THE FORAMINIFERAL SEQUENCE
in
OMEO # 1,
GIPPSLAND BASIN.

for: AUSTRALIAN AQUITAINE PETROLEUM PTY. LTD.

May 5, 1983.

David Taylor,
23 Ballast Point Road, Birchgrove 2041
AUSTRALIA *(02) 82 5643*

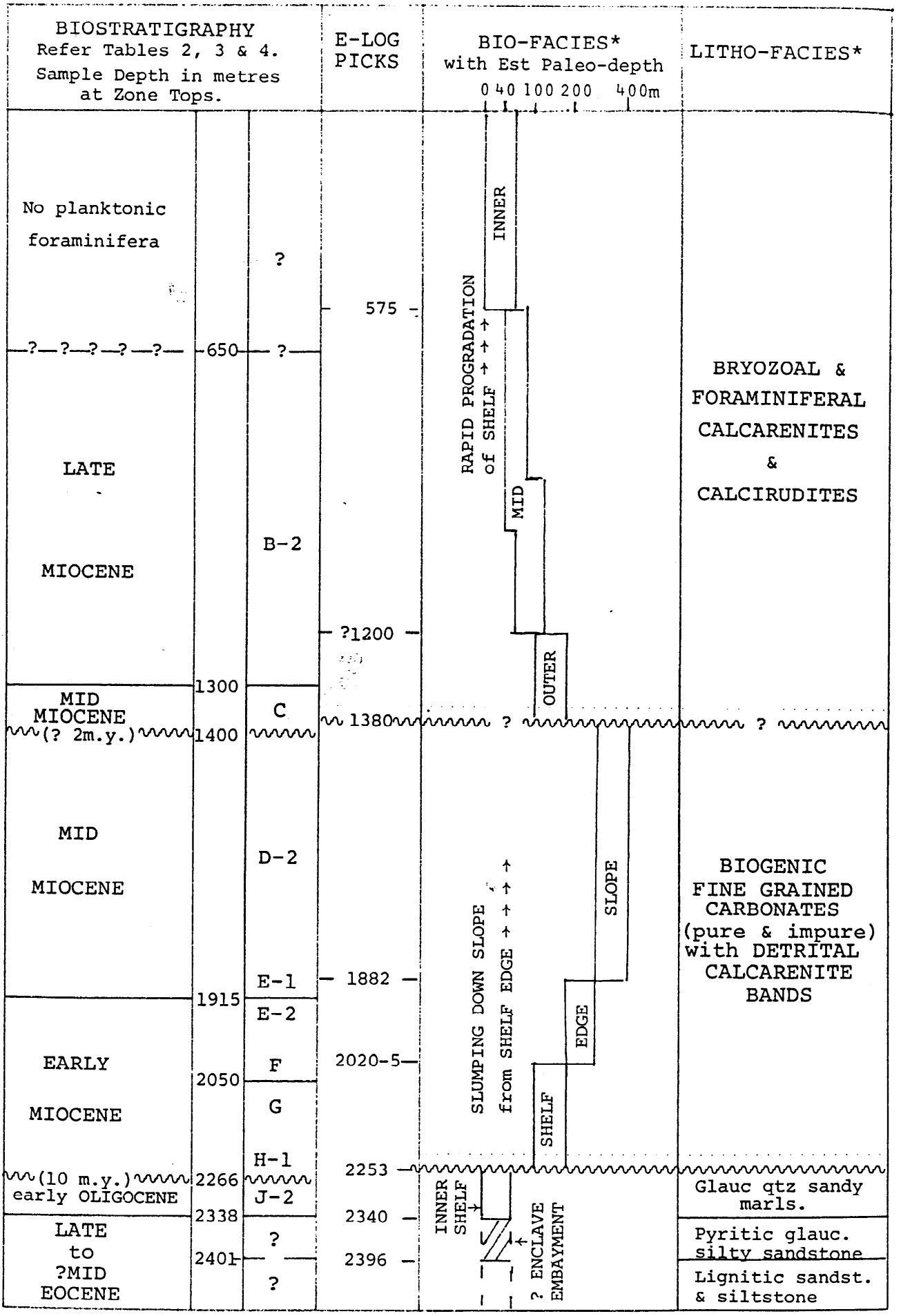

TABLE 1: INTERPRETED FORAMINIFERAL SEQUENCE for OMEO # 1
on Ditch Cutting Samples only.

Note offset between sample depth & E-log picks ~~(10 m.y.)~~ Hiatus with time span

*refer Factual Data - Table 5.

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INTRODUCTION.

Forty two samples of ditch cuttings were submitted for examination from OMEO # 1. Unfortunately, no sidewall cores were available, so all interpretations had to be based on first appearances downhole (= *range tops*). Downhole contamination increased with depth, due not only to cavings but also to the fact that the fine grained Miocene carbonates of the Gippsland Basin are readily incorporated in the mud. This mud contamination shows a cyclity of appearance in ditch cutting samples which could be correlated with circulation rate. For instance, the spherical planktonic foraminifera *Orbulina universa* and *O. suturalis* occur sporadically below 1915m; this depth is interpreted as being the base of range of these forms (compare Factual Distribution Chart of Table 4 with Interpreted Biostratigraphy of Table 2).

The biostratigraphy presented on Table 2, was abstracted from the factual data (Table 4), by applying the known sequence of *range tops* for Gippsland as well as documentation by Jenkins (1971), Kennett (1980) and Srinivasan & Kennett (1981) for the Tasman Sea Region. *Range tops* of benthonic foraminifera and other fossil indicators were utilized in designating facies units and estimating paleo-depths. Accumulated data from fossil and extant Gippsland facies sequences were applied for those interpretations as well as information from the Tasman Sea Region published by Hornibrook (1968) and Hayward & Buzas (1979). Depths cited for significant facies changes were adjusted after perusal of E-logs; compare Factual Data of Table 5 with the Interpretation of Table 1. The poignant features of the sequence are briefly discussed below in ascending, time-stratigraphic order.

EOCENE - 2340m to 2396m to ? from E-logs; 2401m to 2569m from samples.

A distinctly Eocene assemblage was first encountered in ditch cuttings at 2401m and a biostratigraphic position in the vicinity of the Mid/Late Eocene boundary was confirmed by the presence of *Globigerinatheka barri* and *Globorotalia turgida* at 2455m. These assemblages are mixed with obvious downhole contaminants, but the Eocene faunas may in fact be cavings, as these faunas are associated with lignitic sands rather than their anticipated host lithology of pyritic, glauconitic silty sandstones, which were present immediately above 2340m. Distinctly Eocene benthonic

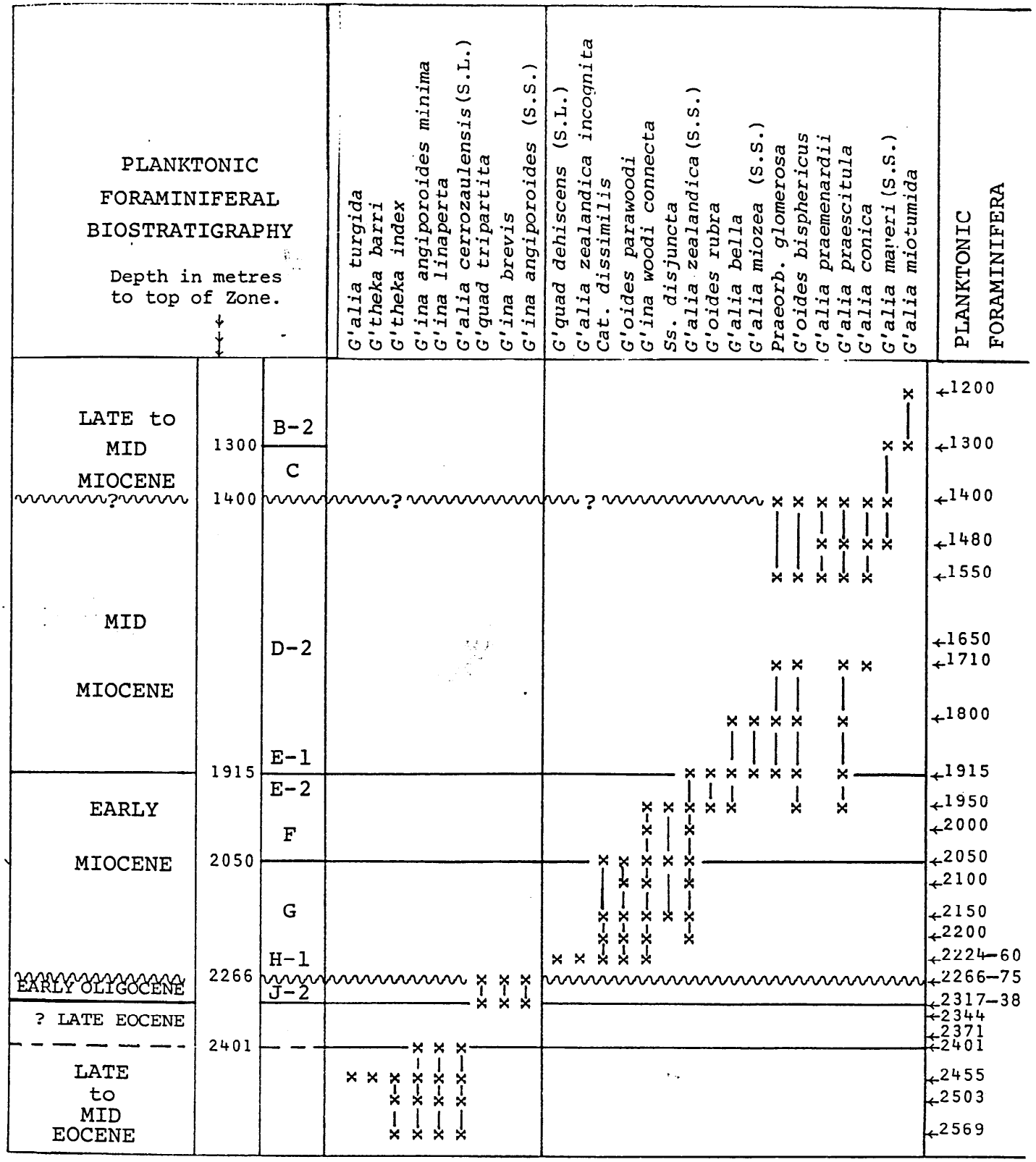

TABLE 2 : INTERPRETED BIOSTRATIGRAPHY - OMEO # 1

As only DITCH CUTTINGS available, range tops of selected planktonic foraminiferal species were utilized. Refer TABLE 4 (back of report) for FACTUAL DISTRIBUTION CHART.
Range tops = first appearance downhole in ditch cuttings.

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assemblages could not be designated as all species were present above the Eocene planktonic *range tops*.

Alas, this inability to deduce the nature and extent of the marine Eocene sediments is inauspicious, as the Omeo # 1 samples contain the best examples of Late/Mid Eocene planktonic faunas yet seen in the Gippsland Basin. The planktonic specimens appear to be more numerous and specifically more diverse than those in recognised developments of Late/Mid Eocene sediments in adjacent wells (e.g. the Bream and Gurnard wells). These observations would suggest that Omeo # 1 was in the most marine location, being axially situated in a depression. Edina # 1 was probably on the extreme margins of such a facies regime. Similar depressions formed enclaves for Eocene deposition elsewhere in Southern Australia and New Zealand. A feature of such enclave is the traceable facies progression from shallow to deeper water, such as in the Otway Basin (Taylor, 1971). So not only were the sediments preserved structurally, but originally sedimentation was controlled by structural configuration and not merely the response to the eustatic sea level high which occurred at the Mid/Late Eocene boundary (refer Loutit & Kennett, 1951).

EARLY OLIGOCENE - 2253m to 2340m from E-logs; 2266m to 2338m from samples.

Typical early Oligocene (Zone J-2) *Globigerina* assemblages, without associated deep water *Globorotalia* spp. (e.g. *G. gemma*). The shallow water aspect is confirmed by the benthonic fauna and the glauconitic, quartz sandy marl lithology.
No comment can be made regarding the relationship with the underlying Mid/Late Eocene faunas.

EARLY to MID MIOCENE - 1380m to 2253m from E-logs; 1400m to 2260m from samples.

The total absence of late Oligocene forms as well as the close proximity of Zone H-1 assemblage *range tops* above Zone J-2 *range tops* indicate a hiatus during the Oligocene which has been identified in many other Gippsland offshore sections. Deposition deepened with obvious slumping of outer shelf accumulation, down slope.

MID to LATE MIOCENE - ? to 1380m from E-logs; ? to 1300m from samples.

The short time span, occupied by Zone D-1 of the Mid Miocene, appears to be missing. Rapid progradation of the continental shelf was evident at the resumption of deposition. Planktonic foraminifera were either sparse or absent above 650m, where the robust nature of the bryozoal skeleton indicates high energy conditions. It could not be determined whether Pliocene was present.

REFERENCES.

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TABLE 3

MICROPALEONTOLOGICAL DATA SHEET

BASIN: GIPPSLAND ELEVATION: KB: 30m GL: -62.6m

WELL NAME: OMEO # 1 TOTAL DEPTH:

AGE		FORAM. ZONULES	HIGHEST DATA					LOWEST DATA				
			Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
PLEISTOCENE		A_1										
		A_2										
PLIOCENE		A_3										
		A_4										
MIOCENE		B_1										
	LATE	B_2						1200	3			
		C	1300	3				1300	3			
	MIDDLE	D_1										
		D_2	1400	3				1800	4			
		E_1	1800	4				1800	4			
		E_2	1915	3				1915	3			
	EARLY	F	1950	3				2000	3			
		G	2050	3				2200	3			
		H_1	2224					2260	3			
OLIGOCENE	LATE	H_2										
		I_1										
		I_2										
	EARLY	J_1										
		J_2	2266	3				2338	3			
EOCENE		K										
		Pre-K	2401	4				2569	4			

COMMENTS: ONLY DITCH CUTTINGS SUBMITTED

Pre-K - Mid/Late Eocene assemblages probably displaced downhole. Probable interval was between 2340 & 2396m from lithology and E-logs.

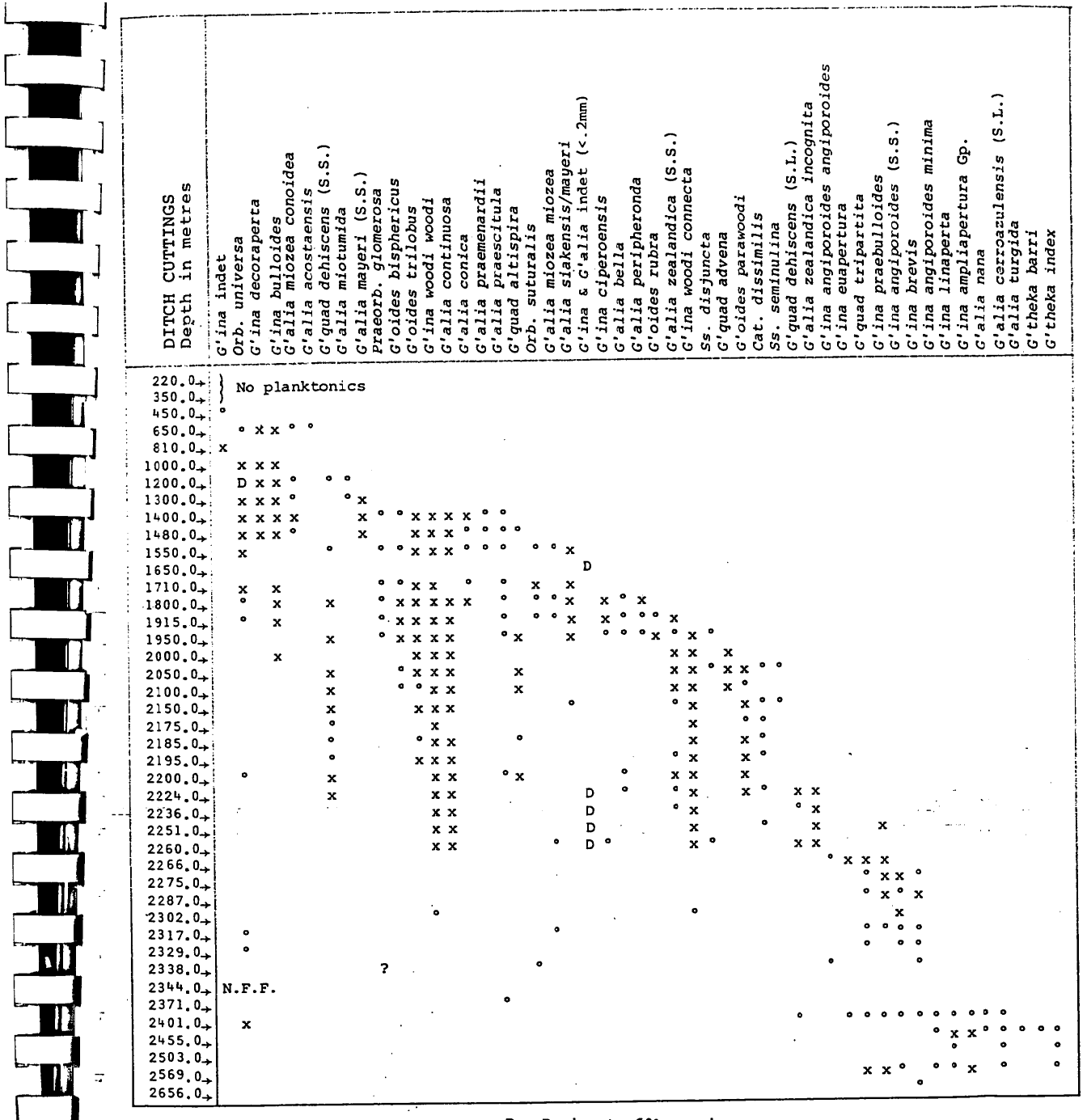
CONFIDENCE RATING:

0:	SWC or Core	- Complete assemblage (very high confidence).
1:	SWC or Core	- Almost complete assemblage (high confidence).
2:	SWC or Core	- Close to zonule change but able to interpret (low confidence).
3:	Cuttings	- Complete assemblage (low confidence).
4:	Cuttings	- Incomplete assemblage, next to uninterpretable or SWC with depth suspicion (very low confidence).

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: David Taylor DATE: May 3, 1983.

DATA REVISED BY: DATE:



SYMBOLS ° = <20 specimens D = Dominant >60% specimens
x = >20 specimens N.F.F. = no foraminifera found

TABLE 4: FACTUAL DATA of PLANKTONIC FORAMINIFERAL DISTRIBUTION - OMEO # 1.

(refer Table 2 for Interpreted Biostratigraphy).

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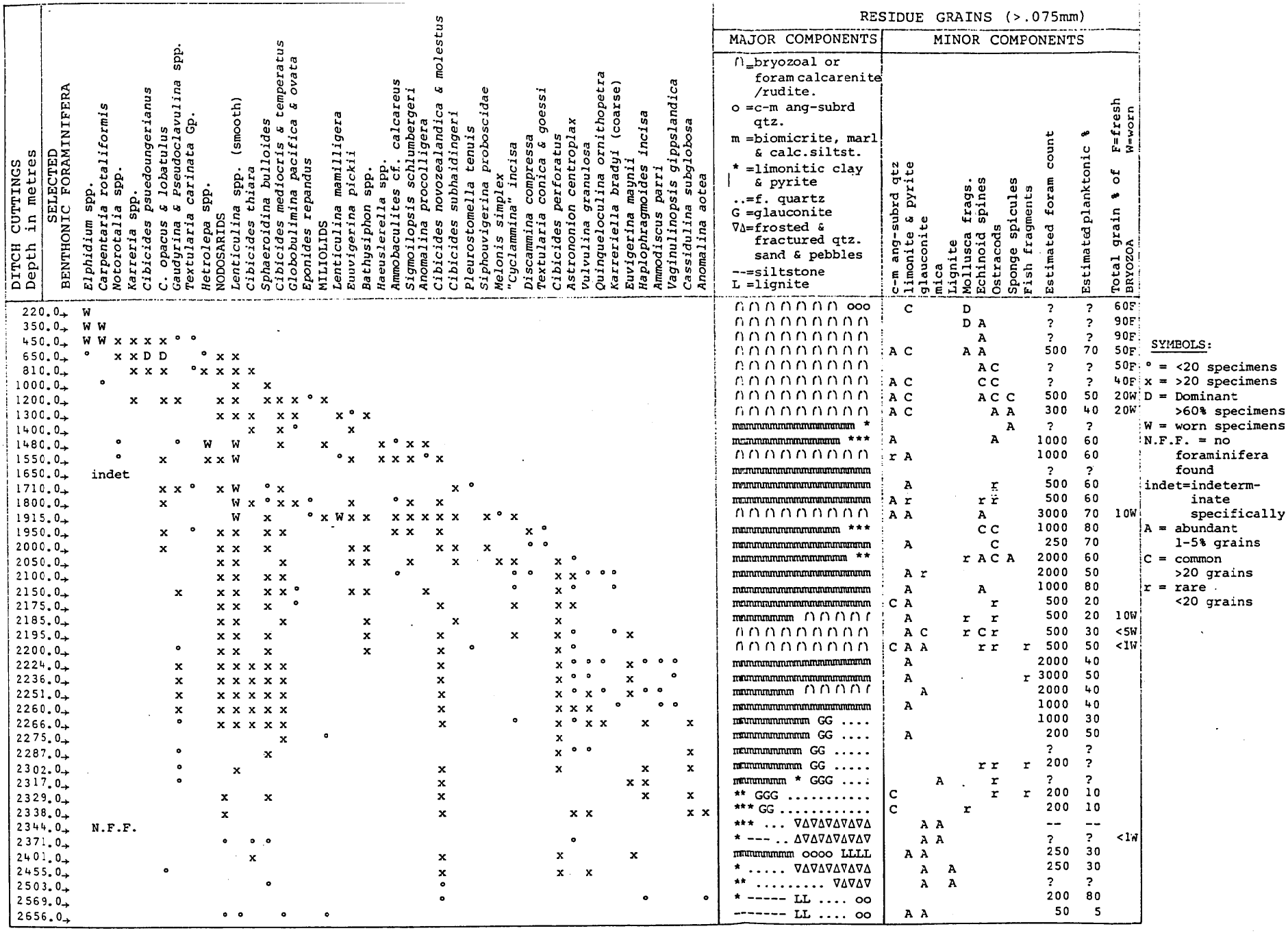

RESIDUE GRAINS (>.075mm)

MAJOR COMPONENTS	MINOR COMPONENTS												
∩=bryozoal or foram calcarenite /rudite. o =c-m ang-subrd qtz. m =biomicrite, marl & calc.siltst. * =limonitic clay & pyrite ..=f. quartz G =glauconite ∇Δ=frosted & fractured qtz. sand & pebbles --=siltstone L =lignite	c-m ang-subrd qtz	limonite & pyrite	glauconite	mica	Lignite	Mollusca frags.	Echinoid spines	Ostracods	Sponge spicules	Fish fragments	Estimated foram count	Estimated planktonic %	Total grain % of BRYOZOA	F=fresh W=worn
∩∩∩∩∩∩∩∩ ooo		C			D						?	?	60F	
∩∩∩∩∩∩∩∩∩∩					D	A					?	?	90F	
∩∩∩∩∩∩∩∩∩∩						A					?	?	90F	
∩∩∩∩∩∩∩∩∩∩	A	C				A	A				500	70	50F	
∩∩∩∩∩∩∩∩∩∩							A	C			?	?	50F	
∩∩∩∩∩∩∩∩∩∩	A	C					C	C			?	?	40F	
∩∩∩∩∩∩∩∩∩∩	A	C					A	C	C		500	50	20W	
∩∩∩∩∩∩∩∩∩∩	A	C						A	A		300	40	20W	
mmmmmmmmmmmmmmmmmm *									A		?	?		
mmmmmmmmmmmmmmmmmm ***	A							A			1000	60		
∩∩∩∩∩∩∩∩∩∩	r	A									1000	60		
mmmmmmmmmmmmmmmmmmmm											?	?		
mmmmmmmmmmmmmmmmmmmm		A						r			500	60		
mmmmmmmmmmmmmmmmmmmm	A	r					r	r			500	60		
∩∩∩∩∩∩∩∩∩∩	A	A					A				3000	70	10W	
mmmmmmmmmmmmmmmm ***							C	C			1000	80		
mmmmmmmmmmmmmmmmmmmm		A						C			250	70		
mmmmmmmmmmmmmmmmmm **						r	A	C	A		2000	60		
mmmmmmmmmmmmmmmmmmmm		A	r								2000	50		
mmmmmmmmmmmmmmmmmmmm		A					A				1000	80		
mmmmmmmmmmmmmmmmmmmm	C	A						r			500	20		
mmmmmmmm ∩∩∩∩∩		A				r		r			500	20	10W	
∩∩∩∩∩∩∩∩∩∩		A	C			r	C	r			500	30	<5W	
∩∩∩∩∩∩∩∩∩∩	C	A	A				r	r		r	500	50	<1W	
mmmmmmmmmmmmmmmmmmmm		A									2000	40		
mmmmmmmmmmmmmmmmmmmm		A								r	3000	50		
mmmmmmmm ∩∩∩∩∩			A								2000	40		
mmmmmmmmmmmmmmmmmmmm		A									1000	40		
mmmmmmmmmm GG											1000	30		
mmmmmmmmmm GG		A									200	50		
mmmmmmmmm GG											?	?		
mmmmmmmmm GG							r	r		r	200	?		
mmmmmmm * GGG				A				r			?	?		
** GGG	C							r		r	200	10		
*** GG	C					r					200	10		
*** ... ∇Δ∇Δ∇Δ∇Δ∇Δ			A	A							--	--		
* --- .. Δ∇Δ∇Δ∇Δ∇Δ∇			A	A							?	?	<1W	
mmmmmmmm oooo LLLL		A	A								250	30		
* ..... ∇Δ∇Δ∇Δ∇Δ∇Δ			A		A						250	30		
** ..... ∇Δ∇Δ∇			A		A						?	?		
* ----- LL .... oo											200	80		
------- LL .... oo		A	A								50	5		

SYMBOLS:

° = <20 specimens
x = >20 specimens
D = Dominant >60% specimens
W = worn specimens
N.F.F. = no foraminifera found
indet=indeterminate specifically
A = abundant 1-5% grains
C = common >20 grains
r = rare <20 grains

TABLE 5: FACTUAL DATA of BENTHONIC FORAMINIFERAL DISTRIBUTION & SEDIMENT GRAIN ANALYSIS - OMEO # 1.
(refer TABLE 1 for Facies Interpretation)

David Taylor, May 4, 1983.