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PALYNOLOGY REPORT

BIOSTRATIGRAPHY OF SELECTED SAMPLES IN KILLARA NO. 1, 984M - 2405M, OTWAY BASIN

by

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PHOENIX OIL & GAS N.L.

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## SUMMARY

The following are biostratigraphic results of a palynological investigation of four samples from Killara No.1, Otway Basin:

Depth (m) Biostratigraphic Allocation Age

Dettmann & Douglas (1988) Helby et al. (1987)

984	C. paradoxa	C. paradoxa	m-1 Albian
1753	C. hughesii (upper)	C. hughesii	l BarremAptian
2049	C. hughesii (lower)	F. wonthaggiensis	ValangBarrem.
2405	C. stylosus	C. australiensis	TithonValang.

The palynological evidence confirms that the sample at 984m is from sediments in the upper part of the Eumeralla Formation, and that from 1753 from the lower part of the same formation. The sample at 2049m is a correlative of the Geltwood Beach Formation, and the lowermost sample (2405m) is a correlative of the 'Basal Unit' or the overlying Pretty Hill Sandstone.

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## INTRODUCTION

Two sidewall cores (1753m, 2405m) and two cuttings samples (984m, 2049m) from Killara No.1 have been palynologically analysed to ascertain the age and biostratigraphic relationships of the sediments.

Preparation of the samples was by standard techniques (Phipps & Playford, 1984), and three strew slides of each residue were scanned. Species distributions are documented in Table 1.

## BIOSTRATIGRAPHY AND AGE

Biostratigraphic syntheses is in terms of the scheme developed for the Otway Basin (Dettmann & Douglas, 1976; Dettmann, 1986) and the more generalized Australia-wide one (Helby *et al.*, 1987). Although several of the zonal indices are known to have different stratigraphic ranges in disparate sedimentary basins within Australia (Table 2, from Dettmann, 1986), relationships between the Otway Basin and the Australia-wide schemes have been adduced.

1. <u>984m;</u> C. pàradoxa Zone, mid-late Albian

The sample is assigned to the *C. paradoxa* Zone on the basis of *Coptospora paradoxa* and in the absence of *Dictyotosporites speciosus* and other species known to be restricted to zones older than the *C. paradoxa* Zone. Although down-hole contamination is likely in cuttings, the extracted palynoflora is entirely consistent with those occurring in the *C. paradoxa* Zone. Palynomorphs identified are all of land plant origin.

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the sample. The occurrence of these species indicate assignment to the upper *C. hughesii* Zone (Otway Basin scheme) and *C. hughesii* Zone (pan-Australian scheme). Occasional non marine algal cysts were encountered in the assemblage which is predominantly of land plant palynomorphs.

3. <u>2049m</u>; *C. hughesii* (lower) Zone, Valanginian-Barremian The assemblage obtained from the cuttings sample contains *Dictyotosporites speciosus* associated with *Crybelosporites stylosus* and *Foraminisporis wonthaggiensis*. Accordingly the sample is believed to be at or near the base of the lower *C. hughesii* Zone (Otway Basin) and equivalent *F. wonthaggiensis* Zone (pan-Australia). The assemblage is entirely of land plant palynomorphs.

4. <u>2405m;</u> C. stylosus Zone, Tithonian-Valanginian

A restricted palynoflora was extracted from the sample. The presence of *Dictyotosporites speciosus* and *Cyclosporites hughesii* indicates that the sample is younger than the *R. watherooensis* Zone and is assigned to the *C. stylosus* Zone (Otway Basin) and equivalent *C. australiensis* Zone (pan-Australia). Deposition in a lacustrine situation is indicated by the presence of fresh water algal cysts.

## REFERENCES

Dettmann, M. E. 1986. Early Cretaceous palynoflora of subsurface strata correlative with the Koonwarra Fossil Bed, Victoria. *Mem. Assoc. Australas. Palaeontols.* 3, 79-110.

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Palaeontols. 4, 1-94.

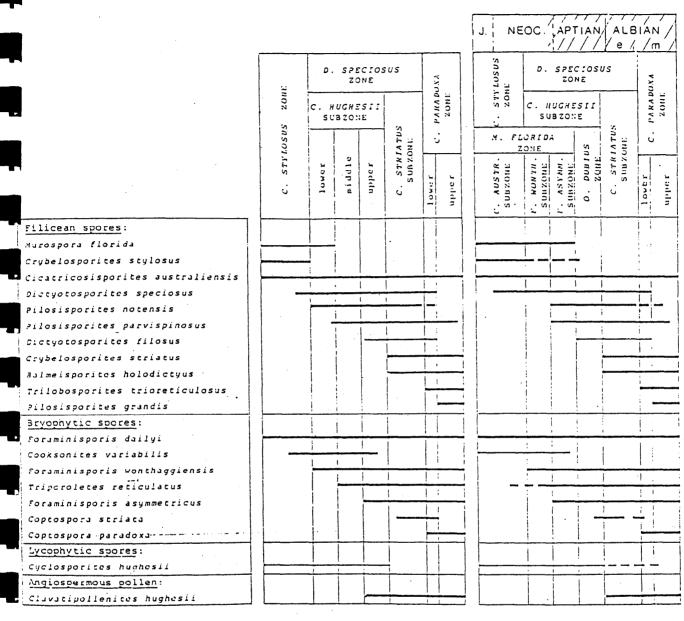
Phipps, D. & Playford, G. 1984. Laboratory techniques for extraction of

palynomorphs from sediments. Pap. Dept. Geol. Univ. Qd 11(1), 1-23.

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TABLE 1	PALYNOMORPH							01214120									~=	7
COMPANY: PHOENIX OIL & GAS	N.L	•										Sh	eet	. 1	of	2		
WELL: KILLARA NO. 1			• .			В	AS	IN		OTW	AY							
Sample type	S	D	S <sup>.</sup>	D				•	1				<u> </u>					
Depth (m) Palynomorph	2405	2049	1753	984	, ,													. •
CRYPTOGAM SPORES:						1										_		
Aequitriradites spinulosus	+			+	<u> </u>						, 	1	1		<u> </u>	1	<u> </u>	
aculatisporites comaumensis	÷	÷	+	+		1	_			·								
Contignisporites cooksoniae	+				<u> </u> .									_				
Couperisporites tabulatus	+	+										1			1			
Cyclosporites hughesii	+	÷	÷									<u> </u>			·			
Ceratosporites equalis	+	÷	+	+	.							<u> </u>						
Cyathidites australis/minor	+	+	+	+													<u> </u>	
Dictyotosporites speciosus	+	+	+		İ													
Dictyophyllidites crenatus	+	ļ+	ļ+			1	•					.		·	•			
Laevigatosporites belfordii	+	i		i	i					İ								
Leptolepidites verrucatus	+	+	+	ļ				i										
Leptolepidites major	+	+	+	+														
Neoraistrickia truncata	+	+	+	+														<u>.</u>
Retitriletes austroclavatidites	+	i+	<u>i</u> +		1	İ				.		İ			1			
R. douglasii	+	+	+		ļ	.												
R. eminulus	j+	+	1+	+	i	i				İ	İ	İ	İ	.				
R. circolumenus	+	+	1							ł								
Stereisporites antiquasporites	+	+	4	+	Ι									ŀ	.			
Biretisporites spectabilis	·	+	Τ															
Cicatricosisporites australiensis	.	+	+	+											1	1		
C. ludbrookiae		+	1	ŀ						1								
Crybelosporites stylosus	i	4	İ							1							•	
Cyathidites asper		+	1	+										.				
Foraminisporis dailyi	.	+	Τ	+														
F. wonthaggiensis	·	+	. 4	+  +														
Klukisporites scaberis		+		+	·													
Osmundacidites wellmanii	1.	+																
Retitriletes facetus	Ī	+	1	1	+							I	T					Ļ
R. nodosus	1	+	.	+									T					1
Sestrosporites pseudoalveolatus		4									Γ							1
Biretisporites potoniae	1	1	.	+					T			T						Ļ
Cvathidites punctatus				+	+													+
Foraminisporis asymmetricus		Ī	<u> </u>	+	+							$\downarrow$					-	+
Perinomonoletes sp.				+														1

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COMPANY: Phoenix OIL & (	GAS. N	۱.L.							SI	neet	t 2	of	2	-	
WELL: KILLARA No. 1					B	ASI	۲:	OTI	VAV						
Sample type	S	D	S	D			1		1	1	1			T	T
Denti					1	İ						<u> </u>		<u> </u>	$\frac{1}{1}$
Depth (M) Palynomorph	2405	2049	1753	984											
Perotriletes linearis			+		İ				1		İ		<u></u>	<u> </u>	t
Retitriletes reticulumsporites	ľ	İ	+										1	Ι	Ī
R. watherooensis	ł		+					1						1	T
Aequitriradites verrucosus				+		1					1		.  .		Ī
Cicatricosisporites hughesii				+									1.		T
Coptospora paradoxa				+					•						T
Crybelosporites striatus				+			.								Ī
Gleicheniidites circinidites				+	.			1 .							Ī
Laevigatosporites ovatus	İ	1	l	+			1						İ	Ī	Ť
Stereisporites pocockii		ļ	!	+	.			1	1	1				1	Ī
Trilobosporites trioreticulosus	i	i	i	+		.		1				}	Ī	1	İ
Triporoletes reticulatus				+			·		1	1	Ī		$\overline{1}$	<u> </u>	İ
T. simplex	1		1	+			Ì						İ	<u> </u>	Í
Velosporites triquetrus	1 .			+		Ì	1	1	1		1		İ		İ
GYMNOSPERMOUS POLLEN:	Ì	•				1	1	Í	1	<u> </u>	<u> </u>		<u></u>		Ť
Alisporites grandis	+	+	+	+		1	1	Ī	<u> </u>				<u> </u>	İ	İ
A. similis	1	+	•		i	i	i	i	1	1		İ	1	1	İ
Araucariacites australis	+	1	+		1			1						İ	Ť
Callialasporites dampieri	+		+					1						1	Ī
Classopollis chataeunovii	+	+	+	+		1			ĺ		· .		1	İ	Ť
	1.+	+	+	+							<u> </u>		1	1	† T
licrocachryidites antarcticus	+	+	+	+			Í	1	1				İ	<u> </u>	Ť
Podocarpidites ellipticus	1+	+	+	+			1.	1				<u> </u>			Ť
richotomosulcites subgranulatus			+				1	1	1						Ť
ANGIOSPERMOUS POLLEN:															Ī
Clavatipollenites hughesii	·			+		1	1	1.	1		· ·				Γ
ALGAL PALYNOMORPHS:							Ì	1	Ì						T
Sigmopollis sp.	+		+			1			1						T
/eryhachium sp.	+				1	1		1						Γ	Ī
									•				<u> </u>		T
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						1	1	İ					i	1	Ť
					1	1		1							T
	i	i	1		1	1	1		1	1	ī	<u> </u>	1	1	Ť



Gippsland/Otway Basins

Eromanga/Surat Basins

Table 2. Comparison of Early Cretaceous palynostratigraphic sequences in southern margin (Gippsland/Otway) and intracratonic (Eromanga/Surat) Basins (from Dettmann, 1986).