W891.

WCR VOL 2

EAST KINGFISH-1

W 891

ESSO EXPLORATION AND PRODUCTION
AUSTRALIA INC.

WELL COMPLETION REPORT

EAST KINGFISH-1

 VOLUME 2

GIPPSLAND BASIN, VICTORIA

ESSO AUSTRALIA LIMITED

Compiled by: G.A. Nash
June, 1986

EAST KINGFISH-1

WELL COMPLETION REPORT

VOLUME II

(Interpretative Data)

CONTENTS

FIGURES

APPENDICES

ENCLOSURES

(0575F1)

GEOLOGICAL AND GEOPHYSICAL ANALYSIS

INTRODUCTION

East Kingfish-1 was located in Vic/L7, approximately 2.5km east-northeast of the Kingfish 'B' Platform and was spudded on November 30, 1984.

The primary purpose of this well was to test the then current reservoir simulation and geological models for the East Kingfish area. In short, a significant volume of undrained oil was expected downdip of the producing 'B' platform wells. It was postulated that drainage of the eastern flank could have been inhibited by the presence of low permeability zones which subcropped against the top of Coarse Clastics and dipped away from the producing wells.

Previous Drilling History

The Kingfish field was discovered in May 1967 by the wildcat well Kingfish-1. Two further wells were drilled on the structure in 1968 before Kingfish was declared commercial. Subsequently, two 21 conductor development platforms, Kingfish A and Kingfish B, were emplaced to develop the oil reserves. The first production began in April 1971 with the last production well being drilled in October 1971.

Following this development phase of drilling, four exploration outpost wells were drilled; Kingfish-4 in 1973, Kingfish-5 in 1974, Kingfish-6 in 1975 and Kingfish-7 in 1977.

In mid 1982 the West Kingfish platform was installed from which 19 development wells were drilled up to May 1984.

The Kingfish structure is located 77 km offshore in 79m of water within Vic/L7 and Vic/L8 licence blocks. It has a maximum gross oil column of 83 metres with a common field oil-water contact of 2306m subsea. The main reservoir is Early Eocene in age (Lower M.diversus).

Structure

The Kingfish structure is a large, unfaulted palaeotopographic high. The structure at the top of the M-1 reservoir approximately reflects the internal structural configuration. This suggests that the Top of Coarse Clastics surface had a subdued topographic expression at the time of its erosion.

East Kingfish-1 penetrated the Top of Coarse Clastics Unconformity 18.0m TVD (true vertical depth) low to prediction. Post drill mapping of the area has resulted in a reduction in area of the prominent pre-drill north-east trending nose upon which East Kingfish-1 was located.

The Kingfish structure could be described as a doubly plunging truncated anticline or elongate dome. The hingeline of this forced anticline is oriented east-west. At the Top of Coarse Clastics the flanks of the structure dip at 1° to 1.5° (southern flank) to 2° to 4° (northern flank). The east and west noses of the structure plunge at 1° to 1.5° and 2° respectively.

In the central and western areas, the internal beds dip at a greater angle to the west than the Top of Coarse Clastics Unconformity so that progressively younger beds subcrop at the unconformity surface in a westerly direction. To the east, the internal structure flattens then dips to the southeast.

Structural History: The Kingfish Structure at the Top of Coarse Clastics is unfaulted. Down to basement normal faulting dies out by the Early to Middle Paleocene level. This faulting is the result of pervasive extension via crustal thinning and subsidence related to the Tasman Rift (rift graben) development.

Closure at the Top of Coarse Clastics is provided by erosion and by compressive folding during the Eocene to Mid Miocene. This folding was probably progressive through time and not a single event. Because of this, the Lakes Entrance Formation which forms the seal for the structure generally does not markedly onlap the Top of Coarse Clastics/Top of Latrobe and is itself folded in part reflecting the Top of Latrobe configuration. This folding decrases rapidly at shallower depths however, and has no obvious expression within the Upper Miocene section.

STRATIGRAPHY

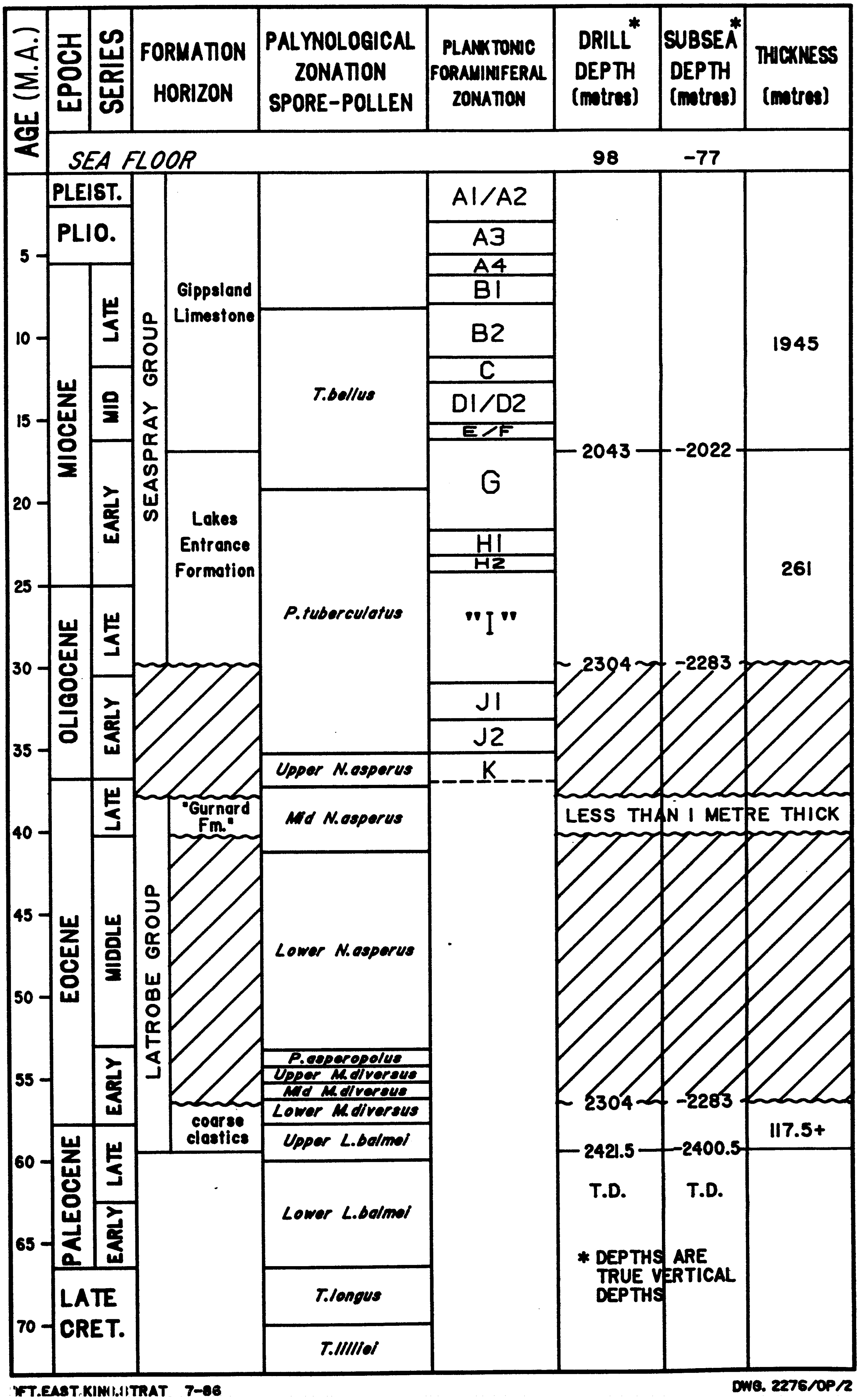
Introduction

The stratigraphic system proposed by previous authors for the Kingfish Field has been modified herein. Three unit designations have been abandoned, namely, the M-1.6.0, M-1.6.1 and M-1.7T.

In summary:

(a) the M-1.6.0 and M-1.6.1 units become part of the M-1.5/1.6 unit,
(b) the M-1.7T unit becomes part of the M-1.7 unit,
(c) the M-1.5/1.6 and M-1.7 units are kept as separate units in the East Kingfish area replacing the composite M-1.5/1.7 unit,
(d) no intra-Latrobe Marker is picked.

East Kingfish-1
STRATIGRAPHIC TABLE



FT.EAST.KINGSTRAT 7-86

DWG. 2276/OP/2

STRATIGRAPHIC SUMMARY

Age	Unit / Horizon	DEPTHS Predicted (m) KB	DEPTHS Drilled (m) KB	DEPTHS Drilled (m) SS	Thickness (m)
Recent to Early Miocene	Gippsland Limestone	98	98	77	1945
	Base of Miocene Channel	1786	1801	1778	-
Early Miocene to Late Oligocene	Lakes Entrance Formtion	1971	2043	2022	261
Early Eocene to Late Paleocene	Latrobe Group (Top of Coarse Clastics Unconformity)	2286	2304	2283	117.5+
Early Eocene	M-1.5/1.6	2286	2304	2283	22.5+
	Current OWC	-	2318.5	2297.5	-
Early Eocene	M-1.6.2	-	2326.5	2305.5	10
	Original OWC	2327	2328	2307	-
Early Eocene/ Late Paleocene	M-1.7	-	2336.5	2315.5	85+
	TOTAL DEPTH	2421	2421.5	2400.5	-

East Kingfish-1 contains a relatively continuous sequence of sediments from the Late Paleocene Upper L. balmei zone to the Early Eocene Lower M. diversus zone. Two major periods of non-deposition are recognized. The first is between the Top of Coarse Clastics Unconformity and an unnamed glauconitic sandstone (Middle N. asperus). This interval encompasses an age equivalent to the Gurnard Formation present in wells further east. However, due to its restricted development here (less than one metre thick), no attempt was made to distinguish a Gurnard Formation. A second hiatus is developed between the "Gurnard Formation" and the Lakes Entrance Formation. The base of the Lakes Entrance Formation is marked by a thin glauconitic sandstone unit of P. tuberculatus age.

The Top of Coarse Clastics was intersected approximately 18m low to prediction. The M-1.5/1.6 unit, the youngest Kingfish unit intersected has been truncated by a Middle to Early Eocene Unconformity. Generally, the M-1.5/1.6 is a high net to gross unit composed of fine to very coarse grained quartz arenites with rarer granule conglomerates and siltstone. It's reservoir properties are usually excellent. However, East Kingfish-1 penetrated a quite different stratigraphy. The M-1.5/1.6 unit in this well was exceptional in that it had a very low net to gross (0.67) relatively speaking. In addition, net sand averaged a porosity of 18%. This compares with field wide averages of 0.97% and 23% respectively. The majority of sediment within the M-1.5/1.6 unit in the Kingfish Field was deposited under marine conditions within the traction current reworked upper shoreface. The sediments in East Kingfish-1 however, were deposited below fair weather wave base in the lower shoreface, and are therefore much siltier and heavily bioturbated. These sediments do not readily correlate to any nearby Kingfish wells because:

a) East Kingfish-1 is slightly more down depositional dip than Kingfish-1 and,

b) the section in East Kingfish-1 represents the distal "toe" of a progradational sand package over which another more proximal package prograded later in time. It is these younger sediments that can be seen in Kingfish-5 and Kingfish-6.

The lower boundary of this unit with the M-1.6.2 is gradational and conformable. The M-1.5/1.6 in East Kingfish-1 then is interpreted as a depositionally downdip lateral equivalent of upper shoreface sands further west.

The M-1.6.2 unit is typically a low net to gross unit composed of siltstone, fine grained sandstone and shale/claystone. In East Kingfish-1 the whole of the unit is net with an average porosity of 18.5%. This constrasts with the better quality sands of the M-1.7 unit below it. The contact between the M-1.6.2 and M-1.7 is sharp and represents a sequence boundary between the upper shoreface M-1.7 and lower shoreface M-1.6.2. Thin reltively clean sands within the M-1.6.2 in East Kingfish-1 are interpreted as sediment pulses from laterally equivalent upper shoreface deposits during times of high wave energy. These sands may have been deposited by currents generated by storm waves or been dumped into deeper water via mass gravity flows (e.g. turbidity currents).

Pressure data from the RFT survey run in East Kingfish-1 suggests that the M-1.6.2 is not behaving as a permeability barrier and that there is only one hydraulic reservoir system. Thin clean sands within the unit probably communicate both vertically and laterally with better quality sands of the M-1.7 and M-1.5/1.6.

The M-1.7 unit is a high net to gross unit composed primarily of medium to coarse grained quartz arenites with some thin siltstone and shale horizons. It is a thick unit (85m+ in East Kingfish-1) with excellent porosity and permeability. The M-1.7 unit in the East Kingfish area comprises a series of stacked shoreface packages which prograded out over each other to the south east during Upper L. balmei, Lower M. diversus time. The lack of significant shales within the M-1.7 suggests that the water depth at the time of deposition was not great and that sediments were reworked by traction currents well above storm wave base.

Hydrocarbons

The combined effect of lower than expected reservoir interception, poor quality reservoir rock and raised oil water contact resulted in very little net oil sand being present within the East Kingfish-1 section.

Upon the completion of drilling, the hole was logged and an RFT survey conducted. The RFT data suggested that the original OWC had moved upwards by approximately 10m to 2297.5m TVDSS. The original OWC was picked at 2307m TVDSS based on core shows very close to the accepted fieldwide contact of 2306m TVDSS. Log analysis could define no clear OWC but identified hydrocarbons down to 2311.5m TVDSS even though there were no core shows (resistivity anomaly, see Appendix 3).

A further anomaly was that thin, good quality sands above the current OWC based on RFT data had very high water saturtions possibly indicating that they had undergone partial depletion due to production. Because of these high saturation values only 0.6m TVT (true vertical thickness) of net oil sand was encountered in the top section of East Kingfish-1 within the M-1.5/1.6 unit. This thin sand had an average porosity of 18.5% and an average water saturation of 63%.

CONCLUSION

Because East Kingfish-1:

a) intersected the target 18m TVD low to prediction,

b) encountered poorer quality rock towards the top of the reservoir than expected, and

c) could define no significant undrained net oil sands

The assessed volume was considered too small to support a subsea completion development and the well was plugged and abandoned.

APPENDIX 1

SERVCO
Division of Smith International, Inc.

COMPANY : ESSO AUSTRALIA LIMITED
LOCATION: BASS STRAIT
WELL NO : EAST KINGFISH 1
DATE : 3rd JANUARY, 1985

Sii DATADRIL

Division of Smith International, Inc.

ESSO EXPLORATION
EAST KINGFISH 1
BASS STRAIT
RIG: SOUTHERN CROSS
2ND JANUARY 1985

MAGNETIC MULTISHOT
13.4 DEG EAST TO GRID N
PROPOSAL 141.4 DEG GRID.

File Name: EKINGFISH1

*** RECORD OF SURVEY ***

Calculated by Sii DATADRIL's C.A.D.D.S. System

Radius of Curvature Method
All Angles are Decimal
Vertical Section Plane: 141.50 Degs

MEASURED DEPTH (M)	INCL ANGLE (DEG)	DRIFT AZIMUTH (DEG)	COURSE LENGTH (M)	TOTAL VERTICAL DEPTH	TOTAL RECTANGULAR COORDINATES (M)		VERTICAL SECTION (M)	CLOSURE DISTANCE (M)	CLOSURE AZIMUTH (DEG)	DOGLEG SEVERITY (DEG/30 M)
813.00	0.00	0.00	0.00	813.00	0.00 N	0.00 E	0.00	0.00	0.00	0.00
856.10	.25	138.50	43.20	856.20	.07 S	.06 E	.09	.09	138.50	.17
885.10	3.00	148.50	28.90	885.09	.73 S	.55 E	.91	.91	142.98	2.86
914.00	7.00	148.50	28.90	913.87	2.88 S	1.87 E	3.41	3.43	147.03	4.15
942.90	8.50	154.50	28.90	942.50	6.30 S	3.72 E	7.25	7.32	149.41	1.77
971.79	11.50	153.50	28.89	970.95	10.81 S	5.92 E	12.14	12.32	151.28	3.12
1000.69	13.25	148.50	28.90	999.18	16.22 S	8.92 E	18.25	18.52	151.18	2.13
1029.59	13.25	134.00	28.90	1027.31	21.37 S	13.06 E	24.86	25.05	148.58	3.44
1058.49	15.50	128.50	28.90	1055.30	26.10 S	18.45 E	31.91	31.97	144.75	2.73
1087.38	18.50	127.00	28.89	1082.93	31.27 S	25.13 E	40.12	40.12	141.22	3.15
1116.28	22.00	126.50	28.90	1110.04	37.26 S	33.14 E	49.79	49.87	138.35	3.64
1145.18	24.50	126.50	28.90	1136.59	44.04 S	42.31 E	60.81	61.07	136.15	2.60
1174.08	27.00	126.00	28.90	1162.62	51.47 S	52.44 E	72.92	73.47	134.46	2.60
1202.97	29.00	126.50	28.89	1188.12	59.49 S	63.37 E	86.01	86.92	133.19	2.09
1231.87	28.50	134.50	28.90	1213.46	68.51 S	73.94 E	99.64	100.79	132.82	4.03
1260.77	29.75	142.50	28.90	1238.71	79.03 S	83.25 E	113.67	114.79	133.51	4.24
1289.67	32.00	144.00	28.90	1263.51	90.91 S	92.12 E	128.50	129.43	134.62	2.47
1318.56	31.25	142.50	28.89	1288.11	103.05 S	101.18 E	143.64	144.42	135.52	1.13
1347.46	30.75	142.50	28.90	1312.88	114.86 S	110.25 E	158.52	159.21	136.17	.52
1376.36	30.00	142.50	28.90	1337.81	126.45 S	119.14 E	173.13	173.74	136.71	.78
1405.26	29.50	142.50	28.90	1362.91	137.83 S	127.87 E	187.47	188.01	137.15	.52

Sii DATADRIL

Division of Smith International, Inc.

ESSO EXPLORATION
EAST KINGFISH 1

BASS STRAIT
RIG: SOUTHERN CROSS

MEASURED DEPTH (M)	INCL ANGLE (DEG)	DRIFT AZIMUTH (DEG)	COURSE LENGTH (M)	TOTAL VERTICAL DEPTH	TOTAL RECTANGULAR COORDINATES (M)		VERTICAL SECTION (M)	CLOSURE DISTANCE (M)	CLOSURE AZIMUTH (DEG)	DOGLEG SEVERITY (DEG/30 M)
1434.15	29.50	142.50	28.89	1388.05	149.12 S	136.53 E	201.69	202.18	137.52	0.00
1463.05	29.25	142.50	28.90	1413.23	160.36 S	145.16 E	215.87	216.31	137.85	.26
1491.95	28.50	142.50	28.90	1438.54	171.44 S	153.66 E	229.82	230.22	138.13	.78
1520.85	28.25	142.50	28.90	1463.97	182.33 S	162.02 E	243.55	243.92	138.38	.26
1549.74	27.75	143.00	28.89	1489.48	193.13 S	170.23 E	257.11	257.44	138.61	.57
1578.64	27.00	144.00	28.90	1515.14	203.81 S	178.13 E	270.39	270.68	138.85	.91
1607.54	25.25	146.50	28.90	1541.09	214.27 S	185.38 E	283.09	283.33	139.13	2.15
1636.44	26.00	148.00	28.90	1567.14	224.78 S	192.15 E	295.53	295.71	139.48	1.03
1665.33	27.25	148.50	28.89	1592.97	235.79 S	198.96 E	308.38	308.51	139.84	1.32
1694.23	28.50	151.50	28.90	1618.52	247.49 S	205.71 E	321.74	321.82	140.27	1.95
1723.13	29.75	154.50	28.90	1643.76	260.02 S	212.10 E	335.53	335.55	140.80	1.99
1752.03	31.25	155.50	28.90	1668.66	273.31 S	218.30 E	349.79	349.79	141.39	1.64
1780.92	31.25	154.50	28.89	1693.36	286.89 S	224.63 E	364.36	364.37	141.94	.54
1809.82	31.00	154.50	28.90	1718.10	300.38 S	231.06 E	378.92	378.97	142.43	.26
1838.72	30.50	154.50	28.90	1742.94	313.71 S	237.42 E	393.31	393.43	142.88	.52
1867.62	30.75	155.00	28.90	1767.81	327.03 S	243.70 E	407.64	407.85	143.31	.37
1896.51	30.50	155.00	28.89	1792.67	340.37 S	249.92 E	421.96	422.27	143.71	.26
1925.41	31.00	155.00	28.90	1817.50	353.76 S	256.17 E	436.32	436.77	144.09	.52
1954.31	31.25	155.50	28.90	1842.24	367.33 S	262.42 E	450.83	451.44	144.46	.37
1983.21	31.50	155.50	28.90	1866.92	381.02 S	268.66 E	465.43	466.21	144.81	.26
2012.10	31.25	155.00	28.89	1891.58	394.68 S	274.96 E	480.04	481.01	145.14	.37
2041.00	31.25	154.50	28.90	1916.29	408.24 S	281.35 E	494.64	495.80	145.43	.27
2069.90	31.25	154.50	28.90	1941.00	421.77 S	287.81 E	509.24	510.61	145.69	0.00
2098.80	31.25	154.50	28.90	1965.70	435.30 S	294.26 E	523.85	525.43	145.94	0.00
2127.69	31.50	154.50	28.89	1990.37	448.88 S	300.74 E	538.51	540.31	146.18	.26
2156.59	31.00	155.00	28.90	2015.08	462.44 S	307.13 E	553.10	555.14	146.41	.58
2185.49	30.50	154.00	28.90	2039.91	475.77 S	313.50 E	567.50	569.77	146.62	.74
2214.39	30.50	154.00	28.90	2064.81	488.96 S	319.93 E	581.82	584.32	146.80	0.00
2243.28	31.00	155.50	28.89	2089.64	502.32 S	326.23 E	596.20	598.95	147.00	.95
2272.18	31.00	155.50	28.90	2114.41	515.86 S	332.40 E	610.64	613.68	147.20	0.00
2301.08	31.25	156.00	28.90	2139.15	529.48 S	338.53 E	625.12	628.46	147.41	.37
2329.98	31.50	156.00	28.90	2163.83	543.23 S	344.65 E	639.69	643.34	147.61	.26
2358.87	31.75	156.00	28.89	2188.43	557.07 S	350.82 E	654.35	658.33	147.80	.26

Sii DATADRIL
Division of Smith International, Inc.

ESSO EXPLORATION
EAST KINGFISH 1

BASS STRAIT
RIG: SOUTHERN CROSS

MEASURED DEPTH (M)	INCL ANGLE (DEG)	DRIFT AZIMUTH (DEG)	COURSE LENGTH (M)	TOTAL VERTICAL DEPTH	TOTAL RECTANGULAR COORDINATES (M)		VERTICAL SECTION (M)	CLOSURE DISTANCE (M)	CLOSURE AZIMUTH (DEG)	DOGLEG SEVERITY (DEG/30 M)
2386.77	32.00	156.50	27.90	2212.12	570.55 S	356.75 E	668.60	672.90	147.98	.39
2416.67	32.50	156.00	29.90	2237.41	585.15 S	363.18 E	684.03	688.70	148.17	.57
2445.57	32.50	157.00	28.90	2261.78	599.39 S	369.37 E	699.03	704.06	148.36	.56
2474.46	32.50	157.00	28.89	2286.15	613.68 S	375.43 E	713.99	719.41	148.54	0.00
2503.36	33.25	159.00	28.90	2310.42	628.23 S	381.31 E	729.03	734.89	148.74	1.37
2532.26	33.50	159.00	28.90	2334.55	643.07 S	387.01 E	744.19	750.54	148.96	.26
2561.16	34.25	159.00	28.90	2358.55	658.11 S	392.78 E	759.55	766.41	149.17	.78
2590.05	34.75	159.00	28.89	2382.36	673.38 S	398.64 E	775.16	782.54	149.37	.52
2618.95	35.50	159.00	28.90	2405.99	688.91 S	404.60 E	791.02	798.93	149.57	.78
2631.95	36.00	159.00	13.00	2416.54	696.00 S	407.32 E	798.26	806.43	149.66	1.15

BOTTOM HOLE CLOSURE: 806.43 Meters at 149 Degrees 39 Minutes 36 Seconds

APPENDIX 2

EAST KINGFISH 01 M/SHOT

ZONE STATE	COUNTRY AREA	WELL REF NUMBER	SIDETRACK NUMBER	SURVEYING COMPANY	TYPE OF SURVEY	ORIGIN CODE	INPUT UNITS	TARGET BEARING
55	160			EAST	MS		M	S 21. 0. E

BOTTOM HOLE LOCATION CALCULATIONS USING RADIUS OF CURVATURE

COURSE LENGTH	MEASURED DEPTH	TRUE VERTICAL DEPTH	INCLINATION DEG	MIN	DIRECTION DEG	MIN	RECTANGULAR COORDINATES NORTH/SOUTH	EAST/WEST	POLAR COORDINATES DISTANCE	DEG	MIN	VERTICAL SECTION
	856.20	856.20	0.	15.	S 41.	30. E	0.07 S	0.0 W	0.1	S 0.	0. W	0.1
28.90	885.10	885.09	3.	0.	S 31.	30. E	0.73 S	0.49 E	0.9	S 33.	46. E	0.9
28.90	914.00	913.87	7.	0.	S 31.	30. E	2.38 S	1.80 E	3.4	S 32.	5. E	3.3
28.90	942.90	942.50	8.	30.	S 25.	30. E	6.30 S	3.66 E	7.3	S 30.	10. E	7.2
28.89	971.79	970.95	11.	30.	S 26.	30. E	10.81 S	5.36 E	12.3	S 23.	23. E	12.2
28.90	1000.69	999.13	13.	15.	S 31.	30. E	16.22 S	8.86 E	18.5	S 28.	39. E	18.3
28.90	1029.59	1027.21	13.	15.	S 46.	0. E	21.37 S	13.00 E	25.0	S 31.	18. E	24.6
28.90	1058.49	1055.30	15.	30.	S 51.	30. E	26.10 S	18.39 E	31.9	S 35.	10. E	31.0
28.89	1087.38	1082.93	18.	30.	S 53.	0. E	31.27 S	25.07 E	40.1	S 38.	43. E	38.2
28.90	1116.28	1110.04	22.	0.	S 33.	30. E	38.52 S	31.89 E	50.0	S 39.	37. E	47.4
28.90	1145.18	1136.59	24.	30.	S 53.	30. E	46.75 S	39.70 E	61.3	S 40.	20. E	57.9
28.90	1174.08	1162.62	27.	0.	S 54.	0. E	54.18 S	49.82 E	73.6	S 42.	36. E	68.4
28.89	1202.97	1188.12	29.	0.	S 53.	30. E	62.20 S	60.75 E	86.9	S 44.	20. E	79.8
28.90	1231.87	1213.46	28.	30.	S 45.	30. E	71.22 S	71.32 E	100.8	S 45.	2. E	92.0
28.90	1260.77	1238.71	29.	45.	S 37.	30. E	81.74 S	80.63 E	114.8	S 44.	37. E	105.2
28.90	1289.67	1263.51	32.	0.	S 36.	0. E	93.62 S	89.51 E	129.5	S 43.	43. E	119.5
28.89	1318.56	1288.11	31.	15.	S 37.	30. E	105.76 S	98.57 E	144.6	S 42.	59. E	134.1
28.90	1347.46	1312.83	30.	45.	S 37.	30. E	117.57 S	107.63 E	159.4	S 42.	28. E	148.3
28.90	1376.36	1337.81	30.	0.	S 37.	30. E	129.16 S	116.53 E	174.0	S 42.	3. E	162.3
28.90	1405.26	1362.90	29.	30.	S 37.	30. E	140.54 S	125.26 E	188.3	S 41.	43. E	176.1
28.89	1434.15	1388.05	29.	30.	S 37.	30. E	151.83 S	133.92 E	202.4	S 41.	25. E	189.7
28.90	1463.05	1413.23	29.	15.	S 37.	30. E	163.07 S	142.55 E	216.6	S 41.	9. E	203.3
28.90	1491.95	1438.54	28.	30.	S 37.	30. E	174.15 S	151.04 E	230.5	S 40.	56. E	216.7
28.90	1520.85	1463.97	28.	15.	S 37.	30. E	185.04 S	159.41 E	244.2	S 40.	45. E	229.9
28.89	1549.74	1489.47	27.	45.	S 37.	0. E	195.84 S	167.62 E	257.8	S 40.	34. E	242.9
28.90	1578.64	1515.14	27.	0.	S 36.	0. E	206.52 S	175.52 E	271.0	S 40.	22. E	255.7
28.90	1607.54	1541.08	25.	15.	S 33.	30. E	216.97 S	182.77 E	283.7	S 40.	7. E	268.1
28.90	1636.44	1567.14	26.	0.	S 32.	0. E	227.49 S	189.53 E	296.1	S 39.	48. E	280.3
28.89	1665.33	1592.97	27.	15.	S 31.	30. E	238.49 S	196.35 E	308.9	S 39.	28. E	293.0
28.90	1694.23	1618.51	28.	30.	S 28.	30. E	250.19 S	203.10 E	322.3	S 39.	4. E	306.4
28.90	1723.13	1643.76	29.	45.	S 25.	30. E	262.73 S	209.49 E	336.0	S 38.	34. E	320.3
28.90	1752.03	1668.66	31.	15.	S 24.	30. E	276.02 S	215.69 E	350.3	S 38.	0. E	335.0
28.89	1780.92	1693.36	31.	15.	S 25.	30. E	289.60 S	222.02 E	364.9	S 37.	28. E	349.9
28.90	1809.82	[illegible]	31.	0.	S 25.	30. E	303.08 S	228.45 E	379.5	S 37.	0. E	364.8
28.90	1838.72	1742.93	30.	30.	S 25.	30. E	316.42 S	234.81 E	394.0	S 36.	35. E	379.6
28.90	1867.62	1767.80	30.	45.	S 25.	0. E	329.74 S	241.09 E	408.5	S 36.	10. E	394.2
28.89	1896.51	1792.65	30.	30.	S 25.	0. E	343.07 S	247.31 E	422.9	S 35.	47. E	408.9
28.90	1925.41	1817.50	31.	0.	S 25.	0. E	356.46 S	253.56 E	437.4	S 35.	25. E	423.7
28.90	1954.31	1842.24	31.	15.	S 24.	30. E	370.03 S	259.81 E	452.1	S 35.	4. E	438.6
28.90	1983.21	1866.91	31.	30.	S 24.	30. E	383.72 S	266.05 E	466.9	S 34.	44. E	453.6
28.89	2012.10	1891.58	31.	15.	S 25.	0. E	397.38 S	272.35 E	481.8	S 34.	25. E	468.6
28.90	2041.00	1916.29	31.	15.	S 25.	30. E	410.94 S	278.74 E	496.6	S 34.	9. E	483.5
28.90	2069.90	1940.99	31.	15.	S 25.	30. E	424.47 S	285.20 E	511.4	S 33.	54. E	498.5
28.90	2098.80	1965.70	31.	15.	S 25.	30. E	438.00 S	291.65 E	526.2	S 33.	39. E	513.4

28.89	2127.69	1990.37	31.	30.	S	25.	30.	E	451.58 S	298.13 E	541.1	S	33.	26.	E	528.4
28.90	2156.59	2015.07	31.	0.	S	25.	0.	E	465.14 S	304.52 E	556.0	S	33.	13.	E	543.4
28.90	2185.49	2039.91	30.	30.	S	26.	0.	E	478.48 S	310.89 E	570.6	S	33.	1.	E	558.1
28.90	2214.39	2064.81	30.	30.	S	25.	30.	E	491.69 S	317.26 E	585.2	S	32.	50.	E	572.7
28.89	2243.28	2089.64	31.	0.	S	24.	30.	E	505.07 S	323.50 E	599.8	S	32.	38.	E	587.5
28.90	2272.18	2114.41	31.	0.	S	24.	30.	E	518.62 S	329.67 E	614.5	S	32.	27.	E	602.3
28.90	2301.08	2139.15	31.	15.	S	24.	0.	E	532.24 S	335.81 E	629.3	S	32.	15.	E	617.2
28.90	2329.98	2163.86	31.	15.	S	24.	0.	E	545.93 S	341.91 E	644.2	S	32.	3.	E	632.2
28.89	2358.87	2188.49	31.	45.	S	24.	0.	E	559.72 S	348.05 E	659.1	S	31.	52.	E	647.3
27.90	2386.77	2212.18	32.	0.	S	23.	30.	E	573.21 S	353.99 E	673.7	S	31.	42.	E	662.0
29.90	2416.67	2237.47	32.	30.	S	24.	0.	E	587.81 S	360.41 E	689.5	S	31.	31.	E	677.9
28.90	2445.57	2261.84	32.	30.	S	23.	0.	E	602.05 S	366.60 E	704.9	S	31.	20.	E	693.4
28.89	2474.46	2286.21	32.	30.	S	23.	0.	E	616.34 S	372.66 E	720.2	S	31.	9.	E	709.0
28.90	2503.36	2310.48	33.	15.	S	21.	0.	E	630.88 S	378.54 E	735.7	S	30.	58.	E	724.6
28.90	2532.26	2334.61	33.	30.	S	21.	0.	E	645.72 S	384.24 E	751.4	S	30.	45.	E	740.5
28.90	2561.16	2358.61	34.	15.	S	21.	0.	E	660.76 S	390.01 E	767.3	S	30.	33.	E	756.6
28.84	2590.00	2382.38	34.	45.	S	21.	0.	E	676.01 S	395.86 E	783.4	S	30.	21.	E	773.0
23.95	2613.95	2406.05	35.	30.	S	21.	0.	E	691.56 S	401.33 E	799.8	S	30.	9.	E	789.6
13.00	2631.95	2416.50	36.	0.	S	21.	0.	E	698.65 S	404.55 E	807.3	S	30.	4.	E	797.2
6.05	2632.00	2421.50	36.	0.	S	21.	0.	E	701.97 S	405.63 E	810.3	S	30.	2.	E	800.8

EAST KINGFISH 01 M/SHOT

MEASURED DEPTH	TRUE VERTICAL DEPTH	INCLINATION DEG	INCLINATION MIN	DIRECTION	DIRECTION DEG	DIRECTION MIN		RECTANGULAR COORDINATES NORTH/SOUTH		EAST/WEST		POLAR COORDINATES DISTANCE		DEG	MIN		VERTICAL SECTION
2480.00	2290.88	32.	39.	S	22.	37.	E	619.09	S	373.82	E	723.2	S	31.	7.	E	711.9
2481.00	2291.72	32.	40.	S	22.	33.	E	619.59	S	374.03	E	723.7	S	31.	7.	E	712.5
2482.00	2292.56	32.	42.	S	22.	29.	E	620.09	S	374.23	E	724.3	S	31.	7.	E	713.0
2483.00	2293.40	32.	43.	S	22.	25.	E	620.58	S	374.44	E	724.9	S	31.	6.	E	713.6
2484.00	2294.24	32.	45.	S	22.	20.	E	621.08	S	374.64	E	725.3	S	31.	6.	E	714.1
2485.00	2295.08	32.	46.	S	22.	16.	E	621.59	S	374.85	E	725.9	S	31.	5.	E	714.6
2486.00	2295.93	32.	48.	S	22.	12.	E	622.09	S	375.06	E	726.4	S	31.	5.	E	715.2
2487.00	2296.77	32.	50.	S	22.	8.	E	622.59	S	375.26	E	726.9	S	31.	5.	E	715.7
2488.00	2297.61	32.	51.	S	22.	4.	E	623.09	S	375.46	E	727.5	S	31.	4.	E	716.3
2489.00	2298.45	32.	53.	S	21.	60.	E	623.59	S	375.67	E	728.0	S	31.	4.	E	716.8
2490.00	2299.29	32.	54.	S	21.	55.	E	624.10	S	375.87	E	728.5	S	31.	3.	E	717.3
2491.00	2300.12	32.	56.	S	21.	51.	E	624.60	S	376.07	E	729.1	S	31.	3.	E	717.9
2492.00	2300.96	32.	57.	S	21.	47.	E	625.11	S	376.28	E	729.6	S	31.	3.	E	718.4
2493.00	2301.80	32.	59.	S	21.	43.	E	625.61	S	376.48	E	730.2	S	31.	2.	E	719.0
2494.00	2302.64	33.	0.	S	21.	39.	E	626.12	S	376.68	E	730.7	S	31.	2.	E	719.5
2495.00	2303.48	33.	2.	S	21.	35.	E	626.62	S	376.88	E	731.2	S	31.	1.	E	720.1
2496.00	2304.32	33.	4.	S	21.	31.	E	627.13	S	377.08	E	731.8	S	31.	1.	E	720.6
2497.00	2305.15	33.	5.	S	21.	26.	E	627.64	S	377.28	E	732.3	S	31.	1.	E	721.2
2498.00	2305.99	33.	7.	S	21.	22.	E	628.15	S	377.48	E	732.8	S	31.	0.	E	721.7
2499.00	2306.83	33.	8.	S	21.	18.	E	628.66	S	377.68	E	733.4	S	30.	60.	E	722.3
2500.00	2307.67	33.	10.	S	21.	14.	E	629.17	S	377.88	E	733.9	S	30.	59.	E	722.8
2501.00	2308.51	33.	11.	S	21.	10.	E	629.68	S	378.07	E	734.5	S	30.	59.	E	723.3
2502.00	2309.34	33.	13.	S	21.	6.	E	630.19	S	378.27	E	735.0	S	30.	58.	E	723.9
2503.00	2310.18	33.	14.	S	21.	1.	E	630.70	S	378.47	E	735.5	S	30.	58.	E	724.4
2504.00	2311.02	33.	15.	S	21.	0.	E	631.21	S	378.66	E	736.1	S	30.	58.	E	725.0
2505.00	2311.85	33.	16.	S	21.	0.	E	631.72	S	378.86	E	736.6	S	30.	57.	E	725.5
2506.00	2312.69	33.	16.	S	21.	0.	E	632.23	S	379.06	E	737.2	S	30.	57.	E	726.1
2507.00	2313.52	33.	17.	S	21.	0.	E	632.75	S	379.25	E	737.7	S	30.	56.	E	726.6
2508.00	2314.36	33.	17.	S	21.	0.	E	633.26	S	379.45	E	738.2	S	30.	56.	E	727.2
2509.00	2315.20	33.	18.	S	21.	0.	E	633.77	S	379.65	E	738.8	S	30.	55.	E	727.7
2510.00	2316.03	33.	18.	S	21.	0.	E	634.28	S	379.84	E	739.3	S	30.	55.	E	728.3
2511.00	2316.87	33.	19.	S	21.	0.	E	634.80	S	380.04	E	739.9	S	30.	54.	E	728.8
2512.00	2317.70	33.	19.	S	21.	0.	E	635.31	S	380.24	E	740.4	S	30.	54.	E	729.4
2513.00	2318.54	33.	20.	S	21.	0.	E	635.82	S	380.44	E	740.9	S	30.	54.	E	729.9
2514.00	2319.37	33.	21.	S	21.	0.	E	636.34	S	380.63	E	741.5	S	30.	53.	E	730.5
2515.00	2320.21	33.	21.	S	21.	0.	E	636.85	S	380.83	E	742.0	S	30.	53.	E	731.0
2516.00	2321.04	33.	22.	S	21.	0.	E	637.36	S	381.03	E	742.6	S	30.	52.	E	731.6
2517.00	2321.88	33.	22.	S	21.	0.	E	637.88	S	381.22	E	743.1	S	30.	52.	E	732.1
2518.00	2322.71	33.	23.	S	21.	0.	E	638.39	S	381.42	E	743.7	S	30.	51.	E	732.7
2519.00	2323.55	33.	23.	S	21.	0.	E	638.90	S	381.62	E	744.2	S	30.	51.	E	733.2
2520.00	2324.39	33.	24.	S	21.	0.	E	639.42	S	381.81	E	744.7	S	30.	51.	E	733.8
2521.00	2325.22	33.	24.	S	21.	0.	E	639.93	S	382.01	E	745.3	S	30.	50.	E	734.3
2522.00	2326.05	33.	25.	S	21.	0.	E	640.44	S	382.21	E	745.8	S	30.	50.	E	734.9
2523.00	2326.89	33.	25.	S	21.	0.	E	640.96	S	382.41	E	746.4	S	30.	49.	E	735.4
2524.00	2327.72	33.	26.	S	21.	0.	E	641.47	S	382.60	E	746.9	S	30.	49.	E	736.0
2525.00	2328.56	33.	26.	S	21.	0.	E	641.99	S	382.80	E	747.5	S	30.	48.	E	736.5

EAST KINGFISH 01 M/SHOT

MEASURED DEPTH	TRUE VERTICAL DEPTH	INCLINATION DEG	INCLINATION MIN	DIRECTION	DIRECTION DEG	DIRECTION MIN		RECTANGULAR COORDINATES NORTH/SOUTH		EAST/WEST		POLAR COORDINATES DISTANCE		DEG	MIN		VERTICAL SECTION
2526.00	2329.39	33.	27.	S	21.	0.	E	642.50	S	383.00	E	748.0	S	30.	48.	E	737.1
2527.00	2330.23	33.	27.	S	21.	0.	E	643.02	S	383.20	E	748.5	S	30.	47.	E	737.6
2528.00	2331.06	33.	28.	S	21.	0.	E	643.53	S	383.39	E	749.1	S	30.	47.	E	738.2
2529.00	2331.90	33.	28.	S	21.	0.	E	644.05	S	383.59	E	749.6	S	30.	47.	E	738.7
2530.00	2332.73	33.	29.	S	21.	0.	E	644.56	S	383.79	E	750.2	S	30.	46.	E	739.3
2531.00	2333.56	33.	29.	S	21.	0.	E	645.08	S	383.99	E	750.7	S	30.	46.	E	739.8
2532.00	2334.40	33.	30.	S	21.	0.	E	645.59	S	384.18	E	751.3	S	30.	45.	E	740.4
2533.00	2335.23	33.	31.	S	21.	0.	E	646.11	S	384.38	E	751.8	S	30.	45.	E	740.9
2534.00	2336.06	33.	33.	S	21.	0.	E	646.62	S	384.58	E	752.3	S	30.	44.	E	741.5
2535.00	2336.90	33.	34.	S	21.	0.	E	647.14	S	384.78	E	752.9	S	30.	44.	E	742.0
2536.00	2337.73	33.	36.	S	21.	0.	E	647.65	S	384.[illegible]	E	753.4	S	30.	44.	E	742.6
2537.00	2338.56	33.	37.	S	21.	0.	E	648.17	S	385.18	E	754.0	S	30.	43.	E	743.2
2538.00	2339.40	33.	39.	S	21.	0.	E	648.69	S	385.37	E	754.5	S	30.	43.	E	743.7
2539.00	2340.23	33.	40.	S	21.	0.	E	649.21	S	385.57	E	755.1	S	30.	42.	E	744.3
2540.00	2341.06	33.	42.	S	21.	0.	E	649.72	S	385.77	E	755.6	S	30.	42.	E	744.8
2541.00	2341.89	33.	44.	S	21.	0.	E	650.24	S	385.97	E	756.2	S	30.	42.	E	745.4
2542.00	2342.72	33.	45.	S	21.	0.	E	650.76	S	386.17	E	756.7	S	30.	41.	E	745.9
2543.00	2343.56	33.	47.	S	21.	0.	E	651.28	S	386.37	E	757.3	S	30.	41.	E	746.5
2544.00	2344.39	33.	48.	S	21.	0.	E	651.80	S	386.57	E	757.8	S	30.	40.	E	747.0
2545.00	2345.22	33.	50.	S	21.	0.	E	652.32	S	386.77	E	758.4	S	30.	40.	E	747.6
2546.00	2346.05	33.	51.	S	21.	0.	E	652.84	S	386.97	E	758.9	S	30.	39.	E	748.2
2547.00	2346.88	33.	53.	S	21.	0.	E	653.36	S	387.17	E	759.5	S	30.	39.	E	748.7
2548.00	2347.71	33.	55.	S	21.	0.	E	653.88	S	387.37	E	760.0	S	30.	39.	E	749.3
2549.00	2348.54	33.	56.	S	21.	0.	E	654.40	S	387.57	E	760.6	S	30.	38.	E	749.8
2550.00	2349.37	33.	58.	S	21.	0.	E	654.92	S	387.77	E	761.1	S	30.	38.	E	750.4
2551.00	2350.20	33.	59.	S	21.	0.	E	655.44	S	387.97	E	761.7	S	30.	37.	E	750.9
2552.00	2351.03	34.	1.	S	21.	0.	E	655.96	S	388.17	E	762.2	S	30.	37.	E	751.5
2553.00	2351.85	34.	2.	S	21.	0.	E	656.49	S	388.37	E	762.8	S	30.	36.	E	752.1
2554.00	2352.68	34.	4.	S	21.	0.	E	657.01	S	388.57	E	763.3	S	30.	36.	E	752.6
2555.00	2353.51	34.	5.	S	21.	0.	E	657.53	S	388.77	E	763.9	S	30.	36.	E	753.2
2556.00	2354.34	34.	7.	S	21.	0.	E	658.06	S	388.97	E	764.4	S	30.	35.	E	753.7
2557.00	2355.17	34.	9.	S	21.	0.	E	658.58	S	389.17	E	765.0	S	30.	35.	E	754.3
2558.00	2356.00	34.	10.	S	21.	0.	E	659.10	S	389.37	E	765.5	S	30.	34.	E	754.9
2559.00	2356.82	34.	12.	S	21.	0.	E	659.63	S	389.57	E	766.1	S	30.	34.	E	755.4
2560.00	2357.65	34.	13.	S	21.	0.	E	660.15	S	389.78	E	766.6	S	30.	33.	E	756.0
2561.00	2358.48	34.	15.	S	21.	0.	E	660.68	S	389.98	E	767.2	S	30.	33.	E	756.6
2562.00	2359.30	34.	16.	S	21.	0.	E	661.20	S	390.18	E	767.7	S	30.	33.	E	757.1
2563.00	2360.13	34.	17.	S	21.	0.	E	661.73	S	390.38	E	768.3	S	30.	32.	E	757.7
2564.00	2360.96	34.	18.	S	21.	0.	E	662.26	S	390.58	E	768.9	S	30.	32.	E	758.2
2565.00	2361.78	34.	19.	S	21.	0.	E	662.78	S	390.78	E	769.4	S	30.	31.	E	758.8
2566.00	2362.61	34.	20.	S	21.	0.	E	663.31	S	390.99	E	770.0	S	30.	31.	E	759.4
2567.00	2363.43	34.	21.	S	21.	0.	E	663.83	S	391.19	E	770.5	S	30.	31.	E	759.9
2568.00	2364.26	34.	22.	S	21.	0.	E	664.36	S	391.39	E	771.1	S	30.	30.	E	760.5
2569.00	2365.08	34.	23.	S	21.	0.	E	664.89	S	391.59	E	771.6	S	30.	30.	E	761.1
2570.00	2365.91	34.	24.	S	21.	0.	E	665.42	S	391.80	E	772.2	S	30.	29.	E	761.6
2571.00	2366.73	34.	25.	S	21.	0.	E	665.94	S	392.00	E	772.8	S	30.	29.	E	762.2

EAST KINGFISH 01 M/SHOT

MEASURED DEPTH	TRUE VERTICAL DEPTH	INCLINATION DEG	INCLINATION MIN	DIRECTION	DIRECTION DEG	DIRECTION MIN		RECTANGULAR COORDINATES NORTH/SOUTH	RECTANGULAR COORDINATES EAST/WEST	POLAR COORDINATES DISTANCE		POLAR DEG	POLAR MIN		VERTICAL SECTION
2572.00	2367.56	34.	26.	S	21.	0.	E	666.47 S	392.20 E	773.3	S	30.	28.	E	762.8
2573.00	2368.38	34.	27.	S	21.	0.	E	667.00 S	392.40 E	773.9	S	30.	28.	E	763.3
2574.00	2369.21	34.	28.	S	21.	0.	E	667.53 S	392.61 E	774.4	S	30.	28.	E	763.9
2575.00	2370.03	34.	29.	S	21.	0.	E	668.06 S	392.81 E	775.0	S	30.	27.	E	764.5
2576.00	2370.86	34.	30.	S	21.	0.	E	668.59 S	393.01 E	775.5	S	30.	27.	E	765.0
2577.00	2371.68	34.	31.	S	21.	0.	E	669.11 S	393.22 E	776.1	S	30.	26.	E	765.6
2578.00	2372.50	34.	33.	S	21.	0.	E	669.64 S	393.42 E	776.7	S	30.	26.	E	766.2
2579.00	2373.33	34.	34.	S	21.	0.	E	670.17 S	393.62 E	777.2	S	30.	26.	E	766.7
2580.00	2374.15	34.	35.	S	21.	0.	E	670.70 S	393.82 E	777.8	S	30.	25.	E	767.3
2581.00	2374.97	34.	36.	S	21.	0.	E	671.23 S	394.03 E	778.3	S	30.	25.	E	767.9
2582.00	2375.80	34.	37.	S	21.	0.	E	671.76 S	394.23 E	778.9	S	30.	24.	E	768.4
2583.00	2376.62	34.	38.	S	21.	0.	E	672.29 S	394.44 E	779.5	S	30.	24.	E	769.0
2584.00	2377.44	34.	39.	S	21.	0.	E	672.82 S	394.64 E	780.0	S	30.	24.	E	769.6
2585.00	2378.27	34.	40.	S	21.	0.	E	673.35 S	394.84 E	780.6	S	30.	23.	E	770.1
2586.00	2379.09	34.	41.	S	21.	0.	E	673.89 S	395.05 E	781.1	S	30.	23.	E	770.7
2587.00	2379.91	34.	42.	S	21.	0.	E	674.42 S	395.25 E	781.7	S	30.	22.	E	771.3
2588.00	2380.73	34.	43.	S	21.	0.	E	674.95 S	395.45 E	782.3	S	30.	22.	E	771.8
2589.00	2381.55	34.	44.	S	21.	0.	E	675.48 S	395.66 E	782.8	S	30.	22.	E	772.4
2590.00	2382.38	34.	45.	S	21.	0.	E	676.01 S	395.86 E	783.4	S	30.	21.	E	773.0
2591.00	2383.20	34.	47.	S	21.	0.	E	676.54 S	396.07 E	784.0	S	30.	21.	E	773.5
2592.00	2384.02	34.	48.	S	21.	0.	E	677.08 S	396.27 E	784.5	S	30.	20.	E	774.1
2593.00	2384.84	34.	50.	S	21.	0.	E	677.61 S	396.48 E	785.1	S	30.	20.	E	774.7
2594.00	2385.66	34.	51.	S	21.	0.	E	678.14 S	396.68 E	785.6	S	30.	19.	E	775.3
2595.00	2386.48	34.	53.	S	21.	0.	E	678.68 S	396.89 E	786.2	S	30.	19.	E	775.8
2596.00	2387.30	34.	54.	S	21.	0.	E	679.21 S	397.09 E	786.8	S	30.	19.	E	776.4
2597.00	2388.12	34.	56.	S	21.	0.	E	679.75 S	397.30 E	787.3	S	30.	18.	E	777.0
2598.00	2388.94	34.	57.	S	21.	0.	E	680.28 S	397.50 E	787.9	S	30.	18.	E	777.6
2599.00	2389.76	34.	59.	S	21.	0.	E	680.82 S	397.71 E	788.5	S	30.	17.	E	778.1
2600.00	2390.58	35.	1.	S	21.	0.	E	681.35 S	397.91 E	789.0	S	30.	17.	E	778.7
2601.00	2391.40	35.	2.	S	21.	0.	E	681.89 S	398.12 E	789.6	S	30.	17.	E	779.3
2602.00	2392.22	35.	4.	S	21.	0.	E	682.42 S	398.32 E	790.2	S	30.	16.	E	779.8
2603.00	2393.04	35.	5.	S	21.	0.	E	682.96 S	398.53 E	790.7	S	30.	16.	E	780.4
2604.00	2393.85	35.	7.	S	21.	0.	E	683.50 S	398.74 E	791.3	S	30.	15.	E	781.0
2605.00	2394.67	35.	8.	S	21.	0.	E	684.03 S	398.94 E	791.9	S	30.	15.	E	781.6
2606.00	2395.49	35.	10.	S	21.	0.	E	684.57 S	399.15 E	792.4	S	30.	15.	E	782.1
2607.00	2396.31	35.	11.	S	21.	0.	E	685.11 S	399.35 E	793.0	S	30.	14.	E	782.7
2608.00	2397.12	35.	13.	S	21.	0.	E	685.65 S	399.56 E	793.6	S	30.	14.	E	783.3
2609.00	2397.94	35.	15.	S	21.	0.	E	686.19 S	399.77 E	794.1	S	30.	13.	E	783.9
2610.00	2398.76	35.	16.	S	21.	0.	E	686.72 S	399.98 E	794.7	S	30.	13.	E	784.5
2611.00	2399.57	35.	18.	S	21.	0.	E	687.26 S	400.18 E	795.3	S	30.	13.	E	785.0
2612.00	2400.39	35.	19.	S	21.	0.	E	687.80 S	400.39 E	795.9	S	30.	12.	E	785.6
2613.00	2401.21	35.	21.	S	21.	0.	E	688.34 S	400.60 E	796.4	S	30.	12.	E	786.2
2614.00	2402.02	35.	22.	S	21.	0.	E	688.88 S	400.80 E	797.0	S	30.	11.	E	786.8
2615.00	2402.84	35.	24.	S	21.	0.	E	689.42 S	401.01 E	797.6	S	30.	11.	E	787.3
2616.00	2403.65	35.	25.	S	21.	0.	E	689.96 S	401.22 E	798.1	S	30.	11.	E	787.9
2617.00	2404.47	35.	27.	S	21.	0.	E	690.51 S	401.43 E	798.7	S	30.	10.	E	788.5

EAST KINGFISH-01 M/SHOT

MEASURED DEPTH	TRUE VERTICAL DEPTH	INCLINATION DEG	INCLINATION MIN	DIRECTION	DIRECTION DEG	DIRECTION MIN		RECTANGULAR COORDINATES NORTH/SOUTH	RECTANGULAR COORDINATES EAST/WEST	POLAR COORDINATES DISTANCE		POLAR COORDINATES DEG	POLAR COORDINATES MIN		VERTICAL SECTION
2618.00	2405.28	35.	29.	S	21.	0.	E	691.05 S	401.63 E	799.3	S	30.	10.	E	789.1
2619.00	2406.09	35.	30.	S	21.	0.	E	691.59 S	401.84 E	799.9	S	30.	9.	E	789.7
2620.00	2406.91	35.	32.	S	21.	0.	E	692.13 S	402.05 E	800.4	S	30.	9.	E	790.2
2621.00	2407.72	35.	35.	S	21.	0.	E	692.67 S	402.26 E	801.0	S	30.	9.	E	790.8
2622.00	2408.54	35.	37.	S	21.	0.	E	693.22 S	402.47 E	801.6	S	30.	8.	E	791.4
2623.00	2409.35	35.	39.	S	21.	0.	E	693.76 S	402.68 E	802.2	S	30.	8.	E	792.0
2624.00	2410.16	35.	42.	S	21.	0.	E	694.31 S	402.89 E	802.7	S	30.	7.	E	792.6
2625.00	2410.97	35.	44.	S	21.	0.	E	694.85 S	403.09 E	803.3	S	30.	7.	E	793.2
2626.00	2411.78	35.	46.	S	21.	0.	E	695.40 S	403.30 E	803.9	S	30.	7.	E	793.7
2627.00	2412.59	35.	49.	S	21.	0.	E	695.94 S	403.51 E	804.5	S	30.	6.	E	794.3
2628.00	2413.41	35.	51.	S	21.	0.	E	696.49 S	403.72 E	805.0	S	30.	6.	E	794.9
2629.00	2414.22	35.	53.	S	21.	0.	E	697.04 S	403.93 E	805.6	S	30.	5.	E	795.5
2630.00	2415.03	35.	55.	S	21.	0.	E	697.58 S	404.14 E	806.2	S	30.	5.	E	796.1
2631.00	2415.84	35.	58.	S	21.	0.	E	698.13 S	404.35 E	806.8	S	30.	5.	E	796.7
2632.00	2416.64	36.	0.	S	21.	0.	E	698.68 S	404.56 E	807.4	S	30.	4.	E	797.3
2633.00	2417.45	36.	0.	S	21.	0.	E	699.23 S	404.78 E	807.9	S	30.	4.	E	797.8
2634.00	2418.26	36.	0.	S	21.	0.	E	699.78 S	404.99 E	808.5	S	30.	4.	E	798.4
2635.00	2419.07	36.	0.	S	21.	0.	E	700.33 S	405.20 E	809.1	S	30.	3.	E	799.0
2636.00	2419.88	36.	0.	S	21.	0.	E	700.88 S	405.41 E	809.7	S	30.	3.	E	799.6
2637.00	2420.69	36.	0.	S	21.	0.	E	701.42 S	405.62 E	810.3	S	30.	2.	E	800.2
2638.00	2421.50	36.	0.	S	21.	0.	E	701.97 S	405.83 E	810.8	S	30.	2.	E	800.8

PE903312

This is an enclosure indicator page.
The enclosure PE903312 is enclosed within the container PE180271 at this location in this document.

The enclosure PE903312 has the following characteristics:

ITEM_BARCODE = PE903312
CONTAINER_BARCODE = PE180271
NAME = Directional drilling survey
BASIN = GIPPSLAND
PERMIT = VIC/L7
TYPE = WELL
SUBTYPE = DIAGRAM
DESCRIPTION = East Kingfish 1 directional drilling survey, Planned and Actual Deviation vs. Vertical Section (from WCR vol.2)
REMARKS =
DATE_CREATED = 30/06/86
DATE_RECEIVED = 24/09/86
W_NO = W891
WELL_NAME = East Kingfish-1
CONTRACTOR = Smith Servco Directional Services
CLIENT_OP_CO = Esso Australia Ltd.

(Inserted by DNRE - Vic Govt Mines Dept)

APPENDIX 3

MICROPALAEONTOLOGICAL REPORT,

EAST KINGFISH-1,

GIPPSLAND BASIN

by

J.P. REXILIUS

Esso Australia Ltd.

Palaeontology Report 1985/8

March, 1985

1455L

INTERPRETATIVE DATA

INTRODUCTION

Ten sidewall core samples from East Kingfish-1 between 2440.01 m and 2497.1 m (KB depth) were processed for foraminiferal and calcareous nannoplankton analysis. Table 1 summarises the biostratigraphy of the units in East Kingfish-1. Tables 2 and 3 summarise the palaeontological analysis of East Kingfish-1 (basic and interpretative data). A range chart for planktonic foraminifera and calcareous nannoplankton is included as basic data.

TABLE 1: BIOSTRATIGRAPHIC SUMMARY, EAST KINGFISH-1

Age	Unit	Plank Foram Zone	Nannofossil Zone	Depth (mKB)
				# above 2440.01
Early Miocene		G	CN1a-CN1b	2440.01
Early Miocene	Lakes Entrance	H2 or younger	CN1a-CN1b	2445.09
Early Miocene	Formation	I1 or younger	CN1a-CN1b	2450.05-2475.03
Late Oligocene		I1 or younger	CP19	2480.08
-		Indeterm.	Indeterm.	2491.06
---------- log break at 2493m ----------				
-	"Gurnard	Indeterm.	Indeterm.	2493.91-2495.08
* Late Eocene	Formation"	Indeterm.	Indeterm.	2496.02
---------- log break at 2497m (basal Late Eocene disconformity) ----------				
* Early Eocene	Latrobe Group ("Coarse Clastics")	Indeterm.	Indeterm.	2497.1
				# below 2497.1

TD 2638m

Not studied.

* Age based on Marshall, N.G. (Provisional Palynological Report No. 1, East Kingfish-1).

1455L

GEOLOGICAL COMMENTS

The Latrobe Group "Coarse Clastics" is disconformably overlain by the "Gurnard Formation". The log break at 2497m probably represents the basal Late Eocene disconformity of Vail et al. (1977). Sidewall core samples immediately below (SWC at 2497.1m) and above (SWC at 2496.02m) the disconformity have been assigned to the Early Eocene Lower *M. diversus* and Late Eocene Middle *N. asperus* spore/pollen Zones respectively (see Marshall, N. G. - Provisional Palynological Report No. 1, East Kingfish-1). The hiatus between the Latrobe Group "Coarse Clastics" and "Gurnard Formation" spans at least 10 my. The "Gurnard Formation" consists of glauconitic and pyritic sandstone with glauconite representing a minor component. The unit is very poorly sorted in sidewall core samples at 2495.8 and 2496.1m with quartz grains ranging from very coarse to fine. The "Gurnard Formation" in East Kingfish-1 has a distinct log response with high sonic, bulk density and PEF readings, and no significant evidence of caving. The overlying Lakes Entrance Formation however is severely caved. Several sidewall core samples shot in the "Gurnard Formation" contain low yields of poorly preserved planktonic foraminifera and calcareous nannoplankton which are not age-diagnostic. These assemblages are considered to be mud contaminants.

The "Gurnard Formation" may be conformably or disconformably overlain by the Lakes Entrance Formation. Poor sample control over the basal 13m of the Lakes Entrance Formation in East Kingfish-1 has prevented age-dating of this interval. The Early Oligocene may be represented in this 13m interval. Because of poor hole conditions only one of seven attempted sidewall shots was recovered between 2480.08 and 2493.91m, and this sidewall core sample (SWC at 2491.06m) represents a severely recrystallised limestone which is barren of calcareous microfossils. Definite Late Oligocene-Early Miocene calcareous shales of the Lakes Entrance Formation occur between 2440.01 and 2480.08m. Age-dating of this interval has been mainly reliant on calcareous nannoplankton.

BIOSTRATIGRAPHIC ANALYSIS

The Gippsland Basin planktonic formaniferal zonal scheme of Taylor (in prep.) is used in this investigation. The CN-CP calcareous nannoplankton letter scheme of Bukry (1981) is used in this study. Calcareous nannoplankton studies by Edwards (1971), Edwards & Perch-Nielsen (1975) and Siesser (1979) have also been consulted.

Indeterminate Interval: 2491.06-2497.1m

The interval is barren of *in situ* calcareous microfossils. Low yields of planktonic foraminifera and calcareous nannoplankton which are not age-diagnostic occur throughout the interval and are suspected to be contaminants from the Lakes Entrance Formation.

Zone CP19: 2480.08m

The presence of common *Discoaster deflandre*, *Cyclicargolithus floridanus* and *Coccolithus eupelagicus*, associated with rare *Zygrhablithus bijugatus*, and without *Chiasmolithus oamaruensis*, indicates assignment to Zone CP19 of Bukry (1981). The extinction of *Zygrhablithus bijugatus* at or near the top of Zone CP19 is well established in New Zealand (Edwards, 1971) and in the Torquay Basin of Victoria (Siesser, 1979). Likewise, *Chiasmolithus oamaruensis* has been found not to range higher than Zone I2 in the Gippsland Basin (e.g. Bullseye-1, Barracouta-5). The assemblage recorded at 2480.8m is similar to that recorded by Siesser (1979) in the Nerita-1 and Birdrock sections in the Torquay Basin. He equated his assemblage with the Late Oligocene NP24 and NP25 Zones of Martini, 1971 (= Zone CP19 of Bukry, 1981).

Zone I1 or younger: 2450.05-2480.08m

The appearance uphole of Globoquadrina dehiscens at 2480.08m indicates an age no older than Zone I1. Neither Globigerina woodi or G. woodi connecta (Zone H2 and H1 indicators) could be positively identified in the interval. The poor preservational nature of the planktonic foraminiferal assemblages in the interval restricts positive identification of species, particularly species of the genus Globigerina.

Zone CN1a-CN1b: 2440.01-2475.03m

The absence of Zygrhablithus bijugatus and Discoaster druggii in high yielding calcareous nannoplankton assemblages indicate that the interval equates with Zones CN1a and CN1b of Bukry (1981). The extinction of Zygrhablithus bijugatus approximates the top of Zone CP19 (see comments on Zone CP19 on previous page) while the appearance of Discoaster druggii defines the base of Zone CN1c. Siesser (1979) recorded the same biostratigraphic interval in the Nerita-1 and Birdrock sections in the Torquay Basin, and assigned his interval to the NN1 Zone of Martini, 1971 (= CN1a and CN1b Zones of Bukry, 1981). An increase in numbers and diversity of the genus Helicosphaera was noted to occur within Zone CN1a-CN1b in East Kingfish-1. This group needs to be studied thoroughly because Haq (1973) has noted rapid evolution within Helicosphaera elsewhere.

Zone H2 or younger: 2445.09m

Rare specimens of Globigerina woodi were noted in the sidewall core sample at 2445.09m associated with Globoquadrina dehiscens. Globigerina woodi connecta was not recorded at 2445.09m however because of the poor preservational state of the planktonic foraminifera in the sample, its absence may be misleading. For this reason, the sample is not given a definitive zonal assignment.

Zone G: 2440.01 m

The entry of rare specimens of Globigerinoides trilobus at 2440.01 m defines the base of Zone G in East Kingfish-1.

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TABLE 2

SUMMARY OF PALAEONTOLOGICAL ANALYSIS, EAST KINGFISH-1, GIPPSLAND BASIN

INTERPRETATIVE DATA

NATURE OF SAMPLE	DEPTH (mKB)	YIELD		PRESERVATION		DIVERSITY		ZONE		AGE	COMMENTS
		PLANK FORAMS	NANNOS	PLANK FORAMS	NANNOS	PLANK FORAMS	PLANK NANNOS	FORAMS	NANNOS		
SWC13	2497.1	Very low	Very low	Poor	Poor	Very low	Very low	Indeterm.	Indeterm.	Indeterm.	Contaminated with calcareous microfossils from the Lakes Entrance Formation. Rare fish teeth at 2495.08m.
SWC14	2496.02	Barren	Barren	-	-	-	-	-	-	-	
SWC15	2495.08	Low	Very low	Poor	Poor	Very low	Very low	Indeterm.	Indeterm.	Indeterm.	
SWC16	2493.91	Very low	Very low	Poor	Poor	Very low	Very low	Indeterm.	Indeterm.	Indeterm.	
SWC19	2491.06	Barren	Barren	-	-	-	-	-	-	-	Severe recrystallisation.
SWC24	2480.08	High	High	Poor	Moderate/poor	Low	Low	I1 or younger	CP19	Late Oligocene	
SWC25	2475.03	High	High	Poor	Moderate	Low	Low	I1 or younger	CN1a-CN1b	Early Miocene	
SWC28	2450.05	Moderate	High	Poor	Moderate/poor	Very low	Low/moderate	I1 or younger	CN1a-CN1b	Early Miocene	
SWC29	2445.09	High	High	Poor	Moderate/poor	Low	Low/moderate	H2 or younger	CN1a-CN1b	Early Miocene	
SWC30	2440.01	High	High	Poor	Moderate	Low	Low/moderate	G	CN1a-CN1b	Early Miocene	

1455L

TABLE 3

SUMMARY OF PALAEONTOLOGICAL ANALYSIS, EAST KINGFISH-1, GIPPSLAND BASIN

BASIC DATA

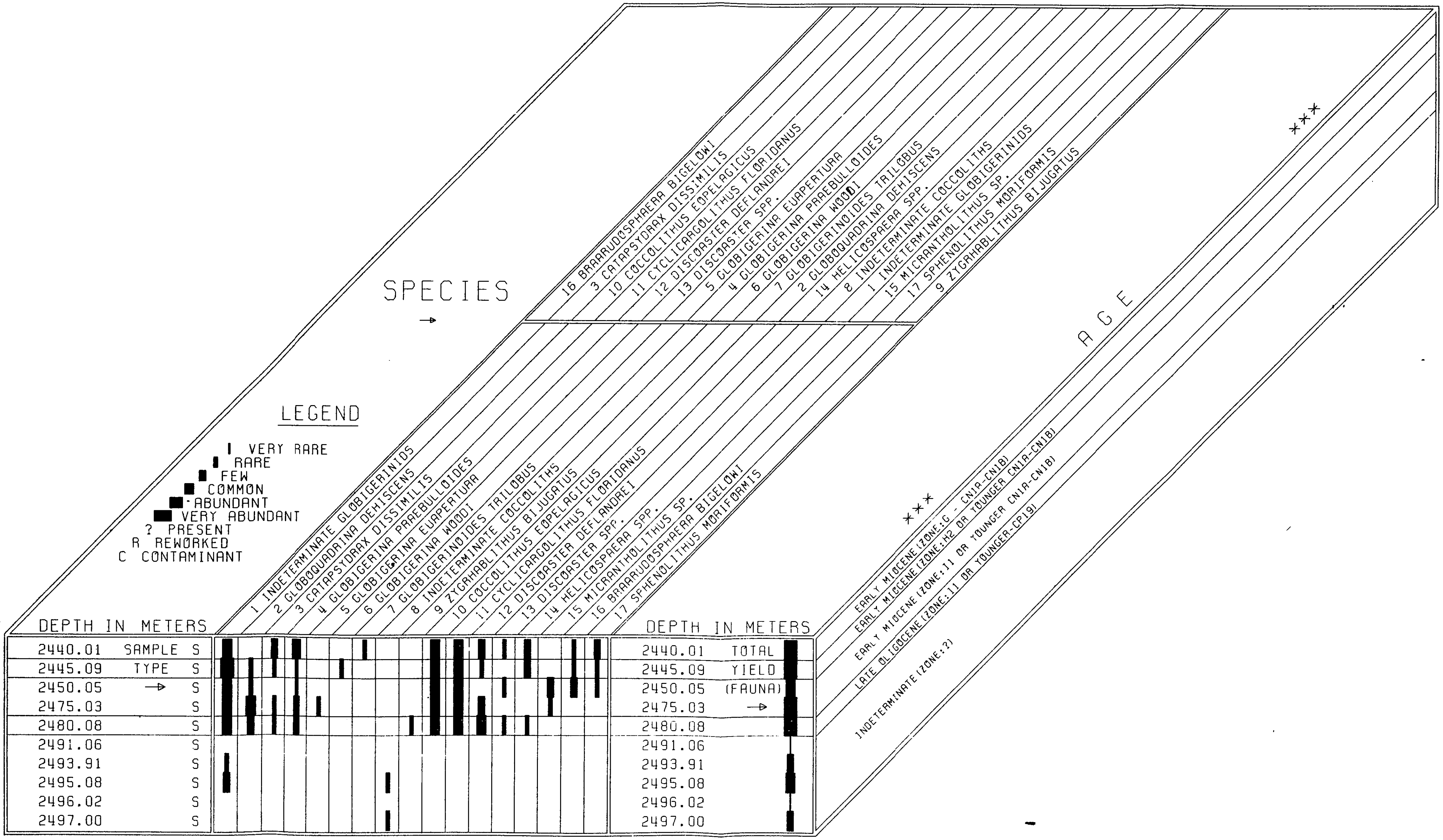
NATURE OF SAMPLE	DEPTH (mKB)	YIELD		PRESERVATION		DIVERSITY	
		PLANK FORAMS	NANNOS	PLANK FORAMS	NANNOS	PLANK FORAMS	PLANK NANNOS
SWC13	2497.1	Very low	Very low	Poor	Poor	Very low	Very low
SWC14	2496.02	Barren	Barren	-	-	-	-
SWC15	2495.08	Low	Very low	Poor	Poor	Very low	Very low
SWC16	2493.91	Very low	Very low	Poor	Poor	Very low	Very low
SWC19	2491.06	Barren	Barren	-	-	-	-
SWC24	2480.08	High	High	Poor	Moderate/poor	Low	Low
SWC25	2475.03	High	High	Poor	Moderate	Low	Low
SWC28	2450.05	Moderate	High	Poor	Moderate/poor	Very low	Low/moderate
SWC29	2445.09	High	High	Poor	Moderate/poor	Low	Low/moderate
SWC30	2440.01	High	High	Poor	Moderate	Low	Low/moderate

BASIC DATA

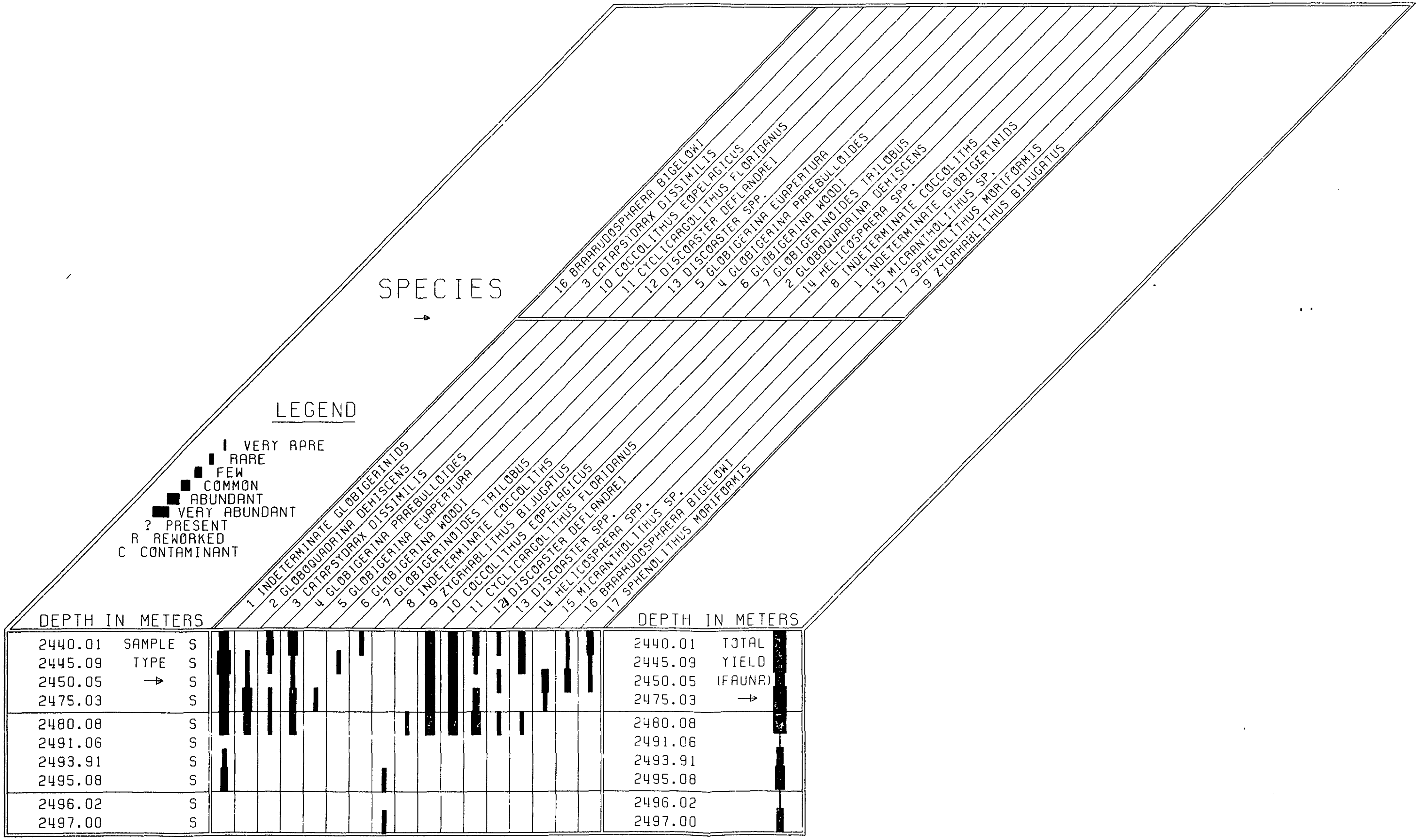
TABLE 3: BASIC DATA, EAST KINGFISH-1

RANGE CHART: CALCAREOUS MICROFOSSILS

ESSO BHP EAST KINGFISH 1. GIPPSLAND BASIN. MICROPAL.



ESSO BHP EAST KINGFISH 1.GIPPSLAND BASIN.MICROPAL.



APPENDIX 4

APPENDIX

PALYNOLOGICAL ANALYSIS OF EAST KINGFISH-1
GIPPSLAND BASIN, VICTORIA

by

Neil G. Marshall

Esso Australia Ltd.

April 1, 1985

Palaeontology Report 1985/13

1491L

CONTENTS

INTRODUCTION

Twenty-two sidewall core and eight conventional core samples were examined for palynomorphs in East Kingfish-1. Occurrences of spore-pollen and dinoflagellate species in each sample are recorded on the enclosed range chart. Tables 1 and 3 summarize interpretative and basic palynological data, and anomalous occurrences of spores and pollen are listed in Table 2.

SUMMARY TABLE

AGE	FORMATION	PALYNOLOGY ZONE	DEPTH (in metres from K.B.)
Early Miocene -Late Oligocene	Lakes Entrance Formation	P. tuberculatus	2440.01-2491.06
log break at 2493m			
Early Oligocene	Unnamed glauconitic sandstone	P. tuberculatus	2493.9-2495.1
Late Eocene	Gurnard Formation	Middle N. asperus and C. incompositum dinoflagellate Zone	2496.0
log break at 2497m *			
Early Eocene	Latrobe Group (coarse clastics)	Lower M. diversus	2497.0-2533.2
Late Paleocene		Upper L. balmei and A. homomorpha dinoflagellate Zone	2571.8-2617.6
			T.D. 2638m

* based on Rexilius (1985)

GEOLOGICAL COMMENTS

1. East Kingfish-1 was drilled to test for the presence of a marine progradational sand facies ranging from the Upper L. balmei Zone to the Lower M. diversus Zone. Palynological analyses confirm the occurrence of these zones. The consistent presence of dinoflagellates in the predominantly sand facies is consistent with deposition in a marine environment.

2. The A. hyperacanthum dinoflagellate Zone was not found within the transition from Upper L. balmei sediments to the Lower M. diversus sequence. This zone may be present in the section between 2571-2533m, but it has not been recognized due to the sparse palynomorph assemblages examined within the interval. Palaeogeographic mapping from other well control suggests it should be present. It could also be argued that the apparent absence of the dinoflagellate zone is due to erosion at a sequence boundary, possibly related to one of the regressive cycles associated with the major channel cutting events in the Early Eocene (e.g. Tuna-Flounder Channels). If the lower part of the Lower M. diversus Zone and the associated A. hyperacanthum Zone have been removed by erosion, the possibility exists that the upper part of the Upper L. balmei Zone has also been lost by this event. There is a distinct change in the characters of the sonic and gamma logs within this interval (at 2535m), which may be related to a sequence boundary.

3. The Latrobe Group coarse clastics are overlain by a thin (3-4m) sequence of glauconitic sandstone, and this was sampled by three sidewall cores at 2493.9, 2495.1 and 2496.0m. The lowest sidewall core at 2496.0m is referred to the Middle N. asperus Zone and is therefore consistent with the assemblages found in the Gurnard Formation. The higher two samples at 2493.9 and 2495.1m in contrast contain P. tuberculatus Zone palynofloras

which have not previously been recorded from the Gurnard Formation. These two samples have therefore been referred to an unnamed greensand unit. Possible interpretations for the development of this unit include:-

a) Reworking of sediments from the underlying Gurnard Formation during deposition of the basal P. tuberculatus Zone. Because of the absence of common reworked Middle N. asperus Zone or older taxa in the assemblages as typically seen in this situation elsewhere in the basin (e.g. Flounder 5 and 6), this explanation is not favoured. However, if the reworked Gurnard Formation was barren of fossils, this is a plausible interpretation.

b) Incorporation of P. tuberculatus Zone fossils into the greensand by burrowing at the hiatal surface at the top of the greensand unit (2493m). This is also unlikely because of a lack of mixed Eocene and Oligocene assemblages. As in case (a), however, it represents a possible explanation if the top of the greensand unit was barren of fossils.

c) Basal Lakes Entrance Formation greensand with the quartz component being derived from erosion of the palaeotopographically higher portions of the Kingfish structure.

d) Contamination of virtually barren Gurnard Formation with drilling mud containing material from the Lakes Entrance Formation. Although drilling mud contamination is evident in both the palynomorph (this report) and calcareous microfossil (Rexilius, 1985) assemblages, this possibility is discounted. This is because the basal sample of the P. tuberculatus Zone (2495.1m) contains a distinctive dinoflagellate assemblage that is replaced one metre up section by an assemblage more typical of the zone (see Biostratigraphic Section). If the presence of P. tuberculatus Zone assemblages in the greensand was entirely due to mud contamination, the composition of the palynoflora over this interval would be expected to remain fairly constant.

The foraminiferal and nannoplankton assemblages recorded by Rexilius (1985) in the two samples studied from the glauconitic sandstone unit (2493.9, 2495.1m) are suspected to be entirely due to downhole contamination through drilling mud of the Lakes Entrance Foramtion. The basal sample of Lakes Entrance Formation (2491.6m) studied by Rexilius (1985) consisted of recrystallized limestone that lacked age-diagnostic foraminiferal taxa.

BIOSTRATIGRAPHY

The spore-pollen zones have been identified following Stover & Partridge (1973). The dinoflagellate zones are modifications on the scheme of Partridge (1976). Discussions of the dinoflagellate assemblages and their zonal assignments are given with the descriptions of their associated spore-pollen zones.

Upper Lygistepollenites balmei Zone 2571-2617.6m

The five sidewall core samples placed in this interval are characterized by the consistent occurrence of L. balmei. Other taxa characteristic of the zone are Proteacidites adenanthoides, Polycolpites langstonii, Gambierina rudata, and Australopollis obscurus.

The dinoflagellate assemblage from this interval is placed in the Apectodinium homomorphum Zone due to the occurrence of A. homomorphum, Deflandrea medcalfii/dartmooria and Senegalinium dilwynense.

The spore-pollen assemblages are placed in the Upper L. balmei Zone because of the occurrences three taxa which first appear in this zone: Proteacidites annularis at 2610.59m, and Malvacipollis subtilis and Banksiaeidites cf. elongatus at 2617.55m. Taxa that characterize the Lower L. balmei Zone are absent, e.g. Tetracolporites verrucosus, Juxtacolpus peiratus and Proteacidites gemmatus. Furthermore, the A. homomorphum dinoflagellate Zone is mainly a stratigraphic equivalent of the Upper L. balmei Zone, and only extends into the uppermost portion of the Lower L. balmei Zone.

The three sidewall core samples (2549.1, 2537.1, 2535.1m) studied from directly above the top of the L. balmei Zone contain extremely low yield spore-pollen and dinoflagellate assemblages that lack taxa which can be used for zonal designation.

Lower Malvacipollis diversus Zone 2533.2-2497.0m

Samples assigned to this zone lack Lygistepollenites balmei, and are characterized by the presence of Malvacipollis duratus, M. diversus, Proteacidites grandis, and P. latrobensis, with infrequent to rare occurrences of Dryptopollenites semilunatus, Triporopollenites helosus and Ischyosporites gremius.

These samples contain dinoflagellate assemblages of low diversity, which include Apectodinium homomorphum, Deflandrea medcalfii/dartmooria, Glaphyrocysta retiintexta, numerous unnamed species of Spinidinium and unindentifiable, thin-walled peridiniacean taxa. The most stratigraphically significant element of this assemblage is Deflandrea medcalfii/dartmooria, which does not range above the top of the Middle M. diversus Zone.

It is suggested that only the upper part of the Lower M. diversus Zone is represented by the above samples. This is based on the apparent absence of dinoflagellates typical of the Apectodinium hyperacanthum Zone, which correlates with the lower part of the Lower M. diversus Zone

Middle Nothofagidites asperus Zone 2496.0m

The sidewall core sample assigned to this zone contains the diagnostic taxa Nothofagidites asperus, N. falcatus and Kuylisporites waterbolkii.

The sample contains a low diversity dinoflagellate assemblage which is correlated with the Corrudinium incompositum Zone. This is based on the rare presence of the zonal species.

Proteacidites tuberculatus Zone 2495.1-2440.0m

The eight sidewall core samples studied from the interval contain the diagnostic taxa Cyatheacidites annulatus, Cyathidites subtilus, Foveotriletes lacunosus, F. crater and Cingulatisporites (Foraminisporis) ozotus, which have their first occurrences within the zone.

The occurrences of the dinoflagellate species Nematosphaeropsis balcombiana, N. rhizoma ms, Dinospheara mammilatus ms, Protoellipsodinium simplex ms, Pyxidinopsis pontus ms, and frequent specimens of Spiniferites spp. and Operculodinium centrocarpum confirm the presence of the P. tuberculatus Zone.

The sample from 2495.1m contains a sparse microplankton assemblage of which the most age-diagnostic elements are Acritarch LEOS types 1 and 2. These taxa are restricted to the basal part of the P. tuberculatus Zone and are mostly associated with greensand facies.

Taxonomic Changes and New Taxa Identified

1. The dinoflagellate taxa Deflandrea medcalfii Stover 1973 and D. dartmooria Cookson & Eisenack 1965 are considered to be variants of a single species in this report, and are recorded as D. medcalfii/dartmooria in the Biostratigraphic Section (note: on the Data Sheets and Tables 1 and 3, they are recorded as D. medcalfii only).

2. An informally named, new species of Deflandrea is proposed. This is recorded as Deflandrea sp. 2530 N.M.

3. Two informally named, new species of acritarch are recorded as Acritarch LEOS types 1 and 2. LEOS is an abbreviation of Lakes Entrance oil shaft, from which these taxa have been recorded by A.D. Partridge (pers. comm.).

Specimens resembling Acritarch LEOS type 1 have been recorded as Forma P by Goodman & Ford (1983; p. 866, Pl. 5, figs 5-13) from the Upper Eocene-Lower Oligocene of DSDP Sites 511 and 513, southwest Atlantic Ocean.

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STOVER, L.E. & PARTRIDGE, A.D., 1973. Tertiary and Late Cretaceous spores and pollen from the Gippsland Basin, southeastern Australia. Proc. Royal Soc. Victoria, 85, 237-286.

PALYNOLOGY DATA SHEET

BASIN: Gippsland — ELEVATION: KB: +21m GL: -77m

WELL NAME: East Kingfish-1 — TOTAL DEPTH: 2638m

AGE	PALYNOLOGICAL ZONES	HIGHEST DATA Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	LOWEST DATA Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
NEOGENE	*T. pleistocenicus*										
	M. lipsis										
	C. bifurcatus										
	T. bellus										
PALEOGENE	*P. tuberculatus*	2440.01	0				2495.08	1			
	Upper *N. asperus*										
	Mid *N. asperus*	2496.02	0				2496.02	0			
	Lower *N. asperus*										
	P. asperopolus										
	Upper *M. diversus*										
	Mid *M. diversus*										
	Lower *M. diversus*	2497.01	0				2533.17	1			
	Upper *L. balmei*	2571.82	1				2617.55	2			
	Lower *L. balmei*										
LATE CRETACEOUS	*T. longus*										
	T. lilliei										
	N. senectus										
	U. *T. pachyexinus*										
	L. *T. pachyexinus*										
	C. triplex										
	A. distocarinatus										
EARLY CRET.	*C. paradoxus*										
	C. striatus										
	F. asymmetricus										
	F. wonthaggiensis										
	C. australiensis										
PRE-CRETACEOUS											

COMMENTS: 3 samples examined between 2549.09-2535.06m contained sparse palynomorph assemblages of indeterminate age.
Corrudinium incompositum Zone (2496.02m); Apectodinium homomorphum Zone (2617.55-2571.82m).

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: Neil G. Marshall — DATE: 28/3/1985

DATA REVISED BY: — DATE:

TABLE I: SUMMARY OF INTERPRETATIVE PALYNOLOGICAL DATA

SAMPLE NO.	DEPTH (m)	SPORE-POLLEN ZONE	DINOFLAGELLATE ZONE	AGE	CONFIDENCE RATING	COMMENTS
SWC 30	2440.01	P. tuberculatus	-	Oligocene-Eocene	0	C. annulatus, F. lucunosus, N. rhizoma, P. simplex
SWC 29	2445.09	Indet.	-	-		
SWC 28	2450.05	P. tuberculatus	-	Oligocene-Eocene	0	C. annulatus, N. rhizoma, N. balcombiana
SWC 25	2475.03	P. tuberculatus	-	Oligocene-Eocene	0	C. annulatus, F. crater, N. rhizoma, N. balcombiana
SWC 24	2480.08	P. tuberculatus	-	Oligocene-Eocene	0	C. annulatus, C. ozotus, N. rhizoma, D. mammilatus, N. balcombiana
SWC 19	2491.06	P. tuberculatus	-	Oligocene-Eocene	I	N. rhizoma, P. simplex, C. subtilis
SWC 16	2493.91	P. tuberculatus	-	Oligocene-Eocene	I	C. annulatus, N. rhizoma, P. simplex, D. mammilatus
SWC 15	2495.08	P. tuberculatus	-	Oligocene-Eocene	I	C. annulatus, N. rhizoma, Acritarch LEOS
SWC 14	2496.02	Middle N. asperus	C. incompositum	Middle-Late Eocene	0	N. asperus, N. falcatus, K. waterbolkii, C. incompositum
SWC 13	2497.01	Lower M. diversus	Indet.	Early Eocene	0	D. semilunatus, P. grandis, D. dartmooria
SWC 12	2516.11	Indet.	Indet.	-	-	
Core 2	2502.87	Lower M. diversus	Indet.	Early Eocene	I	M. diversus, P. grandis, D. dartmooria
Core 2	2503	Lower M. diversus	Indet.	Early Eocene	2	P. grandis, I. gremius, D. dartmooria
Core 2	2506.87	Lower M. diversus	Indet.	Early Eocene	I	P. grandis, D. dartmooria

TABLE 1: SUMMARY OF INTERPRETATIVE PALYNOLOGICAL DATA

SAMPLE NO.	DEPTH (m)	SPORE-POLLEN ZONE	DINOFLAGELLATE ZONE	AGE	CONFIDENCE RATING	COMMENTS
Core 2	2507	Indet.	Indet.	-	-	P. grandis, D. dartmooria
Core 2	2508.87	Lower M. diversus	Indet.	Early Eocene	1	B. elongatus, P. grandis, T. helosus, D. dartmooria
Core 4	2528.4	Indet.	Indet.	-	-	P. grandis
Core 4	2529	Lower M. diversus	Indet.	Early Eocene	2	P. grandis, T. helosus, G. retiintexta
Core 4	2530.4	Lower M. diversus	Indet.	Early Eocene	2	P. grandis, D. dartmooria
SWC 10	2531.17	Lower M. diversus	Indet.	Early Eocene	1	M. diversus, D. dartmooria
SWC 9	2533.17	Lower M. diversus	Indet.	Early Eocene	1	D. semilunatus, P. grandis, P. latrobensis, M. duratus, A. homomorphum, D. dartmooria
SWC 8	2535.06	Indet.	Indet.	-	-	D dartmooria
SWC 7	2537.07	Indet.	Indet.	-	-	L. balmei, P. grandis
SWC 6	2549.09	Indet.	Indet.	-	-	L. balmei, A. homomorphum, D. dartmooria
SWC 5	2571.82	Upper L. balmei	A. homomorphum	Paleocene	1	L. balmei, P. annularis, M. subtilis, A. homomorphum, D. dartmooria, S. dilwynense

TABLE I: SUMMARY OF INTERPRETATIVE PALYNOLOGICAL DATA

SAMPLE NO.	DEPTH (m)	SPORE-POLLEN ZONE	DINOFLAGELLATE ZONE	AGE	CONFIDENCE RATING	COMMENTS
SWC 4	2576.36	Upper L. balmei	A. homomorphum	Paleocene	2	L. balmei, P. langstonii, A. homomorphum, D. dartmooria, S. dilwynense
SWC 3	2590.54	Upper L. balmei	A. homomorphum	Paleocene	2	L. balmei, A. homomorphum
SWC 2	2610.59	Upper L. balmei	A. homomorphum	Paleocene	1	L. balmei, P. langstonii, P. annularis, A. homomorphum, S. dilwynense
SWC 1	2617.55	Upper L. balmei	A. homomorphum	Paleocene	2	L. balmei, G. rudata, A. obscurus, B. cf. elongatus, M. subtilis, A. homomorphum, S. dilwynense

TABLE 2

ANOMALOUS AND UNUSUAL OCCURRENCES OF SPORE-POLLEN TAXA IN KINGFISH-1

SAMPLE NO.	DEPTH (m)	ZONE	TAXON	COMMENTS
SWC 1	2617.5	Upper L. balmei	P. tuberculotumulatus	1 specimen; not known below Middle M. diversus Zone
SWC 1	2617.5	Upper L. balmei	P. demarcatus	not known below M. diversus Zone
SWC 3	2590.54	Upper L. balmei	P. pseudomoides	not known below M. diversus Zone
SWC 6	2549.09	Indet.	C. orthoteichus	1 specimen in sample between Upper L. balmei-Lower M. diversus Zones; not known below M. diversus Zone
SWC 9	2533.17	Lower M. diversus	M. duratus	not known below Upper M. diversus Zone
Core 4	2529	Lower M. diversus	Gothanipollis sp.	1 specimen; not known below N. asperus Zone
Core 9	2533.17	Lower M. diversus	Gothanipollis sp.	1 specimen; not known below N. asperus Zone
Core 2	2502.87	Lower M. diversus	Gothanipollis sp.	1 specimen; not known below N. asperus Zone
SWC 24	2480.08	P. tuberculatus	Cingulatisporites ozotus	very rare ms sp. (A.D.P)

1491L

TABLE 3

SUMMARY OF PALAEONTOLOGICAL ANALYSIS, EAST KINGFISH-1, GIPPSLAND BASIN

BASIC DATA

NATURE OF SAMPLE	DEPTH (mKB)	YIELD		PRESERVATION		DIVERSITY	
		PLANK FORAMS	NANNOS	PLANK FORAMS	NANNOS	PLANK FORAMS	PLANK NANNOS
SWC13	2497.1	Very low	Very low	Poor	Poor	Very low	Very low
SWC14	2496.02	Barren	Barren	-	-	-	-
SWC15	2495.08	Low	Very low	Poor	Poor	Very low	Very low
SWC16	2493.91	Very low	Very low	Poor	Poor	Very low	Very low
SWC19	2491.06	Barren	Barren	-	-	-	-
SWC24	2480.08	High	High	Poor	Moderate/poor	Low	Low
SWC25	2475.03	High	High	Poor	Moderate	Low	Low
SWC28	2450.05	Moderate	High	Poor	Moderate/poor	Very low	Low/moderate
SWC29	2445.09	High	High	Poor	Moderate/poor	Low	Low/moderate
SWC30	2440.01	High	High	Poor	Moderate	Low	Low/moderate

TABLE 3: SUMMARY OF BASIC PALYNOLOGICAL DATA

DIVERSITY -	low	medium	high
S & P	10	10-50	50
D	1-3	3-10	10

SAMPLE NO.	DEPTH (m)	YIELD SPORE-POLLEN	YIELD DINOS	DIVERSITY SPORE-POLLEN	DIVERSITY DINOS	PRESERVATION	LITHOLOGY	COMMENTS
SWC 30	2440.01	low	high	med.	med.	good	calc. slst./clst.	
SWC 29	2445.09	very low	very low	low	low	good	calc. slst./clst.	
SWC 28	2450.05	medium	medium	medium	medium	good	calc. slst./clst.	
SWC 25	2475.03	medium	medium	medium	medium	good	calc. slst./clst.	
SWC 24	2480.08	low	low	medium	medium	good	calc. slst./clst.	
SWC 19	2491.06	low	medium	medium	medium	good	calc. slst./clst.	
SWC 16	2493.91	low	medium	medium	medium	good	glauc. s.st.	rare drilling mud contaminants
SWC 15	2495.08	low	low	low	low	good	glauc. s.st.	
SWC 14	2496.02	medium	low	medium	low	good	glauc. s.st.	
SWC 13	2497.01	medium	low	medium	low	good	s.st.	
SWC 12	2516.11	barren	-	-	-	-	s.st.	
Core 2	2502.87	medium	low	medium	low	good	s.st.	
Core 2	2503	low	low	medium	low	good	s.st.	
Core 2	2506.87	low	low	medium	low	good	s.st.	

TABLE 3: SUMMARY OF BASIC PALYNOLOGICAL DATA

DIVERSITY -	low	medium	high
S & P	10	10-50	50
D	1-3	3-10	10

SAMPLE NO.	DEPTH (m)	YIELD SPORE-POLLEN	YIELD DINOS	DIVERSITY SPORE-POLLEN	DIVERSITY DINOS	PRESERVATION	LITHOLOGY	COMMENTS
Core 2	2507	medium	low	medium	low	good	s.st.	
Core 2	2508.87	medium	low	medium	low	good	s.st.	
Core 4	2528.4	medium	low	low	low	poor-good	s.st.	
Core 4	2529	medium	low	medium	low	good	s.st.	
Core 4	2530.4	medium	low	medium	low	good	s.st.	rare drilling mud contaminants
SWC 10	2531.17	high	low	medium	low	good	s.st.	
SWC 9	2533.17	high	medium	medium	low	good	s.st.	rare drilling mud contaminants
SWC 8	2535.06	low	low	low	low	good	s.st.	
SWC 7	2537.07	very low	none	low	-	good	s.st.	
SWC 6	2549.09	low	low	low	low	good	s.st.	
SWC 5	2571.82	low	low	medium	low	good	s.st	
SWC 4	2576.36	medium	low	medium	low	good	s.st.	rare drilling mud contaminants
SWC 3	2590.54	low	very low	low	low	good	s.st.	
SWC 2	2610.59	high	low	medium	low	good	s.st.	rare drilling mud contaminants
SWC 1	2617.55	medium	low	medium	low	good	s.st.	

PE902448

This is an enclosure indicator page.
The enclosure PE902448 is enclosed within the container PE902447 at this location in this document.

The enclosure PE902448 has the following characteristics:

ITEM_BARCODE = PE902448
CONTAINER_BARCODE = PE902447
NAME = Species List, Basic Data Distribution Chart
BASIN = GIPPSLAND
PERMIT = VIC/L7
TYPE = WELL
SUBTYPE = DIAGRAM
DESCRIPTION = Species List, Basic Data Distribution Chart for East Kingfish-1
REMARKS =
DATE_CREATED =
DATE_RECEIVED = 24/09/86
W_NO = W891
WELL_NAME = East Kingfish-1
CONTRACTOR = ESSO
CLIENT_OP_CO = ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE902449

This is an enclosure indicator page.
The enclosure PE902449 is enclosed within the container PE902447 at this location in this document.

The enclosure PE902449 has the following characteristics:

ITEM_BARCODE =	PE902449
CONTAINER_BARCODE =	PE902447
NAME =	Species List/Interpretative Data Range Chart
BASIN =	GIPPSLAND
PERMIT =	VIC/L7
TYPE =	WELL
SUBTYPE =	DIAGRAM
DESCRIPTION =	Species List/Interpretative Data Range Chart for East Kingfish-1
REMARKS =	
DATE_CREATED =	
DATE_RECEIVED =	24/09/86
W_NO =	W891
WELL_NAME =	East Kingfish-1
CONTRACTOR =	ESSO
CLIENT_OP_CO =	ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

APPENDIX 5

EAST KINGFISH-1
QUANTITATIVE LOG ANALYSIS

Interval: 2490 - 2615m KB

Analyst : D.J. Henderson

Date : February, 1985

QUANTITATIVE LOG ANALYSIS EAST KINGFISH-1

INTERVAL EVALUATED

2490m - 2615m. All depths are measured from Kelly Bushing. KB = 21.0m AMSL.

LOGS AVAILABLE

DLTE-MSFL-GR	2630.0m - 815.0m
LDTC-CNTH-GR	2618.0m - 2400.0m
DITD-GR	2633.5m - 2450.0m
BHC-GR	2626.5m - 814.0m
EPT-GR	2634.0m - 2450.0m

A. ANALYSIS METHOD

1. Prior to calculation of reservoir parameters, the GR, LLD, MSFL, CNL and ILD logs were corrected for borehole environmental effects. No invasion corrections were required for the LLD and ILD logs. The LDT count rates were processed to determine 3-window density values. The resulting density was corrected for hole size and mud weight. The environmentally corrected CNL log was converted to sandstone units using the algorithm:

$$CNLSS = CNL + [.593\ CNL^3 + .733\ CNL^2 + .233\ CNL + .023]$$

2. Total porosity was estimated from the density-neutron combination using both the main and repeat logged intervals and both 2 and 3-window density values.

$$\phi_t ND = \frac{\phi D \times \phi DCN - \phi NSS \times \phi DCD}{\phi DCN - \phi DCD}$$

where: $\phi D = \frac{\rho ma - \rho b}{\rho ma - \rho f}$

ϕDCN = neutron porosity for dry clay

$\phi DCD = \frac{\rho ma - \rho dry\ clay}{\rho ma - \rho f}$

Parameters for the above calculation were determined from crossplots of density and neutron logs.

3. Total porosity was calculated from the sonic log using the algorithm:

$$\phi ts = .625 \times \frac{(\Delta t - \Delta tma)}{\Delta t}$$

where Δt is sonic travel time and Δtma is matrix travel time.

4. The best estimate of total porosity was considered to be the Hodges-Lehmann estimation using 5 input porosity calculations as determined in 2 and 3 above.

   The Hodges-Lehmann estimate is the median value of all possible binary averages and as such is relatively unaffected by anomalous values.

5. Shale fraction was estimated from the gamma ray log.

$$VSHGR = \frac{GR - GRmin}{GRmax - GRmin}$$

6. Clay fraction was estimated using the LDT-CNL combination.

$$VCLND = \frac{\rho maa - \rho maa\ SD}{\rho maacl - \rho maa\ SD}$$

where; $\rho maa = \frac{\rho b - \emptyset NSS}{1 - \emptyset NSS}$

ρ maaSD = apparent grain density for clean sand and,
ρ maacl = apparent grain density for clay

Four estimates of clay fraction were obtained by using parameters from crossplots of the main and repeat logged sections and both 2 and 3-window density values.

7. The best estimate of clay fraction (SWB) was considered to be the Hodges-Lehmann estimation using 5 input variables as calculated in 5 and 6 above.

8. The cementation factor m was calculated using the relationship:

$$m = \frac{-\log RtLLD - \log Rw}{\log \emptyset t}$$

where RtLLD is corrected deep resistivity
Rw is measured from Kingfish produced water
$\emptyset$t is the best estimate of total porosity (4 above)

9. Water saturation was determined using a Dual Water Model as described by Coates et al (1982). The model considers a formation to contain two types of water, bound water which is ionically bound to clay mineral surfaces and free or far water. The model reconstructs expected deep resistivity assuming 100% water saturation (Ro):

$$Ro = \frac{a\ Rwf \times Rwb}{\emptyset t^m\ [Rwb + Swb\ (Rwf - Rwb)]}$$

where Rwf is free or far water resistivity and Rwb is bound water resistivity.

$$Rwa = \emptyset t^m\ RtLLD/a$$

Rwf = Rwa in clean water sand
Rwb = Rwa in shale

10. Total water saturation:

$$SwT = (Ro/RtLLD)^{1/n}$$

11. If calculated SwT was greater than 1.0 total porosity was recalculated assuming SwT = 1 and

$$\emptyset tR = (a\ Rw/RtLLD)^{-1/m}$$

where m was determined in 8 above and;

$$Rw = Rwf + Swb\ (Rwb - Rwf)$$

12. The Dual Water model assumes that hydrocarbons can only replace far water. Effective water saturation Swe is calculated using the algorithms:

$$\emptyset t\ (1 - SwT) = \emptyset e\ (1 - Swe)$$

$$Swe = 1 - \emptyset t/\emptyset e\ (1-SwT)$$

The expression $\phi t/\phi e$ above is not considered to be related to shale corrected porosity but is a function of the apparent porosity present in the analysis model due to the assumed presence of bound and far water. Thus;

$$\phi t \text{ bound} = \left(\frac{a\ Rwb}{Rshale}\right)^{1/m}$$

and $$\phi t \text{ far} = \left(\frac{a\ Rwf}{Rshale}\right)^{1/m}$$

The expression for Swe becomes:

$$Swe = 1 - \beta(1-SwT)$$

where $$\beta = 1 + [Swb\ ((Rwb/Rwf)^{1/m} - 1)]$$

13. Effective porosity was calculated using the relationship:

$$\phi e = \phi t - .05\ Swb$$

This expression gave good agreement with core analysis results for West Kingfish W-12.

14. Filtrate invaded zone water saturation was calculated using MSFL log readings corrected for borehole environmental effects as in 9 and 10 above using:

$$Rmfa = (Rxo \times \phi t^{m})/a$$
Rmfaf = Rmfa in clean water sand
Rmfab = Rmfa in shale

15. Invaded zone water saturations values were limited by:

$$SxoT \gg SwT$$

16. Effective flushed zone water saturation was calculated as in 12 above.

17. Near well bore water saturation was estimated from the EPT log using the TPO method:

a) $A = EATT - 45 - TPL\ (1.3 + -18\ TPL)$
= attenuation corrected for geometric spreading loss

b) $TPO = [TPL^2 - (A/60)^2]^{1/2}$
= "lossless" formation propagation time

c) $EPHI = (TPO - TPM)/(TPWO - TPM)$

where; EPHI is EPT porosity,

TPWO is calculated propagation time of fresh water at formation temperature,

TPM is matrix propagation time
$TPM = TPM_Q + MSI\ (TPM_{SH} - TPM_Q)$

where: TPM_Q = propagation time for quartz
TPM_{SH} = propagation time for shale.

d) $$Esxo = \frac{TPO - TPM + PHIT\ (TPM - TPH)}{PHIT\ (TPWO - TPH)}$$

where Esxo is EPT water saturation, PHIT is total porosity calculated from the LDT-CNT logs, and, TPH is propagation time for oil.

18. Near well bore water saturation was estimated from the EPT log using the "CRIKS" method:

a) $$EPHI = (TPL - TPM)/(TPW - TPM)$$

where: TPW is a function of salinity and temperature, and, TPM determined as above.

b) $$Esxo = \frac{TPL - TPM + PHIT\ (TPM - TPH)}{PHIT\ (TPW - TPH)}$$

B. LOG QUALITY CONTROL

1. DLTE-MSFL-GR

No quality control problems are obvious for this log. Resistivity profiles are consistent with filtrate being less conductive than formation water. The resistivity profiles indicate that little movable oil is present in the hydrocarbon zone.

2. LDTC-CNTH-GR

The LDTC does not meet Schlumberger's quality control specifications as indicated by count rate ratios. Table 1 documents LDT ratios and acceptable tolerances.

TABLE 1

EAST KINGFISH-1 - LDT RATIO ANALYSIS

Ratio	Observed	Tolerance	Remarks
LL/AL [AL]	0.594	0.60 - 0.70	Out of tolerance
LITH/LS [AL]	0.271	0.26 - 0.38	Low in acceptable range
SS1/SS2 [AL]	0.729	0.71 - 0.73	High in acceptable range
LITH/LS [AL] / LITH/LS [AL+Fe]	1.34	1.30 - 1.40	Good
SS1/LS [AL] / SS1/LS [AL + Fe]	1.007	0.98 - 1.02	Good

The density correction curve (DRHO) does not repeat well between the main and repeat sections with DRHO being positive through most of the main log. The bulk density values repeat well indicating that the density correction algorithms are performing satisfactorily.

The density and neutron logs show significant gas effect in clean water sands. Cross-plot grain density using environmentally and lithology corrected values is about 2.60 which is significantly less than the expected value of 2.65,

Calculation of bulk density using 3-window algorithms and use of polynomial lithology corrections for the CNTH resulted in cross-plot grain density of 2.66.

The PEF values are significantly lower than expected values in clean water sands. Over the interval 2607-2610m expected PEF = 1.655 whereas the log reads 1.45 - 1.50.

3. DILD-GR-BHC

The SFL reading failed during running of the log. Deep induction resistivity readings are significantly lower than DLTE readings even though hole conditions and resistivity values are ideal for the induction log. Preliminary evaluation indicates that the DILD log is incorrect. Values of m calculated as in A-7 above using the DILD appear much lower than expected whereas the values using the DLTE log are consistent at about 1.95.

The BHC log appears to be valid with good repeatability, very few cycle skips and Δt readings in casing are very close to expected values.

4. EPT-GR

EPT values of TPL and EATT appear valid on the basis of calculated results using expected parameters and using the following check:

a) Near and far reference voltages NVR and FVR.
b) Far receiver voltages FVU and FUD.
c) Near receiver voltages NVU and NVR.
d) Phase shift PSUP and PSDO.

DISCUSSION OF RESULTS

The results of this analysis indicate that porous and permeable sands in the hydrocarbon section are depleted. Hydrocarbon saturation values appear lower than could be expected if the zone had not been partly produced.

Core #4 indicated that the oil-water contact occurs between 2524.5m and 2525.5m in clean sand. Preliminary log analysis indicated that oil occurs down to about 2530m although no clear contact was identifiable.

Resistivity anomalies have been observed below hydrocarbon zones in several "Top of Latrobe" oil and gas fields in the Gippsland Basin (Tuna, Mackeral, Kingfish, Cobia, Fortescue). These resistivity anomalies have been interpreted as residual hydrocarbon zones although this is inconsistent with core data and RFT pressure data.

The most consistent interpretation of the resistivity anomaly is that connate water in and directly below the hydrocarbon zone is fresher than in the main aquifer. This analysis assumes that this slightly fresher water occurs from the top of Latrobe section to 2534m. Estimates of movable hydrocarbons:

ϕt (Sxot - Swt)

show no movable oil below 2525m MD which is the field OWC and coincides with the OWC seen in core #4.

Near well-bore water saturation calculated using TPO and CRIKS methods agree closely. As expected, EPT saturation values are higher than MSFL saturation values because the EPT is a very shallow investigation tool. Use of the EPT to quantify irreducible hydrocarbon saturation is not recommended in this well because of surfactants which were added to the mud system.

D.J. HENDERSON

REFERENCES:

1. Coates, G.R.; Schulze, R.P.; Throop, W.H.; "VOLAN - An Advanced Computational Log Analysis", SPWLA Twenty-Third Annual Logging Syposium, July, 1982.

2. Dahlberg, K.E.; "Evaluation of Schlumberger's Electromagnetic Propagation (EPT) Log", EPR Research Report EPR. 49 PR.83, 1983.

TABLE 2

EAST KINGFISH-1 - VARIABLE ANALYSIS PARAMETERS

PARAMETERS

Rm	=	.182 ohm-m @ 73° C
Rmf	=	.154 ohm-m @ 73° C
Rmc	=	.237 ohm-m @ 73° C
ρ maa (2-window)	=	2.625 g/cm^3
ρ dc (2-window)	=	2.70 g/cm^3
ØDCN (2-window)	=	.20
ρ f	=	1.01 g/cm^3
ρ maa (3-window)	=	2.66 g/cm^3
ρ dc (3-window)	=	2.70 g/cm^3
ØDCN (3-window)	=	.225
Δ tma	=	184 usec/m
GRmin	=	25
GRmax	=	130
m	=	1.95
a	=	0.96
n	=	2.00
Rwf	=	.067 ohm-m
Rwb	=	.09 ohm-m
Rmfaf = Rmfab	=	.12 ohm-m

TABLE 3

EAST KINGFISH-1 - EPT ANALYSIS PARAMETERS

T_f	=	88° C
TPM_Q (TPO)	=	7.00 nsec/m
TPM_{SH} (TPO)	=	9.00 nsec/m
TPWO	=	25.48 nsec/m
TPH	=	5.00 nsec/m
TPW	=	35.00 nsec/m
TPM_Q (CRIKS)	=	5.50 nsec/m
TPM_{SH} (CRIKS)	=	8.00 nsec/m

TABLE 4

EAST KINGFISH-1 - SUMMARY OF RESULTS

Depth Interval (metres)	Gross Thickness (m)	(1) Net Thickness (m)	(2) Av.	Porosity St. Dev.	(3) Water Saturation	Remarks
2496.50 - 2500.50	4.00	0	.160	.017	.65-.98 (.75)	oil, shaly in part
2502.00 - 2503.00	1.00	0	.130	.006	.75-.81 (.78)	oil, shaly
2504.50 - 2505.50	1.00	0	.135	.008	.74-.84 (.79)	oil, shaly
2507.50 - 2509.50	2.00	0	.150	.016	.65-.81 (.76)	oil
2510.50 - 2511.50	1.00	0	.150	.007	.73-.91 (.82)	oil, most shaly
2513.75 - 2515.25	1.50	0.75	.185	.033	.61-.64 (.63)	oil, clean
2516.25 - 2522.50	6.25	0	.210	.018	.71-1.0 (.81)	oil, some shaly
2522.50 - 2526.75	4.25	0	.190	.024	.80-.96 (.90)	water productive, clean
2526.75 - 2529.50	2.75	0	.185	.004	.96-1.0 (.99)	water, clean
2529.50 - 2533.75	4.25	0	.185	.029	1.0	water, shaly at base
2533.75 - 2534.75	1.00	0	.165	.012	1.0	water, shaly
2534.75 - 2575.75	41.00	0	.230	.009	.94-1.0 (1.0)	water, clean
2576.25 - 2611.25	35.00	0	.220	.012	.92-1.0 (1.0)	water, clean
2611.75 - 2615.00	3.25	0	.201	.022	.98-1.0 (1.0)	water, clean

(1) Net thickness where $\phi e \geq 0.14$ and $Swe \leq 0.65$.
(2) Average and standard deviation are calculated for $\phi e \geq 0.12$.
(3) Where the interval contains effective hydrocarbons, water saturation values are those where $Swe \leq 0.65$.

EAST KINGFISH-1 LOG ANALYSIS

DEPTH	.GR	.LLD	.MSFL	.RHOB	.NPHI	SHALE	PHIE	SWE	SXOE
2495.000	77.731	2.937	4.372	2.631	.193	.900	.108	1.000	1.000
2495.250	81.946	3.243	8.467	2.539	.159	.793	.104	1.000	1.000
2495.500	80.625	2.643	1.489	2.550	.174	.830	.119	1.000	1.000
2495.750	81.355	2.299	2.833	2.459	.266	.594	.155	.979	1.000
2496.000	75.055	2.328	3.372	2.407	.270	.748	.145	.977	1.000
2496.250	73.508	2.547	3.182	2.485	.225	.857	.121	1.000	1.000
2496.500	88.329	2.585	3.635	2.492	.230	.783	.134	.977	1.000
2496.750	95.586	3.004	4.948	2.427	.207	.624	.143	.909	.908
2497.000	92.015	3.965	4.867	2.361	.174	.582	.135	.844	.973
2497.250	92.732	4.320	5.310	2.378	.169	.537	.139	.802	.916
2497.500	81.792	4.590	5.990	2.382	.166	.378	.160	.727	.795
2497.750	74.597	4.703	5.585	2.388	.158	.299	.162	.730	.838
2498.000	78.327	4.907	7.291	2.418	.158	.328	.151	.754	.765
2498.250	76.122	4.890	6.767	2.404	.160	.302	.156	.737	.776
2498.500	73.428	4.517	5.776	2.358	.165	.303	.164	.735	.811
2498.750	70.128	4.352	5.319	2.322	.174	.286	.183	.681	.771
2499.000	72.848	4.454	5.521	2.335	.175	.243	.190	.660	.739
2499.250	79.352	4.899	6.699	2.380	.146	.225	.176	.677	.715
2499.500	78.040	5.212	5.871	2.376	.132	.178	.160	.726	.850
2499.750	76.175	5.074	5.597	2.360	.154	.232	.170	.687	.815
2500.000	71.987	4.832	4.998	2.336	.161	.236	.178	.673	.829
2500.250	66.914	5.314	6.337	2.353	.158	.236	.176	.649	.735
2500.500	65.880	5.487	6.893	2.427	.166	.359	.146	.724	.801
2500.750	65.845	5.963	6.725	2.456	.170	.441	.124	.777	.913
2501.000	67.577	6.262	7.384	2.439	.157	.419	.125	.757	.865
2501.250	70.300	6.494	10.049	2.470	.159	.449	.123	.746	.740
2501.500	65.345	6.170	9.078	2.485	.187	.518	.111	.806	.823
2501.750	59.677	5.873	7.259	2.450	.181	.497	.116	.809	.908
2502.000	61.342	5.865	7.622	2.447	.150	.430	.124	.785	.854
2502.250	62.971	6.038	7.280	2.460	.137	.352	.132	.754	.850
2502.500	64.063	5.374	5.443	2.429	.157	.337	.140	.766	.955
2502.750	62.623	5.282	6.089	2.409	.166	.431	.131	.790	.923
2503.000	62.718	5.562	7.161	2.451	.142	.454	.121	.813	.893
2503.250	66.608	5.745	6.462	2.457	.132	.367	.129	.785	.923
2503.500	67.688	5.490	6.263	2.448	.136	.324	.130	.810	.946
2503.750	65.631	5.466	6.460	2.454	.129	.313	.129	.818	.937
2504.000	66.523	5.602	6.963	2.473	.107	.273	.127	.831	.924
2504.250	67.325	5.709	7.759	2.488	.102	.230	.127	.839	.887
2504.500	68.022	5.464	6.831	2.452	.123	.240	.130	.835	.926
2504.750	66.621	5.218	5.370	2.411	.125	.241	.137	.817	1.000
2505.000	68.020	5.446	6.307	2.408	.135	.228	.150	.741	.854
2505.250	71.533	5.410	6.418	2.435	.149	.310	.142	.761	.868
2505.500	69.426	5.721	8.684	2.446	.144	.387	.126	.795	.797
2505.750	70.971	6.019	8.920	2.448	.153	.373	.125	.785	.794
2506.000	79.086	5.937	7.960	2.426	.158	.388	.124	.790	.845
2506.250	76.872	5.979	6.659	2.423	.151	.477	.114	.819	.971
2506.500	68.126	6.123	7.991	2.452	.139	.407	.118	.806	.874
2506.750	66.802	6.222	7.850	2.461	.129	.324	.126	.784	.862
2507.000	67.952	6.193	6.345	2.448	.136	.374	.121	.793	.978
2507.250	72.289	6.125	7.880	2.449	.137	.390	.116	.821	.897
2507.500	72.980	5.247	6.769	2.413	.157	.380	.131	.807	.885
2507.750	73.083	4.432	4.658	2.327	.174	.293	.167	.731	.900
2508.000	77.376	4.898	4.799	2.322	.153	.236	.183	.652	.827
2508.250	77.644	5.242	7.985	2.401	.139	.291	.162	.692	.690
2508.500	76.014	4.915	5.648	2.418	.137	.313	.142	.795	.929
2508.750	78.322	4.848	6.331	2.398	.135	.283	.143	.806	.878

EAST KINGFISH-1 LOG ANALYSIS

DEPTH	.GR	.LLD	.MSFL	.RHOB	.NPHI	SHALE	PHIE	SWE	SXOE
2509.000	78.464	4.725	6.137	2.376	.141	.264	.153	.773	.844
2509.250	81.940	4.800	6.594	2.377	.139	.267	.156	.753	.797
2509.500	88.001	5.414	7.276	2.456	.123	.330	.132	.802	.857
2509.750	86.555	5.868	7.996	2.471	.128	.350	.123	.815	.863
2510.000	83.230	5.991	6.952	2.450	.156	.337	.130	.775	.892
2510.250	80.837	5.624	7.665	2.460	.171	.466	.112	.858	.915
2510.500	83.123	5.451	8.793	2.465	.169	.560	.102	.898	.895
2510.750	79.159	5.139	7.019	2.416	.148	.407	.113	.907	.969
2511.000	66.024	4.997	6.646	2.394	.140	.304	.142	.790	.851
2511.250	59.354	5.372	7.689	2.365	.128	.164	.158	.728	.747
2511.500	72.192	5.431	8.328	2.421	.142	.234	.145	.763	.760
2511.750	93.629	5.687	7.814	2.487	.168	.483	.109	.864	.918
2512.000	105.636	5.839	9.516	2.495	.188	.744	.073	1.000	1.000
2512.250	105.190	6.019	8.726	2.511	.190	.784	.071	.990	1.000
2512.500	110.630	6.238	8.539	2.506	.184	.753	.079	.927	.999
2512.750	120.531	5.413	8.780	2.505	.224	.867	.080	.935	.932
2513.000	127.658	5.106	6.464	2.487	.222	.911	.084	.917	1.000
2513.250	116.717	5.389	9.610	2.465	.186	.829	.089	.890	.885
2513.500	94.654	6.118	7.460	2.444	.172	.646	.104	.810	.919
2513.750	88.188	5.848	5.909	2.417	.177	.542	.121	.771	.965
2514.000	87.639	5.161	8.083	2.364	.181	.416	.154	.704	.697
2514.250	74.301	4.618	4.213	2.273	.189	.249	.193	.638	.842
2514.500	71.552	4.145	4.054	2.259	.196	.204	.217	.613	.782
2514.750	76.613	3.939	5.240	2.320	.191	.208	.217	.626	.676
2515.000	78.039	4.149	4.645	2.323	.174	.197	.202	.653	.774
2515.250	84.330	4.664	7.495	2.359	.154	.262	.177	.685	.680
2515.500	92.308	4.993	6.622	2.465	.159	.413	.136	.792	.858
2515.750	105.852	5.416	7.970	2.493	.175	.611	.107	.856	.883
2516.000	114.035	4.115	8.192	2.468	.183	.725	.095	1.000	1.000
2516.250	106.270	3.004	5.070	2.395	.208	.727	.113	1.000	1.000
2516.500	81.790	2.273	2.520	2.275	.254	.613	.166	.931	1.000
2516.750	67.545	2.129	3.784	2.191	.264	.412	.233	.760	.755
2517.000	71.792	2.280	3.859	2.234	.248	.305	.251	.705	.700
2517.250	71.179	2.655	5.553	2.329	.229	.370	.218	.729	.724
2517.500	64.869	2.661	4.719	2.302	.218	.367	.207	.764	.759
2517.750	59.422	2.524	3.201	2.278	.202	.272	.216	.772	.879
2518.000	59.923	2.497	3.219	2.336	.181	.266	.210	.797	.900
2518.250	76.334	2.791	5.613	2.373	.178	.321	.189	.819	.816
2518.500	80.667	2.945	5.194	2.328	.194	.332	.189	.793	.790
2518.750	78.111	3.094	4.619	2.297	.202	.327	.199	.740	.765
2519.000	80.469	3.100	10.917	2.319	.199	.347	.199	.736	.732
2519.250	83.971	3.062	5.299	2.306	.223	.430	.191	.753	.747
2519.500	65.114	2.597	2.894	2.241	.244	.425	.198	.791	.971
2519.750	46.654	2.562	2.930	2.258	.194	.278	.217	.762	.917
2520.000	39.464	2.400	3.194	2.310	.161	.146	.213	.829	.918
2520.250	33.371	2.335	2.927	2.309	.152	.041	.208	.884	1.000
2520.500	35.773	2.290	3.603	2.295	.145	.021	.212	.882	.888
2520.750	37.394	2.578	3.396	2.305	.135	.024	.207	.847	.935
2521.000	37.156	2.916	3.529	2.320	.130	.023	.201	.821	.945
2521.250	35.943	2.978	3.559	2.267	.112	.021	.210	.779	.901
2521.500	34.836	2.631	2.864	2.213	.132	.019	.229	.763	.934
2521.750	37.247	2.273	2.822	2.229	.162	.023	.233	.805	.923
2522.000	38.518	2.180	3.051	2.252	.163	.026	.231	.828	.891
2522.250	36.192	2.451	3.523	2.273	.172	.037	.222	.811	.857
2522.500	33.779	2.897	4.439	2.333	.140	.047	.195	.840	.851
2522.750	33.543	3.049	4.444	2.372	.100	.019	.173	.927	.962

EAST KINGFISH-1 LOG ANALYSIS

DEPTH	.GR	.LLD	.MSFL	.RHOB	.NPHI	SHALE	PHIE	SWE	SXOE
2523.000	30.977	3.067	4.505	2.372	.094	.011	.166	.964	.995
2523.250	30.552	3.148	4.323	2.375	.108	.012	.167	.948	1.000
2523.500	31.281	3.250	4.632	2.374	.114	.022	.167	.931	.975
2523.750	32.459	3.223	4.197	2.359	.108	.017	.170	.918	1.000
2524.000	31.852	3.163	4.042	2.357	.115	.019	.176	.896	.997
2524.250	28.392	3.071	4.307	2.346	.121	.006	.183	.878	.929
2524.500	29.520	2.923	4.242	2.349	.100	.009	.183	.903	.940
2524.750	31.633	2.825	4.005	2.356	.098	.013	.183	.917	.969
2525.000	34.058	2.762	3.798	2.341	.124	.017	.184	.919	.989
2525.250	34.068	2.714	3.008	2.340	.165	.095	.179	.929	1.000
2525.500	39.666	2.480	3.980	2.322	.188	.137	.195	.887	.887
2525.750	43.881	2.231	3.975	2.282	.192	.173	.208	.873	.872
2526.000	41.503	2.159	4.692	2.235	.196	.109	.231	.816	.815
2526.250	37.393	2.146	4.827	2.241	.182	.027	.243	.797	.797
2526.500	32.719	2.169	4.481	2.280	.145	.015	.229	.841	.841
2526.750	32.166	2.195	4.504	2.315	.128	.014	.209	.913	.913
2527.000	30.697	2.308	4.629	2.348	.136	.038	.193	.956	.956
2527.250	31.581	2.323	4.422	2.352	.136	.045	.187	.980	.980
2527.500	32.981	2.355	4.481	2.331	.128	.015	.192	.956	.956
2527.750	27.954	2.411	4.798	2.335	.116	.006	.191	.956	.956
2528.000	25.309	2.423	5.058	2.362	.104	.001	.182	.998	.998
2528.250	29.881	2.337	4.867	2.352	.108	.009	.180	1.000	1.000
2528.500	32.259	2.239	4.558	2.329	.112	.014	.185	1.000	1.000
2528.750	32.302	2.219	4.289	2.316	.107	.014	.189	1.000	1.000
2529.000	31.276	2.154	4.542	2.329	.110	.012	.185	1.000	1.000
2529.250	31.705	1.685	4.881	2.336	.120	.013	.183	1.000	1.000
2529.500	34.390	1.383	2.838	2.298	.129	.018	.197	1.000	1.000
2529.750	36.082	1.278	2.773	2.295	.121	.021	.205	1.000	1.000
2530.000	49.102	1.932	2.734	2.332	.104	.046	.189	1.000	1.000
2530.250	59.168	2.387	5.689	2.389	.106	.076	.165	1.000	1.000
2530.500	57.087	2.345	6.248	2.399	.129	.144	.146	1.000	1.000
2530.750	55.959	1.793	3.432	2.337	.166	.225	.167	1.000	1.000
2531.000	56.938	1.367	2.385	2.257	.203	.218	.199	1.000	1.000
2531.250	57.649	1.331	2.366	2.231	.211	.187	.226	1.000	1.000
2531.500	65.792	1.269	2.557	2.240	.199	.169	.233	1.000	1.000
2531.750	76.688	1.297	2.487	2.247	.205	.220	.228	1.000	1.000
2532.000	72.402	1.278	2.872	2.266	.195	.207	.220	1.000	1.000
2532.250	67.449	1.490	3.025	2.305	.172	.194	.203	1.000	1.000
2532.500	71.792	2.121	4.499	2.376	.165	.285	.172	1.000	1.000
2532.750	75.908	2.380	4.768	2.431	.176	.416	.145	1.000	1.000
2533.000	68.044	2.372	6.602	2.434	.193	.507	.136	1.000	1.000
2533.250	61.757	2.014	4.852	2.390	.199	.499	.151	1.000	1.000
2533.500	58.932	1.714	3.809	2.336	.192	.375	.171	1.000	1.000
2533.750	63.169	1.614	3.470	2.346	.181	.333	.181	1.000	1.000
2534.000	74.905	1.691	3.602	2.405	.174	.383	.170	1.000	1.000
2534.250	76.074	2.020	3.487	2.453	.186	.504	.150	1.000	1.000
2534.500	61.289	1.812	5.469	2.407	.191	.518	.160	1.000	1.000
2534.750	43.874	1.495	3.089	2.340	.175	.353	.182	1.000	1.000
2535.000	36.176	1.289	3.085	2.325	.182	.230	.200	1.000	1.000
2535.250	34.469	1.137	2.646	2.295	.188	.148	.215	1.000	1.000
2535.500	29.785	1.085	2.199	2.279	.185	.093	.221	1.000	1.000
2535.750	27.947	1.085	2.140	2.282	.173	.069	.224	.990	1.000
2536.000	27.325	1.063	2.219	2.283	.176	.074	.224	.998	1.000
2536.250	26.132	1.050	2.096	2.283	.188	.106	.226	.997	1.000
2536.500	26.880	1.046	2.130	2.270	.188	.084	.231	.976	1.000
2536.750	28.854	1.047	2.309	2.249	.176	.019	.237	.957	1.000

EAST KINGFISH-1 LOG ANALYSIS

DEPTH	.GR	.LLD	.MSFL	.RHOB	.NPHI	SHALE	PHIE	SWE	SXOE
2537.000	33.005	1.063	2.001	2.273	.176	.038	.228	.984	1.000
2537.250	28.228	1.066	2.458	2.288	.173	.041	.224	1.000	1.000
2537.500	24.499	1.083	2.144	2.264	.170	.007	.224	.993	1.000
2537.750	26.402	1.033	1.962	2.270	.188	.058	.227	1.000	1.000
2538.000	25.626	1.033	2.343	2.273	.187	.073	.227	1.000	1.000
2538.250	22.934	1.047	2.107	2.258	.186	.048	.226	1.000	1.000
2538.500	20.045	1.018	1.869	2.241	.196	.051	.237	.969	1.000
2538.750	22.959	.995	2.162	2.257	.179	.016	.243	.959	1.000
2539.000	26.133	.986	2.113	2.253	.174	.002	.242	.964	1.000
2539.250	25.208	1.000	2.157	2.253	.180	.011	.238	.974	1.000
2539.500	27.964	1.012	1.957	2.258	.174	.012	.233	.989	1.000
2539.750	30.562	1.008	2.163	2.282	.166	.037	.231	1.000	1.000
2540.000	26.840	1.027	2.455	2.310	.173	.075	.228	1.000	1.000
2540.250	25.000	1.024	2.236	2.305	.182	.075	.228	1.000	1.000
2540.500	25.956	1.021	2.384	2.286	.173	.049	.229	1.000	1.000
2540.750	25.731	1.043	2.312	2.298	.161	.044	.226	1.000	1.000
2541.000	27.314	1.053	2.697	2.308	.158	.033	.226	1.000	1.000
2541.250	27.279	1.068	2.422	2.299	.159	.025	.224	1.000	1.000
2541.500	26.043	1.057	2.212	2.300	.162	.028	.225	1.000	1.000
2541.750	24.249	1.042	2.322	2.282	.160	.002	.227	1.000	1.000
2542.000	22.509	1.021	2.227	2.275	.162	.010	.229	1.000	1.000
2542.250	23.882	1.001	2.273	2.296	.166	.045	.231	1.000	1.000
2542.500	24.976	1.004	2.441	2.308	.161	.042	.231	1.000	1.000
2542.750	27.707	1.030	2.440	2.316	.159	.043	.228	1.000	1.000
2543.000	27.846	1.055	2.390	2.321	.168	.068	.225	1.000	1.000
2543.250	24.852	1.035	2.405	2.311	.167	.051	.227	1.000	1.000
2543.500	23.196	.967	2.117	2.292	.163	.030	.236	1.000	1.000
2543.750	25.515	.964	2.370	2.296	.166	.038	.236	1.000	1.000
2544.000	24.912	1.016	2.372	2.295	.151	.011	.230	1.000	1.000
2544.250	27.226	1.072	2.751	2.316	.142	.018	.224	1.000	1.000
2544.500	29.782	1.079	2.594	2.326	.147	.044	.223	1.000	1.000
2544.750	30.173	1.063	2.646	2.327	.151	.046	.224	1.000	1.000
2545.000	28.517	1.076	2.621	2.328	.155	.051	.223	1.000	1.000
2545.250	24.829	1.072	2.468	2.301	.149	.002	.224	1.000	1.000
2545.500	24.201	1.054	2.346	2.287	.157	.016	.226	1.000	1.000
2545.750	25.555	1.068	2.378	2.282	.151	.055	.224	1.000	1.000
2546.000	28.715	1.064	2.252	2.286	.141	.054	.224	1.000	1.000
2546.250	31.498	1.049	2.208	2.297	.171	.064	.226	1.000	1.000
2546.500	27.672	1.063	2.336	2.309	.173	.089	.224	1.000	1.000
2546.750	25.839	1.048	2.200	2.293	.159	.042	.226	1.000	1.000
2547.000	25.656	1.015	2.345	2.282	.163	.032	.230	1.000	1.000
2547.250	27.278	1.014	2.475	2.296	.163	.034	.230	1.000	1.000
2547.500	33.682	1.024	2.494	2.295	.157	.027	.229	1.000	1.000
2547.750	36.999	1.063	2.522	2.303	.154	.044	.224	1.000	1.000
2548.000	34.827	1.084	2.709	2.312	.162	.070	.222	1.000	1.000
2548.250	32.634	1.075	2.696	2.307	.156	.064	.223	1.000	1.000
2548.500	30.430	1.043	2.637	2.277	.162	.056	.226	1.000	1.000
2548.750	29.651	.990	2.371	2.254	.163	.040	.233	1.000	1.000
2549.000	29.610	.997	2.593	2.265	.163	.023	.232	1.000	1.000
2549.250	33.705	1.005	2.530	2.278	.172	.059	.231	1.000	1.000
2549.500	36.173	1.004	2.293	2.283	.168	.063	.231	1.000	1.000
2549.750	33.441	.987	2.410	2.276	.171	.036	.233	1.000	1.000
2550.000	34.917	.957	2.359	2.273	.179	.050	.237	1.000	1.000
2550.250	37.219	.945	2.242	2.262	.174	.032	.239	1.000	1.000
2550.500	35.566	.978	2.484	2.269	.179	.048	.234	1.000	1.000
2550.750	33.822	.982	2.343	2.277	.178	.049	.234	1.000	1.000

EAST KINGFISH-1 LOG ANALYSIS

DEPTH	.GR	.LLD	.MSFL	.RHOB	.NPHI	SHALE	PHIE	SWE	SXOE
2551.000	32.361	.964	2.324	2.272	.176	.046	.236	1.000	1.000
2551.250	32.018	.954	2.246	2.260	.166	.028	.237	1.000	1.000
2551.500	35.324	.941	2.219	2.262	.161	.035	.239	1.000	1.000
2551.750	35.734	.952	2.227	2.274	.184	.073	.237	1.000	1.000
2552.000	36.148	.960	2.567	2.288	.188	.100	.236	1.000	1.000
2552.250	39.110	.981	2.283	2.287	.165	.060	.234	1.000	1.000
2552.500	36.365	.965	2.353	2.295	.162	.064	.236	1.000	1.000
2552.750	39.492	.965	2.342	2.290	.170	.107	.235	1.000	1.000
2553.000	40.185	.950	2.405	2.278	.170	.100	.237	1.000	1.000
2553.250	38.652	.953	2.306	2.274	.180	.095	.237	1.000	1.000
2553.500	37.094	.947	2.326	2.277	.182	.094	.238	1.000	1.000
2553.750	37.337	.956	2.274	2.287	.185	.118	.236	1.000	1.000
2554.000	40.191	.951	2.227	2.277	.187	.116	.237	1.000	1.000
2554.250	46.948	.961	2.234	2.268	.176	.086	.236	1.000	1.000
2554.500	48.813	.995	2.447	2.273	.182	.100	.232	1.000	1.000
2554.750	45.252	.997	2.576	2.289	.178	.127	.231	1.000	1.000
2555.000	40.789	.996	2.353	2.284	.168	.126	.231	1.000	1.000
2555.250	36.685	.975	2.442	2.280	.174	.094	.234	1.000	1.000
2555.500	43.065	.996	2.349	2.291	.180	.105	.231	1.000	1.000
2555.750	51.966	1.010	2.287	2.306	.174	.141	.229	1.000	1.000
2556.000	48.234	.978	2.483	2.283	.191	.158	.233	1.000	1.000
2556.250	43.267	.919	1.982	2.262	.197	.155	.241	1.000	1.000
2556.500	48.293	.933	2.009	2.256	.183	.128	.239	1.000	1.000
2556.750	50.755	.972	2.259	2.251	.185	.100	.235	.997	1.000
2557.000	46.777	1.011	2.291	2.269	.187	.116	.230	1.000	1.000
2557.250	43.936	1.015	2.389	2.294	.182	.129	.229	1.000	1.000
2557.500	49.401	1.015	2.406	2.290	.173	.109	.229	1.000	1.000
2557.750	52.262	.988	2.374	2.280	.184	.110	.232	1.000	1.000
2558.000	52.965	.923	2.002	2.257	.208	.126	.241	1.000	1.000
2558.250	56.247	.888	2.019	2.241	.213	.125	.246	1.000	1.000
2558.500	55.041	.890	1.988	2.230	.224	.155	.245	1.000	1.000
2558.750	48.380	.923	1.966	2.226	.226	.166	.247	.975	1.000
2559.000	48.569	.955	2.218	2.263	.205	.182	.236	1.000	1.000
2559.250	45.762	.997	2.276	2.293	.174	.123	.231	1.000	1.000
2559.500	41.091	1.020	2.368	2.300	.168	.080	.229	1.000	1.000
2559.750	41.746	1.062	2.599	2.312	.157	.061	.224	1.000	1.000
2560.000	40.533	1.083	2.714	2.308	.155	.052	.222	1.000	1.000
2560.250	37.251	1.109	2.799	2.327	.162	.115	.219	1.000	1.000
2560.500	34.505	1.124	2.828	2.334	.152	.103	.217	1.000	1.000
2560.750	36.975	1.132	2.853	2.321	.153	.095	.217	1.000	1.000
2561.000	40.214	1.039	2.702	2.291	.169	.092	.226	1.000	1.000
2561.250	44.076	.950	2.302	2.247	.188	.109	.237	1.000	1.000
2561.500	44.421	.941	2.079	2.261	.194	.144	.238	1.000	1.000
2561.750	40.209	.997	2.306	2.285	.182	.152	.231	1.000	1.000
2562.000	40.741	.972	2.285	2.269	.171	.143	.234	1.000	1.000
2562.250	41.490	.956	2.123	2.245	.193	.119	.236	1.000	1.000
2562.500	45.387	.983	2.123	2.258	.194	.118	.233	1.000	1.000
2562.750	49.152	1.020	3.012	2.279	.181	.129	.228	1.000	1.000
2563.000	46.541	1.006	2.211	2.266	.186	.124	.230	1.000	1.000
2563.250	41.214	.976	2.271	2.261	.189	.142	.234	1.000	1.000
2563.500	41.030	.997	2.239	2.247	.204	.151	.231	1.000	1.000
2563.750	43.706	1.016	2.250	2.266	.197	.133	.229	1.000	1.000
2564.000	48.371	1.015	2.722	2.274	.201	.140	.229	1.000	1.000
2564.250	49.071	1.001	2.147	2.261	.209	.166	.230	1.000	1.000
2564.500	48.379	1.014	2.315	2.259	.200	.151	.229	.999	1.000
2564.750	48.959	1.015	2.238	2.240	.198	.143	.232	.985	1.000

EAST KINGFISH-1 LOG ANALYSIS

DEPTH	.GR	.LLD	.MSFL	.RHOB	.NPHI	SHALE	PHIE	SWE	SXOE
2565.000	52.490	.973	2.149	2.225	.194	.131	.238	.982	1.000
2565.250	54.501	.946	2.061	2.230	.207	.132	.240	.990	1.000
2565.500	52.295	1.004	2.140	2.234	.222	.183	.236	.972	1.000
2565.750	49.768	1.020	2.561	2.260	.204	.178	.228	1.000	1.000
2566.000	44.078	.998	2.328	2.263	.188	.151	.231	1.000	1.000
2566.250	35.702	.907	2.015	2.252	.184	.113	.243	1.000	1.000
2566.500	33.209	.924	2.038	2.258	.183	.075	.241	1.000	1.000
2566.750	31.258	.935	2.016	2.245	.189	.056	.240	1.000	1.000
2567.000	32.771	.928	1.829	2.245	.195	.096	.240	1.000	1.000
2567.250	35.837	.916	1.856	2.253	.198	.144	.241	1.000	1.000
2567.500	34.652	.910	1.914	2.233	.203	.106	.243	1.000	1.000
2567.750	35.098	.905	1.973	2.234	.209	.088	.243	1.000	1.000
2568.000	36.912	.923	1.929	2.237	.197	.063	.242	.996	1.000
2568.250	36.191	.933	1.905	2.217	.204	.063	.245	.980	1.000
2568.500	36.092	.941	2.054	2.236	.193	.048	.244	.978	1.000
2568.750	39.853	.961	2.178	2.271	.173	.045	.241	.983	1.000
2569.000	39.001	.991	2.220	2.274	.179	.059	.234	.993	1.000
2569.250	37.035	.973	2.126	2.267	.197	.092	.234	1.000	1.000
2569.500	42.616	.946	2.033	2.255	.204	.106	.238	1.000	1.000
2569.750	48.491	.934	2.219	2.260	.199	.105	.239	1.000	1.000
2570.000	52.162	1.001	2.136	2.275	.199	.129	.231	1.000	1.000
2570.250	53.258	1.017	2.668	2.291	.199	.174	.228	1.000	1.000
2570.500	50.548	1.024	2.303	2.277	.202	.170	.227	1.000	1.000
2570.750	44.570	.967	2.121	2.265	.202	.117	.235	.999	1.000
2571.000	40.740	.956	2.088	2.253	.190	.079	.240	.985	1.000
2571.250	38.019	.929	1.895	2.260	.187	.095	.241	.996	1.000
2571.500	53.788	.942	1.917	2.271	.190	.154	.238	1.000	1.000
2571.750	87.372	.980	2.129	2.307	.189	.299	.231	1.000	1.000
2572.000	74.212	1.001	2.083	2.315	.218	.325	.229	1.000	1.000
2572.250	52.888	.992	2.230	2.277	.224	.239	.231	1.000	1.000
2572.500	53.727	.997	2.111	2.265	.201	.194	.233	.991	1.000
2572.750	55.572	1.047	2.490	2.278	.190	.182	.225	1.000	1.000
2573.000	49.063	1.158	2.698	2.292	.173	.138	.215	.993	.997
2573.250	45.953	1.195	2.542	2.315	.175	.169	.209	1.000	1.000
2573.500	47.515	1.138	2.556	2.306	.181	.202	.215	1.000	1.000
2573.750	49.757	1.109	2.302	2.271	.184	.166	.218	1.000	1.000
2574.000	50.006	1.089	2.493	2.257	.185	.148	.222	.995	1.000
2574.250	50.036	1.125	2.478	2.255	.176	.128	.222	.977	1.000
2574.500	48.573	1.138	2.442	2.266	.175	.130	.218	.988	1.000
2574.750	45.310	1.162	2.355	2.268	.173	.115	.219	.974	1.000
2575.000	46.965	1.229	2.633	2.270	.164	.070	.222	.940	.997
2575.250	50.819	1.354	2.927	2.292	.166	.118	.208	.946	.987
2575.500	55.079	1.440	3.620	2.328	.156	.147	.195	.976	.977
2575.750	59.205	1.669	3.828	2.387	.150	.223	.174	1.000	1.000
2576.000	81.577	2.192	6.318	2.478	.200	.524	.143	1.000	1.000
2576.250	100.617	1.550	6.598	2.486	.248	.753	.171	1.000	1.000
2576.500	77.546	1.214	2.389	2.372	.239	.749	.199	1.000	1.000
2576.750	50.665	1.094	2.348	2.314	.192	.408	.217	1.000	1.000
2577.000	44.892	1.114	2.432	2.304	.178	.141	.218	1.000	1.000
2577.250	43.823	1.084	2.450	2.300	.192	.126	.221	1.000	1.000
2577.500	38.811	1.004	1.975	2.295	.171	.067	.231	1.000	1.000
2577.750	31.253	.937	2.054	2.282	.172	.070	.239	1.000	1.000
2578.000	29.462	.921	2.073	2.250	.195	.104	.241	1.000	1.000
2578.250	31.540	.931	1.861	2.234	.188	.070	.240	1.000	1.000
2578.500	31.347	.980	2.328	2.260	.171	.026	.239	.981	.999
2578.750	32.460	.980	2.160	2.260	.174	.028	.236	.993	1.000

EAST KINGFISH-1 LOG ANALYSIS

DEPTH	.GR	.LLD	.MSFL	.RHOB	.NPHI	SHALE	PHIE	SWE	SXOE
2579.000	35.449	.955	2.166	2.249	.178	.043	.237	1.000	1.000
2579.250	35.888	.920	2.036	2.247	.178	.040	.242	1.000	1.000
2579.500	37.824	.910	1.986	2.242	.183	.029	.243	1.000	1.000
2579.750	40.664	.916	1.973	2.230	.192	.037	.243	.997	1.000
2580.000	41.964	.923	1.969	2.231	.189	.060	.243	.993	1.000
2580.250	39.107	.918	1.994	2.236	.199	.084	.243	.996	1.000
2580.500	35.685	.918	1.950	2.224	.194	.056	.242	1.000	1.000
2580.750	32.082	.899	1.838	2.238	.187	.038	.245	1.000	1.000
2581.000	32.488	.913	1.933	2.235	.189	.054	.245	.992	1.000
2581.250	33.189	.939	1.855	2.231	.187	.025	.248	.967	1.000
2581.500	32.932	.956	1.859	2.234	.189	.051	.244	.973	1.000
2581.750	38.625	.987	2.229	2.248	.180	.087	.233	1.000	1.000
2582.000	49.913	1.147	3.064	2.296	.172	.099	.215	1.000	1.000
2582.250	56.404	1.269	3.082	2.314	.177	.149	.203	1.000	1.000
2582.500	56.707	1.202	2.482	2.292	.189	.158	.209	1.000	1.000
2582.750	57.877	1.220	3.049	2.289	.187	.195	.207	1.000	1.000
2583.000	58.466	1.153	2.875	2.287	.173	.147	.214	1.000	1.000
2583.250	55.600	1.074	2.525	2.275	.182	.164	.222	1.000	1.000
2583.500	56.723	1.060	2.251	2.260	.197	.191	.223	1.000	1.000
2583.750	54.882	1.084	2.396	2.256	.202	.190	.220	1.000	1.000
2584.000	52.951	1.120	2.600	2.263	.197	.196	.217	.996	.996
2584.250	53.966	1.152	2.984	2.266	.193	.165	.218	.979	.980
2584.500	51.652	1.108	2.276	2.257	.189	.152	.221	.988	1.000
2584.750	50.379	1.084	2.373	2.242	.191	.161	.224	.984	1.000
2585.000	47.346	1.053	2.365	2.238	.192	.138	.228	.984	1.000
2585.250	48.385	1.121	2.652	2.249	.184	.150	.221	.984	.984
2585.500	52.826	1.201	3.018	2.271	.194	.205	.210	.994	.995
2585.750	53.981	1.211	2.756	2.294	.207	.255	.207	1.000	1.000
2586.000	57.064	1.193	2.625	2.286	.198	.249	.208	1.000	1.000
2586.250	56.013	1.107	2.491	2.265	.190	.195	.218	1.000	1.000
2586.500	52.169	1.099	2.348	2.263	.198	.189	.219	1.000	1.000
2586.750	57.381	1.124	2.671	2.265	.201	.220	.216	1.000	1.000
2587.000	57.339	1.203	3.001	2.285	.203	.282	.207	1.000	1.000
2587.250	55.947	1.098	2.193	2.269	.204	.268	.218	1.000	1.000
2587.500	57.421	1.030	2.150	2.245	.222	.247	.226	1.000	1.000
2587.750	52.652	1.059	2.665	2.258	.223	.225	.223	1.000	1.000
2588.000	48.027	1.063	2.383	2.254	.197	.167	.223	1.000	1.000
2588.250	46.948	1.009	2.208	2.248	.203	.161	.229	1.000	1.000
2588.500	48.712	1.007	2.601	2.256	.198	.152	.230	1.000	1.000
2588.750	50.076	1.027	2.759	2.263	.189	.146	.227	1.000	1.000
2589.000	50.942	1.026	2.559	2.273	.209	.209	.227	1.000	1.000
2589.250	53.142	1.019	2.519	2.257	.219	.225	.227	1.000	1.000
2589.500	46.755	1.039	2.906	2.246	.190	.149	.226	.998	.998
2589.750	37.205	1.100	2.872	2.272	.153	.086	.223	.988	.988
2590.000	35.708	1.118	2.768	2.297	.155	.074	.218	1.000	1.000
2590.250	39.063	1.125	2.769	2.289	.153	.051	.218	1.000	1.000
2590.500	42.012	1.111	2.559	2.279	.147	.049	.219	1.000	1.000
2590.750	45.450	1.118	2.645	2.278	.165	.080	.218	1.000	1.000
2591.000	46.170	1.120	2.660	2.279	.165	.080	.218	1.000	1.000
2591.250	41.445	1.117	2.612	2.274	.172	.092	.218	1.000	1.000
2591.500	42.138	1.130	2.498	2.275	.178	.096	.217	1.000	1.000
2591.750	47.067	1.117	2.593	2.276	.182	.090	.219	.997	1.000
2592.000	48.449	1.114	2.686	2.272	.184	.100	.218	1.000	1.000
2592.250	47.134	1.126	2.638	2.278	.181	.103	.217	1.000	1.000
2592.500	46.961	1.151	2.706	2.279	.183	.099	.215	.996	1.000
2592.750	49.648	1.092	2.774	2.276	.179	.102	.221	1.000	1.000

EAST KINGFISH-1 LOG ANALYSIS

DEPTH	.GR	.LLD	.MSFL	.RHOB	.NPHI	SHALE	PHIE	SWE	SXOE
2593.000	49.845	1.108	2.407	2.266	.185	.143	.218	1.000	1.000
2593.250	49.788	1.174	2.374	2.278	.163	.107	.215	.990	1.000
2593.500	56.122	1.224	3.590	2.333	.143	.107	.208	1.000	1.000
2593.750	53.725	1.131	2.716	2.326	.169	.150	.216	1.000	1.000
2594.000	49.724	1.025	2.426	2.272	.190	.142	.228	1.000	1.000
2594.250	53.546	1.006	2.554	2.272	.201	.201	.229	1.000	1.000
2594.500	50.947	1.004	1.922	2.266	.207	.193	.230	1.000	1.000
2594.750	51.666	1.036	1.766	2.270	.203	.202	.226	1.000	1.000
2595.000	57.995	1.040	2.503	2.281	.208	.266	.224	1.000	1.000
2595.250	55.086	1.042	2.317	2.248	.220	.272	.224	1.000	1.000
2595.500	51.049	1.047	2.475	2.263	.205	.210	.224	1.000	1.000
2595.750	55.715	1.135	2.649	2.285	.187	.205	.215	1.000	1.000
2596.000	54.383	1.093	3.476	2.276	.177	.160	.220	1.000	1.000
2596.250	53.957	1.118	2.246	2.260	.193	.180	.217	1.000	1.000
2596.500	57.126	1.065	3.073	2.262	.195	.211	.222	1.000	1.000
2596.750	56.584	1.170	2.236	2.294	.174	.190	.211	1.000	1.000
2597.000	56.469	1.180	4.398	2.313	.170	.208	.210	1.000	1.000
2597.250	52.518	1.168	2.632	2.281	.197	.233	.211	1.000	1.000
2597.500	47.946	1.048	2.235	2.247	.215	.250	.224	1.000	1.000
2597.750	46.152	1.041	2.367	2.251	.202	.214	.225	1.000	1.000
2598.000	46.241	1.033	2.391	2.271	.188	.150	.227	1.000	1.000
2598.250	52.496	1.036	2.300	2.263	.198	.153	.226	1.000	1.000
2598.500	50.521	1.073	2.275	2.257	.197	.161	.223	.997	1.000
2598.750	51.641	1.129	2.737	2.275	.179	.137	.220	.984	.984
2599.000	52.550	1.156	2.904	2.284	.180	.133	.218	.981	.981
2599.250	55.255	1.092	2.427	2.257	.186	.130	.221	.998	1.000
2599.500	61.591	1.058	2.215	2.257	.186	.117	.226	.991	1.000
2599.750	60.119	1.133	2.543	2.281	.191	.175	.221	.975	.995
2600.000	55.788	1.175	2.735	2.281	.196	.201	.213	.992	.992
2600.250	55.137	1.136	2.415	2.273	.204	.218	.215	1.000	1.000
2600.500	57.840	1.082	2.362	2.253	.199	.201	.220	1.000	1.000
2600.750	58.385	1.042	2.124	2.232	.198	.168	.228	.987	1.000
2601.000	57.264	1.093	2.311	2.258	.204	.190	.226	.973	1.000
2601.250	57.281	1.120	2.972	2.284	.202	.227	.216	1.000	1.000
2601.500	57.831	1.119	2.921	2.258	.200	.226	.216	1.000	1.000
2601.750	57.893	1.119	2.186	2.247	.204	.236	.216	1.000	1.000
2602.000	63.243	1.235	3.103	2.294	.184	.224	.206	.996	.996
2602.250	64.143	1.359	4.363	2.345	.173	.236	.198	.981	.981
2602.500	61.635	1.287	3.020	2.309	.191	.269	.200	1.000	1.000
2602.750	61.066	1.219	2.406	2.259	.207	.212	.208	.992	1.000
2603.000	57.696	1.117	2.635	2.258	.215	.203	.217	1.000	1.000
2603.250	58.256	1.095	2.621	2.252	.209	.224	.219	1.000	1.000
2603.500	56.301	1.100	2.459	2.242	.198	.188	.219	.998	1.000
2603.750	57.512	1.141	2.798	2.269	.193	.200	.216	.994	.994
2604.000	60.447	1.216	2.867	2.280	.189	.225	.207	.997	.997
2604.250	61.634	1.199	2.842	2.284	.192	.256	.208	1.000	1.000
2604.500	56.859	1.165	2.407	2.271	.209	.248	.211	1.000	1.000
2604.750	53.144	1.102	2.346	2.250	.222	.257	.218	1.000	1.000
2605.000	53.290	1.075	2.407	2.254	.221	.256	.221	1.000	1.000
2605.250	52.881	1.081	2.419	2.259	.204	.199	.221	.999	1.000
2605.500	52.863	1.083	2.505	2.256	.197	.163	.225	.982	.989
2605.750	57.198	1.086	2.438	2.256	.207	.201	.220	.998	1.000
2606.000	56.421	1.101	2.613	2.266	.191	.199	.218	1.000	1.000
2606.250	55.049	1.110	2.607	2.266	.176	.150	.218	1.000	1.000
2606.500	59.995	1.163	2.727	2.283	.182	.155	.213	1.000	1.000
2606.750	57.614	1.189	2.892	2.292	.179	.154	.211	.997	.997

EAST KINGFISH-1 LOG ANALYSIS

DEPTH	.GR	.LLD	.MSFL	.RHOB	.NPHI	SHALE	PHIE	SWE	SXOE
2607.000	53.982	1.183	2.703	2.278	.174	.163	.211	1.000	1.000
2607.250	52.465	1.167	2.553	2.283	.187	.180	.212	1.000	1.000
2607.500	53.595	1.131	2.546	2.276	.184	.146	.216	1.000	1.000
2607.750	58.348	1.118	2.522	2.266	.176	.140	.220	.987	1.000
2608.000	58.570	1.109	2.525	2.275	.185	.159	.222	.983	.998
2608.250	60.483	1.120	2.539	2.278	.181	.139	.221	.983	1.000
2608.500	61.714	1.139	2.562	2.265	.180	.119	.221	.976	1.000
2608.750	62.088	1.145	2.732	2.265	.178	.135	.220	.976	.976
2609.000	65.858	1.171	2.770	2.275	.176	.144	.218	.973	.974
2609.250	71.212	1.213	2.871	2.271	.187	.193	.216	.961	.962
2609.500	68.614	1.217	2.797	2.274	.185	.210	.213	.972	.973
2609.750	62.954	1.219	3.111	2.284	.175	.201	.210	.983	.984
2610.000	59.779	1.212	2.444	2.275	.178	.190	.211	.986	1.000
2610.250	61.800	1.115	2.420	2.263	.197	.197	.217	1.000	1.000
2610.500	66.637	1.090	2.528	2.255	.188	.170	.222	.992	.996
2610.750	68.265	1.099	3.016	2.288	.148	.145	.219	1.000	1.000
2611.000	64.967	1.474	3.557	2.357	.140	.185	.190	.986	.986
2611.250	64.922	2.379	6.031	2.405	.143	.292	.154	.922	.926
2611.500	65.228	2.891	7.471	2.474	.148	.396	.124	1.000	1.000
2611.750	62.371	2.510	7.471	2.431	.154	.451	.133	1.000	1.000
2612.000	63.690	1.645	5.576	2.324	.146	.371	.173	1.000	1.000
2612.250	66.440	1.282	2.841	2.284	.146	.254	.200	1.000	1.000
2612.500	68.093	1.242	2.706	2.288	.151	.181	.205	1.000	1.000
2612.750	66.769	1.200	2.661	2.283	.154	.140	.212	.989	1.000
2613.000	66.045	1.210	2.669	2.291	.153	.129	.210	.993	1.000
2613.250	68.149	1.199	2.740	2.275	.150	.136	.210	1.000	1.000
2613.500	64.795	1.201	2.549	2.254	.148	.127	.213	.985	1.000
2613.750	59.690	1.181	2.682	2.257	.138	.095	.216	.980	1.000
2614.000	62.806	1.168	2.590	2.273	.137	.113	.213	1.000	1.000
2614.250	65.324	1.185	2.612	2.277	.145	.137	.211	1.000	1.000
2614.500	65.075	1.195	2.762	2.282	.150	.128	.210	1.000	1.000
2614.750	65.015	1.209	2.713	2.273	.149	.124	.209	1.000	1.000
2615.000	65.054	1.195	2.787	2.270	.148	.079	.216	.976	.987
2615.250	67.377	1.197	2.744	2.273	.151	.090	.215	.977	.996
2615.500	70.915	1.182	2.721	2.272	.152	.143	.211	1.000	1.000
2615.750	68.973	1.158	2.666	2.284	.151	.141	.213	1.000	1.000
2616.000	63.157	1.195	2.733	2.298	.152	.154	.210	1.000	1.000
2616.250	65.306	1.226	2.725	2.295	.152	.185	.206	1.000	1.000
2616.500	69.818	1.191	2.731	2.288	.151	.152	.210	1.000	1.000
2616.750	69.181	1.189	2.534	2.271	.147	.133	.211	1.000	1.000
2617.000	68.599	1.197	2.685	2.281	.145	.150	.210	1.000	1.000
2617.250	1700.461	1.203	2.630	2.283	.148	.261	.207	1.000	1.000
2617.500	3212.000	1.242	2.739	2.268	.151	.276	.204	1.000	1.000
2617.750	3212.000	1.253	2.772	2.295	.150	.291	.202	1.000	1.000
2618.000	3212.000	1.326	2.853	2.298	.153	.322	.196	1.000	1.000
2618.250	3212.000	1.296	2.496	2.292	.156	.314	.198	1.000	1.000
2618.500	3212.000	1.337	2.773	2.307	.152	.337	.195	1.000	1.000
2618.750	3212.000	1.603	3.806	2.320	.147	.361	.175	1.000	1.000
2619.000	3212.000	1.842	5.120	2.317	.154	.364	.166	.977	.979
2619.250	3212.000	1.936	3.841	2.319	.152	.359	.165	.958	.992
2619.500	3212.000	1.819	4.380	2.326	.150	.364	.166	.983	.984
2619.750	3212.000	1.542	2.621	2.317	.147	.339	.180	1.000	1.000
2620.000	3212.000	1.339	2.542	2.307	.048	.332	.194	1.000	1.000

PE601193

This is an enclosure indicator page.
The enclosure PE601193 is enclosed within the container PE902447 at this location in this document.

The enclosure PE601193 has the following characteristics:

ITEM_BARCODE =	PE601193
CONTAINER_BARCODE =	PE902447
NAME =	EPT Log Analysis
BASIN =	GIPPSLAND
PERMIT =	VIC/L7
TYPE =	WELL
SUBTYPE =	WELL_LOG
DESCRIPTION =	EPT Analysis (enclosure from WCR) for East Kingfish-1
REMARKS =	
DATE_CREATED =	12/02/85
DATE_RECEIVED =	24/09/86
W_NO =	W891
WELL_NAME =	East Kingfish-1
CONTRACTOR =	ESSO
CLIENT_OP_CO =	ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE601195

This is an enclosure indicator page.
The enclosure PE601195 is enclosed within the container PE902447 at this location in this document.

The enclosure PE601195 has the following characteristics:

ITEM_BARCODE =	PE601195
CONTAINER_BARCODE =	PE902447
NAME =	Quantitative Log Analysis
BASIN =	GIPPSLAND
PERMIT =	VIC/L7
TYPE =	WELL
SUBTYPE =	WELL_LOG
DESCRIPTION =	Log Analysis (enclosure from WCR) for East Kingfish-1
REMARKS =	
DATE_CREATED =	8/02/85
DATE_RECEIVED =	24/09/86
W_NO =	W891
WELL_NAME =	East Kingfish-1
CONTRACTOR =	ESSO
CLIENT_OP_CO =	ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

APPENDIX 6

EAST KINGFISH-1 RFT

During December 24 and 25, 1984 an RFT run was made in East Kingfish-1. A total of 12 seats were attempted, resulting in 8 successful pretests.

Attachment 1 tabulates the pressure data, while Figure 1 shows the plot of pressure versus depth.

The current oil water contact is estimated to be at 2297.5m TVDss. This is 10 metres above the original oil water contact of 2307.5m TVDss seen in the well based on core shows (c.f. interpreted field original OWC of 2306m TVDSS).

From Figure 1 we see that the pretest pressures in the aquifer zone all fall on a straight line (gradient of 1.39 psi/m) which indicates a single aquifer system. The oil zone was demonstrated to be in a zone of significantly poorer reservoir quality with four of the six pretests encountering tight rock. For determining the current oil water contact, pretest point 12 and a gradient of 0.994 psi/m have been used (0.994 psi/m is representative for Kingfish).

Pressure draw-down at East Kingfish-1 is 119 psi below the original basin aquifer pressure and 35 psi above the last previous Kingfish Reservoir measurement (well A-5 on 1/12/83). At East Kingfish-1, the current reservoir pressure datumed to -2286m TVDSS is 3204 psig.

(1065f:5)

ATTACHMENT 1

RFT PRETEST PRESSURES

Well: East Kingfish-1

Date: December 24-25, 1984

Engineer: D.J. Wright

Gauge Type: HP974 RFT 80621

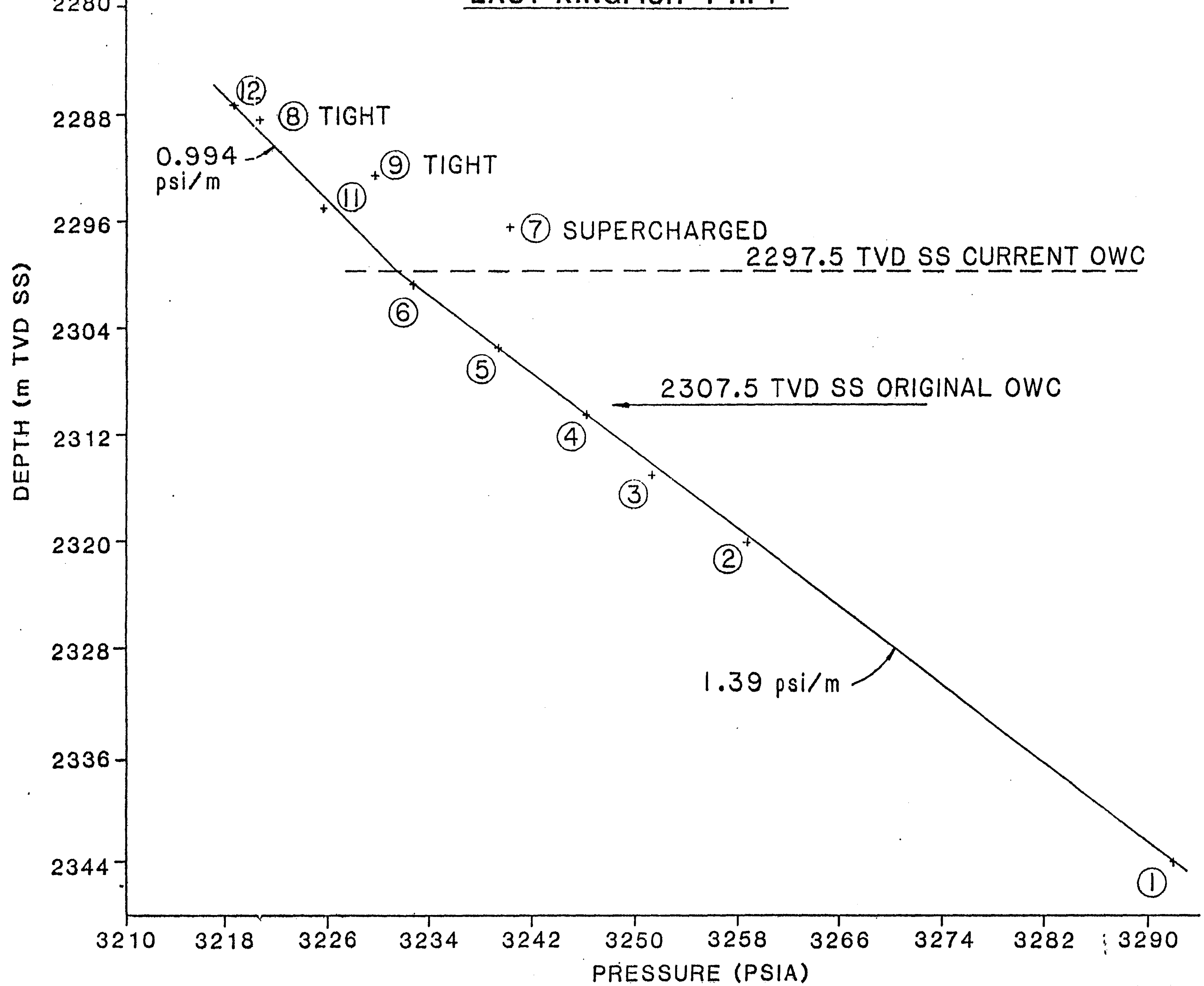
Probe Type: Long Nose

RFT No.	Depth m MDKB	Depth m TVDSS KB = 21 m	IHP RFT psig	IHP HP psia	Time Set hrs	Minimum Flowing Pressure psi	Formation Pressure RFT/HP psig/psia		Temp. °C	Time Retract	RFT FHP psi		Comments
1	2565.0	2341.5	3709	3716.7	1915	3231.1	3286	3292.02	85	1920	3710	3716.0	Valid
2	2537.0	2317.7	3660	3679.5	1935	3240.0	3241	3258.58	85.3	1938	3662	3680.6	Valid
3	2531.5	2313.0	3651	3673.4	1948	3199.3	3233	3251.77	85	1955	3651	3673.4	Valid
4	2526	2308.3	3644	3665.7	2002	3229.8	3227	3245.92	84.2	2013	3645	3666.5	Valid
5	2520.5	2303.6	3638	3657.8	2025	3225.1	3221	3239.18	83.4	2040	3640	3658.9	Valid
6	2514.5	2298.5	3632	3649.6	2045	3199.9	3217	3232.32	83.0	2054	3633	3650.4	Valid
7	2509	2293.9	3625	3642.3	2103		3221	3240.14	82.0	2115	3623	3643.5	supercharged
8	2500	2286.2	3612	3631.0	-	1266.9	3202	3219.95	79.3	2144	3614	3632.1	supercharged
9	2505	2290.4	3620	3638.7	2203	2264.9	3213	3229.3	79.5	2221	3622	3639.1	supercharged
10	2507.8	2292.8	3627	3645.1	2313	831.7	(31)	(1487.96)	78.4	2318	3625	3644.5	Invalid, tight
11	2507.8	2292.8	3616	3642.5	2344		3200	3225.5	80.4	2355	3615	3644.5	Valid
12	2498.8	2285.2	3601	3627.3	0010	3164.5	3194	3218.37	78.5	0021	3602	3628.2	Valid

(1065f:6)

FIGURE 1

EAST KINGFISH-1 RFT



ENCLOSURES 1 → 3

PE902450

This is an enclosure indicator page.
The enclosure PE902450 is enclosed within the container PE902447 at this location in this document.

The enclosure PE902450 has the following characteristics:

ITEM_BARCODE = PE902450
CONTAINER_BARCODE = PE902447
NAME = Structure map - top of coarse clastics
BASIN = GIPPSLAND
PERMIT = VIC/L7
TYPE = WELL
SUBTYPE = HRZN_CNTR_MAP
DESCRIPTION = Structure map - top of coarse clastics for East Kingfish-1
REMARKS =
DATE_CREATED = 31/08/86
DATE_RECEIVED = 24/09/86
W_NO = W891
WELL_NAME = East Kingfish-1
CONTRACTOR = ESSO
CLIENT_OP_CO = ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE902451

This is an enclosure indicator page.
The enclosure PE902451 is enclosed within the container PE902447 at this location in this document.

The enclosure PE902451 has the following characteristics:

ITEM_BARCODE = PE902451
CONTAINER_BARCODE = PE902447
NAME = Geological cross section
BASIN = GIPPSLAND
PERMIT = VIC/L7
TYPE = WELL
SUBTYPE = CROSS_SECTION
DESCRIPTION = Geological cross section for East Kingfish-1
REMARKS =
DATE_CREATED = 31/12/85
DATE_RECEIVED = 24/09/86
W_NO = W891
WELL_NAME = East Kingfish-1
CONTRACTOR = ESSO
CLIENT_OP_CO = ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE601944

This is an enclosure indicator page.
The enclosure PE601944 is enclosed within the container PE902447 at this location in this document.

The enclosure PE601944 has the following characteristics:

ITEM_BARCODE = PE601944
CONTAINER_BARCODE = PE902447
NAME = Well Completion Log
BASIN = GIPPSLAND
PERMIT = VIC/L7
TYPE = WELL
SUBTYPE = COMPLETION_LOG
DESCRIPTION = East Kingfish 1 Well Completion Log. Enclosure 3 of WCR volume 2.
REMARKS =
DATE_CREATED =
DATE_RECEIVED = 24/09/86
W_NO = W891
WELL_NAME = East Kingfish-1
CONTRACTOR =
CLIENT_OP_CO = Esso Australia

(Inserted by DNRE - Vic Govt Mines Dept)