

Petrofina Exploration Australia S.A.



ATTACHMENT TO WCR MUDSKIPPER-1 W1032

PETROFINA EXPLORATION AUSTRALIA S.A.

PETROLLION DIVISION | MUDSKIPPER-1

M

POST DRILLING APPRAISAL REPORT

06 NOV 1991

GL/90/061 PhL/JMQ/BD/k1 17 August 1990

WELL DATA SUMMARY: MUDSKIPPER-1

Well:

Mudskipper-1

Permit:

VIC/P20, Gippsland Basin, Australia

Operator:

Petrofina Exploration Australia S.A.

(30%)

Partners:

Japex Gippsland Limited

(30%)

Overseas Petroleum & Investment Corporation

(30%)

Bridge Oil Limited

(10%)

Latitude:

38°54'31.6" S

Longitude:

148°07'58.2" E

UTM:

X

598,173.2 E

Υ

5,692,721.7 N

KBE:

27m

WD:

74m

Type of Rig:

Semi-Submersible

Name:

Zapata Arctic

Contractor:

Zapata Offshore Company

Objectives:

Stratigraphic pinch-out resulting from onlap of

Maastrichtian braided stream sandstones onto a

basement nose with top seal provided by Palaeocene

transgressive siltstones and shales.

Spud Date:

11 June 1990

Date Reached TD:

20 June 1990

Date Plugged and Abandoned: 25 June 1990

Drilled Depth:

1631m (drillers)

1620m (loggers)

Well Status:

Plugged and abandoned. Dry Well.

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1. SUMMARY AND CONCLUSIONS

- (a) Mudskipper-1 was designed to test a Maastrichtian pinch-out in the Latrobe Group resulting from onlap onto a basement nose with top seal provided by Palaeocene transgressive deposits.
- (b) The well was plugged and abandoned as a dry hole on 25 June 1990 after 14 days on location. Total depth was 1631m bkb (-1604m bsl).
- (c) The well did not intersect the Cretaceous section of the Latrobe Group before reaching a granite basement at 1612m bkb (1585m bs1).
- (d) Tie-back of well results to the seismic shows that the Top
 Maastrichtian pick was miscorrelated just north of the well
 location to a strong reflector which actually represents the top of
 the transgressive Palaeocene interval at 1586m bkb (-1559m bsl) in
 Mudskipper-1.
- (e) The Maastrichtian section does pinch-out north of Mudskipper-1, and the play concept may still be valid, but the size of the closure is expected to be substantially smaller than originally predicted at Mudskipper-1.
- (f) The vertical sealing potential of the Palaeocene section must now be severely downgraded because:
 - (i) the Palaeocene section (1525-1586m bkb) is much sandier than originally predicted from correlation with Moray-1,
 - (ii) a large section of the basal Palaeocene transgressive cycle is lost by onlap onto basement between Moray-1 and Mudskipper-1. The part of the sequence still present at Mudskipper-1 comprises reworked basement, siltstones and sandstones with extremely poor sealing potential.
- (g) The complete absence of any shows in Mudskipper-1 creates doubt that migrating hydrocarbons ever reached the basal reservoirs along the Southern Platform margin.

(h) Although the Mudskipper play concept still exists, the perceived risk is now significantly higher than before the drilling of Mudskipper-1. Critical aspects of stratigraphy and hydrocarbon migration must be reviewed before further drilling on the play can be considered.

2. INTRODUCTION

Exploration well Mudskipper-1 is located in the southern part of Permit VIC/P20, some 8.2 km southeast of Moray-1. This well was drilled as the commitment well for Year 4 in the Permit, ending 22 July 1991. The Joint Venture partners for the operation are:

Petrofina Exploration Australia S.A.	30%	(Operator)
Japex Gippsland Limited	30%	
Overseas Petroleum and Investment Corporation	30%	
Bridge Oil Limited	10%	

The objective of Mudskipper-1 was to evaluate a possible stratigraphic trap resulting from the onlap of Maastrichtian Sandstones onto a basement nose, with topseal provided by transgressive Palaeocene siltstones and shales (Fig. 1). Additional traps related to inter-fingering of sandstone and shale units within the Palaeocene section were considered as secondary objectives. The main exploration risks perceived were the integrity of the top and base seal and the continuity of migration paths within the Latrobe Group from the Central Deep to the north.

Although the Mudskipper prospect was considered a high risk play, its high possible reward (mean reserves of 135 MMBO Rec) and relatively low cost when drilled as part of a 4-well sequence made it an attractive prospect to drill.

Mudskipper-1 was spudded on 11 June 1990 and reached a total depth of 1631m (drillers) on 20 June 1990 after having intersected the basement at 1612m bkb.

107.5m of Tertiary Latrobe Group was intersected directly above the basement. No hydrocarbon indications were encountered during drilling and Mudskipper-1 was plugged and abandoned on 25 June 1990 as a dry well.

3. PRE-DRILLING MODEL

3.1 Seismic Data

Seismic control over the Mudskipper Prospect was provided by the 4 x 4 km grid of GF88C lines, with some coverage by GP81 survey data in the north. The Prospect extended eastward into Permit VIC/P23 operated by Cultus Petroleum, where two lines from the GUT83A survey available on open file provided additional control.

Over the Prospect, the following seismic markers were picked:

- Near Base Gippsland Limestone
- Intra Lakes Entrance Unconformity
- Top Gurnard Formation
- Top Maastrichtian (Top UK5)
- Top Basement

Moray-1, drilled by Esso in 1972, provides the closest well control, though sonic log coverage in both Moray-1 and Pike-1 is neither sufficient to identify any sub-division of velocity units within the Gippsland Limestone, nor to recognize the base of the Gippsland Limestone.

A constant interval velocity model was used for the depth conversion with interval velocities derived from Moray-1. The velocity units comprised the water layer, Gippsland Limestone, Lakes Entrance Formation, Tertiary Latrobe Group and the remaining Latrobe Group overlying basement.

3.2 Traps

The trapping concept for the Prospect was stratigraphic, resulting from onlap of Maastrichtian sandstones onto a basement high, with topsealing by Palaeocene transgressive silty and shaley units. In the Mudskipper area, Maastrichtian sediments were expected to consist of continental braided stream sandstones, deposited in palaeo-valleys incised in the basement.

The expected southward extent of the Maastrichtian Sandstones was the pinch-out as shown on Figures 1 and 2. North of the pinch-out, the sands were expected to overlie a northward-plunging basement nose which provided 3-way dip closure. Closure to the south was provided by overstep of the Palaeocene silty and shaley unit across the Maastrichtian pinch-out, while basement was invoked as base seal.

3.3 Reservoirs

The anticipated reservoirs in the Maastrichtian target were braided stream sands similar to those encountered in Moray-1. The sands were expected to be fine to coarse grained, poorly sorted and poorly rounded, reflecting their proximity to the provenance area. Additional reservoirs were anticipated in the Palaeocene section and were expected to be upper shoreface sandstones.

3.4 Seals

Sealing was perceived to be the major risk on the Prospect. Top seal was interpreted to be the transgressive argillaceous facies at the base of the Palaeocene section, while basement was expected to act as base seal.

In Moray-1, the basal transgressive Palaeocene section consists of glauconitic and micaceous shaley siltstones interbedded with sandstones deposited in a lower to upper shoreface environment. The first true shales (as defined by neutron-density separation) within the transgressive sequence at Moray-1 occur some 45m above the Top Maastrichtian, with another good shale 100m higher within the Palaeocene regressive sequence.

The Palaeocene section was expected to extend beyond the southern limit of VIC/P20, pinching out north of the Groper wells where it is absent.

Basement lithology was thought from regional considerations most probably to consist of granite. Other basement lithologies in the basin include Palaeozoic red-beds, schists and volcanics, any of which is a potential base seal.

3.5 <u>Hydrocarbon Source and Migration</u>

Oil was the prognosed hydrocarbon type in the Mudskipper Prospect, sourced from the mature Campanian and Maastrichtian paludal facies of the Kingfish Kitchen. Both vertical and lateral migration were invoked for charging the structure. This long distance migration over the Omeo Terrace incurred the risk that the migrating hydrocarbons could have reached the top of the Latrobe Group before reaching the Mudskipper prospect.

4. MUDSKIPPER-1 WELL RESULTS

4.1 <u>Stratigraphy</u>

Formations and seismic horizons intersected during the drilling of Muskipper-1 are listed in Table 1.

Mudskipper-1 penetrated 1403.5m of limestone, marls, calcareous claystones and siltstones of the Pliocene to Middle Eocene Seaspray Group which directly overlies the Latrobe Group. The base of the Seaspray Group is represented by a 29.5m thick red, radioactive silty to sandy claystone of Middle Eocene to early Oligocene age (N.asperus zone). The basal part of these red claystones is equivalent to the Gurnard Formation (Lower N.asperus zone of Middle Eocene age).

The Top Latrobe unconformity was intersected at 1504.5m bkb (1477.5m bs1). The Latrobe Group is represented by 107.5m of Tertiary sediments directly overlying a granitic basement. The upper 81.5m of Latrobe Group consists of very clean, fine to coarse, light grey sandstones deposited in a beach environment. The basal 26m are mainly sandstones and radioactive siltstones with abundant argillaceous and micaceous matrix, corresponding to

reworked basement. The low to moderate dinoflagellate content and diversity, associated with abundant glauconite, indicates a near-shore marine environment. The basal 26m has been interpreted as a transgressive facies while the upper part (from 1504.5-1586m bkb) represents a regressive facies.

The youngest Latrobe Group sediments are inferred from log correlations with Moray-1 to be at least early Eocene age (see section 5.2).

The oldest sediments found overlying the basement belong to the Palaeocene Lower <u>L.balmei</u> zone and the presence of the dinoflagellate <u>E.crassitabulata</u> confirms that Middle Palaeocene sediments are also present.

Granitic basement was intersected at 1612m bkb (-1585m bsl) and was drilled from 19m to TD at 1631m bkb. The first two metres comprised an altered granite wash rich in clays, containing L.balmei spores.

There were no palynological indications of Cretaceous section within Mudskipper-1. This lack of Cretaceous section is further confirmed from log correlations between Moray-1 and Mudskipper-1.

4.2 Mudskipper Structure

All the horizons were 80m to 120m shallower than prognosed and the Maastrichtian target is absent at Mudskipper-1 location (Table 2). The discrepancy between actual and prognosed depths results mainly from the uncertainty in seismically picking the Base Gippsland Limestone and, to a lesser extent, slower-than-expected velocities within these limestones. (There is no velocity control for this interval at Moray-1.) These factors result in a 108.5m discrepancy for the Top Lakes Entrance Formation, which is maintained down to TD. The isopachs for the upper and lower Lakes Entrance Formation (TL1 and TL2) were correctly prognosed.

Major lithological changes in the Palaeocene regressive sequence between Moray-1 and Mudskipper-1 result in slower velocities in these clean, very porous sandstones at Mudskipper and explain why the Latrobe Group section was thinner than prognosed (87m versus 125m).

Comparison of the seismic interpretation before and after the drilling of Mudskipper-1, using a vertically exaggerated composite regional section (GF88C-7 through Moray-1; GF88C-10; and GF88C-19 through Mudskipper-1), illustrates that the section was correctly tied at Moray-1 and correctly jump-correlated across the Southern Boundary Fault onto the Southern Platform (Figs. 1 and 3). This display also shows how the Top Maastrichtian (Top UK5) was mistied to a strong seismic event just north of the well location, which now correlates with the top of the basal transgressive unit of the Palaeocene PL1 sequence in Mudskipper-1. This mistie resulted in the incorrect prognosis that the Maastrichtian would pinch-out by onlap south of Mudskipper-1 (Figs. 1 and 2).

Checkshot calibration of the Latrobe Group sequence in Mudskipper-1 highlights how this mistie occurred. Probable palaeo-escarpments in the eroded basement effectively localized the lap-out of both the Campanian and Maastrichtian sections about 1 km north of Mudskipper-1 (Fig. 3 and Encls. 1, 2 and 3). These palaeo-geomorphological features are thought to be expressions at the erosion surface of north-hading faults, probably splays from the Southern Boundary Fault. Without the hindsight of the well results, however, standard interpretational criteria such as seismic event continuity (although this is hampered where the reflectivity dims markedly over the escarpment features); jump correlation of seismic character; and consistency of isochron interval below the Gurnard Formation suggest that the uppermost Maastrichtian (UK5) laps out south of Mudskipper-1. Rapid facies changes within the upper prograded (notably downlapping clinoforms) and lower transgressive sections of the Palaeocene have therefore resulted in unpredicted reflectivity changes which created the clear but mistaken impression that the Maastrichtian extends south of Mudskipper-1.

4.3 Reservoir

The main target reservoirs were not found in Mudskipper-1. The secondary targets within the Tertiary Latrobe Group proved to be excellent reservoirs with better than predicted characteristics.

Within the upper 81.5m of Eocene and Palaeocene regressive sequence, 80.4m are gross reservoir (Vshale < 40%; porosity > 6%) (gross reservoir to gross interval thickness ratio = 98.5%). Average porosities are 28.6% in the Eocene Sequence and 23.1% in the Palaeocene Sequence. In the basal transgressive sequence from 1586-1612m bkb, 9.5m are gross reservoirs giving a gross reservoir to gross interval thickness ratio of 36.5%. The average porosity in these reservoirs is 20.9%.

4.4 Hydrocarbon

No hydrocarbon shows in the form of fluorescence and cut in cuttings or mud gas anomalies were encountered while drilling Mudskipper-1. Subsequent log evaluation confirmed that the sandstones were water wet.

5. CORRELATIONS BETWEEN MUDSKIPPER-1 AND MORAY-1

The stratigraphic picks at Mudskipper-1 and the correlations between Mudskipper-1 and Moray-1 are summarised in Table 3 and illustrated for the Latrobe Group section on a cross section on Enclosure 3.

The geology of the basal Seaspray Group (including the Gurnard Formation), the Eocene and Palaeocene sections, together with the correlation of these units between the two wells Mudskipper-1 and Moray-1, is discussed below.

5.1 Base Lakes Entrance Formation

The base Seaspray Group is characterized in Mudskipper-1 and Moray-1 by 30m of red silty sandy offshore claystones perfectly correlatable on log responses (high GR, sonic break on top and bottom, very high NPhi and high Rhob response) and on palynological

data (<u>N.asperus</u> zone). The basal 5m within the Lower <u>N.asperus</u> zone (<u>D.heterophlycta</u> dinoflagellate zone) of middle Eocene age makes it equivalent to the Gurnard Formation, although there is no apparent lithological change or log break at that level.

5.2 <u>Latrobe Eocene Section</u>

The youngest Latrobe sediments found in Moray-1 were dated as Early Eocene by the presence of <u>M.diversus</u> with <u>B.elongatus</u> spores at 1694m bkb (SWC) in a thin (3.5m) radioactive layer 14.5m below the Top Latrobe Unconformity.

In Mudskipper-1, no age dating was possible above the transgressive Palaeocene sequence as all samples above that level are extemely lean in spores and dinoflagellates. Thickness and good log correlations with Moray-1 strongly suggest that the Early Eocene section is present in Mudskipper-1 where it corresponds to the 20.5m of sandstones at the Top Latrobe. As in Moray-1, the base of the Eocene corresponds to a radioactive siltstone rich in chlorite, biotite and glauconite.

5.3 <u>Latrobe Palaeocene Section</u>

The Palaeocene section intersected at Mudskipper-1 is characterized by two distinct units. The upper unit down to 1586m bkb corresponds to an extremely clean sandstone interpreted as beach sandstone and referred to here as the Palaeocene regressive sequence. No age dating was possible in this interval.

The lower unit, directly overlying the basement, is composed of sandstones interbedded with radioactive siltstones assigned to the Lower <u>L.balmei</u> zone. The dinoflagellates present in this interval include the distinctive <u>E.crassitabulata</u>, indicating a middle Palaeocene age. This lower sequence is referred to as the transgressive sequence and is significantly less argillaceous than the equivalent section (<u>E.crassitabulata</u> zone) in Moray-1.

Unfortunately, no dipmeter data is available in Mudskipper-1 (tool failure) from which to verify the definition of transgressive and regressive sequences.

In Moray-1, the regressive sequence has a similar thickness to Mudskipper-1 (65.5m versus 61m), corresponding to a coarsening up sequence with near-shore sandstone at the top and shallow marine sandstone to offshore marine shales at the base. The Top Palaeocene was found to contain the dinoflagellate A.homomorpha.

The beach facies found in Mudskipper-1 are of limited lateral extent and pass northwards into shallow marine facies at Moray-1. On the seismic line GF88C-19 (Figs. 1 and 3), downlaps onto the basal regressive sequence are evident and are interpreted as marking the limit of the beach facies. These are localised above scarps in the underlying basement.

The top of the transgressive cycle has been picked at 1761.5m bkb (-1751.5m bsl) at Moray-1 where it corresponds to the top of the radioactive siltstone and to the appearance of E.crassitabulata.

The base of the Palaeocene transgressive cycle in Moray-1 contains the dinoflagellate <u>T.evittii</u>, the Early Palaeocene marker in the Gippsland Basin. This marker is not present in Mudskipper-1.

Between Moray-1 and Mudskipper-1, a thick section of the Palaeocene transgressive cycle is lost first by onlap onto the underlying Cretaceous section and further south by direct onlap onto the basement (Encl. 3). The maximum thinning takes place along the basement scarps. From the new seismic interpretation, the Palaeocene transgressive sequence is now expected to pinch-out just south of Mudskipper-1, a position equivalent to the pre-drilling pinch-out limit predicted for the Maastrichtian section (Fig. 2).

5.4 Cretaceous Section

All the Cretaceous units (Upper $\underline{T.longus}$, $\underline{T.lilliei}$ and $\underline{C.triplex}$ zones) present in Moray-1 are missing at Mudskipper-1 owing to pinchout north of the well location (Encl. 3).

6. POTENTIAL FOR FURTHER EXPLORATION IN MUDSKIPPER AREA

The concept of a Cretaceous pinch-out play resulting from onlap onto a basement nose with top seal provided by the transgressive Palaeocene cycle remains valid north of Mudskipper-1. The new depth map (Top UK5) based on Moray-1 and Mudskipper-1 shows that area of closure is not likely to exceed 7 km² compared to 35 km² in the original prognosis. Vertical closure is similarly reduced from 105m originally to a maximum of 40m.

Reserves have not been estimated for this closure as there are many uncertainties concerning the pinchout limit and the thickness of the Cretaceous section. Nevertheless, the reserves potential of this structure will be substantially lower than the original Mudskipper estimates.

The sealing potential envisaged for the play is now downgraded from the original view prior to drilling Mudskipper-1. The Palaeocene section as seen at Moray-1, with its moderate sealing potential, was expected to extend far beyond the southern limit of VIC/P20 with little or no facies change between Moray and Mudskipper. Mudskipper-1 results show that there is a marked facies change in the Palaeocene regressive sequence compared to Moray-1, with the sandier facies at Mudskipper-1. The Palaeocene transgressive sequence thins rapidly by onlap onto basement between Moray-1 and Mudskipper-1, pinching out approximately 1 km south of Mudskipper-1. The sediments at the base of the transgressive sequence are now known to contain reworked basement material rich in silt and sand with extremely poor sealing potential.

The total absence of any hydrocarbon shows in Mudskipper-1, even in the more argillaceous lithologies, and despite the favourable location of the well in relation to migration, suggests that hydrocarbons never reached the basement platform south of the Omeo Terrace. Geochemical extract analysis on the cuttings in the transgressive Palaeocene interval is presently in progress and is intended to detect any relict hydrocarbons. The high seal and hydrocarbon charge risk, combined with the greatly reduced size of the Mudskipper structure, militate against the drilling of an additional well on this play.

This is an enclosure indicator page. The enclosure PE903060 is enclosed within the container PE903059 at this location in this document.

The enclosure PE903060 has the following characteristics:

ITEM_BARCODE = PE903060
CONTAINER_BARCODE = PE903059

NAME = Composite Seismic section pre drilling

interp

BASIN = GIPPSLAND PERMIT = VIC/P20

TYPE = SEISMIC SUBTYPE = SECTION

DESCRIPTION = Composite Seismic Section pre Drilling

Interpretation Mudskipper 1 Fig 1.

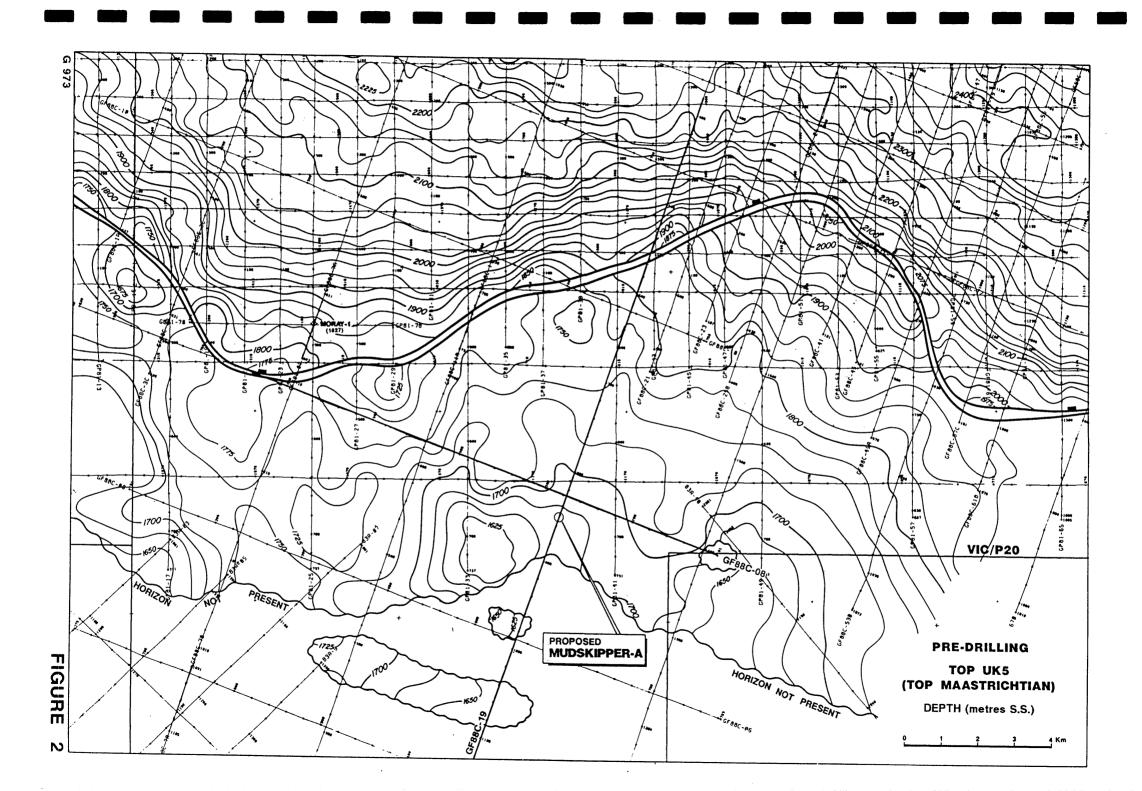
REMARKS =

DATE_CREATED = 31/07/90 DATE_RECEIVED = 6/11/91

 $W_NO = W1032$

WELL_NAME = Mudskipper-1

CONTRACTOR = Petrofina Exploration Australia S.A CLIENT_OP_CO = Petrofina Exploration Australia S.A



This is an enclosure indicator page. The enclosure PE903061 is enclosed within the container PE903059 at this location in this document.

The enclosure PE903061 has the following characteristics:

ITEM_BARCODE = PE903061
CONTAINER_BARCODE = PE903059

NAME = Composite Seismic section post drilling

interp

BASIN = GIPPSLAND PERMIT = VIC/P20

TYPE = SEISMIC SUBTYPE = SECTION

DESCRIPTION = Composite Seismic Section Post Drilling

Interpretation Mudskipper 1 Fig 3.

REMARKS =

DATE_CREATED = 31/07/90 DATE_RECEIVED = 6/11/91

 $W_NO = W1032$

WELL_NAME = Mudskipper-1

CONTRACTOR = Petrofina Exploration Australia S.A CLIENT_OP_CO = Petrofina Exploration Australia S.A

TABLE 1
FORMATION AND SEISMIC TOPS, MUDSKIPPER-1

Horizon	Depth (RKB)m	Depth (SS)m	TWT sec		
Sea Level	27.0	0			
Seafloor/Gippsland Limestone	101.0	(-74.0)	-		
Lakes Entrance Formation	615.5 ?	(-588.5?)			
Intra Lakes Entrance	1175.0	(-1148.0)	1.025		
Top Radioactive Shales (Late Eocene-Early Oligocene)	1475.0	(-1448.0) 	1.242 		
 Top Gurnard Formation (Middle Eocene)	1499.0 ?	(-1472.0?) 	1.258 		
 Top Latrobe Group (Early Eocene)	1504.5	(-1477.5)	1.262 		
 Top Palaeocene Regressive Cycle	1525.0	(-1498.0)	 1 <u>.</u> 276 		
Top Palaeocene Transgressive Cycle (Radioactive Siltstone)	1586.0	(-1559.0)	1.302		
Top Basement	1612.0	(-1585.0)			
Total Depth	1631.0	(-1604.0)			

TABLE 2

MUDSKIPPER-1

PROGNOSED AND ACTUAL DEPTHS AND SEISMIC TOPS

EPTH	THICKNESS	TWT	DEPTH	THICKNESS	TWT	
bsl		(ms)	(m bsl)		l ms J	(m)
	68			 74.0		 +6.0
68	629	91	74.0	514.5?	- 	-114.5
697 		616	588.5		561	
	546			559.5?		+13.5
243		1008	1148.0		1025	
иот ј			1448.0		1242	-
CKED	321			324.0		+3.0
564		1239	1472.0		1258	
! 	5			 5.5		+0.5
569		-	1477.5		1262	
 	12			20.5		+8.5
581		1261	1498.0	 	 1276 	-
TON			1559.0		1302	
CKED	91			 87.0		 -4.0
672		1312	NOT			-
[34		PRESENT	 0 		-34.0
706		1332	1585.0		1312	
ļ	14			19.0		+5.0
720 		-	1604.0			
	68 697 243 NOT CKED 564 569	EPTH THICKNESS bs1) 68 68 629 697 546 243 NOT CKED 321 564 5 572 34 706 14	EPTH THICKNESS TWT	EPTH THICKNESS TWT DEPTH	EPTH THICKNESS TWT DEPTH THICKNESS Mst DEPTH THICKNESS Mst DEPTH THICKNESS Mst DEPTH DEPTH	THICKNESS TWT DEPTH THICKNESS TWT bs1)

TABLE 3

CORRELATIONS BETWEEN MUDSKIPPER-1 AND MORAY-1

HORIZON	HUDSKIPPER-1			MORAY-1			
	DEF mbkb	TH mbsl	THICK NESS	DEI mbkb	TH mbsl	THICK NESS	
Sea Level	27.0	Đ		10.0	0		
Water Depth			74.0			76.0	
Seabed Floor/Gippsland Limestone	101.0	74.0		86.0	76.0	 	
Gippsland Limestone			514.5?	,		550.0?	
Top Lakes Entrance Formation	615.5?	588.5?		636.0?	626.0?		
Upper Lakes Entrance		•	559.5?		i 	645.0?	
Intra Lakes Entrance Unconformity	1175.0	1148.0		1281.0	1271.0		
Lower Lakes Entrance			300.0			367.0	
Top Red Shales	1475.0	1448.0		1648.0	1638.0	 	
Late Eocene	,		24.0	 		25.0	
Top Gurnard	 1499.0?	1472.0?	 	1673.0	1663.0		
Mid Eocene			5.5		! -	5.0	
Top Latrobe Group	1504.5	1477.5		1678.0	1668.0		
Early to Mid Eocene		; ;	20.5			18.0	
Top Palaeocene Regressive Cycle	1525.0	1498.0	l 	1696.0	1686.0		
Palaeocene Regressive Cycle		į	61.0			65.5	
Top Palaeocene Transgressive Cycle	1586.0	1559.0	 	1761.5	1751.5		
Palaeocene Transgressive Cycle		3	26.0			75.5	
Top Cretaceous	Absent	Absent		1837.0	1827.0		
Cretaceous Section		} 	0	_		>833.0	
Top Basement	1612.0	1585.0	1 	Not Peached	Not Reached	i, 	
Total Depth	1631.0	1604.0	>19.0			; ;	

This is an enclosure indicator page. The enclosure PE903062 is enclosed within the container PE903059 at this location in this document.

The enclosure PE903062 has the following characteristics:

ITEM_BARCODE = PE903062
CONTAINER_BARCODE = PE903059

NAME = Structure Map/Horizon contour top UK 5

BASIN = GIPPSLAND PERMIT = VIC/P20 TYPE = SEISMIC

SUBTYPE = HRZN_CONTR_MAP

DESCRIPTION = Mudskipper Prospect Top UK 2 (Top Maastrichtian) Horizon Contour Map Encl. 1. two way travel in msec

REMARKS =

DATE_CREATED = DATE_RECEIVED =

 $W_NO = W1032$

WELL_NAME = Mudskipper-1

CONTRACTOR = Petrofina Exploration Australia S.A CLIENT_OP_CO = Petrofina Exploration Australia S.A

This is an enclosure indicator page. The enclosure PE903063 is enclosed within the container PE903059 at this location in this document.

The enclosure PE903063 has the following characteristics:

ITEM_BARCODE = PE903063
CONTAINER_BARCODE = PE903059

NAME = Structure Map/Horizon contour top UK 5

depth in m

BASIN = GIPPSLAND PERMIT = VIC/P20

TYPE = SEISMIC
SUBTYPE = HRZN_CONTR_MAP

DESCRIPTION = Mudskipper Prospect Top UK 2 (Top

Maastrichtian) Horizon Contour Map

Encl. 2. depth in m

REMARKS =

 $DATE_CREATED = 31/07/90$

DATE_RECEIVED = 6/11/91

 $W_NO = W1032$

WELL_NAME = Mudskipper-1

CONTRACTOR = Petrofina Exploration Australia S.A CLIENT_OP_CO = Petrofina Exploration Australia S.A

This is an enclosure indicator page.

The enclosure PE903064 is enclosed within the container PE903059 at this location in this document.

The enclosure PE903064 has the following characteristics:

ITEM_BARCODE = PE903064
CONTAINER_BARCODE = PE903059

NAME = Schematic well correlation Mudskipper

1-Moray 1

BASIN = GIPPSLAND PERMIT = VIC/P20

TYPE = WELL

SUBTYPE = CROSS_SECTION

DESCRIPTION = Schematic Well Correlation Mudskipper 1

- Moray 1

REMARKS = composite of seismic and well log data

DATE_CREATED = 31/07/90 DATE_RECEIVED = 6/11/91

W_NO = W1032

WELL_NAME = Mudskipper-1
CONTRACTOR = Petrofina Exploration Australia S.A
CLIENT_OP_CO = Petrofina Exploration Australia S.A