

Natural Resources and Environment

AGRICULTURE • RESOURCES • CONSERVATION • LAND MANAGEMENT



WELL SUMMARY SNAPPER - 3 (W568)

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SNAPPER-3 (W568)

Well Summary Report

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Well Summary

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COMPLETION REPORT

CONFIDENTIAL

Date June 1, 1970

WELL DATA RECORD

LOCATION

WELL NAME	STATE		PERMIT or	LICERO	CE :	GEOLOGI	CAL BASIN	FIELD
SNAPPER-3	Victo	oria	Vic.	P-1		Gi	ppsland	Snapper
CO-ORDINATES Lat. Surface 38 ⁰ 12'45"S Bottom Hole Straig				Y 286,796	MAP PROJECT Austra Trausve Mercate	ION DES	OGRAPHICAL CORIPTION Eshore: 23 m Lakes Entra les southwes apper-1.	nce; 1.7 t of
			ELEVA	TIONS 8	DEPTHS		•	
ELEVATIONS	WATE	DEFT	TH .	***************************************	TOTAL DI	EPTH		Avg.Angle
Ground .		0064			M.D.	10	,536 ft.	•
KB 31 ft.		.80ft.			T.V.D.			
RT ST 12.	PILIC	BACK	DEPTH		REASONS	FOR P R		
Braden Head	1 200	Brisic		•	TCSTIO OTIO	1010 1 1 1	•	
	. 4	00 ft				Ab	andonment.	
Top Deck Platform			, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			····		
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Esso		Hemat	ite		Well I Permit		,	
CONTRACTOR		RIG	HAME			EQUIPME	NT TYPE	
Global Marine		G1	omar III			Ship Sh	ape Drilling	Vessel
TOTAL RIG DAYS	DRILLING	AFE	NO.	COMPLE	TION NO.		TYPE COMPLE	TION
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LAHEE WELL	Ве	fore	Drilling	Outpo	st	and the second of the second o	The residence of the second se	and a supplication of the transfer and the supplication supplication and their
CLASSIFICATION	Af	ter	Drilling	Aband	loned suc	cessful	outpost.	

II	INITIAL F	RODUCTION TEST	•			
Date	WELL COMPLETION AS: Oil Well		1	Dry	Hole	
Choke size, inch		·	Calculat	ed P.I.		
Length of Test			Calculat	ed A.O.F		
Oil, BPD			Perforat	ions		
Water, BPD			Shut-In	ВИР		
Gas, MCFD		10	Flowing	вир	****	
Gas Liquids, BPD		1000	Shut-In	Tubing Press	~~~	
Gas-Oil Ratio			Flowing-	Tubing Press		
Gravity, API			Flowing	Temper- ature	Printegraph Services Business Services	
			· · · · · · · · · · · · · · · · · · ·		Market and an artist of the second and the second	P TO THE THE PARTY OF THE PARTY
III PEI	REFORATING RECORD (Pr	od test, Complet	ion, DST	, FIT)		en de la company de la comp
INTERVAL	/ 7/7	SERV. CO. P	IFF. RESS.	PERFORAT FLUID	1	SIZE AND TYPE GUN
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					de distribution de la constitución	

IA		CASI	NG - LINER	- TUBING RECO	ORD		
Туре	Size	. Weight	Grade	Thread	No. Joints	Amount	Depth
Conductor	30"x20"	Pile Join		Vetco	1	39.57	
	20''	94	11–40	Vetco	8	342.99	583.56
•							
Surface	13-3/8"	54.5	J-55	Butt.	61	2335.09	2536
Inter- mediate	95/8"	53	N-80	Butt.	3	129.93	
	9-5/8"	40	и-80	Butt.	124	5139.63	5468
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ngay i bayan (B-EC) A Tingki yapa Agastik I Pina Alba (A-E)					i		
AND THE REAL PROPERTY AND	The second secon			·	the production of the control of the		

v	CEMENT RECOR	D .	£ .
String	20"	13-3/8"	9-5/8"
Type of Cement	550 sx w/2% Gel & 500 sx w/2% CaCl ₂	1100 sx w/2% Ge1 550 sx Neat	415 sx w/2% Ge1 & 200 sx w/.4% HR-7
Number of FT ³	1475	2425	900
Average weight of slurry	13.7 ppg/15.7 ppg	13.5 ppg/ _{15.6 ppg}	13.8 ppg/ _{15.4 ppg}
Cement Top	Sea Floor	Sea Floor (Calc.)	3740' (Temp. Svy)
Casing Tested with	0	1500 psi	2500 spi
Number of Centralizers	0	5	23
Number of Scratchers	0	0	0
Stage Collar etc.	0	0	0
Remarks	Gel Prehydrated	Gel Prohydrated	Gel Prehydrated

R.L. Wood Engineer

VI

SUBSURFACE COMPLETION EQUIPMENT

DATE COMPLETED

	DA.	TE COMPLETED	
Schematic	Equipment Description	Length	Depth
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WELL SHAPPER -3

/11	S/	MAPLES, CONVENTIO	OMAL CORES, SW CO	RES	
INTERVAL	TYPE	RECOVERED	INTERVAL	TYPE	RECOVERED
2580-10536 .	Cuttings	Every 10'	:	*	
5414-2550	swc .	Shot 30 Recovered 27			
10500-5746	swc	Shot 60 Recovered 37			·
No conventions	l cores cut				

VIII

WIRELINE LOGS AND SURVEYS (Incl. FIT)

From To	Type & Scale	From	To:
10512-2536	FIT 1 FIT 2 FIT 3 FIT 4	4580 4598 4638 5496	1
10507-2536	FIT 5 FIT 6	4564 4502	
10508-2536	FIT 7 FIT 8	10276 8800	٠
10507-2536	FIT 9 FIT 10 FIT 11	5886 6140 7600	
10501-9474	FIT 12 FIT 13	8388 8387	
5000-4000	Velocity Survey	_	
		Na.	
	10512-2536 10507-2536 10507-2536 10501-9474	10512-2536 FIT 1 FIT 2 FIT 3 FIT 4 10507-2536 FIT 5 FIT 6 10508-2536 FIT 7 FIT 8 10507-2536 FIT 9 FIT 10 FIT 11 10501-9474 FIT 12 FIT 13	FIT 1

B.G. McKay

Geologist

WELL SURVARY

UNFIDENTIAL 568

SNAPPER-3 WELL SUMMARY

TYPE OF WELL: Wildcat.

The Snapper-3 Well was drilled to define PURPOSE OF WELL:

the size of the Snapper Field and to test

the hydrocarbon potential within the downthrown western fault block of the

Snapper structure.

STATUS: Plugged and abandoned.

38⁰ 12' 45" South **LOCATION:** Latitude

Longitude 1470 591 11" East.

Vic/Pl. LEASE:

"Glomar III". RIG:

ELEVATION: Rotary table 31 feet above mean sea level.

180 feet. WATER DEPTH:

SPUDDED: November 24th, 1969.

January 27th, 1970. ABANDONED:

DRILLING TIME: 65 days.

TOTAL DEPTH: 10,536 feet.

CASING: 13 3/8 inch shoe set at 2536 feet.

9 5/8 inch shoe set at 5468 feet.

20 inch shoe set at 583 feet.

CEMENT PLUGS:

Plug No.	<u>Interval (ft.)</u>	Sacks of Cement
1	9210-9500	120 sacks of neat cement with 0.4% HR4. Top tagged.
2	5145-5500	120 sacks of neat cement and 2% Ca Cl_2 .
3	400-600	55 sacks neat cement.

CORES:

No conventional cores were cut. 60 SWC's were attempted and 37 were recovered.

2.

MUDLOGS:

A continuous mudlog record was maintained by Core Laboratories in the interval 2580-10.536 feet (T.D.).

ELECTRIC LOGS:

<u>Log</u>	Run	<pre>Interval (ft.)</pre>
F.I.T.s	1-7 7-13	
IES /	2	5468-10,512
IES	1	2536-5510
FDC	2	5468-10,508
FDC	1	3800-5502
BHCS - Cal	2	5468-10,508
BHCS - Cal	1	2538-5498
MLL /	1	9500-10,508
CDM	1	2536-5502
CDM	2	5468-10,511
Neutron	1	4000-5000

TESTING:

A total of 13 Formation Interval Tests were run, 11 of which were successful.

- F.I.T. No.1 4580 feet Recovered 45 cubic feet gas, 150,000 cc's oil 39° A.P.I. GOR 450.
- F.I.T. No.2 4598 feet Recovered mud with scum of oil (tight zone).
- F.I.T. No.3 4638 feet Recovered formation water.
- F.I.T. No.4 4596 feet Recovered mud only.
- F.I.T. No.5 4564 feet Recovered 98.4 cubic feet gas, 500 cc's condensate, 1000 cc's mud.
- F.I.T. No.6 4502 feet Recovered 95.2 cubic feet gas, 300 cc's condensate, 1700 cc's mud.
- F.I.T. No.7 10,276 feet Packer failed.

TESTING (contd.)

F.I.T.	No.8	8800 feet	<pre>- Recovered l¹/₂ cubic feet gas, 20,000 cc's filtrate (2200 p.p.m. Nq Cl equivalent), scum of oil.</pre>
F.I.T.	No.9	5886 feet	- Recovered 1.1 cubic feet gas, 21,000 cc's filtrate (as above), and scum of oil.
F.I.T.	No.10	6140 feet	- Recovered 0.8 cubic feet gas, 22,000 cc's filtrate (as above) and scum of oil.
F.I.T.	No.11	7600 feet	- Recovered 0.7 cubic feet gas, 21,000 cc's filtrate (as above) and scum of oil.
F.I.T.	No.12	8386 feet	- Packer failed.
F.I.T.	No.13	8387 feet	- Recovered 50 cc's muddy filtrate.

HYDROCARBONS:

The main hydrocarbon zone occurs in lower Lakes Entrance sand and at the top of the Latrobe Valley Formation with gas from 4196 to 4568 feet (net sand 284 feet) and oil in the interval 4578 to 4598 feet (net sand 12 feet).

Minor oil and gas shows were recorded at the following depths:

8796-8817 feet	Small gas kick in sandstone.
9440-9451 feet	Gas sand associated with coal seams.
10261-10362 feet	(Net sand 64 feet) some gas kicks, partly due to coal, and some fluorescence and blue cut.

STRATIGRAPHY:

<u>Formation</u>	Top (R.T.) (ft.)	Subsea (ft.)	Thickness (ft.)
Gippsland Formation	211 (0	3899+
Lakes Entrance Formation	4110	3899	126
Latrobe Valley Formation	4236	4025	6300+

MES:YEF 13.4.70 Melbourne.

SNAPPER - 3

APPENDIX_

LITHOLOGY:

Interval
(ft.)

Gippsland Formation

3113-4110

- Mainly Marl.

Lakes Entrance Formation

4110-4236

- Marl.

<u>Sandstone</u>, brown, very fine grained. <u>Sandstone</u>, medium to very coarse grained, well rounded, well sorted, no fluorescence or cut.

Latrobe Valley

4236-4698 - Sandstone, as above.

Coal.

Mudstone, light grey, calcareous, plant and carbonaceous material.

5190-5510 - As above, with some minor <u>Claystone</u>.

5510-6390 - Siltstone, buff to light brown, carbonaceous.

Coal, grading to carbonaceous Shale.
Sandstone, light grey, quartzose,

dolomitic, sub-angular to angular, fine

to coarse grained, yellow mineral

fluorescence.

6390-7415 - Shale, light to medium brown, carbonaceous.

<u>Siltstone</u>, white to light brown, occasionally sandy and dolomitic.

<u>Coal</u> some bleeding gas.

Sandstone, white, very fine to fine grained, light, dolomitic in part,

mineral fluorescence.

7415-8004 - <u>Shale</u>, as above.

<u>Siltstone</u>, as above.

Sandstone, as above, at 7880 feet showed

fluorescence and cut.

8004-9160 - Shale, as above, with occasional sand

stringers.

Coal.

Siltstone, light grey to brown, hard and some sandy, carbonaceous, traces of

Coal and Sandstone.

Sandstone, white to grey, very fine to

Latrobe Valley (contd.)

fine grained, sub-angular, partly dolomitic, tight, some mineral fluorescence.

9160-10,340

<u>Sandstone</u>, light grey, quartzose, dolomitic in part, blue and yellow fluorescence, mainly mineral, but occasional blue cut at below 10,250 feet. <u>Shale</u>.

<u>Siltstone</u>, dark brown-grey, carbonaceous, micaceous.

Coal.

10,340-10,536

Sandstone, white, quartzose, dolomitic cement, decreasing kaolinic cement increasing, occasional slight blue cut, no definite hydrocarbon fluorescence visible.

Siltstone, dark brown-grey, soft,

Siltstone, dark brown-grey, soft carbonaceous.

Shale.
Coal.

BA 14/20

MES:YEF Melbourne.

IX		FORM	ATION TOPS/Zones			
NAME	Tops		Gross	Net	Pay (ft).	REMARKS
	M.D.	Sub-sea	Interval (ft)	Gas	011	ACT WILLY
GIPPSLAND FM.	Sea	Floor	3960		`	
GURNARD FM.	4174	-4143	77	34		
LATROBE N-1	4251	-4220			·	
N-1.1	4251	-4220	155	140		. ,
N-1.2	4406	-4375	181	118	,	
,		• .				
N-1.3	4587	- 4556	· 87	4	-	•
Gas-water conta	ct 4600	-4569	(110			
N-1.4	4674	-4643	91			· ·
N-1.5	4765	-4734	74		() () () () () () () () () ()	
N-1.6	4839	-4808	145	•		
N-1.7	4984	- 4953	207			
M. diversus	4855	-4824	1063			
L. balmei .	5918	- 5887	3458			
T. lillici	9370	- 9339	1166+			
	•					
-						
		,				
			1		1	I

X GEOLOGIC ANALYSIS (Pre Drilling prognosis Vs actual results)

There were two main objectives in drilling the Snapper-3 outpost.

- (i) to evaluate reservoir character of any younger section and hydrocarbon distribution in the N-1 reservoir in the western fault block.
- (ii) to provide further information on the possibility of commercial intra-Latrobe sands.

In the Latrobe N-1 where correlations are very good, over 100' of new younger section was encountered as expected and this proved to contain excellent quality reservoir sands. The gas-water contact was essentially the same as found in Snapper -1 and Snapper -2_x indicating that the faults which intersect the structure are probably not barriers.

In the intra-Latrobe, no significant shows were recorded. Snapper-3 runs between 350' and 1000' down dip from Snapper-1 and this may account for the lack of hydrocarbons.

Also a non-sealing fault between Snapper -1 and 3 would preclude the possibility of separate fault controlled reservoirs. Sand quality decreases markedly below 8600.

This is an enclosure indicator page. The enclosure PE905077 is enclosed within the container PE905074 at this location in this document.

The enclosure PE905077 has the following characteristics:

ITEM_BARCODE = PE905077

CONTAINER_BARCODE = PE905074

NAME = Structure Map

BASIN = GIPPSLAND

PERMIT = VIC/P1

TYPE = SEISMIC

SUBTYPE = HRZN_CNTR_MAP

REMARKS =

DATE_CREATED =

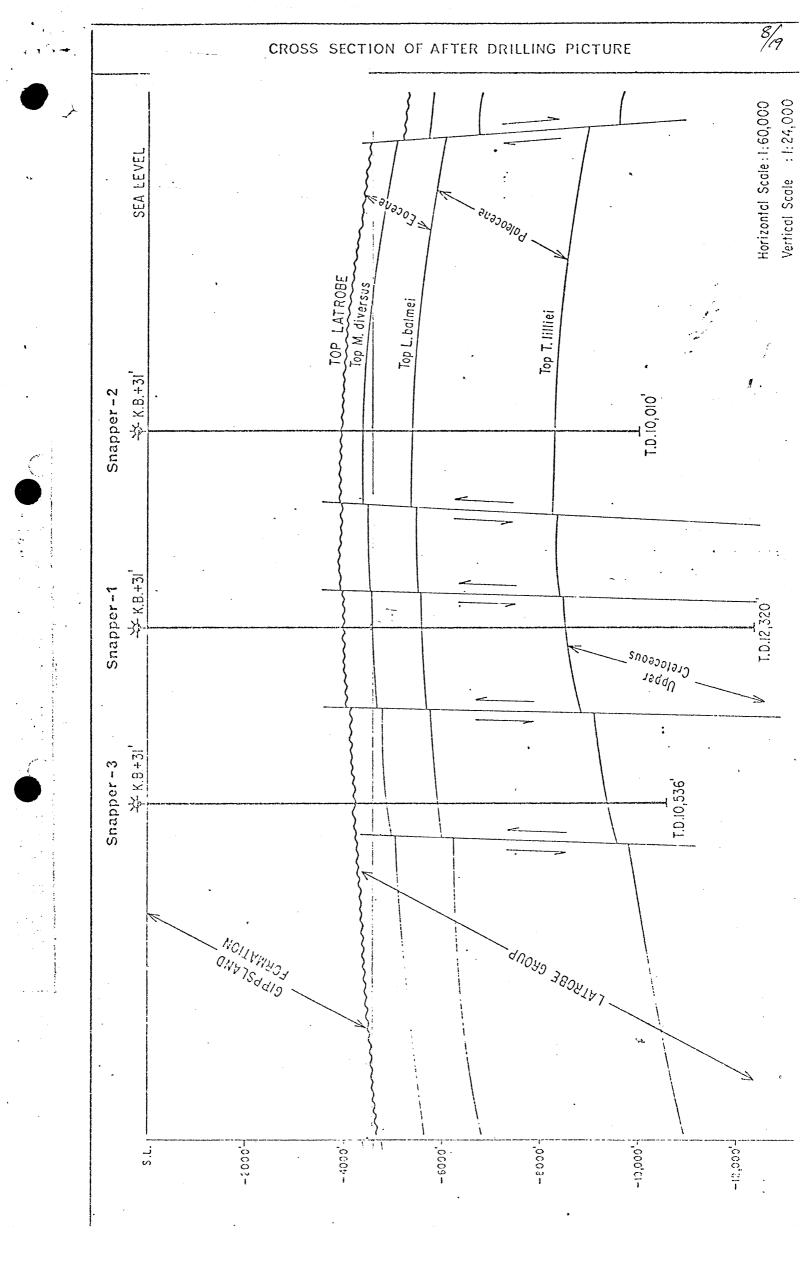
DATE_RECEIVED =

 $W_NO = W568$

WELL_NAME = SNAPPER-3

CONTRACTOR =

 $CLIENT_OP_CO = ESSO AUSTRALIA LIMITED$



SIDEWALL CORE DESCRIPTIONS

_	
R_{\star}	
{< .	

Depth	Recovery	Description
5414'	<u></u> 5∥	Shale; dark grey and brown, fissility increasing; thin laminae and lenses of silt, very slightly calcareous, micaceous.
5250'		No recovery
5030'	½ II	Shale; light grey to buff colour, banded, crumbly slightly micaceous, very slightly calcareious, abundant pyritic lenses. Faint bedding visible due to pyrite lenses, colour banding and silty layers.
4842'	<u> </u>	Silty Shale; dark grey, crumbly slightly micaceous even parallel bedding apparent due to variable amounts of silt.
4770'	3/4"	Sandstone; (Quartz wacke) extremely clay choked sand. Dark brown, poorly sorted; fine, very coars to conglomeratic sub-rounded-rounded quartz. Soft unconsolidated.
4708'	1월"	Mudstone; light grey buff, homogenous, no trace of bedding, crumbly, non calcareous.
4630'	<u></u> 출개	Sandstone; even parallel, dark brown and black carbonaceous laminae. The sand is buff to very light grey, well sorted, fine-medium grained sub-rounded-rounded, slightly micaceous, no matrix discernable. Unconsolidated. No fluoresence. Goo porosity and permeability.
4616'	1"	Sandstone; light grey to white, even textured, we sorted, fine grained, sub-angular quartz, slightly silty, slightly micaceous. Unconsolidated. Scattered carbonaceous fragments, non calcareous. No fluorescence. Good porosity and permeability.
4598'	1"	Sandstone; dark brown, very poorly sorted and clay choked; medium-very coarse grained, sub-rounded-rounded quartz. Carbonaceous matter common. Non calcareous, soft, mushy. Banded, light blue and yellow-green fluorescence, occurring where porosity slow weak light blue cut. Very poor porosity and permeability.
45941	출 ''	Shale with scattered grains of coarse to granular sub-rounded-rounded quartz. Shale; dark brown non-calcareous, pyritic, carbonaceous, crumbly. No fluorescence - very tight. No porosity and permeability.
4582'	1"	Sandstone; medium brown, abundant clay matrix. Moderately sorted tends to be bimodal, medium to very coarse with scattered granular, sub-rounded-rounded quartz grains; very slightly micaceous. Moderate porosity and permeability. Scattered points and banded light yellow fluorescence. Immediate weak, light blue cut.
4522'	<u>1</u> 411	Shale; very light grey to buff micaceous scattered carbonaceous fragments no trace of bedding, crumb
4249		No recovery.
42331		No recovery.
		•

2550

1"

Depth	Recovery	Description
4220'	1"	Sandstone; light-medium grey, well sorted, fine to medium, sub-angular to sub-rounded quartz grains. Abundant scattered medium glauconitic grains, slightly micaceous. Matrix sparse, one thin argillaceious lamina. Medium porosity and permeability. No fluorescence.
4206'	1"	Sandstone; as above with greater volume of glauconite and matrix material.
4198	1"	Glauconitic Sandstone; light grey-green, moderately sorted. Fine to medium, sub-angular sub-rounded quartz grains slightly silty in part, slightly pyritic and micaceous. Approximately 30% medium, rounded glauconite grains. Sparse clay matrix. Medium porosity and permeability. No fluorescence, soft crumbly.
4190'	1"	Silty Sandy Mudstone; very dark grey, very hard dense, scattered glauconite (medium grain rounded), micaceous coarse - very coarse rounded quartz grains. Non calcareous.
4180'	1"	Silty Glauconitic Mudstone; hard, compact 60% glauconite grains (medium rounded) slightly micaceous, scattered white clay lenses. Clay is very dark grey. Slightly calcareous.
4130'	1"	Fossiliferous Mudstone; medium grey, homogeneous, compact, abundant scattered Foraminifera and bryozoal fragments. Very calcareous.
4010 '	1"	Fossiliferous Mudstone; as above light grey.
3910'	1"	Fossiliferous Mudstone; as above, light green grey, and thin laminae of white silt.
3750'	1"	Fossiliferous Mudstone or Marl; as above, apparent increase in calcareous content.
3600'	1½"	Fossiliferous Mudstone or Marl; as above; grey-green, pyritic.
3400'	1"	Fossiliferous Mudstone or Marl; as above.
3200'	1"	Fossiliferous Mudstone or Marl; as above. Light grey-green.
3000'	1"	Fossiliferous Mudstone or Marl; as above.
2850'	1"	Fossiliferous Mudstone or Marl; as above.
2700'	1"	Fossiliferous Mudstone or Marl; as above.

Fossiliferous Mudstone or Marl; as above.

BIOSTRATICRAPHY

INTERPRETATIVE

PALYNOLOGY OF SNAPPER -3 AND REVIEW OF SNAPPER -1 AND -2

bу

P.R. Evans

Palyn. Rept. 1970/33

July 1970.

INTRODUCTION

Samples from Snapper -3 were received on a routine basis for analysis during January 1970. They have been studied with a view to aiding correlations between wells on the Snapper structure, and as part of regional studies, particularly concerning the \underline{T} . $\underline{\text{lilliei/L}}$. $\underline{\text{balmei}}$ Zone boundary and the dinoflagellate content of the $\underline{\text{N}}$. $\underline{\text{goniatus}}$ Zone.

The following report briefly summarizes data obtained from Snapper -3 by July 1970.

Some of the data obtained from Snapper -3 necessitated modification to views expressed about Snapper -1 and Snapper -2 in previous reports. Consequently data from the earlier wells have also been reviewed and correlations between them expressed graphically in the attached diagram.

Previous palynological reports concerning the Snapper well include: 1969/1, 1969/11, 1969/13, 1970/21.

MIERPRETATIVE

SUMMARY OF DETERMINATIONS SNAPPER -3

Sam	ple	Depth (ft)	Age	Zone
swc	16	4206	Late Eocene	N. asperus (0. dictyoplokus)
11	15	4220	11	u ·
11	12	4522	Eocene undiff.	N. asperus
11	11	4582	11	tt
11	10	4594	II	tt ·
11	9	4598	II	
11	6	4705	· tt	P. asperopolus
***	4	4842	?Early Eocene	P. asperopolus/u. M. diversus (Wetzeliella undiff.)
11	58	5970	Paleocene	L. balmei
11	57	6 306	fī	tt
11	55	6950	11	11
11	54	72 74	II .	tt
11	47	8750	ti	tt .
11	45	8934	11	tt
11	40	9378	· II	n .
*1	34	9948	ff · ·	11
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11	3	10409	11	Undiff.

MTERPRETATIVE

COMMENT ON SNAPPER -3

Both divisions of the N. goniatus Zone are well represented in Snapper -3. The samples are grouped into two: the upper, from immediately below the Miocene probably represent the O. dictyoplokus Zone, the dinoflagellate zone detected by L.E. Stover within the N. asperus spore-pollen zone (see palyn. rept. 1970/28 in prep.). Whether or not the underlying N. extense dinoflagellate zone is present at Snapper -3 remains unknown in view of the gap between the upper sample group and the lower with very few dinoflagellates.

The <u>P</u>. asperopolus Zone is well represented at 4705' with a 10% abundance of <u>P</u>. asperopolus and <u>P</u>. pachypolus. The sidewall core at 4842' carries a high proportion of <u>T</u>. harrisii relative to <u>Nothofagidites</u> and to be consistent with previous determinations should be at the base of the <u>asperopolus</u> Zone or the top of the <u>M</u>. diversus Zone. The few dinoflagellates from this horizon are consistent with those in the Flounder Formation (Palyn. Rept. 1970/2) but are insufficient to indicate which zone is represented (Palyn.Rept.1970/21).

The sample gap between 4842 and 5970 feet precludes accurate determination of the diversus/balmei boundary.

Allocation of the sidewall core 9948 feet to the <u>balmei</u> Zone and 10,012 feet to the <u>lilliei</u> Zone provides a relatively precise determination of the top of the <u>lilliei</u> Zone. This is based on criteria used at e.g. Barracouta and Tuna to identify the change between zones. If modifications to this choiceappear necessary, the boundary should be lowered rather than raised.

The residue obtained from 10,409 feet was insufficient to determine whether the stratum at that depth should be referred to the T. lilliei or N. senectus Zone.

INTERPRETATIVE

CORRELATION BETWEEN SNAPPER 1, 2 AND 3

Sampled horizons in Snapper 1, 2 and 3 and the zones to which they are allocated are plotted in the attached figure.

N. goniatus Zone

The <u>P</u>. asperopolus Subzone of the <u>N</u>. goniatus Zone is represented by two samples in each well. The lower of each pair displays the high proportion of <u>T</u>. harrisii relative to Nothofagidites and the upper in a <u>P</u>. asperopolus/pachypolus count of 5-10%.

The overlying N. asperus Subzone is thickest in Snapper -3 where at the top of the zone species representing the O. dictyoplokus dinoflagellate zone are present in greensand. Stover (Palyn. Rept. 1970/21) tentatively referred main cores from Snapper -1 at 4105 and 4122 feet to the O. dictyoplokus Zone. If correct the dictyoplokus Zone extends into the quartzose sandstone portion of the asperus Subzone. Stover tentatively referred Snapper -2, 4232 feet to the D. extensa dinoflagellate Zone. Although the dinoflagellates are not abundant, based on Stover's determinations, it is apparent that most of the N. asperus Zone represents the D. extensa and O. dictyoplokus Zones at Snapper.

M. diversus Zone

Poorly represented by samples in any of the Snapper wells. Abundant dinoflagellates from Snapper -1 4586 feet, in the upper M. diversus Zone are indicative of the W. thompsonae dinoflagellate zone, as seen in the Flounder Formation (Palyn. Repts. 1970/2; 1970/21). The vertical extension of the thompsonae Zone at Snapper is unknown: only the core sample from Snapper -1, 4614 feet underlay the dinoflagellate horizon, but unfortunately was barren. Furthermore a large gap occurs between the upper and lower diversus Zone samples in Snapper -1 and -2 so that the transition from one subdivision to the next cannot be determined with useful accuracy.

L. balmei Zone

Assemblages indicative of the top of the <u>L</u>. <u>balmei</u> Zone are present in the highest samples referrable to that zone in each well, and there is no reason to suppose other than continuous deposition occurred from <u>balmei</u> into lower <u>diversus</u> time.



The zone is well represented by samples: all require more detailed study if subdivision of the zone is to be attempted. Dinoflagellates are generally absent from the Zone, although rare specimens were observed in Snapper -2 at 6608 feet.

The base of the <u>balmei</u> Zone is taken to the deepest occurrence of <u>Tripunctisporis</u> sp. prior to a rise in abundance of <u>Nothofagidites</u> spp.

T. lilliei Zone

On current means of definition, the top of the \underline{T} . $\underline{1illiei}$ Zone is relatively accurately located in Snapper -3 between 9948 and 10012 feet. This is at a greater depth than in Snapper -1 and -2, explicable in terms of the fault between the -1 and -3 wells.

General

Re-examination of samples from Snapper-1 and -2 showed that choice of the top of the 1111iei Zone needed to be lowered in those wells. In the -2 well the boundary appears to lie between 8620 and 8736 feet, but if quantitative data are taken into account to accord with data from Snapper -3, a boundary between 8736 and 8910 feet in Snapper -2 might be a better choice. This indicates a throw of about 1200 feet on the fault between Snapper -1 and -3 at the level of the top of the T. 1111iei Zone. As there is about 350 feet difference in structural elevation between the top of the diversus Zone in these wells, about 850 feet of this throw developed during balmei and diversus zone. Comparison of logs indicates that little of this throw developed during deposition of the M. diversus Zone.

INTERPRETATIVE

DATE

WELL	NAME	SNAPP	ER -3			ELE	VATION	<u>+31 f</u>	eet			
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AGE		PALYNOLOGIC ZONES	Preferred Depth	Rtg.	Alternate Depth	Rtg.	2 way time	Preferred Depth	Rtg	Alternate Depth	Rtg.	2 way time
)_IG-	<u>P</u> .	tuberculatus										
-	U.	N. asperus										
	М.	N. asperus	-									
	L.	N. asperus	4206	0				4598	1			
NE	<u>P</u> .	asperopolus	4705	1			-	4842	1			
EOCENE	υ.	M. diversus										
	М.	M. diversus										
	L.	M. diversus										
9	υ.	L. balmei	5970	1				6806	7			
PALEOCE	L.	L. balmei	6950	2				7274	1			
PAL	<u>T</u> .	longus	8750	2				9948	2			
	T.	lilliei	10012	2				10253				
SOOS	N.	senectus				٠						
L 7 CRETALEOUS	<u>c</u> .	trip./T.pach	•									
CRE	<u>c</u> .	distocarin.	·									
	T.	pannosus								•		
EA	RLY	CRETACEOUS										
R	E-CF	RETACEOUS										
COMM	ENTS	3:										

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RATINGS:

- SWC or CORE, EXCELLENT CONFIDENCE, assemblage with zone species of spores, 0; pollen and microplankton.
- SWC or CORE, GOOD CONFIDENCE, assemblage with zone species of spores and pollen or microplankton.
- SWC or $\overline{\text{CORE}}$, $\underline{\text{POOR CONFIDENCE}}$, assemblage with non-diagnostic spores, pollen and/or microplankton.
- ${\tt CUTTINGS}$, ${\tt FAIR}$ ${\tt CONFIDENCE}$, assemblage with zone species of either spore and pollen or microplankton, or both.
 CUTTINGS, NO CONFIDENCE, assemblage with non-diagnostic spores, pollen and/or
- 4; microplankton.

If a sample cannot be assigned to one particular zone, then no entry should be made. NOTE: 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: LES /A.D.P.	DATE June 1971; Dec. 1971
DATA REVISED BY: A.DP.	DATE <u>Jan. 1975.</u>

BY _ Quand TAYLOR

WELL RAME SNAPPER -3

DATE 22 April 197/ FLEV. ±3/

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¹ SWC or Core . Almost complete assemblage (high confidence).

² SNC or Core - Close to zonute change but able to inverprat (low confidence).

³ Guttings - - Complete assemblage (for confidence).

[&]quot; Incomplete assemblege, next to interestable or SVC with depth suspicion (very low confidence). 4 Cuttings

DATE

SNAPPER -3

ELEVATION

4-31 feet

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RATINGS:

- O; SWC or CORE, EXCELLENT CONTINENCE, assemblage with zone species of spores, pollen and microplankton.
- 1; SWC or CORE, GOOD CONFIDENCE, ascemblage with zone species of spores and
- pollen or microplankton.

 2; SWC or COPE, POOR COMPIDENCE, assemblage with non-diagnostic spores, pollen and/or microplankton.
- 3; CUTTINGS, FAIR CONTIDENCE, assemblage with zone species of either spores and pollen or microplankton, or both.
- 4; CUTTINGS, NO COMFIDENCE, askemblage with non-diagnostic spores, police and/or microplankton.

NOTE:	If a sample cannot be assigned to one particular sone, then no entry should be made
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DATE RECORDE	D BY: L.E.S.		2000 1971
DATA REVISED	By: Corrected E.E.		Pac. 1971

ANALYSES

CORE LABORATORIES, INC. Petroleum Reservoir Engineering DALLAS. TEXAS March 4, 1970

Esso Standard Oil (Australia) Ltd. G. P.O. Box 4249 Sydney, New South Wales 2001

Attention: Mr. A. C. Pierce

Subject: Core, Mud and Cuttings Analysis

Snapper-3 Well Stepout Field

Offshore-Bass Strait Victoria, Australia

Gentlemen:

A Core Laboratories Australia combination drill cuttings and core analysis unit was present at the site of the subject well during drilling operations from 2580 feet to the total depth of 10536 feet.

Using standard equipment, a Programmed Hydrocarbon Detector and a Beckman Gas Chromatograph, the drilling fluid was monitored continuously for hydrocarbon content and the drill cuttings were checked at regular intervals for gas and oil content and lithology. Shale density determinations were made at regular intervals when applicable. The results of these operations are shown on the accompanying Grapholog.

Hydrocarbon Shows:

Hydrocarbons were detected in one zone during the drilling of this well. Details of this show are included on the attached Show Report No. 1.

Core Analysis:

No cores were cut and no core analysis was performed.

SHOW REPOR	T		CORI	LABORAT	ORIES AUS	TRALIA	LTD.				
Operator	ESSO	STAND	ARD OIL	(AUST.) L	TD.			No. 1	30, 1969		
Well	SNAPI	PER-3		AU	STRALIBiate	VICTO		CLANO. FL-1			
DESCRIPTI	ON OF SH	IOW:							3		
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HYDRO CARBON EVALUATION

SECRETARY FOR MINES

TELEPHONE: 654 4388



MINES DEPARTMENT
WEST TOWER, PRINCES GATE
171 FLINDERS STREET
MELBOURNE, VIC. 3000

11th. February, 1970.

Memorandum:

Director, Oil and Gas Branch:

Interpretation of Snapper 3.

The logs indicate the gas sands in the upper Latrobe formation approximate in depth those predicted after drilling Snapper 1 and reflected in the Latrobe Delta topographic survey submitted to our Department in April, 1969.

From 4,196' to 4,290', the logs would seem to indicate the presence of residual hydrocarbons in either the Lakes Entrance formation or the upper Latrobe complex.

As anticipated, gas is present in the interval 4,290'-4,568'. I estimate that a nett pay thickness of 215 feet exists at this well location with porosities around 30%.

Between 4,576' and 4,656', there exists a shaly sand zone containing an estimated nett pay of 38 feet of liquid hydrocarbons with water saturation varying from 40 - 60%. A very rough calculation indicates a possible oil in place quantity of 130 M bbls. assuming that the zone extends westwards from the major N.W/S.E. fault bisecting the field between the Snapper 1 and Snapper 3 wells.

At greater depths in the well the logs indicate zones of hydrocarbons. However, they are all too tight to be commercially productive. An interesting example of this is the zone between 7,577' and 7,584'. The gamma ray and the S.P logs indicate sand and the high reading of the induction log at first glance would indicate the presence of hydrocarbons. However, the formation density and the sonic log both indicate a tight cemented formation with practically nil porosities, and this cementation in turn has affected the resistivity log.

A detailed assessment of the various levels in the upper Latrobe Delta zone is included in the attached file. In conclusion I advise that in my opinion the drilling of Snapper 3 has confirmed the gas reserves in the Snapper field as being in excess of 3 T.C.F. and I recommend that a more detailed study be made of the Snapper 1,2 and 3 logs to determine the total oil in place in the zone below the Snapper gasfield.

J. LePage.

We had all fe fait

SMAPPER FIELD PROPERTIES.

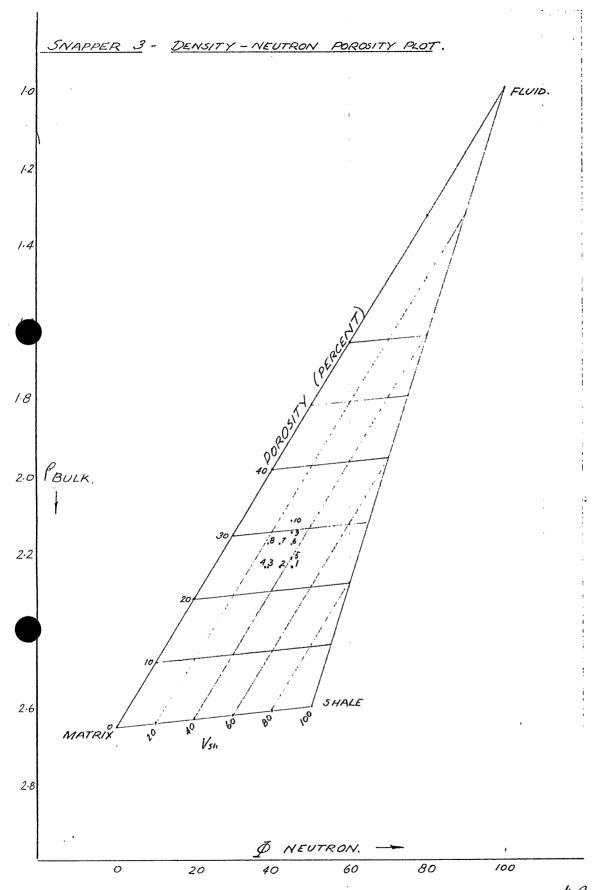
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		J	4540	2.15	30	105	37	510	-	50	45		30	3	40	14	·28	9		·425		'7/	: 3 ,
	-	10:	4655	20/2	. 32	105	37	510	: -	50	-	32	:	7	3.5	13	.27	4	1.//	.39	.60	183	ک بر
	•	//	4530	2.24	25	106	38	545		45	42	25	, <i>35</i>	12	60	!3	.46	22	1.9	· <i>2</i> 2	.28	1.8	4
	7578 - 7593	/2	7584	2.60	3	55	0	:				·			i							:	
	,	I	7588	2.62		55	0					!											: • • • • •
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	SUMMARY.				٠.					1/	. 202											·· ·· - · · · · · · · · · · · · · · · · ·	
	<u>4577'- 458</u>		assu	me po	prosity	25 6	٠, ١	W = A	0,	154	= 33/2		- /	Vet pay	7				÷				
	_ 4594'- 460		1	:		25/0	ر ز	w = 6 W = 6	ο,	Vsh	- 306. - 301		<u> </u>	4 4	0			i	:				:
	4525 - 464		"	:	"	306	,)	W = 6	0	rsh	- 3.)		_ :		19 A			<u>:</u>					•
	_ 4652' - 4650	5	"			306	. , ~	W= 6	0	. 754	-30%				7	i	i .						:
						1		-		/0	`	0		. 43.15	<u> </u>	<u> </u>		1		 	 	:	:
		Rm,	4 = 1.2	.3 (a) (c	00°F	= .	50	@ 150	7	(Rmf)e = ''	PS" X.	50 =	. 423								:	
			= 2.6		40	# /	1.18	@150°	/=														

6/4/20.

and the second of the second o

The zone of interest on the upper hatrobe Valley formation affect to be devided into sex sections which are authored below.

•	-	7070/	1
ZONES	TOTAL	NOT DAY	COMMENTS
4196 - 4290	94	70	He S.P and the 1.E.S legs indicale sands with possible hyporalaba content inthe region 4196-1228 and 1252-1292' However the Newton log clearly identifies the gas zone of the well as
1 290 - 4406	116'	//0′	identifies the gas zone It the bell as commoney and 4292'. The possible explanation is the presence of residual dry trocarlems "en this formation". The earlier analysis of this zone instituted gas to be present over the exhole zone with prosily values. avaging 30%.
4434-4950'	17'	/ 3 ′	The earlier analysis of this zone inducated gas being fresent. Assume forweits 30%.
4458' - 4510'	52'	<i>52</i> ′	This you was assessed as gas bearing and well not be recluibed. asserme
4 528' - 4568'	40'	40'	her zone was assessed as gas hearing in and no fewther Check will be made. assume proority 20%.
4576 - 4656	so'	40'	This zone well be recheled for water and hydrocarbon saturation and D. W. C & Schocerible.
· ·			ans v. w. c sy

gas sands. 225 215 1290': 4561' · 278'

This is an enclosure indicator page. The enclosure PE603642 is enclosed within the container PE905074 at this location in this document.

The enclosure PE603642 has the following characteristics:

ITEM_BARCODE = PE603642
CONTAINER_BARCODE = PE905074

NAME = Well Completion Log

BASIN = GIPPSLAND PERMIT = VIC/P1

TYPE = WELL

SUBTYPE = COMPLETION_LOG

DESCRIPTION = Well Completion Log for Snapper-3

REMARKS =

 $DATE_CREATED = 27/01/70$

DATE_RECEIVED =

 $W_NO = W568$

WELL_NAME = SNAPPER-3

CONTRACTOR =

CLIENT_OP_CO = ESSO AUSTRALIA LIMITED

This is an enclosure indicator page.

The enclosure PE601482 is enclosed within the container PE905074 at this location in this document.

The enclosure PE601482 has the following characteristics:

ITEM_BARCODE = PE601482
CONTAINER_BARCODE = PE905074

NAME = Corelab Grapholog Mudlog

BASIN = GIPPSLAND

PERMIT =

TYPE = WELL

SUBTYPE = MUD_LOG

DESCRIPTION = Corelab Grapholog Mudlog

REMARKS =

DATE_CREATED = 20/01/70

DATE_RECEIVED =

 $W_NO = W568$

WELL_NAME = Snapper-3

CONTRACTOR = CORE LABORATORIES

 $CLIENT_OP_CO = ESSO$

This is an enclosure indicator page. The enclosure PE905075 is enclosed within the container PE905074 at this location in this document.

The enclosure PE905075 has the following characteristics:

ITEM_BARCODE = PE905075
CONTAINER_BARCODE = PE905074

NAME = Time-Depth Curve

BASIN = GIPPSLAND

PERMIT = VIC/P1

TYPE = WELL

SUBTYPE = VELOCITY_CHART

DESCRIPTION = Time Depth Curve (Interpretative) for

Snapper-3

REMARKS =

 $DATE_CREATED = 1/09/70$

DATE_RECEIVED =

 $W_NO = W568$

WELL_NAME = SNAPPER-3

CONTRACTOR =

CLIENT_OP_CO = ESSO AUSTRALIA LIMITED

This is an enclosure indicator page. The enclosure PE905076 is enclosed within the container PE905074 at this location in this document.

The enclosure PE905076 has the following characteristics:

ITEM_BARCODE = PE905076

CONTAINER_BARCODE = PE905074

NAME = FIT Data

BASIN = GIPPSLAND

PERMIT = VIC/P1

TYPE = WELL

SUBTYPE = FIT

DESCRIPTION = FIT Recovery Data

REMARKS =

DATE_CREATED =

DATE_RECEIVED =

 $W_NO = W568$

WELL_NAME = SNAPPER-3

CONTRACTOR = SCHLUMBERGER

CLIENT_OP_CO = ESSO AUSTRALIA LIMITED