Natural Resources and Environment

AGRICULTURE • RESOURCES • CONSERVATION • LAND MANAGEMENT

WELL SUMMARY

MORAY-1 W646

1 Folio No	2 Referred to	3 Date	4 Clearing Officer's Initials	1 Folio No	2 Referred to	3 Date	4 Clearing Officer's Initials

FILE COVER INSTRUCTIONS FOR ACTION OFFICERS

(1) FOLIO NUMBERS: Each subject paper attached to a file is to be given a consecutive number by the attaching officer. Papers must not be removed from or attached to a file without approval.

(2) REFERRAL TO OTHER OFFICERS: When an Officer completes action on the file and further action is required by some other Officer, please initial Column (4) and on the next vacant line, enter the relevant folio number in Column (1), indicate to whom the file is to be forwarded in Column (2) and record the date in Column (3).

(3) BRING UP MARKINGS: When action on a file is required at a later date, the officer will initial Column (4) and, on the next vacant line, enter the relevant folio number in Column (1), then write "B/U" followed by the action officer's name in Column (2) and the date the file is required in Column (3).

(4) PUTAWAY MARKINGS: When ALL action on a file is completed the officer concerned will initial Column (4) and, on the next vacant line, write "P/A" in column (2).

REGISTRY MUST BE NOTIFIED OF ANY FILE MOVEMENTS BETWEEN OFFICERS

LOCATION

EARLIER FILES	LATER FILES	RECORDS DISPOSITION

UCCESSFUL N.F.W.C.

MORAY-1.

SPUD. 15-6-72
COMPLETED. 9-7-72
T.D. 8759'

646.

38° 51' 48"
148° 03' 21"
W.D. 248'. KB
GLOMAR CONCEPT

ESSO. VIC/P2.

IES.	RUN 1.	2" & 5".	679' - 2790'	+ TRANSPARENCIES
	" 2.	2" & 5".	2740' - 8741'	+ "
B.H.C.S./CAL.	" 1.	2" & 5".	2740' - 8738'	+ "
FDC/CNT/GR.	" 1.	2" & 5".	2740' GR/CAL. 5150' - 8740'	+ "
SONIC CALIPER	" 1.	5".	679' - 2788'	+ "
CASING COLLAR LOG.	" 1.	5".	200' - 2680'	
H.D.T.	" 1.	10".	5150' - 8726'	+ "
DIPMETER LOG INTERPRETATION.			5150' - 8726'	+ SEP. LOGS 2" & "
BAROID MUD LOG.			7025' - 8726' 750' - 8759'	+ TRANSPARENCY
" A.D.T.			679' - 8759'	
"d" EXPONENT LOG.		2".	750 - 8759'	+ "
TEMPERATURE LOG	RUN 1.	5"	220' - 2690'.	TRANSPARENCY. 2

CORE DESCRIPTIONS. Nº 1, 2 AND 3.

S.W.C. DESCRIPTIONS.	RUN 1.	2870' - 5390'
	" 2.	5410' - 6720'
	" 3.	5220' - 8720'
	" 4.	5220' - 8570'.

TIME DEPTH CURVE.

COMPLETION REPORT.

CORE Nº1.	5405' - 5416'	CUT 11'.	REC 7½'.	IN STORE
Nº2.	5535' - 5582	" 45'	" 5'.	IN STORE
Nº3.	8531' - 8531½'	" ½'	" ½'	
CUTTINGS.	740 — 8760'.			IN STORE

S.W.C. SHOT 112. REC 88.

CORE ANALYSIS RESULTS FOR CORE Nº1. BY B.M.R.

WELL COMPLETION LOG. + TRANSPARENCY

PALYNOLOGY REPORT BY A.D. PARTRIDGE.

PALAEONTOLOGY " " D. TAYLOR.

PETROGRAPHIC " " AMDEL.

DAILY AND WEEKLY REPORTS.

APPLICATION TO DRILL WITH SEISMIC LINES AND MAPS.

MORAY 1:50 000 MAP. DEPTH TO TOP LATROBE (GURNARD EQUIVALENT) IN VIC/P2 FILE

PETROGRAPHIC REPORT BY AMDEL.

PELYNOLOGICAL SHEET BY W.K. HARRIS

EXEC
Secret
Deputy
Execu
Execu
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COR
Genera
Chief F
Manag
Directo
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PRIM
SCIE
Manag
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Chief V
Directo
Directo
Directo
Directo

WELL SUMMARY
MORAY-1
(W646)

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ESSO STANDARD OIL (AUSTRALIA) LTD.

COMPLETION REPORT

I WELL DATA RECORD

Date _____

LOCATION

WELL NAME	STATE	PERMIT or LICENCE	GEOLOGICAL BASIN	FIELD
MORAY-1	Victoria	Vic P/2	Gippsland	

CO-ORDINATES	Lat.	Long.	X	Y	MAP PROJECTION	GEOGRAPHICAL DESCRIPTION
Surface	38°51'48.1"S	148°03'20.61"E			AMG-AMD Zone 55	55 miles offshore 122 miles from Sale, Victoria.
Bottom Hole			591594E	5697829N		

ELEVATIONS & DEPTHS

ELEVATIONS	WATER DEPTH	TOTAL DEPTH	Avg.Angle
Ground KB 32' RT Braden Head Top Deck Platform	248'	M.D. 8759' T.V.D.	Straight Hole
	PLUG BACK DEPTH 343'	REASONS FOR P.B. Abandonment	

DATES

MOVE IN	RIG UP	SPUDDED
13/6/72	13/6/72	15/6/72
RIG DOWN COMPLETE 9/7/72	RIG RELEASED 9/7/72	PROD.UNIT - Start Rigging Up
PROD.UNIT - Rig Down Complete	I.P. ESTABLISHED	

MISCELLANEOUS

OPERATOR	PERMITTEE or LICENCEE	ESSO INTEREST	OTHER INTEREST
Esso	Hematite	100%	Nil

CONTRACTOR	RIG NAME	EQUIPMENT TYPE
GLOBAL MARINE	GLOMAR CONCEPTION	Ship Shape Drilling Vessel

TOTAL RIG DAYS	DRILLING AFE NO.	COMPLETION NO.	TYPE COMPLETION
26.51	232-302	-	-

LAHEE WELL CLASSIFICATION		
	Before Drilling	New Field Wildcat
	After Drilling	Unsuccessful new field Wildcat

Bruce McKay
Geologist

WELL

II	INITIAL PRODUCTION TEST				
Date	WELL COMPLETION AS: Oil Well _____		Gas Well _____	Dry Hole _____	
Choke size, inch			Calculated P.I.		
Length of Test			Calculated A.O.F.		
Oil, BPD			Perforations		
Water, BPD			Shut-In BHP		
Gas, MCFD			Flowing BHP		
Gas Liquids, BPD			Shut-In Tubing Press		
Gas-Oil Ratio			Flowing-Tubing Press		
Gravity, API			Flowing Temperature		

III	PERFORATING RECORD (Prod.test, Completion, DST, FIT)					
INTERVAL	HPF	TOTAL SHOTS	SERV. CO.	DIFF. PRESS.	PERFORATION FLUID	SIZE AN TYPE GU

Engineer

WELL MORAY-1

IV	CASING - LINER - TUBING RECORD						
Type	Size	Weight	Grade	Thread	No. Joints	Amount	Depth
20"/30"	Pile Joint						
	20"	91.5	X-52	CIW CC Connector CIW Threaded Conn. 10 box and pin		407.06	
			Rotary Bushing to 16 ¾" casing housing			274.00	681.06
	13⅜"	54.5	J-55	Butt	64	2741.18	
			Rotary Bushing to 13⅜" casing housing			280.00	2751.18
Pile Joint & Wellhead Recovered							

V	CEMENT RECORD		
String	20"/30" Pile Joint	20" casing	13⅜" casing
Type of Cement	30 sx Aust. 'N' 2% $CaCl_2$	860 sx Aust. 'N' 6% gel plus 350 sx w/2% $CaCl_2$	850 sx Aust. 'N'
Number of FT^3	35 cu.ft.	1866 cu.ft.	1003 cu.ft.
Average weight of slurry	15.6 ppg	13.7/15.6 ppg	15.2 ppg
Cement Top	-	Surface	1350' - 1500' Temp. Survey
Casing Tested with	-	500 psi	1000 psi
Number of Centralizers	-	6	10
Number of Scratchers	-	-	-
Stage Collar etc.	-	-	-
Remarks	-	-	-

J.M. MACONOCHIE
Engineer

WELL

VI SUBSURFACE COMPLETION EQUIPMENT

DATE COMPLETED ______________

NOT APPLICABLE

Schematic	Equipment Description	Length	Depth

____
Engineer

WELL MORAY-1

VII SAMPLES, CONVENTIONAL CORES, SW CORES

INTERVAL	TYPE	RECOVERED	INTERVAL	TYPE	RECOVERED
750-8759	Cuttings (washed/dried)	Every 10-30 ft.			
750-8759	Cuttings (unwashed/ sacked)	Every 10-30 ft.			
750-8759	Cuttings (canned)	Every 100 ft.			
2870-8720	Sidewall cores	Attempted 112 Recovered 88			
5405-16	Core # 1	Cut 11' Rec. 7½'			
5535-82	Core # 2	Cut 47' Rec. 5'			
8531-31½	Core # 3	Cut ½' Rec. ½'			

VIII WIRELINE LOGS AND SURVEYS (Incl. FIT)

Type & Scale	From To	Type & Scale	From To
IES (2" & 5")	8741' - 681'		
Caliper	2792' - 681'		
BHCS (2"'& 5")	8738' - 2740'		
FDC-CNT-GR (2" & 5"")	8738' - 5150' (GR to 2740')		
HDT	8726' - 5150'		
Velocity Survey			

Bruce McKay
Geologist

WELL MORAY-1

IX	FORMATION TOPS/Zones					
NAME	Tops		Gross Interval (ft)	Net Pay (ft).		REMARKS
	M.D.	Sub-sea		Gas	Oil	
Water Depth		(248')				
Mid-Miocene 1280·16	4200'	-4168'	1270·40			
Oligocene 1423·42	4670'	-4638'				
Oligocene (2) 1511·81	4960'	-4928'				
Latrobe Group 1672·13	5486'	-5454'				
Mid M. diversus	5620' 212·98	-5588'				
Mid Paleocene	6010'	-5978'				
U. Cretaceous	6075'	-6043'				
Strzelecki Group (Middle & Lower Cretaceous)	6312'	-6280'				

X GEOLOGIC ANALYSIS (Pre Drilling prognosis Vs actual results)

Pre Drill: Moray-1 was planned to test a top Latrobe-intra Latrobe fault dependent stratigraphic closure along the large south-bounding fault. Closure against the fault is present in all Upper Cretaceous to Eocene units and top seal should be afforded by upper Eocene or post Eocene mudstones. Seal could also be provided by the fault itself and/or juxtaposition of sand and shale due to the vertical and horizontal lateral shear components. Reservoir sands are expected to be well developed from both marginal marine and non-marine facies. Source rocks occur in a large paleodrainage area to the north. The expected tops are:

AGE	FORMATION	FORMATION TOPS
	Water Depth	(240')
MIOCENE		- 240'
OLIGOCENE		-4900'
EOCENE	Latrobe Group	-5250'
PALEOCENE	" "	-5600'
UPPER CRETACEOUS	" "	-6300'
LOWER CRETACEOUS	Strzelecki Group	-8000'
Proposed Depth		-9000' or 500' into Strzelecki (whichever is shallowest)

Post Drill: Moray-1 penetrated the top of the Latrobe Group 204' low to prediction and consisted of an almost continuous sand section. The anticipated intra-Latrobe shale or siltstone seals were not encountered and the absence of any hydrocarbon shows in the well suggests there is no seal along the fault plane updip to the south.

A normal marine Miocene and Oligocene section was drilled above the Latrobe except for an interval of dark brown dolomite in the Lower Oligocene interpreted to have been formed during the "G. ampliapertura" sea level lowering.

The Latrobe Group consisted of marginal marine sandstones having excellent reservoir qualities to the mid-Paleocene. The Lower Paleocene, Upper Cretaceous and Strzelecki Group (Middle Cretaceous and Lower Cretaceous) are entirely non-marine. The sandstones were probably formed in an alluvial plain environment with the clastics being derived directly from the southern platform area.

A granitic source is evident with mica common below 6300' and feldspar increasingly abundant below 7800' and the sandstones have poor porosity and permeability.

Bruce McKay
Geologist

SAMPLE DESCRIPTIONS

MORAY-1

G.N. Sharrock
18/6/72

SAMPLE DESCRIPTIONS

Depth	%	
		Drilling commenced 1230 hours.
740 - 770	100	Limestone, skeletal, very calcareous, white, very light grey to medium grey, occasionly buff, completely unconsolidated, very coarse to granule size, poorly sorted, subangular to angular. Granules made up of Bryozoans, forams, coral frequent, echinoids, spicules
	+	Cement (approx. 20% of sample)
770- 800	100	Limestone: Skeletal: as above
	+	Cement
800 - 830	100	Limestone: Skeletal: as above + detrital consisting of angular calcite grains white to off-white, unconsolidated
	+	Cement: percentage decreasing (approx. 10%)
830 - 860	100	Limestone: as above, grey angular fragments and fossil fragments, predominantly forams and Bryozoans.
860 - 890	100	Limestone: as above (+Trace cement)
890 - 920	50	Limestone: Skeletal; as above
	50	Limestone: Calcareous, detrital, grey;medium to light, friable, moderately sorted.
920 - 950	50	Limestone: Skeletal: as above
	50	Limestone: Detrital: as above
950 - 980	50	Limestone: Skeletal: as above
	50	Limestone: Detrital as above
980 - 1010	70	Limestone: Skeletal: a.a.
	30	Limestone: Detrital: aa.: + occasional frosted quartz grains
1010-1040	60	Limestone: Skeletal: aa.
	40	Limestone: Detrital: aa. + quartz crystals and occasionally pyritic
1040-1070	50	Limestone: Skeletal: aa.
	50	Limestone: Detrital: aa.
1070-1100	50	Limestone: Skeletal: aa.
	50	Limestone: Detrital: aa.
1100-1130	50	Limestone: Skeletal: aa.
	50	Limestone: Detrital: aa.
1130-1160	50	Limestone: Skeletal; white, off white, mostly forams and bryozoans, poorly sorted, unconsolidated
	50	Limestone: Detrital, white, medium to dark grey, calcareous subangular, hard, poorly sorted
1160-1190	50	Limestone: Skeletal: as above
	50	Limestone: Detrital: as above
1190-1220	50	Limestone: Skeletal: aa.
	50	Limestone: Detrital: aa.
1220-1250	50	Limestone: Skeletal: aa.
	50	Limestone: Detrital: aa. + occasional quartz grains

1250-1280	30	Limestone: Skeletal: as above
	70	Limestone: Detrital: as above
1280-1310	30	Limestone: Skeletal: as above
	70	Limestone: Detrital: as above
1310-1340	30	Limestone: Skeletal: aa.
	70	Limestone: Detrital: aa.
1340-1370	50	Limestone: Skeletal: aa.
	50	Limestone: Detrital: aa.
1370-1400	50	Limestone: Skeletal: aa.
	50	Limestone: Detrital: aa.
1400-1430	30	Limestone: Skeletal: aa.
	70	Limestone: Detrital: aa.
1430-1460	20	Limestone: Skeletal: aa.
	80	Limestone: detrital: aa.
1460-1490	20	Limestone: Skeletal: as above
	80	Limestone: Detrital: as above
1490-1520	40	Limestone: Skeletal: as above
	60	Limestone: Detrital: as above
1520-1550	50	Limestone: Skeletal: aa.
	50	Limestone: Detrital: aa.
1550-1580	30	Limestone: Skeletal: aa.
	70	Limestone: Detrital: aa.
1580-1610	20	Limestone: Skeletal: aa.
	80	Limestone: detrital: aa.
1610-1640	10	Limestone: Skeletal; calcareous, white to buff, unconsolidated, coarse (up to 1mm), poorly sorted, rounded
	90	Limestone: argillaceous, detrital, white, yellow grey, medium to dark grey, friable, medium to fine grained, moderately sorted, angular, calcareous, cement, trace glauconite + Trace cement
1640-1670	Tr.	Limestone: Skeletal aa.
	100	Limestone: Detrital (or sandy detrital micritic Limestone) as above
1670-1700	10	Limestone: Skeletal: as above
	90	Limestone: Detrital: as above
1700-1730	10	Limestone: Skeletal: aa.
	90	Limestone: Detrital: aa. + quartz grains
1730-1760	10	Limestone: skeletal: aa.
	90	Limestone: detrital: aa.
1760-1790	10	Limestone: skeletal: aa.
	90	Limestone: detrital: aa.
1790-1820	10	Limestone: skeletal: aa.
	90	Limestone: detrital: aa.
1820-1850	10	Limestone: skeletal: aa.
	90	Limestone: detrital: aa.
1850-1880	10	Limestone: skeletal: aa.
	90	Limestone: detrital: aa. + Trace cement

N.B. Poor sample returns.

1880-1910	10	Limestone: skeletal: aa.
	90	Limestone: detrital: aa. trace pyritic
1910-1940	10	Limestone: skeletal: aa.
	90	Limestone: detrital: aa.
1940-1970	10	Limestone: skeletal: aa.
	90	Limestone: detrital:aa.
1970-2000	10	Limestone: skeletal: aa.
	90	Limestone: detrital: aa.
2000-2030	10	Limestone: skeletal: aa.
	90	Limestone: detrital: aa.
2030-2060	10	Limestone: skeletal: aa.
	90	Limestone: detrital: aa.
2060-2090	10	Limestone: Skeletal: very calcareous, white to very light grey, dark grey, hard, granule size, poorly sorted, angular to sub angular
	60	Limestone: detrital, light to medium grey, calcareous, hard, silt size, poorly sorted, angular to sub angular.
	30	Siltstone: calcareous, olive grey, very calcareous, friable, silt to very fine grained, moderately sorted, sub angular, glauconitic.
2090-2120	Trace	Limestone: skeletal
	50	Limestone: detrital as above
	50	Siltstone: as above
2120-2130	40	Limestone: detrital: aa.
	60	Siltstone: as above
2130-2140	50	Limestone: detrital aa.
	50	Siltstone: aa.
2140-2150	Trace	Limestone: skeletal aa.
	40	Limestone: detrital: aa.
	60	Siltstone: aa.
2150-60	Trace	Limestone: skeletal aa.
	30	Limestone: detrital aa.
	70	Siltstone: aa.
2160-70	Trace	Limestone: skeletal aa.
	20	Limestone: detrital aa.
	80	Siltstone: aa.
2170-2180	10	Limestone: detrital aa.
	90	Siltstone: (Marl): aa.
2180-2190	10	Limestone: Detrital: aa.
	90	Siltstone: (Marl): aa.
2190-2200	10	Limestone: Detrital aa.
	90	Siltstone: (Marl): aa.
2200-2210	10	Limestone: detrital aa
	90	Siltstone: aa.
2210-2220	10	Limestone: detrital aa.
	90	Siltstone: aa.
2220-2230	10	Limestone: detrital, calcareous, off-white to white. light grey, moderately hard, very fine grained, moderately sorted, angular.
	60	Siltstone: calcareous, olive grey to green grey, moderately hard, very fine to silt, moderately well sorted, subangular, glauconitic and occasional pyritic, (grades into marl).

2230-2240	20 80	Limestone: as above plus occasional unconsolidated foram. Siltstone: as above.
2240-2250	20 80	Limestone: as above plus occasional loose foram and bryozoa. Siltstone: as above and grading into marl.
2250-2260	20 80	Limestone: as above. Siltstone to marl. As above.
2260-2270	10 90	Limestone: as above. Marl: as above.
2270-2280	20 80	Limestone:as above. Marl: as above.
2280-2290	10 90	Limestone: as above. Marl: as above.
2290-2300	10 90	Limestone: as above. Marl: as above.
2300-2310	10 90	Limestone: as above. Marl: as above.
2310-2320	10 90	Limestone: as above. Marl: as above.
2320-2330	10 90	Limestone: as above Marl: as above.
2330-2340	10 90	Limestone: as above. Marl: as above
2340-2350	10 90	Limestone: as above Marl: as above
2350-2360	10 90	Limestone: as above. Marl: as above.
2360-2370	10 90	Limestone: as above. Marl: as above.
2370-2380	10 90	Limestone: as above. Marl: as above.
2380-2390	100	Marl: medium grey to olive grey, calcareous soft to firm clay size up to silt size, moderately sorted, sub angular, glauconitic. Trace: Limestone plus loose forams.
2390-2400	100	Marl: as above. Trace: Limestone forams.
2400-2410	100	Marl: as above. Trace: Limestone Loose fossils.
2410-2420	100	Marl: as above. Trace: Limestone Loose fossils.
2420-2430	100	Marl: as above. Trace: Limestone loose fossils.
2430-2440	100	Marl: as above. Trace: Limestone loose fossils.
2440-2450	100	Marl: medium grey to olive grey, calcareous, soft to firm, varying in grainsize from clay up to silt (grades in places to calcareous mudstone) glauconitic. Trace: Limestones, grey, angular as above. Trace: Loose fossils plus quartz grains.
2450-2460	100	Marl: as above. Trace: Limestone, as above.

2460-2470	100	Marl: as above. Trace: Limestone, as above.
2470-2480	100	Marl: as above (grades into calcareous siltstone). Trace: Limestone as above,detrital grey, angular poorly sorted. Trace: forams.
2480-2490	100	Marl: as above. Trace: Limestone as above. Trace: forams.
2490-2500	100	Marl Trace: Limestone as above. Trace: Forams.
2500-2510	100	Marl Trace: Limestones as above Trace: Forams
2510-2520	100	Marl Trace: Limestone as above Trace: Forams
2520-2530	100	Marl Trace: Limestone as above. Trace: Forams
2530-2540	100	Marl Trace: Limestone as above Trace: Forams.
2540-2550	100	Marl Trace: Limestone as above. Trace: Forams.
2550-2560	100	Marl Trace: Limestone as above Trace: Forams
2560-2570	100	Marl Trace: Limestone as above. Trace: Forams.
2570-2580	50	Siltstone: very calcareous, buff, olive-grey, moderately hard, silty to very fine sand, well cemented poorly sorted, angular, glauconitic.
	50	Marl: calcareous, buff, off-white,soft, silty to clay size, well cemented, well sorted, subangular, glauconitic. Trace: Loose forams plus calcite (mineral fluorescence) plus echinoid spines.
2580-2590	50 50	Siltstone: as above. Marl: as above.
2590-2600	50 50	Siltstone: as above. Marl: as above.
2600-2610	50 50	Siltstone: as above. Marl: as above.
2610-2620	50 50	Siltstone: as above Marl: as above
2620-2630	50	Siltstone: as above Marl: as above.
2630-2640	60 40	Siltstone: as above. Marl: as above.
2640-2650	60 40	Siltstone: as above Marl: as above Trace: forams

2650-2660	50	Siltstone: as above.
	50	Marl: as above
		Trace: Forams
2660-2670	50	Siltstone: as above.
	50	Marl: as above.
2670-2680	70	Siltstone: as above
	30	Marl: as above.
		Trace: Forams cavings
2680-2690	50	Siltstone: as above
	50	Marl: as above
2690-2700	50	Siltstone: as above.
	50	Marl: as above.
2700-2710	50	Siltstone: as above
	50	Marl: as above
2720-2720	50	Siltstone: as above
	50	Marl: as above
2720-2730	50	Siltstone: as above
	50	Marl: as above
2730-2740	50	Siltstone: as above
	50	Marl: as above.
2740-2750	50	Siltstone: as above
	50	Marl: as above.
2750-2760	80	Marl: silty, calcareous, medium grey to dark grey, very friable, silt to clay size, poorly sorted, sub-angular, siliceous and calcareous cement.
	20	Siltstone: as above.
2760-2770	90	Marl: as above.
	10	Siltstone: as above.
2770-2780	90	Marl: as above.
	10	Siltstone: as above
2780-2790	90	Marl: as above
	10	Siltstone: as above.
		trace: loose forams, echinoid spines, calcite crystals.
2790-2800	90	Marl: as above.
	10	Siltstone: as above.
		Trace: loose forams etc. as above.
2800		Stopped drilling @ 1445 hrs. 19/6/72 to run IES, BHC/GR, and run 13-3/8 inch casing.

Drilling recommenced 0030 hrs. 23/6/72.

2800-2810	100	Marl: calcareous, green grey to medium grey, very soft silty to clay size, sticky moderately sorted, subangular trace glauconite, trace pyrite.
2810- 2820	100	Marl: as above. Trace forams and trace cement.
2820-2830	100	Marl: as above.
2830-2840	100	Marl: as above.
2840-2850	100	Marl: as above
2850-2860	100	Marl: as above.

2870-2880	100	Marl: as above
2880-2900	100	Marl: as above.
2900-2920	100	Marl: as above.
2920-2940	100	Marl: as above.
2940-2960	100	Marl: as above
2960-2980	100	Marl: as above

POH 0430 hours 23/6/72.

Bruce McKay
Daryl Eyles

2980 - 3040	100% Marl, light green-grey, very soft, gummy, some loose skeletal material (mainly forams), very calcareous.
3040 - 3060	100% Marl, light green-grey, very soft, occasional forams, some fine grain detrital material, very calcareous.
3060 - 3080	100% Marl, as above, some glauconite, increase in detrital material, mostly foram fragments.
3080 - 3100	100% Marl, as above, very calcareous.
3100 - 3120	100% Marl, light grey-green, very soft, gummy, some foram fragments, some glauconite, some fine grain detrital material, very calcareous.
3120 - 3140	100% Marl, as above.
3140 - 3160	100% Marl, as above.
3160 - 3180	100% Marl, light grey-green, very soft, gummy, trace glauconite, some forams, some foram fragments and detrital material, very calcareous.
3180 - 3200	100% Marl, as above.
3200 - 3220	100% Marl, as above, very calcareous.
3220 - 3240	100% Marl, as above.
3240 - 3260	100% Marl, light grey-green, very soft, gummy, loose fine grained material, mostly foram fragments, very calcareous.
3260 - 3280	100% Marl, as above, trace glauconite.
3280 - 3340	100% Marl, as above, loose forams, trace glauconite, detrital fine grained.
3340 - 3400	100% Marl, as above.
3400 - 3420	100% Marl, abundant forams, bryozoa, trace glauconite, trace pyrite, soft to moderately firm, very calcareous.
3420 - 3440	100% Marl, as above.
3440 - 3460	100% Marl, tending to calcareous siltstone, glauconitic, light green-grey, trace forams, soft to moderately firm.
3460 - 3480	100% Marl, tending to calcareous siltstone, abundant glauconite in coarse subrounded to rounded pellets, pyrite, abundant forams.
3480 - 3500	100% Marl, as above.
3500 - 3520	100% Marl, as above.
3520 - 3540	100% Marl, tending to calcareous siltstone in part, abundant coarse glauconite pellets, skeletal material, abundant forams, trace pyrite, trace quartz grains, trace firm, brown very calcareous glauconitic siltstone; samples becoming firmer.

Note: At 3562 lost pump pressure and POH - suspected washout or lost bit jet.

Sample on bit No. 4 - abundant fossil fragments.

24th June, 1972. 9/21

3540 - 3560	100% Marl, tending to calcareous siltstones, soft to firm, abundant forams and bryozoa fragments, abundant glauconite pellets, pyrite, light grey-green.
3560 - 3580	100% Marl, as above, with pyritic nodules.
3580 - 3600	100% Marl, tending to calcareous siltstone, abundant glauconite, abundant forams, bryozoa fragments, light grey-green.
3600 - 3640	100% Marl - calcareous siltstone, as above.
3640 - 3670	100% calcareous siltstone, light greenish grey, soft to firm, fissile, sparse glauconite pellets, abundant forams, some skeletal material.
3670 - 3700	100% Calcareous siltstone, light green-grey, soft-firm, fissile, abundant glauconite pellets, abundant forams, some skeletal material
3700 - 3730	100% calcareous siltstone, light green-grey, soft to firm, fissile, sparse glauconite pellets, some forams and skeletal material, trace pyrite.
3730 - 3760	100% very calcareous siltstone, light green-grey, soft to firm, slightly fissile, sparse coarse rounded glauconitic pellets, some forams and skeletal material.
3760 - 3790	100% calcareous siltstone - marl, as above.
3790 - 3820	100% calcareous siltstone - marl, as above.
3820 - 3850	100% calcareous siltstone, light green-grey, slightly fissile, some coarse rounded glauconite pellets, some forams and skeletal material, soft to firm.
3850 - 3880	100% calcareous siltstone, as above.
3880 - 3910	100% calcareous siltstone, as above, with trace pyrite.
3910 - 3970	100% calcareous siltstone, as above, slightly fissile in part, no pyrite, forams not as common.
3970 - 4000	100% calcareous siltstone, light grey - light green-grey, soft to moderately firm, very calcareous, fissile in part, glauconite pellets, fossils.
4000 - 4030	100% calcareous siltstone, as above.
4030 - 4060	100% calcareous siltstone, as above, trace quartz grains, coarse, subangular, rare pyrite.
4060 - 4090	100% calcareous siltstone
4090 - 4100	100% calcareous siltstone
4100 - 4120	100% calcareous siltstone, as above
4120 - 4150	100% calcareous siltstone, as above
4150 - 4180	100% calcareous siltstone, as above, tending to become shaly.
4180 - 4210	100% fine grained calcareous siltstone, soft to firm, fissile, light grey-green, occasional glauconite pebbles, some forams and shell, bryozoa fragments, tending to become firmer and slightly darker in colour.

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4210 - 4240	100% calcareous siltstone, shaly in part, slightly fissile, minor glauconite, forams.
4240 - 4270	100% calcareous siltstone, green grey - brown grey.
4270 - 4300	100% calcareous siltstone, becoming more shaly, more fissile.
4300 - 4360	100% calcareous siltstone, as above, trace pyrite, quartz.
4360 - 4390	100% calcareous siltstone, grey - brown grey, fissile, shaly in part.
4390 - 4420	100% calcareous siltstone, olive grey - brown grey, trace forams, fine to medium glauconite.
4420 - 4450	100% calcareous siltstone, as above
4450 - 4480	100% calcareous siltstone, fine grained, fissile in part, soft to moderately firm, abundant forams, some bryozoa fragments, trace pyrite, scattered coarse rounded glauconite pellets.
4480 - 4510	100% calcareous siltstone, as above.
4510 - 4540	100% calcareous siltstone, light grey - green, slightly fissile, soft to moderately firm, forams and bryozoa fragments, some glauconite pellets, trace pyrite.
4540 - 4570	100% calcareous siltstone, as above.
4570 - 4600	100% calcareous siltstone, as above.
4600 - 4630	100% calcareous siltstone, as above.
4630 - 4660	100% calcareous siltstone, as above.
4660 - 4690	100% calcareous siltstone, becoming shalier, light green grey to brown grey, fine to very fine grained, soft to firm, slightly fissile in part, forams and bryozoa fragments, trace glauconite, trace pyrite, very calcareous.
4690 - 4720	100% calcareous siltstone, tending to shale in part, as above.
4720 - 4750	100% calcareous siltstone, light green to grey, massive and darker, firmer, fine grained, fissile fragments which are shalier, fine to very fine grained, soft to firm, some forams, trace bryozoa fragments, trace pyrite, trace glauconite, very calcareous.
4750 - 4810	100% calcareous siltstone, light green grey, fine grained, soft to firm, slightly fissile, some forams and bryozoa fragments, trace glauconite, trace carbonaceous material, trace pyrite.
4810 - 4840	100% calcareous siltstone, green grey to brown grey, slightly shaly in part, slightly fissile, pyrite, glauconite, some fossil material, soft - moderately firm, carbonaceous material.
4840 - 4870	100% calcareous siltstone, green grey to brown grey, slightly shaly and fissile in part, glauconite pellets, trace pyrite, abundant coaly fragments, some fossil material.
4870 - 4900	100% calcareous siltstone, fine to medium grained, green grey to brown grey, trace glauconite, abundant forams and bryozoa fragments, some pyrite, abundant coaly fragments, possible trace quartz grains.

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4900 - 4930	100% calcareous siltstone, fine to medium grains, green grey, abundant glauconite pellets, abundant forams, bryozoa fragments, coaly fragments, fissile in part.
4930 - 4960	100% calcareous siltstone, fine to medium grain, green to grey, glauconite pellets, forams and bryozoa fragments, trace coaly fragments, soft to firm and fissile.
4960 - 4980	100% calcareous siltstone, as above, shaly in part.
4980 - 5000	100% calcareous siltstone, as above, trace pyrite
5000 - 5020	100% calcareous siltstone, green grey to brown grey, shaly in part, increase in glauconite pellets, forams and bryozoa, coaly fragments.
5020 - 5040	100% calcareous siltstone, as above, becoming shalier.
5040 - 5060	calcareous siltstone, green grey, fine grain, soft to firm, fissile and becoming shaly, trace glauconite, forams and bryozoa fragments, trace limestone, coaly fragments.
5060 - 5080	calcareous siltstone, as above.
5080 - 5100	calcareous siltstone, as above, trace pyrite.
5100 - 5120	100% calcareous siltstone, green-grey, fine grained, soft to firm, slightly fissile in part, trace glauconite, forams and bryozoa fragments, coaly fragments.
5120 - 5140	100% calcareous siltstone, as above, trace pyrite.
5140 - 5160	100% calcareous siltstone, green-grey, fine grained, soft to firm, slightly fissile, trace glauconite, forams and bryozoa fragments, coaly fragments.
5160 - 5180	100% calcareous siltstone, as above, trace pyrite.
5180 - 5200	100% calcareous siltstone, as above, trace quartz, trace pyrite, trace glauconite.
5200 - 5220	100% calcareous siltstone, as above, minor pyrite, glauconitic, trace quartz grains, subrounded to rounded, grey green to brown grey, trace coal and carbonaceous material.
5220 - 5240	100% calcareous siltstone, as above.
5240 - 5260	100% calcareous siltstone, as above, abundant coal fragments.
5260 - 5280	100% calcareous siltstone, green to grey, fine grained, minor pyrite, pellets of glauconite, forams and bryozoa, abundant coal fragments.
5280 - 5300	100% calcareous siltstone, green to grey, fine grained, occasional glauconite pellets, forams and bryozoa fragments, abundant coal fragments, trace tight sandstone, fine to medium, glauconite, clay matrix, very calcareous.
5300 - 5320	100% calcareous siltstone, green to grey, fine grained, trace glauconite, forams and bryozoa fragments, abundant coal fragments, trace (?) tight sand, ("green sand"), fine to medium, glauconite, clay matrix, very calcareous.
5320 - 5340	100% calcareous siltstone, becoming sandy in parts, fine grained fissile grey-green; brown-whitish medium grain, very calcareous, glauconitic, clayey fragments, forams and bryozoa, coaly fragments. The whitish cuttings are probably "greensand".

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5340 - 5360 100% calcareous siltstone, as above, trace pyrite.

5360 - 5380 100% calcareous siltstone, as above with occasional fragments medium grained glauconitic siltstone with clay matrix, abundant forams, bryozoa fragments, trace pyrite. Fine grain siltstone is green to grey, coarser "greensand" is brownish-whitish.

5380 - 5400 10% sandstone, fine to medium, quartzose, glauconitic, rarely pyritic, white - buff - brownish, hard. N.S. some mineral fluorescence.
90% calcareous siltstone, green to grey, fine grained, soft to firm, forams and bryozoa fragments, coaly chips.

5400 - 5405 30% sandstone, as above, some with red brown matrix, some mineral fluorescence, No shows
20% iron stained clay, very soft, gummy, earthy red - highly weathered volcanic.
50% calcareous siltstone, as above, with abundant coaly chips.

Circulate out; POOH for Core No. 1.

5405 - 5416 Core No. 1 Cut 11' Recovered 7½' (68%)

5416 - 5420 60% calcareous siltstone, as above with forams, pellets of glauconite, trace pyrite, coaly fragments.
10% sandstone, as above, fine to medium quartzose, glauconite hard, N.S. calcareous.
10% sandstone or siltstone with red iron staining, as above, N.S.
20% iron stained clay, very soft, gummy, calcareous.

5420 - 5430 Note: samples are very red, and much of the clay is washed out.
20% siltstone, iron stained, red to brown, calcareous, very hard, trace quartz, possible fossil remains, iron nodules.
75% calcareous siltstone - grey to green, soft to firm, slightly fissile, whitish clay, fossil fragments, glauconite pellets, trace pyrite.
5% iron stained clay - very soft and gummy, earthy red to brown, abundant iron nodules.

5430 - 5440 Sample as above, with iron stained clay 30%, iron stained siltstone 5%, calcareous siltstone 65%, N.S. scattered quartz grains, fine to coarse grains, rounded to subangular, but predominantly round to subrounded. Much more than previously. Some quartz stained brown. No fluorescence.

5440 - 5450 50 - 55% calcareous siltstone as above
30% iron stained clay, as above
10% rounded to subrounded coarse quartz gains, more abundant than previous sample, iron stained to translucent, smooth.
10% iron stained siltstone, as above, red to earthy brown, trace glauconite sandstone, clayey, whitish to buff.

5450 - 5460 70 to 75% calcareous siltstone, green to grey, as previously, trace pyrite, trace glauconite.
20% iron stained clay, soft, gummy, iron pellets, as previously, trace clayey, glauconitic sandstone.
5 to 10% rounded to subrounded quartz grains, coarse to medium, translucent to iron stained, smooth, some fractured.

5460 - 5470 as above.

5470 - 5480 60% calcareous siltstone
30% iron stained clay
tr. to 5% iron stained siltstone
5 to 10% rounded to subrounded quartz grains, coarse to medium, translucent to iron stained. N.S.

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5480 - 5490	40% calcareous siltstone, grey to green-grey, some fossils. 30% iron stained clay, iron pellets, soft, earthy, trace whitish sandstone, very calcareous, disseminated pyrite. 5% iron stained siltstone 15 - 20% quartz grains, red to coarse, some granule, some fine, rounded to subrounded, translucent with some iron staining. Single grains only. N.S.
5490 - 5500	30% loose quartz grains, unconsolidated, fine to granule, subrounded to rounded, clear to frosted, some iron staining. N.S. 40% calcareous siltstone 30% iron stained clay/siltstone
5500 - 5520	40% loose quartz, up to pebble 30% calcareous siltstone 30% iron stained red brown clay/siltstone.

June 26
Eyles/McKay

MORAY-1

5520-35	70% Quartz very fine to pebbly, white-orange, iron stained in part, sub-angular to rounded, unconsolidated trace pyrite, glauconitic, no fluorescence. 30% Cavings (calcareous siltstone and red brown clay) Circulate out at 5535 for Core #2 Core #2: 5535-82
	June 27
5582-90	60% Quartz, medium to very coarse, sub-angular to sub-rounded, clear to white, occasional orange trace glauconite, pyrite, unconsolidated, no fluorescence 40% Calcareous siltstone, grey, occasional glauconite
5590-5600	70% Quartz grains 30% Calcareous siltstone
5600-20	70% Quartz 30% Calcareous siltstone
5620-30	60% Quartz 40% Calcareous siltstone
5630-40	As above
5640-60	50% Quartz 50% Calcareous siltstone
5660-80	60% Quartz 40% Calcareous siltstone
5680-5700	60% Quartz sand 40% Calcareous siltstone
5700-5720	50% Quartz sand 50% Calcareous siltstone
5720-5740	50% Quartz sand 50% Calcareous siltstone, shaly in part
5740-5760	50% Quartz sand 50% Calcareous siltstone
5760-5800	60% Quartz 40% Calcareous siltstone
5800-20	50% Quartz, fine to very coarse, sub-angular to sub-rounded, clear to white, trace pyrite, glauconite 50% Calcareous siltstone, grey to brown-grey
5820-40	70% Quartz sand, unconsolidated, trace mica 30% Calcareous siltstone
5840-60	80% Quartz mostly milky, very coarse to granular, sub-angular. 20% Calcareous siltstone
5860-5900	As above
5900-5920	80% Quartz, unconsolidated, clear-white (frosted) very fine to granular, sub-angular to sub-rounded, trace pyrite, glauconite, mica. 20% Calcareous siltstone, slightly sandy in part, grey to brown-grey, trace glauconite
5920-40	90% Quartz sand as above 10% Calcareous siltstone, slightly sandy as above
5940-60	As Above

5960-5980	100% Quartz sand Trace calcareous siltstone
5980-6000	80% Quartz sand, glauconite, pyrite and mica 20% Calcareous silstone, glauconite
6000-6020	60% Quartz sand 40% Calcareous siltstone, slightly sandy in part, slightly fissile, soft to moderately firm, calcareous, grey to brown-grey.
6020-6040	50% Quartz 50% Calcareous siltstone, brown grey - grey brown
6040-6060	80% Quartz angular to sub-rounded 20% Calcareous siltstone
6060-6070	85% Quartz, angular - sub angular fractured grains, medium to very coarse. 15% Calcareous siltstone
6070-6080	70% Quartz 30% Calcareous siltstone
6080-6090 -6097	60% Quartz 40% Calcareous siltstone
	Bit locked @ 6097' - POOH.
	28th June
6097-6100	60% Quartz, clear - white, angular to sub-rounded, medium to very coarse, trace pyrite 40% Calcareous siltstone, grey to brown-grey
6100-6110	70% Quartz 30% Calcareous siltstone, shaly in part
6110-6130	90% Quartz sand 10% Calcareous siltstone, slightly sandy, brown grey to grey, glauconite, pyrite.
6130-6140	80% Quartz, angular to sub-angular, fractured 20% Calcareous siltstone
6140-6150	100% Quartz Trace calcareous siltstone
6150-6160	60% Quartz 40% Calcareous siltstone, very calcareous, brown grey, slightly fissile in part.
6160-6170	As above
6170-6190	80% Quartz sand, trace fine to medium sandstone, with white clay matrix. 20% Siltstone, very calcareous, grey-brown.
6190-6200	70% Quartz 30% Calcareous siltstone
6200-6210	70% Quartz sand 30% Siltstone, grey brown, calcareous, glauconitic, slightly sandy, slightly fissile.

6210-6230	60% Quartz 40% Siltstone, trace dark grey carb. (?) shale
6230-6240	70% Quartz, trace white sandstone, fine to coarse, with white clay matrix. 30% Siltstone, calcareous.
6240-6250	40% Quartz sand, trace pyrite, glauconitic 60% Siltstone, slightly sandy, calcareous, brown-grey.
6250-6260	50% Quartz 50% Calcareous siltstone, slightly fissile
6260-6270	As above
6270-6280	80% Quartz sand 20% Calcareous siltstone
6280-6290	60% Quartz 40% Calcareous siltstone
6290-6320	50% Quartz sand 50% Calcareous siltstone, minor fossil fragments ≈ base Latrobe
6320-6330	50% Quartz 50% Calcareous siltstone
6330-40	60% Quartz, trace pyrite 40% Calcareous siltstone Trace coaly material Minor biotite (also white mica) dark brown.
6340-50	50% Quartz 50% Siltstone, trace coaly material Minor mica
6350-6360	60% Quartz 40% Siltstone Minor coal fragments Up to 5% mica (mostly brown biotite) Trace brown-grey siltstone, carbonaceous, calcareous

no more biotite etc. mica

Circulate samples @ 6366'

6360-80	90% Quartz 10% Siltstone grey to brown-grey, carbonaceous in part minor mica.
6380-90	80% Quartz sand 20% Siltstone Minor biotite mica flakes up to 2-3 mm.
6390-6410	100% Sand, trace ~~siltst~~one, mica
6410-6440	70% Sand, trace pyrite 30% Siltstone, minor mica
6440-6460	70% Sand 30% Siltstone Abundant biotite flakes Trace coal
6460-80	60% Sand 40% Siltstone Minor coal, mica
6480-90	50% Sand 50% Siltstone

6490-6500	60% Sand 10% Mica (mostly biotite) 30% Siltstone, very calcareous
6500-10	65% Sand 5% Mica 30% Siltstone
6510-20	50% Quartz 10% Mica 40% Siltstone, calcareous
6520-30	70% Quartz 15% Mica 15% Siltstone, calcareous
6530-40	80% Quartz, some aggregates, trace glauconite, pyrite 15% Mica brown, white and light green 5% Siltstone
6540-70	As above
6570-6610	90% Sand medium to coarse, sub-rounded, better sorting 5% Mica 5% Siltstone
6610-40	As above
6640-50	80% Sand 15% Siltstone 5% Mica
6650-70	65% Sand 5% Mica 30% Siltstone mostly grey-brown grey, calcareous, minor dark grey slightly carbonaceous, rarely calcareous pyrite.
6670-90	70% Sand 10% Mica 20% Siltstone
6690-6700	As above
6700-6720	60% Sand 35% Siltstone 5% Mica
6720-40	70% Sand, abundant mica 30% Siltstone
6740-6750	80% Sand, very micaceous 20% Siltstone
6750-6770	70% Sand medium to very coarse, clear to white, quartz, angular to sub-angular, unconsolidated, pyritic, glauconitic, abundant brown mica flakes, medium to very coarse 30% Siltstone, grey - brown grey, occasionally dark grey, fossiliferous(?), calcareous, slightly fissile, pyritic in part
6770-6790	80% Quartz sand, abundant mica 20% Siltstone
6790-6800	100% Sand, abundant mica, coarse-granular, sub-angular to sub-rounded, white, trace siltstone
6800-6810	As above, decrease in mica

6810-6820	90% Sand, minor mica, trace pyrite 10% Siltstone
6820-6830	As above

6830 - POOH to change bit

29th June.

6830-6840	80% Sand, trace pyrite, glauconite, minor sandstone, glauconitic, white, fine to medium calcareous, trace mica 20% Siltstone
6840-6850	100% Sand, trace pyrite, trace sandstone, trace mica, trace siltstone
6850-6880	100% Quartz, clear to white, medium to granule, sub-angular to sub-rounded, fractured granitic(?) quartz grains, brown and green white micas, pyrite, minor glauconite. Trace siltstone. Some quartz grains consolidated slightly calcareous matrix. Granitic source. No show.
6880-6910	100% Quartz, white, trace mica, pyrite, glauconite, clay matrix, occasional consolidated, mostly loose coarse to granular sand, trace green-grey micac, siltstone
6910-6950	100% Quartz, as above, trace brown-grey siltstone, minor mineral fluorescence in sandstone, aggregates whitish
6950-6990	As above
6990-7000	100% Quartz, micac, very pyritic in part, occasional clay matrix. Trace micac, pyritic, brown grey - grey siltstone, moderately firm, not calcareous
7000-7030	As above
7030-7050	As above, siltstone greenish in part, glauconitic
7050-7090	As above
7090-7110	100% Quartz, mica, abundant pyrite. Trace white - grey sandstone, fairly tight, clay choked fine to medium, occasionally calcareous, no fluorescence
7110-7130	100% Quartz: trace sandstone, clay matrix, increasing
7130-7180	As above
7180-7230	As above
7230-7260	100% Quartz, minor pyrite, occasional mica
7260-7300	100% Quartz, minor mica, trace pyrite
7300-7330	100% Quartz sand, mica, pyrite
7330-7350	100% Quartz sand, trace clay, mica, pyrite
7350-7390	100% Quartz sand
7390-7430	As above
7430-7470	100% Sand, medium to granular, angular to sub-rounded, white, pyrite, mica, trace clay.

Hung off - WOW

7470-7510	100% Sand as above

1st July

7518-7540	60% Quartz Sand, as before 40% Cavings (siltstone, calcareos)
7540-7560	80% Quartz sand, unconsolidated, clear to white medium to very coarse, micaceous, pyritic 20% Cavings
7560-7580	100% Sand: trace cavings
7580-7620	100% Quartz sand: no show
7620-7670	100% Quartz sand: trace quartz/granitic pebbles, trace pyrite, mica, glauconite
7670-7730	100% Sand as above, trace clay choked, micac. white sandstone fine to medium, occasionally calcareous
7730-7750	100% Quartz as above, granitic/quartz pebbles, trace pyrite, mica, glauconite, fine to coarse sandstone, some fractured quartz crystals, minor clay
7750-7780	As above
7780-7810	100% Quartz white-orange some grains translucent, occasional grains pink-red
7810-7840	100% Sand, orange-pink green? feldspar, more likely stained quartz
7840-7870	100% Sand, medium to very coarse, angular to sub-rounded, white-orange, pyrite, mica, glauconite, occasional feldspar?
7870-7880	100% Sand white-cream possibly some feldspar
7880-7910	100% Sand white quartz, cream-pink feldspar? Trace coaly material, mica, pyrite
7910-7930	100% Sand, granitic source quartz, mica possible minor cream-pink feldspar? (or quartz)
7930-7940	100% Sand, white-pink quartz and feldspar
7940-7970	100% Sand, white angular to sub-angular quartz and cream-pink feldspars, angular to sub-angular, pyrite, mica, glauconite.
7970-8000	100% Sand mostly white-clear, angular to sub-angular, medium to very coarse quartz and cream pink angular medium to coarse feldspar (translucent, pearly lustre, cleavage, non calcareous) pyrite, mica, glauconite, increasing feldspar content

2nd July

8000-8020	100% Sand - clear-white quartz and cream-pink feldspar, mica, pyrite, glauconite Feldspar content increasing
8020-8040	As above
8040-8070	100% Sand - granitic quartz and feldspar with mica, pyrite clay trace coaly material Feldspar generally fresh some weathered to white moderately firm clay
8070-8100	As above, some greenish chloritic material hard non calcareous
8100-8120	100% Sand predominantly quartz also cream pink feldspar, mica pyrite.

8120-8140	100% Sand granitic source as above, trace fine to medium tight clay choked sandstone, green grey
8140-8160	100% Sand, unconsolidated, medium to very coarse, angular to sub-angular, as above
8160-8190	As above
8190-8230	As above some grains, quartz with feldspar
8230-8280	100% Sand, unconsolidated quartz/feldspar

Round trip to change bit @ 8278

8278-8290	50% Cavings 50% Sand: quartz, feldspar, mica, pyrite, trace clay (altered feldspar)
8290-8300	20% Cavings 80% Sand as above
8300-8310	10% Cavings 90% Sand
8310-8340	100% Sand, medium to very coarse quartz, angular to sub-angular, unconsolidated, and medium to coarse feldspar, cream-pink orange, mica, pyrite, trace coaly material, trace consolidated fine to medium sandstone, white, clay matrix
8340-8380	100% Sand, as above Trace cavings
8380-8390	100% Sand: quartz/feldspar, mica, pyrite

MORAY-1

3rd July, 1972.
Bruce McKay &
J.R. Black

8390-8410'	100% Quartz/feldspar sand, angular to sub-angular, fine to very coarse, unconsolidated, mica, pyrite.
8410-8460'	As above
8640-8480'	100% granitic sand
8480-8510'	100% Sand, fine to coarse, not as coarse as previously, moderate sorting.
8510-8520'	100% Sand as above Trace grey silty shale, carbonaceous, pyritic hard, non calcareous, mica, also trace brown grey firm siltstone and green white "layered" material (probably mostly cavings)
8520-8530'	100% Sand (actually 80% with 20% siltstone considering caving due to change in MW)

8531 - POOH to core and log.

8531-31½	CORE #3 Pebble Conglomerate

4th July.

8531½-40'	80% Mostly cavings with angular white quartz, pink orthocase unconsolidated sand grains, very coarse/pebbly & some - 20% Sandstone silty matrix hard, tight 0 much like Core #3.
8540-50'	100% Sand as above with few pieces of sandstone made up of coarse quartz and orthocase in a matrix of silty, trace fine grained quartz - very hard, tight with poor porosity and permeability, scattered Biotite, muscovite and chlorite
8550-70'	100% Sand - coarse/pebbly, angular to subrounded quartz, Quartz has light green tinge (Chrome?) about 20% of total sample Strzlecki?? Some pink ortho scatter black grains (hornblende/) some chlorite
8570-8360'	100% Sand coarse/pebbly angular to subrounded quartz, some round pebbles 20% with light green tinge (Strzlecki?) pink ortho, few black grains (coal?) some chlorite abundant Biotite some fine to medium sandstone matrix.

5th July.

8630-90'	100% Sandstone coarse/pebbly milky white quartz, angular to sub angular with occasional well rounded grains 30% green tinged quartz (Strzlecki) Some fine to medium grained sandstone matrix few pieces of biotite.
8690-8370'	100% Sandstone as above, very angular, no subrounded pebbles
8730-59TD	100% Sandstone as above, with abundant mica, (Biotite and phlogopite) very sharp shards of frosty white quartz (ground up pebbles)

Final TD was 8768 adjust upward 9' for collapse of bumper subs.

CORE DESCRIPTIONS

BASIC

ESSO STANDARD OIL (AUSTRALIA) LTD.

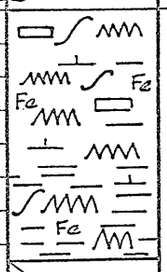
CORE DESCRIPTION

Core No. 1

WELL: MORAY - 1

Interval Cored 5405 - 16 ft., Cut 11 ft., Recovered 7½ ft., (68 %) Fm. GURNARD

Bit Type C-22, Bit Size 8 15/32 in., Desc. by Daryl Eyles/Bruce McKay Date 26th June, 1972

Depth & Coring Rate (min./ft.)	Graphic (1" = 5')	Shows	Interval (ft.)	Descriptive Lithology
0 4 8 5405			5405 - 12½	7' SILTSTONE red brown to brown, silt- fine grained sand, occ. medium, minor quartz, feldspar and clay predominant, glauconitic (weathered to limonite), sl. micaceous, calcareous, iron nodules. Massive although traces of horizontal bedding. Possible fossil traces, grains subrounded-round. Strongly weathered, mineral fluorescence only, strong odour (not hydrocarbon)
5416				5405 - 09 4' very hard, massive 5409 - 10 1' soft - mod. firm, sticky red brown clay: more strongly weathered, more clay 5410 - 10½ 6" hard, consolidated 5410½ - 12½ 2' soft - mod. firm, crumbly at base, sticky clay with 2" band of mod. hard, consolidated siltstone
			5412½ - 16	NO RECOVERY

REMARKS: Barrel jammed → core had to be pumped from barrel.

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

Core No. 2

WELL: MORAY - 1

Interval Cored 5535 - 5582 ft., Cut 47 ft., Recovered 5 ft., (11 %) Fm. LATROBE

Bit Type C-22, Bit Size 8 15/32 in., Desc. by Bruce McKay Date June 27, 1972

Depth & Coring Rate (min./ft.)	Graphic (1" = 5')	Shows	Interval (ft.)	Descriptive Lithology
0 3 6 5535				
40			5535 - 40	5' INTERBEDDED SANDSTONE AND SHALE grey - grey green, soft - crumbly, unconsolidated - friable. Fine - granular quartz grains subangular - rounded clear - white in gray green mud matrix, silty in part, glauconitic, micaceous, calcareous in part, very poorly sorted, shaly matrix predominant. Also silty - fine sandstone, glauconitic, relic pyrite, and minor thin beds of shale, light grey - green grey, soft - moderately firm, thinly interlaminated, horizontal parallel bedding. No shows, H_2S odour in parts Marine environment of deposition. All unconsolidated quartz sand washed away during coring - no recovery zone probably at top of cored interval.
50				
			5340 - 5382	NO RECOVERY
60				
70				
5575				

REMARKS: Barrel jammed - core had to be pumped out of barrel.

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

Core No. 2 (cont'd)

WELL: MORAY-1

Interval Cored ..... ft., Cut ..... ft., Recovered ..... ft., (..... %) Fm. .....

Bit Type ....., Bit Size ..... in., Desc. by ..... Date .....

Depth & Coring Rate (min./ft.)	Graphic (1" = 5')	Shows	Interval (ft.)	Descriptive Lithology
0 5575				
			77	Recovered core could be from this interval – base of core jammed in barrel
5582			82	

REMARKS:

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

Core No. 3

WELL: MORAY - 1

Interval Cored 8531 - 31½ ft., Cut 6" ft., Recovered 6" ft., (100 %) Fm.

Bit Type C-20, Bit Size 8 15/32 in., Desc. by Bruce McKay / John Black Date July 4th, 1972

Depth & Coring Rate (min./ft.)	Graphic (1" = 5')	Shows	Interval (ft.)	Descriptive Lithology
8531			8531 - 31½	6" PEBBLE CONGLOMERATE
8531½				white grey with pink, dark green and black grains. Fine to pebble quartz grains, clear-white, angular to subrounded: fine to very coarse feldspar cream-pink occ. greenish, angular to subangular Mica aggregates (biotite) and flakes (muscovite) common. Clear-white very fine - medium matrix, slightly calcareous in part. Hard, indurated with very poor porosity and permeability. Mineral fluorescence only

REMARKS: Core head very badly worn - face flat

SIDEWALL CORE DESCRIPTIONS

No.	DEPTH 1	BFC 2	ROCK TYPE 3	MODIFIERS 4	CAL 5	COLOR 6	INDUR DEG 7	GRAIN SIZE 8	SRTG 9	RND 10	DISS CLAY 11	STAIN 12	FLOURESCENCE % RK 13	DISTR 14	INTEN 15	COLOR 16	CUT FLUOR. INTEN 17	COLOR 18	CUT RESIDUE QUAN 19	COLOR 20	CHRO 21	PROS 22	REMARKS 23
1	8720	0	NO	Recov.	- Shattered Bullet																		
2	8710	1½	SS	Biotite	-	Wh	Hard	f/cgl	P	SA	-	-	-	-	-	-	-	-	-	-	-	-	V. Tight
3	8672	1	SS	Biot Silt Mat.	-	Wh	Hard	f/cgl	P	SA A	-	-	-	-	-	-	-	-	-	-	-	-	" "
4	8510	2	SH	Silty	-	Lt Grn	Firm	-															
5	8510	0	NO	Recov.	-	Pulled	Off																
6	8430	½	Cgl.		-	Brn Wh	Firm	f/cgl	P	A	-	-	-	-	-	-	-	-	-	-	-	-	Poor P & P
7	8240	½	Cgl.		-	Brn Wh	Firm	f/cgl	P	A	-	-	-	-	-	-	-	-	-	-	-	-	" " " "
8	8226	1½	Cgl	Biot.	-	Grn Wh	Firm	f/cgl	P	A	-	-	-	-	-	-	-	-	-	-	-	-	" " " "
9	8226	0	NO	RECOV. BROKE PIN																			
10	8030	0	"	" "	"																		
11	7958	0	"	" "	"																		
12	7858	0	"	" "	"																		
13	7803	0	"	" "	"																		
14	7710	0	"	" "	"																		
15	7605	0	"	" "	"																		
16	7534	1-⅔	SS	Carb. with coal frags.	-	Blk & Wh.	Firm	f/v.c	P	A	-	-	-	-	-	-	-	-	-	-	-	-	V. Tight
17	7428	0	NO	RECOV. PULL OFF																			
18	7318	0	"	" "	"																		
19	7213	0	"	" "	"																		
20	7124	0	"	" "	"																		
21	7022	0	"	" "	"																		
22	6917	0	"	" "	"																		
83	6490	0	"	" "	"																		
84	6464	0	"	" "	"																		
85	6322	0	"	" "	"																		
86	5680	1 ⅜	sltsl	V. glauc. sdy	-	Grn. Gr.	Firm																
87	5613	1¾	SS	Glauc. pyr. mic.	-	Wh.	Fri	F/M	Mod	sr sa	-	-	-	-	-	-	-	-	-	-	-	-	Fair P & P
88	[illegible]	[illegible]	NO	RECOV. PULL OFF																			

MORAY-1

Company Mobil Oil Corporation Well No. 1 Sec. 30 Page 2
Contractor Schlumberger Run No. 3 Date July 77
Service Co. Run No. Sample Interval

2 of 7

NO. 16	DEPTH 1	RFC 2	ROCK TYPE 3	MODIFIERS 4	CAL 5	COLOR 6	INDUR DEG 7	GRAIN SIZE 8	SRTG 9	RND 10	DISS CLAY 11	STAIN 12	FLOURESCENCE % RK 13	DISTR 14	INTEN 15	COLOR 16	CUT FLUOR. INTEN 17	COLOR 18	CUT RESIDUE QUAN 19	COLOR 20	CHOW 21	PROD 22	REMARKS-GAS 23
89	7605	0	NO	RECOVERY -	PULL OFF																		
90	5618	0	"	"	"	"																	

MORAY-1

Company ... Schlumberger ... IES Run No. ... Date ... July 7, 1974

MORAY-1

3 of 7

NO.	DEPTH	REC	ROCK TYPE	MODIFIERS	CAL	COLOR	INDUR DEG	GRAIN SIZE	SRTG	RND	DISS CLAY	STAIN	FLOURESCENCE % RK	DISTR	INTEN	COLOR	CUT FLUOR. INTEN	COLOR	CUT RESIDUE QUAN	COLOR	SHOW	PROD	REMARKS
	1	2	3	4	5	6	7	8	9	10	11	12		14	15	16	17	18	19	20	21	22	23
91	8570	1"	Cgl	Micac.	-	Grn Wh	Hard	f/peb	P	A	20%	-	-	-	-	-	-	-	-	-	-	-	V. Tight
92	8530	½	SS	Micac.	-	GrnWh	Hard	f/cgl	P	A	20%	-	-	-	-	-	-	-	-	-	-	-	" "
93	8126	¼	SS	Silty Arg.	-	Grn	Fri	f/crse	P	A	30%	-	-	-	-	-	-	-	-	-	-	-	" "
94	8030	½	Cgl	Grn Qtz Ortho	-	Grn Wh	Fri	f/peb	P	A	20%	-	-	-	-	-	-	-	-	-	-	-	" "
95	7958	½	SS	Dk. Gs.	-	Wh/Blk	Fri	f/vc	P	A	-	-	-	-	-	-	-	-	-	-	-	-	Fair P & P
96	7858	¾	SS	Grn Qtz. Biot	-	Blk/Wh	Fri	f/vc	P	A	-	-	-	-	-	-	-	-	-	-	-	-	Detr. Carb.
97	7803	¾	SS	Mica	-	Wh	Fri	f/vc	P	A	-	-	-	-	-	-	-	-	-	-	-	-	
98	7710	¾	SS	Grn Qtz.?	-	Wh	Fri	f/vc	P	A	-	-	-	-	-	-	-	-	-	-	-	-	
99	7605	1	SS	Micac.	-	Wh	Fri	f/vc	P	A	-	-	-	-	-	-	-	-	-	-	-	-	Detr. coal?
100	7428	1 ⅓	SS	Micac.	-	Wh	Fri	f/vc	P	A	-	-	-	-	-	-	-	-	-	-	-	-	
101	7318	1 ⅓	SS	Biot.	-	Wh	Fri	f/vc	P	A	-	-	-	-	-	-	-	-	-	-	-	-	
102	7218	1"	SS	Biot.	-	Wh	Fri	f/vc	P	A	-	-	-	-	-	-	-	-	-	-	-	-	
103	7124	1⅛	SS	Biotite	-	Blk/Wh	Fri	f/vc	P	A	-	-	-	-	-	-	-	-	-	-	-	-	Fair P & P
104	7060	1	SS	Biot.Carb. Pyr.	-	Blk/Wh	Fri	f/vc	P	A	20%	-	-	-	-	-	-	-	-	-	-	-	Shale, Pebbles
105	7022	1	SS	Silty-Peb.	-	Wh	Fri	f/cgl	P	A	20%	-	-	-	-	-	-	-	-	-	-	-	Poor P & P
106	6917	1	Cgl	Pyr. Mica	-	Blk/Wh	Fri	f/Peb	P	A	20%	-	-	-	-	-	-	-	-	-	-	-	Detrital coal?
107	6490	1⅛	Cgl	Lrge. Platy Mica	-	Wh	Fri	f/peb	P	A	20%	-	-	-	-	-	-	-	-	-	-	-	
108	6464	1	SS	Silty	-	Wh	Fri	f/crse	P	A	20%	-	-	-	-	-	-	-	-	-	-	-	
109	6322	1¾	SH	Silty	-	Dk Gr	Firm																Carb?
110	6110	½	SS	Quartz	-	Wh	Uncon	f/crse	Mod	SR	-	-	-	-	-	-	-	-	-	-	-	-	Clean
111	5871	¾	Sltst	Arg.	-	Brn	Fri																
112	5220	1¾	SH	Foss, slty.	-	Olive Brn	Firm																

Geologist... J. HAAR ... Date...July, 1972.
Service Co. SCHLUMBERGER ... JES Run No....1.... SMC Run No....2.... Page 4 of 7

MCRAY-1

SPL No.	DEPTH 1	REC 2	ROCK TYPE 3	MODIFIERS 4	CAL 5	COLOR 6	INDUR DEG 7	GRAIN SIZE 8	SRTG 9	RND 10	DISS CLAY 11	STAIN 12	FLOURESCENCE % RK	DISTR 14	INTEN 15	COLOR 16	CUT FLUOR. INTEN 17	COLOR 18	CUT RESIDUE QUAN 19	COLOR 20	SHOW 21	PROD 22	REMARKS-GAS 23
52	5410	1½	SH	FERR. SILTY MICAC.	V	DK.RD	FRM																
51	5430	1-3/8	SH	V.SILTY, SDY FERR	-	DK.BRN	FRM																BENT.(SWELL IN WTR
50	5450	1-3/4	SLST	ARG, SDY,FERR	-	DK.BRN	FRM																RD. SD. GRNS.
49	5470	1½	SH	ARG.FERR.MICA	-	DK RD.BRN	FRM																LIMONITIC
48	5490	1½	SH	V. SDY. FERR	-	DK BRN	FRM			RND													CRSE.FERR.STN.GS.
47	5498	1-3/4	SH	V.SDY.FERR	-	YELLO BRN	FRM																
46	5505	1-3/4	SS	GLAC. ORTH, MICA	-	GR.WH.	FRI	F/CRS	P	SA SR	-	-	-	-	-	-	-	-	-	-	-	WTR	GOOD P & P
45	5515	1"	SS	QTZ. PYR.	-	WH.	UNCON.	F/CGL	P	SA SR	-	-	-	-	-	-	-	-	-	-	-	WTR	GOOD P & P
44	5540	1-3/8	SD	QTZ.	SLI	WH.	UNCON.	M-VC	P	SA SR	-	-	-	-	-	-	-	-	-	-	-	WTR	GOOD P & P
43	5559	1-3/8	SS	SLTY. GLAUC.	-	WH	FRI.	VF	MOD	SR	±15%	-	-	-	-	-	-	-	-	-	-	WTR	FAIR P & P
42	5572	1	SS	SL.MICAC.QTZ.	-	WH	FRI.	VF. CRSE	P	SA SR													
41	5584	1½	SILTST	SDY. PYR.	-	WH	FRI.	SLT.			±15%	-	-	-	-	-	-	-	-	-	-		
40	5630	1¼	SD	QTZ. CLEAN	-	WH	UNCON.	M VC	P	SR SA	-	-	-	-	-	-	-	-	-	-	-	WTR	GOOD P & P
39	5660	1½	SS	V. GLAUC.	-	GR.WH	FRI	VF/F	MOD	SR	±15%	-	-	-	-	-	-	-	-	-	-	WTR	POOR P & P
38	5710	1-1/8	SS	QTZ.	-	GR.	FRI.	F/M	P	SR	±15%	-	-	-	-	-	-	-	-	-	-	WTR	POOR P & P
37	5806	1½	SS	SILTY	-	GR.	FRI	VF/F	P	SR	±15%	-	-	-	-	-	-	-	-	-	-	WTR	POOR P & P
36	5890	1	SS	CARB. LAM.	-	WH	FRI	SLT/VFG	P	SR	±20%	-	-	-	-	-	-	-	-	-	-	WTR	POOR P & P
35	5952	1¼	SS	SILTY	-	WH	FRI	FG/SLT	MOD	SR	±15%	-	-	-	-	-	-	-	-	-	-	WTR	POOR P & P
34	5977	1 5/8	SS	SILTY	-	WH	FRI	FG	MOD	SR	±15%	-	-	-	-	-	-	-	-	-	-	WTR	FAIR P & P
33	5988	1 3/8	SS	SILTY	-	WH	FRI	FG	P	SR	±15%	-	-	-	-	-	-	-	-	-	-	WTR	SCATTERED CRSE,GS
32	6006	1¼	SS	SILTY	-	WH	FRI	FG		SR	-	-	-	-	-	-	-	-	-	-	-	WTR	FAIR P & P
31	6054	1 1/8	SS	SH PEBBLES	-	DK GR & WH		slt/v.crs	P	ANG	30%	-	-	-	-	-	-	-	-	-	-	-	POOR P & P
30	6110	NO	RECOV.																				
29	6226	1"	SH	W/V.CRS.SD.	-	BRN	FRM	VC	P	SR A													
28	6312	¾	SS	ORTH.,PYR	-	WH	FRI	VC/CGL	P	A	20%	-	-	-	-	-	-	-	-	-	-	WTR	SHALE PEBS.
27	6399	1 1/8	SS	COAL FRAGS. PYR	-	WH/GR	FRI	F/VC	P	A	30%	-	-	-	-	-	-	-	-	-	-	-	POOR P & P
26	6511	7/8	SS	ABUN. BIOTITE	-	WH	FRI	F/VC	P	A	20%	-	-	-	-	-	-	-	-	-	-	WTR	
25	6610	½	SS	PYR. MICA	-	WH		M/CGL	P	A		-	-	-	-	-	-	-	-	-	-	WTR	Larg. Biot.(Layers

Author....J. BLACK..... SIDEWALL CORE DESCRIPTIONS Act....30.... Rec.29....
Geologist....J. BLACK..... Date....July 7, 1972
Service Co....SCHLUMBERGER.. IES Run No....1.... SWC Run No..2.....

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MORAY-1

NO.	DEPTH	RPC	ROCK TYPE	MODIFIERS	CAL	COLOR	INDUR DEG	GRAIN SIZE	SRTG	RND	DISS CLAY	STAIN	FLOURESCENCE %	FLOURESCENCE DISTR	FLOURESCENCE INTEN	FLOURESCENCE COLOR	CUT FLUOR. INTEN	CUT FLUOR. COLOR	CUT RESIDUE QUAN	CUT RESIDUE COLOR	SHOW	PROD	REMARKS-GAS
	1	2	3	4	5	6	7	8	9	10	11	12	RK	14	15	16	17	18	19	20	21	22	23
24	6720	1½	CGL	BIOTITE	-	WH	FRI	F/CGL	P	sr A													
23	6610	1-3/8	CGL	SLT.MATRIX	-	WH	FRI	SLT/CGL	P	A/SR													ABUNDANT BIOTITE

Geologist...J. BLACK..... Area...Moray..... Page...28.....
Service Co. SCHLUMBERGER... IES Run No...1..... SDC Run No.1..... Date...July 7, 1972.....

SIDEWALL CORE DESCRIPTIONS

MORAY-1

SC. No.	DEPTH 1	REC 2	ROCK TYPE 3	MODIFIERS 4	CAL 5	COLOR 6	INDUR DEG 7	GRAIN SIZE 8	SRTG 9	RND 10	DISS CLAY 11	STAIN 12	FLOURESCENCE % RK	DISTR 14	INTEN 15	COLOR 16	CUT FLUOR. INTEN 17	COLOR 18	CUT RESIDUE QUAN 19	COLOR 20	SHOW 21	PROB PROD 22	REMARKS-GAS 23
	GUN #1																						
82	2870	1-3/4	MARL	ARG.	V	GRN.-GR.	FRM																
81	2970	1½	MARL	ARG.	V	GRN.-GR	FRM																
80	3070	1-3/4	MARL	ARG	V	GRN.-GR	FRM																
79	3170	1-5/8	MARL	ARG.FOSS.	V	GRN.-GR.	FRM																
78	3270	1-3/4	MARL	ARG.FOSS.MICA	V	GRN.-GR	FRM																
77	3370	1-3/4	MDST	ARG.	V	GRN.-GR	SOFT-FRM																
76	3470	1-3/4	MDST	ARG.	V	M. GR	SOFT FRM.																
75	3570	N.R. - PULLED OFF																					
74	3670	1-3/4	MDST	ARG. SLTY.	V	GRN.-GR.	FRM																
73	3770	N.R. - PULLED OFF																					
72	3870	1¼	MDST.	ARG.	V	GRN.-GR	FRM																
71	3970	1½	MDST	ARG.	V	GRN.-GR.	FRM																
70	4070	1-3/4	MDST	ARG.V.SLTY	V	LT.GR	FRM																
69	4170	1-3/8	MDST	ARG.SLI.SLTY.	V	GR.	FRM																
68	4270	1½	MARL	SLTY.F.MICAC. FOSS.	V	LT.GR.	FRM																
67	4370	1-3/8	SH.	ARG.V.SLTY.	V	M.GR.	FRM																
66	4470	1-3/4	SH.	ARG. SLI.SLTY.	V	GR	FRM																
65	4570	1½	SH.	ARG. FOSS.	V	M. GR.	FRM																
64	4670	1	SLTST	ARG.F.MICA	V	GR.	FRM																
63	4770	1½	SLTST	V.ARG.F.MICA	V	GR.	FRM																
62	4870	1-3/8	SH	ARG. SLI. LAM.	V	M.GR.	FRM																
61	4970	1-3/8	SLST	ARG. F. MICAC.	V	GR.	FRM																
60	5070	1½	SLTST	SLI. ARG.	V	GR	V.FRM																
59	5170	½	MARL	V. GLAUC.	V	WH.	FRM																
58	5270	1	SH	SILTY	V	M. GR.	FRM																
57	5300	1-3/8	SH.	SILTY	V	LT.GR.	FRM																
[illegible]	5330	7/8	SH	SLI.LAM SILTY.MICA	V	LT.GR.	FRM																

Page ..2..... Att.....30. Rec. 28.....

Date...July 7, 1972

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Well ..MORAY-1..... Geologist...J. BLACK.... Service Co. SCHLUMBERGER... JES Run No...1..... SEC Run No.....1.. SIDEWALL CORE DESCRIPTIONS

MORAY-1

NO.	DEPTH	REC	ROCK TYPE	MODIFIERS	CAL	COLOR	INDUR DEG	GRAIN SIZE	SRTG	RND	DISS CLAY	STAIN	FLOURESCENCE %	FLOURESCENCE DISTR	FLOURESCENCE INTEN	FLOURESCENCE COLOR	CUT FLOR INTEN	CUT FLOR COLOR	CUT RESIDUE QUAN	CUT RESIDUE COLOR	SHOW	PROD	REMARKS
55	5360	1¼	SH.	SILTY	V	LT.BRN	FRM																
54	5376	1	SH.	FERR -SILTY	V	BN.& H GR.	FRM																
53	5390	5/8	SH	GLAUC?. FERR FOSS.	V	DK.RD	FRM																

PALYNOLOGY AND

PALAEONTOLOGY

THE PALYNOLOGY

OF MORAY-1

by A.D. Partridge

Palaeontological Report 1972/14 August, 1972

SUMMARY

The following spore-pollen zones are identified in Moray-1:

Zone	Depth in Feet & Rating
Lower *Nothofagidites asperus*	5490 (1)
Lower *Malvacipollis diversus*	5540 (2) - 5559 (2)
Lygistepollenites balmei	5584 (1) - 6006 (1)
Tricolpites longus	6054 (1)
Tricolporites lilliei	6226 (1)
Cicatricosisporites distocarinatus	6322 (2) - 6399(2)
Zone indeterminant	6464 - 8531

COMMENTS

The palynology indicates that there are probably four breaks in the sequence in this well. These are:

(1) A disconformity between the Lower *N. asperus* Zone at 5490 feet and the Lower *M. diversus* Zone at 5540 feet.

(2) A probable hiatus between 6006 to 6064 feet representing some of the lower part of the *L. balmei* Zone.

(3) A disconformity between the *T. lilliei* Zone at 6226 feet and the *C. distocarinatus* Zone at 6322 feet.

(4) A probable disconformity below the *C. distocarinatus* Zone, between 6399 and 6464 feet.

There is no suggestion of breaks within the *L. balmei* to Lower *M. diversus* sequence or the *T. lilliei* to *T. longus* sequence based on the spore-pollen assemblages.

Dinoflagellates were found in all sidewall cores from the Lower *N. asperus* Zone at 5490 feet to the base of the *L. balmei* Zone at 6006 feet, suggesting a

continuous marginal marine environment. The section below the L. balmei Zone contains only non-marine assemblages.

ZONES

The section from 6464 feet to T.D. (Total Depth) can only be given a general age of Late Jurassic to Cretaceous. The section which is of unfavourable lithology for palynology contains only spre-pollen assemblages of low diversity without any diagnostic species.

The C. distocarinatus Zone identified at 6322 and 6399 feet is found elsewhere in the Gippsland Basin in the following wells: Golden Beach-1 (C. triplex to C. distocarinatus Zone from cuttings between 6000 and 6770 feet); Golden Beach West-1 (6380-90 feet); Merriman-1 (5070-81 feet) and Tuna-1 (11,940 feet). All these samples are of poor quality, containing only spore-pollen assemblages of low diversity. The assemblage most similar to that from Moray-1 at 6322 feet is from Tuna-1. The age of the Moray-1 samples, given as C. distocarinatus Zone, is based on the occurrence of the species Amosopollis cruciformis, Kraeuselisporites majus, Phyllocladidites mawsonii and the lack of angiosperm pollen. The samples could be slightly younger, perhaps equivalent to the Clavifera triplex Zone or the Tricolpites pachyexinus Zone. However, this is not favoured as the Moray-1 samples are distinct, in their lack of angiosperm pollen, from other samples referred to these latter zone in the Gippsland Basin. The presence of larger assemblages containing a few key species is the only difference between the samples referred to in the C. distocarinatus Zone and the samples from the underlying section.

The T. lilliei Zone assemblages at 6226 feet is from near the top of the zone and is closely related in character and therefore age to the T. longus Zone assemblage at 6054 feet. Both assemblages are non-marine.

The L. balmei Zone contains more abundant and slightly more diverse assemblages of dinoflagellates than have been seen elsewhere in this zone in the Gippsland Basin. The environment is therefore probably more marine than elsewhere. The similarity of the dinoflagellates to those recorded in Mackerel-1, 2 and 3 suggests that only the upper part of the L. balmei Zone is represented. This similarity and the distinct change from marine to non-marine in the underlying T. longus Zone is the reason for suggesting a hiatus between the zones.

The Lower M. diversus Zone is identified in two samples with very low spore-pollen yields. Although both samples contained key species of this zone, some obvious contamination, and the possibility of some reworking from the underlying L. balmei Zone gives these samples low reliability. The sample at 5055 feet is probably also Lower M. diversus in age but could be considerably younger, equivalent to either the P. asperopolus Zone or the Lower N. asperus Zone A subdivision. The sample contains almost exclusively dinoflagellates; however, the two dominant species have never been recorded before.

The Lower N. asperus Zone at 5490 feet is represented by a sample of low yield and poor preservation, and cannot be assigned to either the A or B subdivision of this zone. Samples above this in the dolomite unit were of unsuitable lithology for obtaining spore-pollen assemblages. Those processed were barren.

SAMPLES EXAMINED

The presence of dinoflagellates in the samples is indicated by an asterisk following the depth.

Sample	Depth(in feet)	Zone
Cuttings	5340 - 400*	P. tuberculatus
Core-1	5407	Barren
Core-1	5410	Barren
SWC 48	5490*	Lower N. asperus
SWC 47	5498	Barren
SWC 46	5505*	Indeterminant
Core-2	5535	Barren
Core-2	5540	Barren
SWC 44	5540	Lower M. diversus
SWC 43	5559*	Lower M. diversus
SWC 41	5584*	L. balmei
Cuttings	5600 -10*	Indeterminant
SWC 87	5618	Barren
SWC 39	5660*	L. balmei
SWC 86	5680*	L. balmei
SWC 37	5806*	L. balmei

MORAY - 1

Sample	Depth (in feet)	Zone
Cuttings	5820 - 30	Indeterminant
SWC 111	5871 *	L. balmei
SWC 38	5890 *	L. balmei
SWC 33	5988 *	L. balmei
SWC 32	6006 *	L. balmei
SWC 31	6054	T. longus
Cuttings	6080 - 90	T. longus
SWC 29	6226	T. lilliei
SWC 109	6322	C. distocarinatus
SWC 21	6399	C. distocarinatus
SWC 108	6464	Indeterminant
Cuttings	6460 - 70	Indeterminant
Cuttings	6470 - 80 (Dk. gy.sh.)	Indeterminant
SWC 26	6511	Barren
SWC 24	6720	Barren
Cuttings	6810 - 30	Indeterminant
Cuttings	6880 - 910 (coally frag)	Indeterminant
SWC 106	6917	Barren
SWC 105	7022	Indeterminant
SWC 104	7060	Indeterminant
SWC 101	7318	Barren
Cuttings	7400 - 30	Indeterminant
SWC 16	7704	Barren
SWC 97	7803	Indeterminant
SWC 96	7858	Indeterminant
Cuttings	7860 - 80	Indeterminant
SWC 94	8030	Barren
Cuttings	8050 - 60 (coally frag)	Indeterminant
SWC 93	8126	Barren
SWC 8	8226	Indeterminant
Cuttings	8300 - 10	Indeterminant
Core 3	8531	Indeterminant (no older than Late Jurassic)
SWC 19	8570	Barren
SWC 4	8610	Barren

BASIN GIPPSLAND DATE July 20, 1972

WELL NAME MORAY-1 ELEVATION +32

AGE	PALYNOLOGIC ZONES	HIGHEST DATE					LOWEST DATA				
		Preferred Depth	Rtg	Alternate Depth	Rtg	2 way time	Preferred Depth	Rtg.	Alternate Depth	Rtg.	2 way time
OLIGO-MIOC.	T. bellus										
	P. tuberculatus										
EOCENE	U. N. asperus										
	L. N. asperus	5490	1				5490	1			
	P. asperopolus										
	U. M. diversus										
	L. M. diversus	5540	2				5559	2			
PALEOCENE	L. balmei	5584	1				6006	1			
	T. longus	6054	1				6054	1			
LATE CRETACEOUS	T. lilliei	6226	1				6226	1			
	N. senectus										
	C. trip./T.pach.										
	C. distocarin.	6322	2				6322	2			
	T. pannosus										
EARLY CRETACEOUS	C. paradoxa										
	C. striatus										
	U. C. hughesii										
	L. C. hughesii										
	C. stylosus										
Pre-Cretaceous											

COMMENTS: Samples below 6322 feet contain only long ranging species (giving an age range of Late Jurassic to Middle Cretaceous.)

RATINGS:
0; SWC or CORE, EXCELLENT CONFIDENCE, assemblage with zone species of spores, pollen and microplankton.
1; SWC or CORE, GOOD CONFIDENCE, assemblage with zone species of spores and pollen or microplankton.
2; SWC or CORE, POOR CONFIDENCE, assemblage with non-diagnostic spores, pollen and/or microplankton.
3; CUTTINGS, FAIR CONFIDENCE, assemblage with zone species of either spores and pollen or microplankton, or both.
4; CUTTINGS, NO CONFIDENCE, assemblage with non-diagnostic spores, pollen and/or microplankton.

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

DATE RECORDED BY: A.D. PARTRIDGE DATE July 20, 1972

DATA REVISED BY: DATE

FORM No. R200 4/71

BASIN GIPPSLAND DATE

WELL NAME MORAY-1 ELEVATION +32 feet

PALYNOLOGIC ZONES	HIGHEST DATA					LOWEST DATA				
	Preferred Depth	Rtg.	Alternate Depth	Rtg.	2 way time	Preferred Depth	Rtg.	Alternate Depth	Rtg.	2 ti
P. tuberculatus										
U. N. asperus										
M. N. asperus										
L. N. asperus	5490	1				5490	1			
P. asperopolus										
U. M. diversus	5505	1				5505	1			
M. M. diversus										
L. M. diversus	5540	2				5559	2			
U. L. balmei	5584	1				5680	2			
L. L. balmei	5806	0				6006	0			
T. longus	6054	1				6054	1			
T. lilliei	6226	1				6226	1			
N. senectus										
C. trip./T.pach.										
C. distocarin.	6322	1				6322	1			
T. pannosus										

COMMENTS: Dinoflagellate Zones:
Deflandrea heterophylcta 5490 (1)
Wetzeliella homomorpha 5584 (1)
Eisenackia crassitabulata 5806 (1) – 5871 (1)
Trithyrodinium evittii 6006 (1)
Samples below 6322' contain only long ranging species

RATINGS:
0; SWC or CORE, EXCELLENT CONFIDENCE, assemblage with zone species of spores, pollen and microplankton.
1; SWC or CORE, GOOD CONFIDENCE, assemblage with zone species of spores and pollen or microplankton.
2; SWC or CORE, POOR CONFIDENCE, assemblage with non-diagnostic spores, pollen and/or microplankton.
3; CUTTINGS, FAIR CONFIDENCE, assemblage with zone species of either spore and pollen or microplankton, or both.
4; CUTTINGS, NO CONFIDENCE, assemblage with non-diagnostic spores, pollen and microplankton.

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

DATA RECORDED BY: ADP DATE July 1972.

DATA REVISED BY: ADP DATE Jan. 1972.

PALAEONOLOGICAL LIST FOR MORAY-1.

1 of 1

WELL NAME: MORAY # 1

W646

DEPTH (FT)	SAMPLE TYPE	PRESER-VATION	DIVERSITY	SPORE/POLLEN ZONE	DINOFLAGELLATE ZONE	CONFIDENCE LEVEL	ENVIRONMENT
5340-400	Cuttings	Good	Moderate	Indet.	-	-	-
5407	Core 1	Barren	-	-	-	-	-
5410	Core 1	Good	High	? T. bellus	Un-named	3	Marginal marine
5490	SWC 48	Fair	Moderate	?N. asperus	Spiniferites assemb	3	Marine
5498	SWC 47	-	-	-	-	-	-
5505	SWC 46	Good	V. Low	Indet.	Indet	4	Marine
5535	Core 2	Barren	-	-	-	-	-
5540	Core 2	Barren	-	-	-	-	-
5540	SWC 44	Fair	Moderate	M. diversus	Indet	3	Non-marine
5559	SWC 43	Good	Moderate	M. diversus	Indet	3	Marginal marine
5584	SWC 41	Good	Moderate	Late L. balmei	unnamed	4	Marginal marine
5600-10	Cuttings	-	-	Indet	Indet	-	-
5618	SWC 87	Barren	-	-	-	-	-
5660	SWC 39	Fair	Low	L. balmei	Indet	5	Marginal marine
5680	SWC ?	Fair	Moderate	L. balmei	Indet	5	Marginal marine
5806	SWC 37	Fair	Low	L. balmei	Indet	4	Marine
5820-30	Cuttings	Good	Moderate	L. balmei	Indet	2	-
5871	SWC 111	Good	High	L. balmei	Indet	5	Marine
5890	SWC 36	Fair	Moderate	L. balmei	Indet	5	Marine
5988	SWC 33	Fair	Moderate	L. balmei	Indet	4	Marginal marine
6006	SWC 32	Poor	Moderate	L. balmei	Indet	4	Marginal marine
6080-90	Cuttings	Fair	High	?T. longus	-	3	Non-marine
6226	SWC 20	Good	High	T. lilliei	-	5	Non-marine
6322	SWC 109	Fair	Moderate	L. Cret. undiff	-	-	Non-marine
6399	SWC 21	Poor	V. low	L. Cret. undiff	-	-	Non-marine
6460-70	Cuttings	-	-	Indet.	-	-	-
6464	SWC 108	Fair	V. low	L. Cret. undiff.	-	-	Non-marine

COMMENTS: ALL CUTTINGS SAMPLES WERE HEAVILY CONTAMINATED BY DRILLING MUD OF NORTH AMERICAN ORIGINA

OIL and GAS DIVISION - 3 FEB 1983

BY W.K. HARRIS
FOR AQUITAINE, PHILLIPS, SHELL

Page 1 of 1
PALAEONOLOGY SUMMARY.

Form R 193 3/71

BASIN GIPPSLAND BY D.J. TAYLOR

WELL NAME MORAY-1 DATE 6/9/72 ELEV. +32

Foram Zonules

		Highest Data	Quality	2 Way Time	Lowest Data	Quality	2 Way Time
MIOCENE	A						
	Alternate						
	B						
	Alternate						
	C						
	Alternate						
	D_1						
	Alternate						
	D_2	2870	1		3270	1	
	Alternate	2970	0				
	E	* 3370	0		* 3970	0	
	Alternate						
	F	4070	1		4470	1	
	Alternate						
	G	4570	1		4870	0	
	Alternate						
	H_1	4970	1		5070	1	
	Alternate						
	H_2	5170	1		5300	1	
	Alternate						
OLIGOCENE	I_1	5330	0		5360	1	
	Alternate						
	I_2						
	Alternate						
	J_1						
	Alternate						
	J_2						
	Alternate						
EOC.	K						
	Alternate						
	Pre K						

* Zone E can be subdivided into:

E1 Highest 3370 (0) to Lowest 3670 (0)

E2 Highest 3700 (3), alternative 3870 (0) to Lowest 3970 (0)

Zone J is present in cuttings from 5420 feet.

COMMENTS: The SWC's below 5360 feet are contaminated by drilling mud. The foraminifera found in these SWC's are all contamination derived from higher in the well.

Note: If highest or lowest data is a 3 or 4, then an alternate 0, 1, 2 highest or lowest data will be filled in if control is available.

If a sample cannot be interpreted to be one zonule, as apart from the other, no entry should be made.

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

Date Revised _____

By _____

VELOCITY DATA

Well MORAY 1

Basin Gippsland Basin

Velocity Data

Esso personnel P.J. Birmingham

Contractor United Geophysical

Supplied (1) Instruments

(2) Personnel

Seismic Observer J. Larsen

Marine Shooter L. Moore

(3) Licenced Shooting Boat

name Not used

~~Gas Gun~~ Gas Gun Survey

date released

Agent

amount of powder lbs

size of cans lbs

number of cans

number of caps

number of boosters

Personnel and Instruments

assembled at Melbourne date 4/7/72

boarded (rig) Glomar Conception date 5/7/72

date of survey 6/7/72

casing depth 2734

T.D. when shot 8750 PTD 8750

water depth

SURVEY PROCEDURE

Weather: sea Moderate

rig movement Slight

rig noise Moderate

Hydrophones: number Two

depth below sea level 40 ft

position One in Moon Pool

One strapped to gun

Shot Positioning and Charges:

marker buoys number Not used

distance

direction

Gas Gun Depth

~~Airgun depth~~ 45' ft

number of shots charge size lbs

number of shots charge size lbs

number of misfires

amount of powder used lbs

EXPLORATION

amount of powder dumped..... lbs.

Well-phone positioning:

T-bar .....Not used.....

number of depths .....six.....

Time: first shot .....12:05 a.m.....

last shot .....4.00 a.m.....

rig time .....3 hrs 55 mins.....

RESULTS

Quality of records (good .....
(fair .....
(poor .....
(not used .....

Comparison of Interval Times.
with sonic log

/ /average..1:1..... microsec/foot

/ max/.....2:6..... microsec/foot

CONCLUSION

Reliability of T-D curve ...Fair/Good.....

COMMENTS

This was a gas gun survey. The quality of the monitors can only be considered as poor, however some good playbacks were obtained by summing ten pops together. This was so, particularly in the deeper levels. The gas gun performed fairly well extra rig time being required to replace a fractured gas line connection. The spark plug was also replaced.

P.J. Birmingham.

Gas Gun Survey

Company: ESSO EXPLORATION ACS AUSTRALIA INC.

Well: Moray I

Elevation (Derrick Floor): 32'

Total Depth:

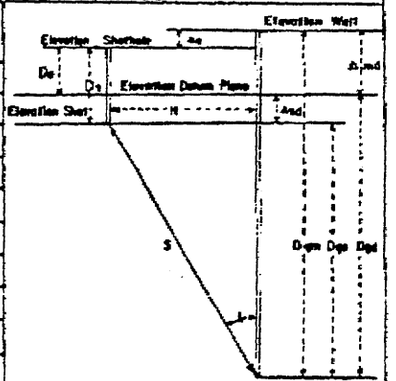
Coordinates:

Section, Township, Range:

Gippsland Basin

DATUM : Mean Sea Level

of Shot	Dgm	Ds	hs	tr	T Reading	T Priority	T Grade	Dgs	H	TAN I	Cos I	Tgs	Δsd	Δsd/V	Tgd	Tgd Average	Dgd	ΔDgd	ΔTgd	Vi Interval Velocity	Va Average Velocity
	2900	45	9	17	367	U	P	2836	54		1.000	367	45	9	376	376	2868				7628
																		1300	166	7831	
	4200	45	9	17	533	D	F	4136	54		1.000	533	45	9	542	542	4168				7690
																		1202	127	9464	
	5402	45	9	17	660	D	P	5338	54		1.000	660	45	9	669	669	5370				8027
																		910	79	11519	
	6312	45	9	17	739	D	F	6248	54		1.000	739	45	9	748	748	6280				8396
																		1538	121	12710	
	7850	45	9	17	860	D	G	7786	54		1.000	860	45	9	869	869	7818				8996
																		725	49	14795	
	8575	45	9	17	909	D	G	8511	54		1.000	909	45	9	918	918	8543				9306



Dgm = Gunphone depth measured from well elevation

Dgs = " " " " shot "

Dgd = " " " " datum "

Ds = Depth of shot

De = Shothole elevation to datum plane

H = Horizontal distance from well to shotpoint

S = Straight line travel path from shot to well gunphone

tsd = Uphole time at shotpoint

T = Observed time from shotpoint to well gunphone.

tr = " " " to reference gunphone.

Δe = Difference in elevation between well & shotpoint.

Δsd = " " " " shot & datum plane

Δsd = Ds - De

Dgs = Dgm - Ds ± Δe ; tan I = $\frac{H}{Dgs}$

Tgs = cos I ; T = Vert. travel time from shot shot to gunphone

Tgd = Tgs ± $\frac{\Delta sd}{V}$ " " " datum plane " "

Dgd = Dgm - Δsd

Vi = Interval velocity = $\frac{\Delta Dgd}{\Delta Tgd}$

Va = Average " = $\frac{D\,gd}{T\,gd}$

Surveyed by: _____

Date: _____

Weathering Data:

Casing Record

DWG. 1107/OP/3

Depth Rel. S.L.	Av. Vertical Travel Time (check shots)	Ti Check Shots (sec.)	Ti Sonic Log (sec.)	(Millisecs.)	Depth Interval (ft.)	Error (Microsec per ft.)
2868	376	.166	.167	→+1	1300	.7
4168	542					
4168	542	.127	.128	→+1	1202	.8
5370	669					
6280	748	.079	.080	→+1	910	1.1
6280	748					
7818	869	.121	.125	→+4	1538	2.6
7818	869					
8543	918	.049	.050	→+1	725	1.4

OTHER REPORTS

"FORMATION WATER SALINITY IN VIC/P20 LICENCE" BY PETROFINA (M. TRINGHA

an average of 43%, to a water zone with 0% calculated hydrocarbon saturation. If a fresher formation water is assumed then unrealistic water saturations higher than 100% would result.

In **Helios-1** a DST was performed on the Gurnard Formation (2591-2609m) but this was tight. The well gave an initial good blow but died after two hours, and drilling mud only was reversed out. Petrofina SP log calculation results are shown in Figure 1, and reveal salinities decreasing downwards from the sandy Upper Latrobe into the coaly paludal sequence.

In **Hermes-1** four brackish water samples were recovered in DST and FIT's with salinities all significantly fresher than the mud filtrate salinity. The SP log has no coherent response although in sandstones from the DST intervals positive deflections do occur as would be expected with fresher formation water.

In **Moray-1** an SP calculation has been performed (Figure 1), however for **Athene-1** and **Selene-1** the SP log shows no measurable response. These latter two wells were drilled with seawater based muds of normal salinity (30,000-35,000 ppm NaCl) and the lack of SP response probably indicates that the formation water has a similar salinity to the mud. It is interesting to note that in the lower most part of Athene-1 a -ve SP response begins to appear, giving a qualitative indication that salinities increase downwards.

FIGURE 1 "FORMATION WATER SALINITY IN VIC/P20 LICENCE" BY PETROFINA (M TRINGHAM)

TABLE OF FORMATION WATERS VIC/P20 AREA

Well	Sample Type	Depth	Temp. °C	Resis. Ωm	Salinity ppm NaCl equiv.	Comment
Hapuku-1	FIT#2	9,352'	21	0.42	20,000	mud filtrate?
Hapuku-1	FIT#6	9,258'	24	0.55	10,600	mud filtrate
Hapuku-1	FIT#8	9,322'	23	0.6	10,600	mud filtrate
Hapuku-1	FIT#9	11,550'	19	0.89	8,400	mud filtrate
Hapuku-1	SP log	11,300'	88	.06	45,000	Petrofina Anal.
Hapuku-1	SP log	9,500'	53	.11	35,000	Petrofina Anal.
Hapuku-1	SP log	9,500'	53	.101	37,000	Esso Anal.
Hapuku-1	Rwa Analysis	9,500'	53	.08	48,000	Esso Anal.
Hapuku-1	(Mud Filtrate)	-	-	-	(11,000)	mud sample
Helios-1	SP log	2,690m	67	.057	60,000	Petrofina Anal.
Helios-1	SP log	3,200m	79	.083	35,000	Petrofina Anal.
Helios-1	SP log	3,340m	82	.095	29,000	Petrofina Anal.
Helios-1	(Mud Filtrate)	-	-	-	(85,000)	mud sample
Hermes-1	DST#1	4,425m	25	1.195	6,313*	brackish
Hermes-1	DST#2	4,390m	25	0.513	17,851	brackish
Hermes-1	FIT#1	4,231m	15	0.451	17,000	brackish
Hermes-1	FIT#2	3,569m	18	0.39	20,000	brackish
Hermes-1	(Mud Filtrate)	-	-	-	(35,000)	mud sample
Moray-1	SP log	6,000'	68	0.14	22,000	Petrofina Anal.
Moray-1	(Mud Filtrate)	-	-	-	(8,000)	mud sample
Selene-1	SP log	2840-3539	-	-	35,000	No SP response
Selene-1	(Mud Filtrate)	-	-	-	v. approx (35,000)	
Athene-1	SP log	3,100-3384	-	-	40,000	Slight -ve
Athene-1	(Mud Filtrate)	-	-	-	v. approx (30,000)	SP response mud sample

* This value is an average of two laboratory sample analyses which are of doubtful accuracy since they differ between themselves, and between the well-site salinity measurements.

GEARHART PTY LTD - GEODATA

UNION TEXAS AUSTRALIA INC.

GEOCHEMICAL ANALYSES OF WELLS FROM THE GIPPSLAND BASIN, AUSTRALIA

BARRACOUTA-1, HALIBUT-1, HAPUKU-1, KINGFISH-1, MORAY-1, PERCH-A1, PIKE-1, PISCES-1, SNAPPER-1, TUNA-1

Project No. 9/83/10S

By

S. Sengupta, S. Hindmarsh and P.J. Bigg

January, 1984

FILED IN GEOCHEMICAL REPORTS I.M. UNDER UNION TEXAS.

Prepared by:

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Australia

Prepared for:

Union Texas Australia Inc.
23rd Level
459 Collins Street
Melbourne, VIC 3000
Australia

BIOSTRATIGRAPHIC & PALEOENVIRONMENTAL DATA PACKAGE # 1 for GIPPSLAND BASIN.

MORAY-1

for: AUSTRALIAN AQUITAINE PETROLEUM PTY. LTD.

July 20, 1983.

David Taylor
23 Ballast Point Road,
BIRCHGROVE, 2041.
AUSTRALIA. (02)810 5643.

and

Helene A Martin,
School of Botany,
University of New South Wales,
Box 1 P.O., KENSINGTON, 2033.
AUSTRALIA. (02)662 2954

THE STRATIGRAPHIC PALYNOLOGY OF SELECTED SAMPLES FROM BULLSEYE - 1 MORAY - 1 PERCH - 1 PIKE - 1, GIPPSLAND BASIN.

for: AUSTRALIAN AQUITAINE PETROLEUM PTY. LTD.

July, 1983.

Helene A Martin,
School of Botany,
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Box 1, P.O.,
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AUSTRALIA. (02)662 2954.

ENCLOSURES

PE902777

This is an enclosure indicator page.
The enclosure PE902777 is enclosed within the container PE906523 at this location in this document.

The enclosure PE902777 has the following characteristics:

```
     ITEM_BARCODE = PE902777
CONTAINER_BARCODE = PE906523
             NAME = Moray Prospect Structure Map Top of
                    Latrobe
            BASIN = GIPPSLAND
           PERMIT =
             TYPE = SEISMIC
          SUBTYPE = HRZN_CONTR_MAP
      DESCRIPTION = Moray Prospect Structure Map Top of
                    Latrobe
          REMARKS =
     DATE_CREATED = 01/11/1971
    DATE_RECEIVED =
             W_NO = W646
        WELL_NAME = Moray-1
       CONTRACTOR = ESSO
     CLIENT_OP_CO = ESSO
```

(Inserted by DNRE - Vic Govt Mines Dept)

PE902776

This is an enclosure indicator page.
The enclosure PE902776 is enclosed within the container PE906523 at this location in this document.

The enclosure PE902776 has the following characteristics:

```
     ITEM_BARCODE = PE902776
CONTAINER_BARCODE = PE906523
             NAME = Geological Cross Section A-A' Moray 1
                    Prospect
            BASIN = GIPPSLAND
           PERMIT =
             TYPE = WELL
          SUBTYPE = CROSS_SECTION
      DESCRIPTION = Geological Cross Section A-A' Moray 1
                    Prospect
          REMARKS =
     DATE_CREATED = 01/05/1971
    DATE_RECEIVED =
             W_NO = W646
        WELL_NAME = Moray-1
       CONTRACTOR = ESSO
     CLIENT_OP_CO = ESSO
```

(Inserted by DNRE - Vic Govt Mines Dept)

PE902775

This is an enclosure indicator page.
The enclosure PE902775 is enclosed within the container PE906523 at this location in this document.

The enclosure PE902775 has the following characteristics:

```
     ITEM_BARCODE = PE902775
CONTAINER_BARCODE = PE906523
             NAME = Time Depth Curve
            BASIN = GIPPSLAND
           PERMIT =
             TYPE = WELL
          SUBTYPE = VELOCITY_CHART
      DESCRIPTION = Time Depth Curve (Interpretative) for
                    Moray-1
          REMARKS =
     DATE_CREATED = 06/07/1972
    DATE_RECEIVED =
             W_NO = W646
        WELL_NAME = Moray-1
       CONTRACTOR = ESSO
     CLIENT_OP_CO = ESSO
```

(Inserted by DNRE - Vic Govt Mines Dept)

PE601606

This is an enclosure indicator page.
The enclosure PE601606 is enclosed within the container PE906523 at this location in this document.

The enclosure PE601606 has the following characteristics:

```
     ITEM_BARCODE = PE601606
CONTAINER_BARCODE = PE906523
             NAME = Well completion log
            BASIN = GIPPSLAND
           PERMIT = VIC P/2
             TYPE = WELL
          SUBTYPE = COMPLETION_LOG
      DESCRIPTION = Well completion log (enclosure from
                    Well Summary) for Moray 1
          REMARKS =
     DATE_CREATED = 9/07/72
    DATE_RECEIVED =
             W_NO = W646
        WELL_NAME = Moray-1
       CONTRACTOR = Esso Exploration and Production
                    Australia Inc.
     CLIENT_OP_CO = Esso Exploration and Production
                    Australia Inc.
```

(Inserted by DNRE - Vic Govt Mines Dept)

PE601604

This is an enclosure indicator page.
The enclosure PE601604 is enclosed within the container PE906523 at this location in this document.

The enclosure PE601604 has the following characteristics:

```
     ITEM_BARCODE = PE601604
CONTAINER_BARCODE = PE906523
             NAME = Baroid ppm Log/Mud Log
            BASIN = GIPPSLAND
           PERMIT = VIC/P2
             TYPE = WELL
          SUBTYPE = MUD_LOG
      DESCRIPTION = Baroid ppm log /Mud log , measuring
                    conc hydrocarbon in mud (ppm),
                    enclosure from Well Summary, for
                    Moray-1
          REMARKS =
     DATE_CREATED = 5/07/72
    DATE_RECEIVED =
             W_NO = W646
        WELL_NAME = Moray-1
       CONTRACTOR = BAROID
     CLIENT_OP_CO = Esso Australia
```

(Inserted by DNRE - Vic Govt Mines Dept)

PE601605

This is an enclosure indicator page.
The enclosure PE601605 is enclosed within the container PE906523 at this location in this document.

The enclosure PE601605 has the following characteristics:

```
     ITEM_BARCODE = PE601605
CONTAINER_BARCODE = PE906523
             NAME = Drill Penetration Log
            BASIN = GIPPSLAND
           PERMIT = VIC P/2
             TYPE = WELL
          SUBTYPE = WELL_LOG
      DESCRIPTION = Moray 1 well log pore pressure/Drill
                    Penetration Log (enclosure from Well
                    Summary) for Moray-1
          REMARKS =
     DATE_CREATED =
    DATE_RECEIVED =
             W_NO = W646
        WELL_NAME = Moray-1
       CONTRACTOR = Baroid NL
     CLIENT_OP_CO = Esso Australia Ltd.
```

(Inserted by DNRE - Vic Govt Mines Dept)

PE601609

This is an enclosure indicator page.
The enclosure PE601609 is enclosed within the container PE906523 at this location in this document.

The enclosure PE601609 has the following characteristics:

```
     ITEM_BARCODE = PE601609
CONTAINER_BARCODE = PE906523
             NAME = Dipmeter log interpretation Moray 1 (5
                    "":100ft scale)
            BASIN = GIPPSLAND
           PERMIT = VIC/P2
             TYPE = WELL
          SUBTYPE = WELL_LOG
      DESCRIPTION = Dipmeter log Interpretation , 5 inch
                    scale, (enclosure from well summary)
                    for Moray-1
          REMARKS =
     DATE_CREATED = 7/07/72
    DATE_RECEIVED =
             W_NO = W646
        WELL_NAME = Moray-1
       CONTRACTOR = Schlumberger
     CLIENT_OP_CO = Esso Australia Ltd.
```

(Inserted by DNRE - Vic Govt Mines Dept)

PE903092

This is an enclosure indicator page.
The enclosure PE903092 is enclosed within the container PE906523 at this location in this document.

The enclosure PE903092 has the following characteristics:

```
     ITEM_BARCODE = PE903092
CONTAINER_BARCODE = PE906523
             NAME = Moray prospect structure map contoured
            BASIN = GIPPSLAND
           PERMIT =
             TYPE = WELL
          SUBTYPE = HRZN_CONTR_MAP
      DESCRIPTION = Moray prospect structure map upper
                    Cretaceous (contoured on basement south
                    of South-Bounding Fault),enclosure from
                    Well Summary, for Moray-1
          REMARKS =
     DATE_CREATED = 30/11/71
    DATE_RECEIVED =
             W_NO = W646
        WELL_NAME = Moray-1
       CONTRACTOR = Esso Exploration and Production
                    Australia Inc.
     CLIENT_OP_CO = Esso Exploration and Production
                    Australia Inc.
```

PE903075

This is an enclosure indicator page.
The enclosure PE903075 is enclosed within the container PE906523 at this location in this document.

The enclosure PE903075 has the following characteristics:

```
     ITEM_BARCODE = PE903075
CONTAINER_BARCODE = PE906523
             NAME = Seismic line g71a-475 Moray 1
            BASIN = GIPPSLAND
           PERMIT =
             TYPE = SEISMIC
          SUBTYPE = SECTION
      DESCRIPTION = Seismic section G71A-475 with
                    interpretive overlay (enclosure from
                    Well Summary) for Moray-1
          REMARKS =
     DATE_CREATED = 30/04/71
    DATE_RECEIVED =
             W_NO = W646
        WELL_NAME = Moray-1
       CONTRACTOR = Geophysical Service International
     CLIENT_OP_CO = Esso Standard Oil (Aust) Ltd.
```

(Inserted by DNRE - Vic Govt Mines Dept)

PE903090

This is an enclosure indicator page.
The enclosure PE903090 is enclosed within the container PE906523 at this location in this document.

The enclosure PE903090 has the following characteristics:

```
     ITEM_BARCODE = PE903090
CONTAINER_BARCODE = PE906523
             NAME = Seismic section G71A-497 Moray 1
            BASIN = GIPPSLAND
           PERMIT =
             TYPE = SEISMIC
          SUBTYPE = SECTION
      DESCRIPTION = Seismic section G71A-497 with
                    interpretive overlay (enclosure from
                    Well Summary) for Moray-1
          REMARKS =
     DATE_CREATED =
    DATE_RECEIVED =
             W_NO = W646
        WELL_NAME = Moray-1
       CONTRACTOR =
     CLIENT_OP_CO = Esso Australia Ltd.
```

(Inserted by DNRE - Vic Govt Mines Dept)

PE903074

This is an enclosure indicator page.
The enclosure PE903074 is enclosed within the container PE906523 at this location in this document.

The enclosure PE903074 has the following characteristics:

```
     ITEM_BARCODE = PE903074
CONTAINER_BARCODE = PE906523
             NAME = Seismic line g71a-497 Moray 1
            BASIN = GIPPSLAND
           PERMIT =
             TYPE = SEISMIC
          SUBTYPE = SECTION
      DESCRIPTION = Seismic section G71A-497 with
                    interpretive overlay(enclosure from
                    Well Summary) for Moray-1
          REMARKS =
     DATE_CREATED = 30/04/71
    DATE_RECEIVED =
             W_NO = W646
        WELL_NAME = Moray-1
       CONTRACTOR = Geophysical Service International
     CLIENT_OP_CO = Esso Standard Oil (Aust) Ltd.
```

(Inserted by DNRE - Vic Govt Mines Dept)