near the base of the greensand. This age is strongly reinforced by the dinoflagellates especially the sporadic occurrence of Wetzeliella thompsonae.

The lower part of core-2 was originally misidentified as belonging to the Upper M. diversus Zone in provisional palynological reports. These early determinations were based on the identification of the dinoflagellate Wetzeliella ornata which is normally not found above the Upper M. diversus Zone. Its occurrence in Kingfish-7 is interpreted as insitue recycling of the very slowly accummulating greensand facies.

The top of the P. asperopolus Zone is picked above the top of the major sands between 7498 and 7524 feet, on the highest occurrences or extinction points of the spore-pollen species Intratriporopollenites notabilis, Myrtaceidites tenuis and Conbaculites apiculatus and the dinoflagellate species Wetzeliella edwardsii and Homotryblium tasmanense.

Nothofagidites asperus Zones 7415 to 7475 feet

The 13 million years represented by the Lower, Middle and Upper N. asperus Zones are represented in Kingfish-7 by a maximum of 65 feet. This represents an accumulation rate of 5 feet/million years of 1.5 millimetres per 1000 years. Obviously the section cannot represent continuous sedimentation at this slow rate without continual reworking of the sediment leading to complete masking of any zone boundaries. That differentiation into three spore-pollen zones and a number of dinoflagellate zones can be made implies that sediments were delivered to the Kingfish-7 location in discrete packages of sediment which are separated by very substantial hiatuses. A minimum of a five-fold subdivision can be recognised in the section based on dinoflagellates.

It is also on the basis of the dinoflagellates that the section is actually age dated. In most samples the spore-pollen diversity is too low, because of the low yields obtained from the sidewall cores, to differentiate the spore-pollen zones. Instead the spore-pollen zones are extrapolated from knowledge of how the spore-pollen and dinoflagellate zones correlate elsewhere in the basin.

This upper greensand unit in Kingfish-7 shows the same sequence of dinoflagellate zones or events as in Swordfish-1 (Partridge 1977). The lowest and oldest zone recognised is termed the Areosphaeridium diktyoplokus Zone (7470 to 7475 feet) and is based on the association of this species with Deflandrea oebisfeldensis. Above this is the Wetzeliella echinosuturata Zone based on the occurrence of the nominated species. Its occurrence in Kingfish-7 is only the second time it has been found in the Gippsland Basin. The next zone is based on the first occurrence followed by a short acme of the species Deflandre heterophylcta. The top of this zone is placed at the last appearance of A. diktyoplokus. These three zones are correlated with the Lower N. asperus Zone which correlates with the total range of A. diktyoplokus.

The Middle N. asperus Zone is based on Browns Creek Clays style dinoflagellate assemblages between 7425 and 7440 feet. The best sample which is at 7430 feet contains Eisenackia ornata.

The Upper N. asperus Zone is based on negative evidence. It is restricted to two samples at 7415 and 7420 feet. The underlying sample contains the last occurrence of the dinoflagellate Corrudinium incompositum one of the best indicator species for the Browns Creek Clays, while the overlying sample contains the lowest occurrence of the spore Cyatheacidites annulata which is used to mark the base of the Proteacidites tuberculatus Zone documented in samples at 7407 and 7410 feet.

REFERENCES

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PARTRIDGE, A.D., 1977, Palynological analysis Swordfish-1, Gippsland Basin: Esso Aust. Ltd., Palaeo. Rept. 1977/13

WILSON, G.J., 1967, Some species of Wetzeliella Eisenack (Dinophyceae) from New Zealand Eocene and Paleocene strata: New Zealand J. Botany, v. 5, no. 4, p. 469-497.

BASIN GIPPSLAND BASIN DATE

WELL NAME KINGFISH-7 ELEVATION K.B. +83 feet

AGE	PALYNOLOGIC ZONES	HIGHEST DATA					LOWEST DATA				
		Preferred Depth	Rtg.	Alternate Depth	Rtg.	2 way time	Preferred Depth	Rtg.	Alternate Depth	Rtg.	2 way time
OLIG-MIO.	P. tuberculatus	7407	0				7410	1			
EOCENE	U. N. asperus	7415	2				7420	2			
	M. N. asperus	7425	1				7440	2	7430	0	
	L. N. asperus	7445	1				7475	1			
	P. asperopolus	7480	2	7497	0		7553*	2	7552*	0	
	U. M. diversus										
	M. M. diversus										
	L. M. diversus	7575*	2	7586*	1		7797	1			
PALEOCENE	U. L. balmei										
	L. L. balmei										
	T. longus										
LATE CRETACEOUS	T. lilliei										
	N. senectus										
	C. trip./T.pach.										
	C. distocarin.										
	T. pannosus										
EARLY CRETACEOUS											
PRE-CRETACEOUS											

COMMENTS:

W. echinosuturata Dinoflagellate Zone 7465 feet

W. edwardsii Dinoflagellate Zone 7497-7502 feet

W. thompsonae Dinoflagellate Zone 7526-7552* feet

*Convention core samples, depth corrected to E-logs.

T.D. 7923 feet

RATINGS:
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 spore and pollen or microplankton, or both.
4; CUTTINGS, NO CONFIDENCE, assemblage with non-diagnostic spores, pollen and/or microplankton.

NOTE: If a sample cannot be assigned to one particular zone, then no entry should be made. Also, if an entry is given a 3 or 4 confidence rating, an alternate depth with a better confidence rating should be entered, if possible.

DATA RECORDED BY: A.D. Partridge DATE September, 1977

DATA REVISED BY: A.D. Partridge DATE 5th November, 1977

SAMPLE and DEPTH (in feet)			ZONE	AGE	CONFIDENCE RATING	YIELD	DIVERSITY	COMMENT
SWC 41	7407'		P. tuberculatus	Early Oligocene	0	Moderate	High	
SWC 40	7410'		P. tuberculatus	" "	1	Low	Moderate	
SWC 39	7415'		Upper N. asperus	" "	2	Low	Fair	
SWC 38	7420'		" " "	" "	2	Low	Fair	
SWC 37	7425'		Middle N. asperus	Late Eocene	1	Very Low	Fair	
SWC 36	7430'		" " "	" "	0	Low	High	
SWC 35	7435'		" " "	" "	2	Very Low	Fair	
SWC 34	7440'		" " "	" "	2	High	Low	
SWC 33	7445'		Lower N. asperus	Middle Eocene	1	Moderate	High	Top occurrence of A. diktyoplokus
SWC 32	7450'		" " "	" "	2	High	Moderate	
SWC 31	7455'		" " "	" "	1	Low	High	Base occurrence of D. heterophylcta
SWC 30	7460'		" " "	" "	1	High	Low	
SWC 29	7465'		" " "	" "	1	Low	Fair	Occurrence of W. echinosuturata
SWC 28	7470'		" " "	" "	1	Low	Fair	
SWC 27	7475'		" " "	" "	1	Moderate	Fair	Base occurrence of A. diktyoplokus
SWC 26	7480'		P. asperopolus	Early Eocene	2	Moderate	Fair	
Cuttings	7480'-90'		Indeterminant		-	Low	Fair	
SWC 24	7497'		P. asperopolus	Early Eocene	0	Moderate	High	W. edwardsii Dino. Zone
SWC 22	7502'		P. asperopolus	" "	0	Moderate	High	W. edwardsii Dino. Zone
SWC 21	7506'		Indeterminant	" "	-	Very Low	Very Low	
SWC 20	7508'		Barren	" "	-	-	-	
SWC 11	7526'		P. asperopolus	" "	1	Very Low	Very Low	W. thompsonae Dino. Zone top
SWC 10	7528'		" "	" "	0	Moderate	Fair	
SWC 9	7530'		" "	" "	0	Low	Moderate	
Core 2	7533'	(7528')	" "	" "	0	Moderate	Moderate	
Core 2	7537'	(7532')	" "	" "	0	Low	High	Reworked? W. waiparaensis
Core 2	7540'	(7535')	" "	" "	0	Moderate	Moderate	
Core 2	7545'11"	(7540'11")	" "	" "	0	Moderate	High	Reworked? W. ornata
Core 2	7549' 7"	(7544' 7")	" "	" "	0	Low	High	
Core 2	7550'10"	(7545'10")	" "	" "	0	Moderate	High	Reworked? W. ornata
Core 2	7552'	(7547')	" "	" "	0	High	High	Reworked? W. ornata
Core 2	7552' 6"	(7547' 6")	" "	" "	0	Moderate	High	
Core 2	7553'11"	(7548'11")	" "	" "	0	Moderate	High	
Core 2	7554'10"	(7549'10")	" "	" "	0	Low	High	
Core 2	7555' 6"	(7550' 6")	" "	" "	0	Moderate	High	
Core 2	7556' 5"	(7551' 5")	" "	" "	0	Moderate	High	
Core 2	7557' 4"	(7552' 4")	" "	" "	0	Moderate	High	Lowest occurrence W. thompsonae
Core 2	7558'	(7553')	" "	" "	2	Moderate	Fair	
Core 2	7559'11"	(7554'11")	Indeterminant	" "	-	Very Low	Very Low	
Core 2	7580'	(7575')	Lower M. diversus	Early Eocene	2	Low	Low	
Core 3	7591'	(7586')	" " "	" "	1	Low	Moderate	
Core 4	7643'	(7638')	Indeterminant	" "		Very Low	Very Low	
Core 6	7724'	(7725')	Lower M. diversus	" "	1	Moderate	Moderate	
SWC 7	7730'		" " "	" "	1	Low	Moderate	Contaminated from drilling mud.
Core 6	7751'	(7752')	" " "	" "	0	High	High	With D. dartmooria
SWC 6	7759'		Indeterminant	" "	-	Low	Fair	Contaminated by Oligocene dinoflagellates from drilling mud.
SWC 4	7797'		Lower M. diversus	" "	1	Low	Fair	
SWC 2	7880'		Barren					
SWC 1	7900'		Indeterminant or Barren		-	-	-	Contamination from Lakes Entrance Fm. only thing identified.

NB: E-log adjusted conventional core depths are given in brackets.

TABLE-1: SUMMARY OF PALYNOLOGICAL ANALYSES, KINGFISH-7, GIPPSLAND BASIN

Well Name KINGFISH-7 Basin GIPPSLAND Sheet No. 1 of 8

SAMPLE TYPE *	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	C	C	C	C	C	C
DEPTHS / PALYNOMORPHS	7407'	7410'	7415'	7420'	7425'	7430'	7435'	7440'	7445'	7450'	7455'	7460'	7465'	7470'	7475'	7480'	7497'	7504'	7506'	7526'	7528'	7530'	7533'	7537'	7540'	7545'11"	7549'7"	7550'10"
A. qualumis																												
A. acutullus																												
A. luteoides																												
A. oculatus																												
A. sectus																												
A. triplaxis																												
A. obscurus																												
B. disconformis																												
B. arcuatus																												
B. elongatus																												
B. mutabilis																												
B. otwayensis																												
B. elegansiformis																												
B. trigonalis																												
B. verrucosus																												
B. bombaxoides																												
B. emaciatus																												
C. bullatus																												
C. heskermensis																												
C. horrendus																												
C. meleosus																												
C. apiculatus																												
C. leptos																												
C. striatus																												
C. vanraadshooveníi																												
C. orthoteichus/major																												
C. annulatus																												
C. gigantis																												
C. splendens																												
D. australiensis																												
D. granulatus																												
D. tuberculatus																												
D. delicatus																												
D. semilunatus																												
E. notensis																												
E. crassiexinus																												
F. balteus																												
F. crater																												
F. lucunosus																												
F. palaequetrus																												
G. edwardsii																												
G. rudata																												
G. divaricatus																												
G. gestus																												
G. catathus																												
G. cranwellae																												
G. wahooensis																												
G. bassensis																												
G. nebulosus																												
H. harrisii																												
H. astrus																												
H. elliottii																												
I. anguloclavatus																												
I. antipodus																												
I. notabilis																												
I. gremius																												
I. irregularis																												
J. peiratus																												
K. waterbolkii																												
L. amplus																												
L. crassus																												
L. ohaiensis																												
L. bainii																												
L. lanceolatus																												
L. balmei																												
L. florinii																												
M. diversus																												
M. duratus																												
M. grandis																												
M. perimagnus																												

*C= core; S= sidewall core; T= cuttings.

Well Name KINGFISH-7 Basin GIPPSLAND Sheet No. 2 of 8

SAMPLE TYPE *	C	C	C	C	C	C	C	C	C	C	C	C	C	C	S	C	S	S	S
DEPTHS / PALYNOMORPHS	7552'	7552'6"	7553'11"	7554'10"	7555'6"	7556'5"	7557'4"	7558'	7559'11"	7580'	7591'	7643'	7724'	7730'	7751'	7759'	7797'	7900'	
A. qualumis																			
A. acutullus																			
A. luteoides																			
A. oculatus																			
A. sectus																			
A. triplaxis																			
A. obscurus																			
B. disconformis																			
B. arcuatus																			
B. elongatus																			
B. mutabilis																			
B. otwayensis																			
B. elegansiformis																			
B. trigonalis																			
B. verrucosus																			
B. bombaxoides																			
B. emaciatus																			
C. bullatus																			
C. heskermensis																			
C. horrendus																			
C. meleosus																			
C. apiculatus																			
C. leptos																			
C. striatus																			
C. vanraadshooveni																			
C. orthoteichus/major																			
C. annulatus																		C	
C. gigantis																			
C. splendens																			
D. australiensis																			
D. granulatus																			
D. tuberculatus																			
D. delicatus																			
D. semilunatus																			
E. notensis																			
E. crassiexinus																			
F. balteus																			
F. crater																			
F. lucunosus																			
F. palaequetrus																			
G. edwardsii																			
G. rudata			RN																
G. divaricatus																			
G. gestus																			
G. catathus																			
G. cranwellae																			
G. wahooensis																			
G. bassensis																			
G. nebulosus																			
H. harrisii															A				
H. astrus																			
H. elliottii																			
I. anguloclavatus																			
I. antipodus																			
I. notabilis																			
I. gremius																			
I. irregularis																			
J. peiratus																			
K. waterbolkii																			
L. amplus																			
L. crassus																			
L. ohaiensis																			
L. bainii																			
L. lanceolatus																			
L. balmei																			
L. florinii																		C	
M. diversus																			
M. duratus																			
M. grandis																			
M. perimagnus																			

*C= core; S= sidewall core; T= cuttings.

Well Name KINGFISH-7 Basin GIPPSLAND Sheet No. 4 of 8

SAMPLE TYPE *	C	C	C	C	C	C	C	C	C	C	C	C	C	C	S	C	S	S	S
DEPTHS / PALYNOMORPHS	7552'	7552'6"	7553'11"	7554'10"	7555'6"	7556'5"	7557'4"	7558'	7559'11"	7580'	7591'	7643'	7724'	7730'	7751'	7759'	7797'	7900'	
M. subtilis	/		/		/	/	/	/		/				/	/				
M. ornamentalis																			
M. hypolaenoides																			
M. homeopunctatus																			
M. parvus/mesonesus	/		/																
M. tenuis	/		/	/	A		/												
M. verrucosus													/						
M. australis																/			
N. asperus																			
N. asperoides						/													
N. brachyspinulosus																			
N. deminutus	/	/	/					/			/		/	/	/				
N. emarcidus/heterus																			
N. endurus																			
N. falcatus	/		/			/	/	/			/		/	/	/		/		
N. flemingii																			
N. goniatus																			
N. senectus																			
N. vansteenisii																			
O. sentosa																			
P. ochesis														/					
P. catastus														/	/				
P. demarcatus	/					/		/							/				
P. magnus																			
P. polyoratus																			
P. vesicus																			
P. densus																			
P. velosus																			
P. morganii/jubatus																			
P. mawsonii	/		/					/			/		/	/	/		/		
P. reticulosaccatus																			
P. verrucosus																			
P. crescentis																			
P. esobalteus							/												
P. langstonii																			
P. reticulatus																			
P. simplex																			
P. varus																			
P. adenanthoides (Prot.)	/					/	/						/	/	/				
P. alveolatus																			
P. amolosexinus																			
P. angulatus																			
P. annularis	/				/	/		/						/	/				
P. asperopolus						/													
P. biornatus	/					/	/												
P. clarus																			
P. cleinei																			
P. confragosus																			
P. crassis					/														
P. delicatus																			
P. formosus																			
P. grandis	/	/			/	/	A	/		A	/	/	A	A	A	/	A		
P. grevillaensis																			
P. incurvatus														/					
P. intricatus																			
P. kopiensis																			
P. lapis	/														/				
P. latrobensis						/													
P. leightonii	/				/														
P. obesolabrus																			
P. obscurus	/												/	/	/				
P. ornatus		/				/													
P. otwayensis																			
P. pachypolus	A		A		A		/												
P. palisadus																			
P. parvus																			
P. plemmelus																			
P. prodigus								/						/	/		/		
P. pseudomoides										/				/					
P. recavus			/																

*C = core; S = sidewall core; T = cuttings.

Well Name KINGFISH-7 Basin GIPPSLAND Sheet No. 5 of 8

SAMPLE TYPE *	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	C	C	C	C	C	C
DEPTHS / PALYNOMORPHS	7407'	7410'	7415'	7420'	7425'	7430'	7435'	7440'	7445'	7450'	7455'	7460'	7465'	7470'	7475'	7480'	7497'	7504'	7506'	7526'	7528'	7530'	7533'	7537'	7540'	7545'11"	7549'7"	7550'10"	
P. rectomarginis			/			/																							
P. reflexus																													
P. reticulatus																													
P. reticuloconcavus																													
P. reticuloscabratus															/		/	/											
P. rugulatus																													
P. scitus																													
P. stipplatus																													
P. tenuiexinus																	/												
P. truncatus																													
P. tuberculatus																													
P. tuberculiformis																													
P. tuberculotumulatus																												/	
P. xestoformis (Prot.)										/																	/		
Q. brossus																													
R. boxatus			/																										
R. stellatus																													
R. mallatus																													
R. trophus																	/					/							
S. cainozoicus																	/					/	/	/	/			/	
S. rotundus									/								/												
S. digitatoides																													
S. marlinensis																													
S. rarus																													
S. meridianus									/	/					/									/	/			/	
S. prominatus																													
S. uvatus																													
S. punctatus																													
S. regium																													
T. multistrixus (CP4)																													
T. textus																													
T. verrucosus																													
T. securus																													
T. confessus (C3)																													
T. gillii																													
T. incisus																												/	
T. longus																													
T. phillipsii																													
T. renmarkensis																													
T. sabulosus																													
T. simatus																													
T. thomasii																													
T. waiparaensis																													
T. adelaidensis (CP3)				/		/				/							/											/	
T. angurium																													
T. delicatus																													
T. geraniodes																													
T. leuros																													
T. lilliei																													
T. marginatus																													
T. moultonii																													
T. paenestriatus															/							/	/	/	/		/	/	
T. retequetrus																											/	/	
T. scabratus																													
T. sphaerica											/			/															
T. magnificus (P3)																													
T. spinosus																													
T. ambiguus																													
T. chnosus			/																										
T. helosus																													
T. scabratus																													
T. sectilis																													
V. attinatus																													
V. cristatus																													
V. kopukuensis	/			/	/		/							/	/		/								/				

*C= core; S= sidewall core; T= cuttings.

Well Name KINGFISH-7 Basin GIPPSLAND Sheet No. 6 of 8

SAMPLE TYPE *	C	C	C	C	C	C	C	C	C	C	C	C	C	C	S	C	S	S	S
DEPTHS / PALYNOMORPHS	7552'	7552'6"	7553'11"	7554'10"	7555'6"	7556'5"	7557'4"	7558'	7559'11"	7580'	7591'	7643'	7724'	7730'	7751'	7759'	7797'	7900'	
P. rectomarginis																			
P. reflexus																			
P. reticulatus																			
P. reticuloconcavus																			
P. reticuloscabratus	/		/			/	/												
P. rugulatus																			
P. scitus																			
P. stipplatus																			
P. tenuiexinus	/							/							/		/		
P. truncatus																			
P. tuberculatus																			
P. tuberculiformis		/					/												
P. tuberculotumulatus											/								
P. xestoformis (Prot.)																			
O. brossus																			
R. boxatus		/																	
R. stellatus																			
R. mallatus											/			/	/				
R. trophus																			
S. cainozoicus																			
S. rotundus																			
S. digitatoides																			
S. marlinensis																			
S. rarus																			
S. meridianus	/				/	/	/	/	/				/	/	/		/		
S. prominatus																			
S. uvatus																			
S. punctatus																			
S. regium																			
T. multistrixus (CP4)													/	/	/				
T. textus																			
T. verrucosus															/				
T. securus																			
T. confessus (C3)																			
T. gillii															A				
T. incisus	/																		
T. longus																			
T. phillipsii							/								/				
T. renmarkensis																			
T. sabulosus																			
T. simatus																			
T. thomasii																			
T. waiparaensis																			
T. adelaidensis (CP3)		/						/					/	/	/				
T. angurium																			
T. delicatus																			
T. geraniodes																			
T. leuros																			
T. lilliei																			
T. marginatus																			
T. moultonii					/	/	/												
T. paenestriatus				/	/	/		/											
T. retequetrus																			
T. scabratus														/					
T. sphaerica													/	/					
T. magnificus (P3)																			
T. spinosus																			
T. ambiguus															/				
T. chnosus																			
T. helosus			/		/														
T. scabratus																			
T. sectilis																			
V. attinatus																			
V. cristatus																			
V. kopukuensis							/				/			/					

*C = core; S = sidewall core; T = cuttings.

Well Name KINGFISH-7 Basin GIPPSLAND Sheet No. 7 of 8

SAMPLE TYPE *	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	C	C	C	C	C	C
DEPTHS / PALYNOMORPHS	7407'	7410'	7415'	7420'	7425'	7430'	7435'	7440'	7445'	7450'	7455'	7460'	7465'	7470'	7475'	7480'	7497'	7504'	7506'	7526'	7528'	7530'	7533'	7537'	7540'	7545'11"	7549'7"	7550'10"
Chiro. dispersum	/																											
Dinos. mamilatus	/																											
plys. fibrosum	/																											
Dinos. scabroellipticus	/																											
Penta. laticinctum	/																											
Dinos. simplex	/								cf			C						C		C		C						
H-kolp. rigaudae	/	/	/																									
Nemat. balcombiana	/	/				/			/		/																	
System. placacantha	/	/	/	/		/					/																	
Leptodinium spp.	/	/		/							/			/														
Scrin. australiense	/																							/				
Operc. centrocarpum	/	/	/	A	/	/	/	/	/	/	/	C												/				
Hemicystidinium spp.	/											/						A	/				/	/		/	/	/
Spinif. ramosus	/		/	/		/		/				/	/	/	/	/	/					/	/	/			/	/
Lingu. solarum		/	/																									
Phthan. delicatum			/		/	/																						
Phthan. coreoides					/				/																			
Tectat. marlum					/						/																	
Corru. incompositum					/				/	/											? / C							
Dinos. pontus					cf	/			/	/																		
Balti. nanum						cf																						
Defla. extensa						/																						
Eisen. ornata						/																						
Diphy. ariensis						/	/																					
Neoten. dentalia						/	/																					
Corru. corrugatum						/		/	/																			
Samlan. reticulifera						/			/																			
Phthan. eocenicum						/			/					/		/												
Phthan. rotundum						/																						
Emmat. urnaformis							/																					
Defl. leptodermata							/		A																			
System. capricornum									/																			
Wetz. glabra									/																			
Delf. heterophyleta									/	/	A																	
Hystio. variata									/	/	/				/													
Areos. diktyoplokus									A	/	/	A	A	A	A													
Defl. oebisfeldensis									cf	/	/	cf	/	A	/													
Reticulodimum spp.									/	/	/	/	/	/	/		/	/										
Lingu. machaerophorum									/	/	/	/	/	/	/		/	/										
Spinidinium spp.									/	/	/	/	/	/	/		/	/					/	/				
Pareo. indentata									/	/	/	/	/	/	/		/	/					/	/		/	/	/
Kolpom. tuberculoides									/	/	/	/	/	/	/		/	/					/	/		/	/	/
Wetz. echinosuturata									/	/	/	/	/	/	/	/	/	/					/	/		/	/	/
Cordos. inodes									/	/	/	/	/	/	/	/	/	/		/			/	/	/	/	/	/
Thalas. pelagica									/	/	/	/	/	/	/	/	/	/	/	/			/	/	/	/	/	/
Defl. flounderensis									/	/	/	/	/	/	cf	cf	/	/	/	/		cf	/	A		A	A	/
Areoligera sp.									/	/	/	/	/	/	A	A	/	/	/	/		/	/	/		/	/	/
Wetz. edwardsii									/	/	/	/	/	/	/	/	/	/	/	/		/	/	/		/	/	/
Kenelyia spp.									/	/	/	/	/	/	/	/	/	/	/	/		/	/	/		/	/	/
Homot. tasmanense									/	/	/	/	/	/	/	/	/	/	/	/		/	/	/		/	/	/
Wetz. symmetricus									/	/	/	/	/	/	/	/	/	/	/	/		/	/	/		/	/	/
Wetz. thompsonae									/	/	/	/	/	/	/	/	/	/	/	/		/	/	/		/	/	/
Defl. longispinosa									/	/	/	/	/	/	/	/	/	/	/	/		/	/	/		/	/	/
Hetera. paxilla									/	/	/	/	/	/	/	/	/	/	/	/		/	/	/		/	/	/
Defl. asymmetricum									/	/	/	/	/	/	/	/	/	/	/	/		/	/	/		/	/	/
Senoni. morayensis									/	/	/	/	/	/	/	/	/	/	/	/		/	/	/		/	/	/
Wetz. waiparaensis									/	/	/	/	/	/	/	/	/	/	/	/		/	/	RW		/	/	/
Wetz. homomorpha									/	/	/	/	/	/	/	/	/	/	/	/		/	/	/		/	/	/
Wetz. ornata									/	/	/	/	/	/	/	/	/	/	/	/		/	/	/		RW	/	RW
Spinif. crassipellis									/	/	/	/	/	/	/	/	/	/	/	/		/	/	/		/	/	/
Tubios. filosa									/	/	/	/	/	/	/	/	/	/	/	/		/	/	/		/	/	cf
H-kolp. varispinosum									/	/	/	/	/	/	/	/	/	/	/	/		/	/	/		/	/	cf
Adnat. retiintextum									/	/	/	/	/	/	/	/	/	/	/	/		/	/	/		/	/	/
Wetz. hyperacantha									/	/	/	/	/	/	/	/	/	/	/	/		/	/	/		/	/	/
Diphy. colligerum									/	/	/	/	/	/	/	/	/	/	/	/		/	/	/		/	/	/
Palaeoc. australinum									/	/	/	/	/	/	/	/	/	/	/	/		/	/	/		/	/	/
Defl. dartmooria									/	/	/	/	/	/	/	/	/	/	/	/		/	/	/		/	/	/
									/	/	/	/	/	/	/	/	/	/	/	/		/	/	/		/	/	/
FORAM LINERS	/ A	/	/	/				/		/						/		/										

*C= core; S= sidewall core; T= cuttings.

A = Abundant or Common
C = Caved or contamination
RW = Reworked or recycled

Well Name KINGFISH-7 Basin GIPPSLAND Sheet No. 8 of 8

SAMPLE TYPE *	C	C	C	C	C	C	C	C	C	C	C	C	C	C	S	C	S	S	S
DEPTHS / PALYNOMORPHS	7552'	7552'6"	7553'11"	7554'10"	7555'6"	7556'5"	7557'4"	7558'	7559'11"	7580'	7591'	7643'	7724'	7730'	7751'	7759'	7797'	7900'	
Chiro. dispersum																			
Dinos. mamilatus																			
Polys. fibrosum																			
Dinos. scabroellipticus																			
Penta. laticinctum																			
Dinos. simplex								C											
H-kolp. rigaudae																			
Namat. balcombiana																			
System. placacantha																			
Leptodinium spp.																			
Scrin. australiense																			
Operc. centrocarpum																			
Hemicystidinium spp.																			
Spinif. ramosus																			
Lingu. solarum																			
Phthan. delicatum																			
Phthan. coreoides																			
Tectat. marlum																			
Corru. incompositum																			
Dinos. pontus																			
Balti. nanum																			
Defla. extensa																			
Eisen. ornata																			
Diphy. ariensis																			
Neoten. dentalia																			
Corru. corrugatum																			
Samlan. reticulifera																			
Phthan. eocenicum																			
Phthan. rotundum			cf	cf		cf					cf								
Emmat. urnaformis																			
Defl. leptodermata																			
System. capricornum																			
Wetz. glabra																			
Delf. heterophyleta																			
Hystio. variata																			
Areos. diktyoplokus																			
Defl. oebisfeldensis																			
Reticulodimum spp.																			
Lingu. machaerophorum																			
Spinidinium spp.																			
Pareo. indentata																			
Kolpom. tuberculoides																			
Wetz. echinosuturata																			
Cordos. inodes																			
Thalas. pelagica																			
Defl. flounderensis																			
Areoligera sp.																			
Wetz. edwardsii																			
Kenelyia spp.																			
Homot. tasmanense	A																		
Wetz. symmetricus																			
Wetz. thompsonae					A														
Defl. longispinosa																			
Hetera. paxilla																			
Defl. asymmetricum																			
Senoni. moravensis																			
Wetz. waiparaensis																			
Wetz. homomorpha																			
Wetz. ornata	RW																		
Spinif. crassipellis																			
Tubios. filosa																			
H-kolp. varispinosum																			
Adnat. retiintextum																			
Wetz. hyperacantha																			
Diphy. colligerum																			
Palaeoc. australinum																			
Defl. dartmooria															A				

*C= core; S= sidewall core; T= cuttings.