PETROFINA EXPLORATION AUSTRALIA S. A.

FINA

ANGLER-1

WELL COMPLETION REPORT

PLEASE NOTE:

1. Appendix 3, Geochemistry, to follow when available. 201089
(PE 903255)

2. Volume II, Interpretative Data, to follow when available. ? (Missing)

PETROFINA EXPLORATION AUSTRALIA S.A.

ANGLER-1

WELL COMPLETION REPORT

BASIC DATA

GL/89/022

MT/JMQ/AH/BT/kl

22 August 1989

ANGLER-1

WELL COMPLETION REPORT ANGLER-1

BASIC DATA

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SUMMARY

Exploration well Angler-1 was located in Licence VIC/P20 in the Gippsland Basin offshore Victoria, south-eastern Australia. The well represents the first of a four well drilling commitment on VIC/P20 to be fulfilled before 23 July 1990. Joint venture partners for the operation were:

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

The objective of the well was to evaluate the hydrocarbon potential of Maastrichtian and Campanian aged Latrobe Group sandstones in a fault controlled structural closure. Angler-1 was spudded on 24 March 1989 using the semi-submersible rig Zapata Arctic, and reached a total depth of 4337.5m (loggers) on 13 May 1989. Two zones with significant oil shows were encountered together with a gas bearing reservoir near TD. These zones were fully evaluated by wireline logs and RFT tests, and Angler-1 was plugged and abandoned as a non-commercial gas discovery on 27 May 1989.

WELL DATA SUMMARY: ANGLER-1

Well:	Angler-1
Permit:	VIC/P20, Gippsland Basin, Australia
Operator:	Petrofina Exploration Australia S.A.
Latitude:	38°39'35.4" S
Longitude:	148°26'29.1" E
UTM:	625,413.9 E
	5,719,971.8 N
KBE:	27m
WD:	276m
Type of Rig:	Semi Submersible
Name:	Zapata Arctic
Contractor:	Zapata Offshore Company
Objectives:	Deltaic and lower coastal plain Selene Sandstone in a fault controlled structural closure.
Spud Date:	24 March 1989
Date Reached TD:	13 May 1989
Date Completed:	27 May 1989
Drilled Depth:	4330m (driller)
	4337.5m (logger)
Well Status:	Plugged and Abandoned. Non-Commercial Gas Discovery.

GEOLOGICAL SAMPLING

CUTTINGS SAMPLES

Sample Type	No. of Sets	Addressee	Sample Interval
Washed and dried	3	PEXAUS	10,5*
	1	Japex, Tokyo	10,5*
	1	OPIC, Taiwan	10,5*
	1	Bridge Oil, Sydney	10,5*
	1	DITR, Melbourne	10,5*
	1	BMR, Canberra	10,5*
Unwashed	2	PEXAUS	10,5*
Canned Geochemical	1	Amdel	10**
	1	PSA, Brussels	10**

* 10m intervals from 630-2888m, 5m intervals from 2888-4330m

** from 2620-4330m

BASIC DATA

CORES

One fibre glass sleeved core was cut.
Cored interval from 3833-3842m with 99% recovery.

SIDEWALL CORES

Run No.	Cores Attempted	Cores Recovered
1	60	23
2	30	23

BASIC DATA

CUTTINGS DESCRIPTION

303-613m	Returns to seafloor.
613-800m	CALCARENITE: off white to light grey, firm to moderately hard, dispersive in part, abundant foraminifera, sucrosic texture, trace glauconite, trace pyrite.
800-925m	CALCARENITE: light to medium grey, soft to firm, sticky, sucrosic texture, moderate calcite cement, abundant foraminifera.
925-950m	CALCILUTITE: light grey to off white, medium grey in part, soft, sticky, moderate to trace calcite cement, abundant fossils.
950-1075m	CALCILUTITE: light grey, soft, sticky, fine to microcrystalline, trace cement, abundant foraminifera, grades in part to calcarenite as above.
1075-1200m	MARL: light grey, soft, sticky, plastic, occasionally silty.
1200-1580m	CALCARENITE: off white to tan, firm to moderately hard, occasionally hard, fine to very finely crystalline, rarely coarsely crystalline, moderately well cemented, common white calcite matrix, common forams, calcareous spicules, traces of glauconite, no visual porosity, grading to light grey, soft calcilutite.
1580-1600m	CALCILUTITE: light to medium grey, soft, dispersive minor glauconite, minor black flecks.
1600-2050m	CALCARENITE: light grey to light grey brown, firm to moderately hard, very fine grained, sucrosic texture, abundant calcareous cement, argillaceous matrix, trace very fine glauconite, blocky, occasionally subfissile, nil porosity, no show, grades in part to:

CALCILUTITE: light grey, soft to moderately firm, occasionally moderately hard, silty in part, trace glauconite, blocky to subfissile.

2050-2125m MARL: light brown to light grey, predominantly soft to hard in part, chalky, sticky, calcareous matrix, occasionally with argillaceous matrix, dispersive, slightly silty.

2125-2525m MARL: light to medium grey, soft to firm, silty in part, very argillaceous, trace pyrite, amorphous to blocky, grades in part to:
CALCAREOUS CLAYSTONE: light brown to grey, soft to dispersive, firm in part, blocky, silty in part, minor aggregates of microcrystalline pyrite, grading to shale and marl in part.

2525-2770m CLAYSTONE: light to medium grey, light grey brown, occasionally light green grey, soft to firm, silty, calcareous, amorphous to blocky, trace very fine glauconite, micromicaceous.

2770-2825m SANDSTONE: brown to green to clear, dominantly unconsolidated, very fine to coarse grained, subangular to subrounded, poorly sorted, argillaceous matrix, common coarse glauconitic grains, poor to excellent inferred visible porosity, no shows.

2825-3010m SANDSTONE: translucent-transparent, occasionally light grey to light brown, medium to coarse grained, poorly to moderately sorted, angular to subrounded, predominantly loose grains, occasionally weakly to moderately cemented with silica, common quartz overgrowths, locally common disseminated pyrite, trace mica, trace glauconitic pellets, grades to siltstone in part, moderate visual porosity, no shows.

SILTSTONE: light to medium grey, brownish-grey in part, firm to hard, trace calcareous cement, trace argillaceous matrix, pyritic in part.

3010-3220m SANDSTONE: transparent-translucent, loose, coarse to medium grained, occasionally fine grained, poor to moderately sorted, subangular to subrounded, trace of disseminated pyrite, poor to fair inferred porosity, grading to coal and siltstone in part, no shows.

SILTSTONE: light grey to light brownish-grey, firm, commonly carbonaceous, traces to common interlaminated coals, poor to no inferred porosity.

COAL: black-dark grey to brownish black, dominantly subvitreous, vitreous in part, firm to hard, blocky to subconchoidal in part, fractured.

3220-3240m SANDSTONE: light grey, clear to translucent, loose, medium to coarse, subangular to subrounded, poorly sorted, poor to fair porosity, no shows.

SILTSTONE: medium grey to brown grey, soft to firm, blocky, carbonaceous, with trace moderately bright yellow fluorescence in sandy matrix of tight coaly siltstone.

COAL: black, hard, vitreous, conchoidal fractures.

3240-3385m SANDSTONE: transparent to translucent, loose, medium to coarse grained, subangular to subrounded, poorly to moderately sorted, no visible cement or matrix, traces of disseminated pyrite, fair to good inferred porosity, no shows.

3385-3495m SANDSTONE: light grey, translucent, loose, medium to coarse, angular to subangular, poorly sorted, no visible cement or matrix, fair to good inferred visual porosity, no show, with minor:

SILTSTONE: light olive brown, firm, blocky, coaly.

COAL: black, vitreous, hard, conchoidal fractures.

3495-3525m SANDSTONE: off white, light grey, firm to moderately hard, fine to medium, subangular to angular, moderately sorted, off white argillaceous matrix, silica cemented, poor porosity, no show.

SILTSTONE: dark grey, dark brown, grading to black, firm to moderately hard, very carbonaceous, platey to subfissile with trace moderately bright yellow green fluorescence.

3525-3555m SANDSTONE: light grey, clear, translucent, dominantly loose, fine to coarse, dominantly medium, subangular to subrounded, moderately sorted, generally clean, good porosity, no show.

SILTSTONE: light to medium grey, dominantly medium grey, firm to moderately hard, argillaceous, occasionally very fine sandy matrix, carbonaceous in part.

3555-3580m SANDSTONE: light grey, off white, firm to moderately hard, fine to medium, subangular to subrounded, moderately sorted, off white argillaceous matrix, trace calcite cement, some silica cement, poor to moderate porosity, with trace to 10% dull yellow gold fluorescence.

3580-3715m SANDSTONE: transparent-translucent, loose, medium to coarse grained occasionally fine grained, moderately to poorly sorted, subangular to subrounded, no visible cement, occasionally argillaceous matrix, trace pyrite, good inferred porosity, with trace dull yellow fluorescence.

SILTSTONE: light to dark grey, occasionally brownish-grey, soft to firm, subblocky-subfissile, carbonaceous, common argillaceous matrix, grading to carbonaceous claystone in part.

3715-3825m SANDSTONE: transparent-translucent-occasionally very light grey, loose, coarse to fine, dominantly coarse grained, moderately sorted, subangular to subrounded, rare silica cement, no matrix, trace to minor pyrite micronodules, good inferred porosity, no shows, grading to siltstone.

SILTSTONE: dark grey to dark brown, firm to moderately hard, dominantly subfissile-occasionally fissile, commonly micromicaceous, very carbonaceous in part, grading to shale and coal in part.

3825-3836m SANDSTONE: transparent-translucent to white, loose, coarse to fine grained, dominantly coarse, subangular to subrounded, trace silica cement, trace white calcareous matrix, trace mica, abundant pyrite, 50% moderate bright yellow direct fluorescence, fast streaming yellow cut fluorescence, and abundant brown oil staining.

3836-3940m SILTSTONE: light grey, medium to dark brown, firm to moderately hard, blocky, subfissile, argillaceous in part, micromicaceous, carbonaceous in part.

SANDSTONE: translucent, light grey, loose, fine to medium, angular to subangular, poorly sorted, weak calcite cement, trace pyrite, moderate porosity, no shows.

3940-3985m SILTSTONE: medium to dark brown, occasionally light brown, firm to hard, blocky to subfissile, carbonaceous in part, micromicaceous.

3985-4000m SANDSTONE: clear to translucent, off white, hard, medium to coarse, subangular to angular, poorly sorted, trace calcite cement, fair to poor porosity, with trace to 10% moderately bright green yellow fluorescence.

SILTSTONE: brown grey, firm to moderately hard, blocky, carbonaceous with very rare glauconite.

4000-4202m SILTSTONE: light to medium brown, medium to dark brown, firm, carbonaceous specks, feldspathic grains, arenaceous in part, trace glauconite in part, minor biotite with chlorite alteration, very fine mica and pyrite along fractures.

SANDSTONE: transparent, unconsolidated to hard, fine-medium grained, moderately sorted, fractured grains, frosted in part, trace to moderate calcite cement, minor pyrite aggregates, poor inferred porosity, no shows.

4202-4330m SANDSTONE: translucent, white, very light grey, fine to coarse grained-fining with depth, moderately well sorted becoming poorly sorted with depth, subangular to subrounded, traces of mica, (biotite altering to chlorite), trace of calcite cement, common pyrite, good inferred porosity decreasing to poor at depth, no show to 20% pale yellow fluorescence.

SILTSTONE: light grey to medium brown, moderately hard to hard, blocky to subfissile, very arenaceous in part, grades to very fine grained sandstone.

CORE DESCRIPTION

CORE NO. 1

BASIC DATA

Interval Cored: 3833-3842m **Recovery:** 99%

3833-3835.5m SANDSTONE: medium grey, firm to very hard, very coarse to pebbly, subangular to angular, poorly sorted, sandy matrix, silica and calcite cement, abundant biotite, poor porosity, light brown oil stain, moderately bright to bright direct fluorescence and instant bright yellow cut fluorescence.

3835.5-3836.6m SANDSTONE: light grey, very hard, medium to very coarse, angular to subrounded, moderately sorted, sandy matrix, abundant calcareous cement, very poor porosity, light brown oil stain, bright direct fluorescence with instant bright yellow cut fluorescence.

3836.6-3839.4m SANDSTONE: medium grey, friable to loose, coarse to very coarse, moderately sorted, subrounded, weak silty matrix, very good porosity, no shows.

3839.4-3841m SANDSTONE: light grey, friable, medium to coarse, subangular to subrounded, moderately sorted, moderate silica cement, trace biotite, moderate to good porosity, no shows.

3841-3841.9m SANDSTONE: medium grey, friable to moderately firm, medium to coarse, subangular to subrounded, moderately sorted, moderate silica cement, trace biotite, poor to moderate porosity, no shows.

BASIC DATA

SIDEWALL CORE DESCRIPTION

WELL: ANGLER-1	LOCATION: VIC/P20	GEOLOGIST: A. HODGSON
RUN NUMBER: 1	TYPE:	HOLE SIZE: 8½"

DEPTH (m)	RECOVERY (inches)	LITHOLOGICAL DESCRIPTION	VISIBLE POROSITY	SHOWS
4334	1½	SILTSTONE: dark grey-light brown, firm, blocky, trace calcareous, common argillaceous matrix, grading in parts to very fine-fine grain sandstone, trace carbonaceous specks.	poor	trace direct fluorescence, no cut
4324	1	SILTSTONE: dark brown grey, soft-firm, blocky-subblocky, common-abundant argillaceous matrix, trace carbonaceous specks, grading in parts to silty claystone.	poor-nil	trace direct fluorescence, no cut
4321	NR			
4311	1	SILTSTONE: dark brown grey, firm, common-abundant argillaceous matrix, blocky-subblocky, grading in parts to silty claystone and in parts to very fine sandstone.	poor	trace direct fluorescence, no cut
4298	3/4	SANDSTONE: transparent-translucent, off white, hard-very hard, fine-coarse, poorly sorted, subangular-subrounded, trace calcareous cement, trace quartz overgrowths, trace carbonaceous specks, trace glauconite, trace pyrite.	poor	dull direct fluorescence, trace yellow weak cut fluorescence, no residue ring
4279.5	3/4	Interbedded SANDSTONE and SILTSTONE SANDSTONE: clear, translucent, light grey-off white, hard-very hard, fine-coarse, poorly sorted, angular-subrounded, trace to moderate calcareous cement, trace carbonaceous specks, trace pyrite. SILTSTONE: medium brown grey, soft-firm, blocky, common argillaceous matrix grades in parts to silty claystone, trace-common carbonaceous specks and laminae.	moderate-poor	trace dull direct fluorescence, trace cut yellow fluorescence
4271	NR			
4251	NR			
4246.5	NR			
4242	NR			
4233	NR			
4228	NR			
4225	½	Interbedded SANDSTONE and SILTSTONE SANDSTONE: clear-translucent, off white-light grey, firm-hard, fine-very coarse, poorly sorted, angular-subrounded, trace calcareous cement, trace mica, trace very fine lithics, massive. SILTSTONE: A/A	fair-good	trace-10% very dull yellow fluorescence with trace cut and very faint residue ring fluorescence

BASIC DATA

SIDEWALL CORE DESCRIPTION

WELL: ANGLER-1		**LOCATION:** VIC/P20	**GEOLOGIST:** A. HODGSON	
RUN NUMBER: 1		**TYPE:**	**HOLE SIZE:** 8½"	

DEPTH (m)	RECOVERY (inches)	LITHOLOGICAL DESCRIPTION	VISIBLE POROSITY	SHOWS
4222	NR			
4220	NR			
4216	NR			
4214	½	SANDSTONE: clear-translucent, light grey-off white, hard-very hard, fine-very coarse, dominantly medium-fine, moderately-poorly sorted, common poorly consolidated grains, subangular-subrounded, trace calcareous cement, trace pyrite.	fair-good	trace dull direct fluorescence, no cut
4208	1¼	SILTSTONE: dark grey-brown grey, firm, subblocky, massive, carbonaceous in parts, micromicaceous, trace feldspar, trace very fine quartz.	nil	nil
4181	½	SILTSTONE: A/A.	nil	nil
4157	NR			
4132	3/4	SILTSTONE: dark grey brown, firm, very argillaceous, massive, trace carbonaceous specks.	nil	nil
4104	NR			
4081	NR			
4055	¼	SILTSTONE: A/A.	nil	nil
4032	3/4	SILTSTONE: dark brown grey, soft-firm, abundant argillaceous matrix, trace-common carbonaceous, trace micromica, trace feldspar, massive.	nil	nil
4011	NR			
3973	NR			
3956	¼	SILTSTONE: dark grey brown, soft-firm, blocky, occasional subfissile, argillaceous, micromicaceous, carbonaceous.	nil	nil
3938	NR			
3916	NR			
3908	2	SILTSTONE: dark grey, firm-moderately hard, massive argillaceous, micromicaceous in parts.	nil	nil
3892	NR			
3880	NR			
3867	NR			
3857.5	NR			
3856	NR			
3853	NR			
3851	NR			

BASIC DATA

SIDEWALL CORE DESCRIPTION

WELL: ANGLER-1	**LOCATION:** VIC/P20	**GEOLOGIST:** A. HODGSON
RUN NUMBER: 1	**TYPE:**	**HOLE SIZE:** 8½"

DEPTH (m)	RECOVERY (inches)	LITHOLOGICAL DESCRIPTION	VISIBLE POROSITY	SHOWS
3836	3/4	SANDSTONE interbedded with SILTSTONE. SANDSTONE: off white-light grey, firm-moderately hard, fine-very coarse, poorly sorted, angular-subrounded, calcareous and argillaceous in parts. SILTSTONE: Medium grey, firm-hard, argillaceous in parts, micromicaceous in parts.	poor-moderate	10% patchy yellow fluorescence with very weak cut and weak crush cut fluorescence
3831.5	NR			
3830.5	NR			
3827	2	SILTSTONE: dark grey brown, firm-moderately hard, massive, very argillaceous, abundant carbonaceous flecks and laminae.	nil	nil
3825	NR			
3820	1½	SILTSTONE: dark grey brown, massive, moderately hard-hard, carbonaceous, argillaceous.	nil	nil
3807	½	Interbedded SANDSTONE and SILTSTONE SANDSTONE: off white-white, firm, very fine-fine, subangular-subrounded, poorly sorted, argillaceous, silty in parts, trace calcareous. SILTSTONE: dark brown, argillaceous, trace carbonaceous matrix, soft-firm.	poor	nil
3802.5	3/4	SANDSTONE: light-medium grey, firm-moderately hard, very fine-fine, subangular-subrounded, moderately sorted, silty in parts, carbonaceous in parts, non calcareous.	moderate-poor	nil
3795.5	NR			
3788	1	SILTSTONE: argillaceous, dark grey brown, very slightly calcareous, grades in parts to very fine sandstone, massive.	nil	nil
3783	NR			
3750	NR			
3717	NR			
3689	½	SILTSTONE: medium-dark grey brown, firm, massive, argillaceous in parts, micromicaceous, occasional very fine quartz grains, trace carbonaceous detritus.	nil	nil
3667.5	NR			
3655.5	NR			
3638	3/4	SANDSTONE: light grey, firm-moderately hard, massive, very fine-fine, subangular-subrounded, moderately-well sorted, non calcareous, argillaceous in parts. Trace feldspar.	moderate-poor	nil

BASIC DATA

SIDEWALL CORE DESCRIPTION

WELL: ANGLER-1		LOCATION: VIC/P20		GEOLOGIST: A. HODGSON
RUN NUMBER: 1		TYPE:		HOLE SIZE: 8½"
DEPTH (m)	RECOVERY (inches)	LITHOLOGICAL DESCRIPTION	VISIBLE POROSITY	SHOWS
3598	NR			
3592	NR			
3570	NR			
3510	NR			
3496	½	SILTSTONE: light-medium grey, soft-firm, massive, argillaceous, slightly calcareous, carbonaceous in parts.	nil	nil
		Sidewall Core Run No. 1 Shot 60 bullets Recovered 23 cores		

BASIC DATA

SIDEWALL CORE DESCRIPTION

WELL: ANGLER-1	LOCATION: VIC/P20	GEOLOGIST: A. HODGSON
RUN NUMBER: 2	TYPE:	HOLE SIZE: 8½"

DEPTH (m)	RECOVERY (inches)	LITHOLOGICAL DESCRIPTION	VISIBLE POROSITY	SHOWS
4250	NR			
4230	½	SANDSTONE: clear, translucent, light grey, firm-hard, fine-very coarse, occasional pebble, poorly sorted, subangular-subrounded, common calcareous cement, argillaceous matrix, moderate-good porosity.	moderate-good	50% patchy yellow green fluorescence moderate instant cut, thin fluorescence residue ring
4100	NR			
3848	3/4	SANDSTONE: A/A, hard, fine-medium, occasionally coarse, subangular-subrounded, moderately sorted, calcareous cement.	moderate	no show
3830	NR			
3743	¼	SILTSTONE: medium-dark grey brown, firm-moderately hard, massive, argillaceous, occasional very fine quartz grains, common very fine carbonaceous flecks.	nil	nil
3587	½	SILTSTONE: A/A.		
3485	3/4	Interlaminated SILTSTONE and SANDSTONE		
		SILTSTONE: medium grey-dark grey brown, firm-moderately hard, micromicaceous, argillaceous, occasional fine disseminated pyrite, carbonaceous.	nil	nil
		SANDSTONE: off white-light grey, firm-moderately hard, very fine-fine, silty in parts, trace calcareous, subangular-subrounded, well sorted.	poor	nil
3462.5	NR			
3440	3/4	SANDSTONE: off white-light grey, firm-moderately hard, fine-coarse, dominantly fine-medium, moderately-poorly sorted, argillaceous in parts, trace calcareous cement, massive. hard.	poor	nil
3397	½	SILTSTONE: light-medium grey, firm-hard, micromicaceous, argillaceous in parts, trace carbonaceous matrix, grades in parts to very fine sandstone, massive.		
3359	½	SANDSTONE: brown, off white, mottled, firm, fine-very coarse, subangular-subrounded, poorly sorted, very argillaceous, non calcareous, crumbly grades to arenaceous claystone.	poor	no show

BASIC DATA

SIDEWALL CORE DESCRIPTION

WELL: ANGLER-1	LOCATION: VIC/P20	GEOLOGIST: A. HODGSON
RUN NUMBER: 2	TYPE:	HOLE SIZE: 8½"

DEPTH (m)	RECOVERY (inches)	LITHOLOGICAL DESCRIPTION	VISIBLE POROSITY	SHOWS
3352	½	SANDSTONE: clear-translucent, light grey, firm-hard, very fine-very coarse, occasional pebbles, subangular-subrounded, argillaceous in parts, occasional lithics, occasional mica, massive.	poor	nil
3306	1¼	SANDSTONE: A/A.	poor	nil
3276	1¼	SILTSTONE: dark grey brown, firm-moderately hard, very argillaceous, occasional very fine quartz grains, occasional carbonaceous detected, massive.	nil	nil
3260	1	SANDSTONE: Clear-translucent, light grey, firm-hard, fine-medium, dominantly fine, well sorted subangular-subrounded, argillaceous in parts, occasional pyrite, massive.	moderate	nil
3236.5	3/4	SANDSTONE: A/A.		70% very dull uniform yellow green fluorescence, with no cut and weak crush cut fluorescence
3222.5	1	SANDSTONE: light grey, clear-translucent, firm-hard, very fine-fine, subangular-subrounded, moderately-well sorted, argillaceous, slightly calcareous, abundant carbonaceous laminae.	moderate	nil
3204	2	SILTSTONE: light brown grey, soft-firm, blocky, trace-common argillaceous matrix, carbonaceous grading in parts to fine-coarse sandstone.	nil	nil
		SANDSTONE: transparent-translucent, firm-hard, fine-coarse, dominantly fine, moderately-well sorted, argillaceous in parts.	poor-fair	nil
3183	1¼	SANDSTONE: transparent-translucent, moderately hard-hard, fine-coarse, dominantly medium, subangular-subrounded, moderately-well sorted, silty in parts, carbonaceous, trace pyrite.	fair	nil

BASIC DATA

SIDEWALL CORE DESCRIPTION

WELL: ANGLER-1	LOCATION: VIC/P20	GEOLOGIST: A. HODGSON
RUN NUMBER: 2	TYPE:	HOLE SIZE: 8½"

DEPTH (m)	RECOVERY (inches)	LITHOLOGICAL DESCRIPTION	VISIBLE POROSITY	SHOWS
3178	1	Interbedded SILTSTONE and SANDSTONE SILTSTONE: dark brown grey, firm-hard, blocky, subfissile, trace-common argillaceous matrix, carbonaceous, grading in parts to silty claystone and in parts to very fine sandstone. SANDSTONE: A/A.	nil	no show
3130	1½	SILTSTONE: dark brown grey, firm-hard, very argillaceous, trace very fine quartz grains, micromicaceous, massive.	nil	nil
3104	½	SANDSTONE: transparent-translucent, moderately hard, fine-medium, subangular-subrounded, moderately-well sorted, trace-common argillaceous matrix, very silty.	poor-fair	nil
3083	1½	SILTSTONE: dark brown grey, soft-firm, common argillaceous matrix, carbonaceous in parts, coaly in parts, grading in parts to silty claystone.	nil	nil
3050	1 3/4	SILTSTONE: A/A.	nil	nil
2970.5	1	SANDSTONE: transparent-translucent, hard, fine-coarse, dominantly medium, subangular-subrounded, moderately-well sorted, trace-common argillaceous matrix, trace pyrite, hard.	fair	nil
2952	1	SANDSTONE: A/A.	fair	nil
		Sidewall Core Run No. 2 30 shots fired 23 cores recovered		

BASIC DATA

RFT RESULTS

Interpretation made with HP pressure gauge

* Strain gauge pressure test taken after HP gauge blockage

FILE NO.	TEST NO.	DEPTH (m)	HYDROST. BEFORE (PSIA)	PRESSURE AFTER (PSIA)	FORMATION PRESSURE (PSIA)	
54	10	4269.0			6381.4	* seal failure
53	9	4257.0			6386.2	* SGP supercharged
51	8	4254.2			6361.1	* SGP taken
50	7	4251.0			6356.5	seal failure
48	6	4243.0				dry test
46	4	4235.0	7013.0	7015.5	6479.8	super charged
47	5	4234.2				dry test
45	3	4230.0	7001.8	7003.0	6352.7	good test
44	2	4226.0	6994.5	6995.8	6351.0	good test
56	11	4226.0				sample taken
43	1	4220.0	6982.7	6985.1	6349.3	good test
37	33	4216.0	6971.2	6973.7	6347.7	good test
36	32	4214.0				dry test
34	31	3867.0	6411.1	6411.5	5513.5	good test
33	30	3845.0	6375.4	6375.6	5482.5	good test
32	29	3836.0				seal failure
31	28	3831.0				dry test
30	27	3825.5				seal failure
29	26	3825.0				dry test
28	25	3814.0	6322.1	6322.7	5434.9	good test
27	24	3806.9	6309.1	6309.8	5424.2	good test
26	23	3756.0	6226.7	6226.7	5352.4	good test
24	22	3668.7				seal failure
23	21	3667.0	6080.8	6081.4	5227.2	good test
22	20	3538.0	5866.0	5866.8	5040.9	good test

BASIC DATA

RFT RESULTS (cont'd)

FILE NO.	TEST NO.	DEPTH (m)	HYDROST. BEFORE (PSIA)	PRESSURE AFTER (PSIA)	FORMATION PRESSURE (PSIA)	
21	19	3453.0	5727.7	5728.4	4921.0	good test
20	18	3305.0	5480.1	5480.7	4708.5	good test
19	17	3292.0	5458.6	5459.1	4689.7	good test
17	16	3278.0	5436.6	5436.8	4670.7	good test
16	15	3262.0	5409.6	5409.9	4648.1	good test
15	14	3256.0	5399.4	5399.8	4639.5	good test
14	13	3248.5	5386.5	5387.3	4629.4	good test
13	12	3236.0	5366.0	5366.4	4613.6	good test
12	11	3231.0	5357.4	5358.0	4619.7	super charged
11	10	3222.5	5343.2	5343.7	4590.3	good test
10	9	3208.5	5319.6	5320.2	4568.7	good test
9	8	3205.5	5314.5	5316.1	4564.7	valid test
8	7	3197.0	5300.6	5301.0	4550.4	good test
7	6	3193.0	5293.1	5293.6	4544.7	good test
6	5	3182.0	5275.4	5276.0	4529.3	good test
5	4	3171.5	5256.9	5257.5	4509.9	good test
4	3	3157.5	5233.2	5233.4	4488.9	good test
3	2	3142.0	5207.1	5207.5	4466.7	good test
2	1	3125.0	5178.7	5179.3	4442.7	good test

* Segregated fluid samples collected at 4226m, 2 3/4 gal chamber contained 92.4 cu ft gas and 600 cc's condensate.

Gas Composition: C1=88.24% C2=5% C3=1.63% IC4=0.11% NC4=0.13% CO2=3.0% H2S=nil

Condensate SG=0.77 @21.8C, 52 degrees API

1 gal pressure sample preserved for PVT analysis

BASIC DATA

HYDROCARBON SHOWS

DEPTH	LITHOLOGY	GAS %	OIL SHOWS
3219-3240m	Siltstone	TG 2.5 C1 1.7 C2 0.4 C3 0.2 C4 Tr	Trace moderately bright yellow fluorescence with moderately slow to moderately fast bluish yellow cut fluorescence and a thin residual ring
3495-3505m	Siltstone	No Gas	Trace moderately bright yellow green grading to moderately dull cut fluorescence with a thin residual ring
3557-3579m	Sandstone	No Gas	Trace to 10% dull yellow gold fluorescence with trace dull yellow gold faint cut fluorescence
3687-3689m	Sandstone	No Gas	Medium brown oil stain with dull gold fluorescence and no cut fluorescence
3825-3836m	Sandstone	TG 0.55 C1 0.5 C2 0.025 C3 Tr	50-60% bright yellow fluorescence with fast streaming bright yellow cut fluorescence and abundant light brown oil staining
3988-3994m	Sandstone	TG 0.08 C1 0.08 C2 Tr C3 Tr	Trace to 10% moderately bright green yellow fluorescence, with a slow streaming cut and very thin residual ring

HYDROCARBON SHOWS (cont'd)

DEPTH	LITHOLOGY	GAS %	OIL SHOWS
4202-4260m	Sandstone	TG 11.5 C1 10 C2 0.5 C3 0.17 iC4 0.0072 nC4 0.0089	20% moderately pale yellow fluorescence with a slow weak green yellow cut fluorescence and no stain or residual ring
4260-4305m	Sandstone	TG 0.9 C1 no data C2 no data	Trace to 10% very dull yellow fluorescence with a weak cut fluorescence and no residual ring

WIRELINE LOGS: ANGLER-1

SUITE NO.	LOG	INTERVAL
1	DIL/GR	1155-300m
	SLS/GR	1153-603m
2	DLL/SLS/GR/CAL	2891-1151m
	LDL/CNL/GR	2888-2740m
3	DLL/SLS/MSFL/GR/CAL	4333-2888m
	LDL/CNL/NGL	4336-2888m
	RFT/GR	4269-3125m
	SHDT/FMS/GR	4336-2888m
	CST/GR	4334-2906m
	CBL/GR	1300-1000m

MWD LOGS: ANGLER-1

HOLE SIZE	TOOLS	INTERVAL
17½"	Directional	613-1165m
12¼"	Directional	1165-2918m
8½"	Resistivity, Gamma Ray, Directional	2918-4330m

APPENDIX 1

APPENDIX 1

MICROPALAEONTOLOGY

BASIC DATA

CONTENTS

INTERPRETATIVE

INTRODUCTION

A total of 31 ditch cutting samples from Angler No.1 were submitted by Petrofina Exploration Australia S.A. for foraminiferal age determination and interpretation of depositional environment.

The foraminiferal zonation used to date this sequence is the scheme developed by David J.Taylor for the Gippsland Basin. A preliminary account of this zonation is given in Taylor (1966). The zonation was based on some initial work done by Carter (1964) and Jenkins (1960), but grew mostly out of Taylor's work for the Esso-B.H.P. partnership on wells in the offshore Gippsland Basin. My interpretation of the significant features of this zonation is based on an unpublished chart of Taylor's (copyright David Taylor, Paltech P/L, 1981).

The Angler No.1 sequence intersects Taylor's Zones A (Late Pliocene) to J (Early Oligocene), although whether the sequence is complete and conformable is impossible to determine. The sequence between 1770m and 2030m is very sparsely fossiliferous, due possibly to very little fauna being released from a hard silty limestone. Below 2170m, most of the fauna appears to be caving from the Late Miocene and Pliocene. Below 2270m, these faunas are joined by Early Miocene caving as well; so that although there are rare indications of Oligocene fauna below 2400m, in general the in situ faunas are heavily masked by the caving. Because of the caving problem, there has been little point in logging the benthonic fauna below 2170m. Only species which appeared to be new down-hole appearances in the benthos have been logged, and little can be said about the water depths present in the Early Miocene and Oligocene.

Below 2730m very rare indications of Eocene age can be seen in the heavily caved planktonic assemblages. All these faunas are tentatively placed in Taylor's Zone N, of Middle Eocene age. Only one sample (at 2790m) can be given a definite Zone N age determination. The planktonic assemblages are accompanied by large specimens of arenaceous benthonic genera which suggest unfavourable bottom conditions, possibly in a channel situation. Taylor (1983) has interpreted similar faunas of this age as indicative of an "estuarine entrance" environment, and has postulated water depths of less than 10m for the assemblage. The quality of the ditch cuttings is so poor that no such environmental interpretation could reliably be given for the Angler-1 sequence. The base of the foraminiferal sequence cannot be ascertained from the ditch cuttings because of the persistent caving.

LIST OF SAMPLES EXAMINED

DC 1040m
DC 1160m
DC 1220m
DC 1260m (cement)
DC 1360m
DC 1450m
DC 1670m
DC 1770m
DC 1880m
DC 2030m
DC 2080m
DC 2170m
DC 2270m
DC 2400m
DC 2460m
DC 2490m
DC 2590m
DC 2690m
DC 2730m
DC 2740m
DC 2770m
DC 2780m
DC 2790m
DC 2800m
DC 2810m
DC 2820m
DC 2830m
DC 2840m
DC 2860m
DC 2890m
DC 2945m

AGE SIGNIFICANCE OF THE FORAMINIFERAL ASSEMBLAGES ENCOUNTERED.

At 1040m : Zone A-3 (- Zone N21): Late Pliocene.

The abundant planktonic assemblage contains common Globorotalia inflata, G. crassaformis ronda and G. scitula scitula. Rare specimens of Globorotalia puncticulata and G. tosaensis tosaensis define the age as Late Pliocene - Early Pleistocene. Assuming that the assemblage is in situ, Globorotalia inflata indicates Taylor's Zone A-3 or younger, and the absence of Globorotalia truncatulinoides indicates an age older than the Pleistocene Zone A-2.

The diverse benthonic fauna contains abundant Euuvigerina cf. peregrina. Cibicides spp. are moderately common, but species such as Vulvulina pennatula and Reophax scorpiurius suggest upper slope water depths. An environment of deep outer shelf to uppermost slope is suggested.

At 1160m : Zone probably B-2 : probably Late Miocene.

The age is based on the presence (indeed, abundance) of Globorotalia miotumida miotumida and G. miozea conoidea. According to Taylor, G. miotumida miotumida does not range above Zone B-2. Very rare specimens of older species such as Praeorbulina glomerosa, Globigerina ampliapertura and Globorotalia miozea miozea are tentatively interpreted as reworked; G. tosaensis tosaensis is interpreted to be caved. With some indication of both caving and reworking within this ditch cutting, and with no sample coverage for 120m above, the age interpretation is necessarily tentative.

Euuvigerina is extremely prominent among the diverse benthonic assemblage. The environmental interpretation is much the same as for the sample above - deep outer shelf to uppermost slope.

1220 - 1450m : Zone D-1? : Middle Miocene.

At 1220m the planktonic assemblage consists of abundant Orbulina universa in a moderately hard calcarenite. Based on the abundance of Orbulina, and the presence of rare Globorotalia cf. miozea, G. menardii and Globigerinoides ruber, a Middle Miocene age is suggested, with a preference for a D-1 age rather than C or D-2. Still present are moderately abundant G.

miozea conoidea and G. miotumida, so that a Late Miocene age is not out of the question. The benthonic assemblage of this sample appears very much the same as above, and it is not possible to say how much of this is caving.

The sample at 1260m consisted largely of driller's cement, and 1220m was added to the sample set as a substitute. At 1360m the cement has diminished somewhat, and a moderately hard limestone has yielded a low diversity assemblage of Orbulina universa, Globorotalia miozea conoidea, G. fohsi group (logged as G. cf. praefohsi), Nonion sp. and numerically little else. The presence of any representatives of the G. fohsi group are taken to indicate a Zone D-1 age, as the group appears to have only a short time range in Gippsland. Zone D-1 spans the interval of time correlated approximately with zones N10 to N13 of the tropical foraminiferal zonation.

At 1450m the sample consists of hard bioclastic silty limestone which has broken down poorly in processing. A rather sparse assemblage of foraminifera includes moderate numbers of Globorotalia miotumida, possibly as caving, and two specimens of Globorotalia miozea miozea which suggest a Zone D-1 age or older. One specimen of Praeorbulina glomerosa is interpreted to be in place here. The benthonic assemblage consists mostly of small specimens, among which Cassidulina carinata and Cassidulinoides cf. orientale and Globocassidulina subglobosa are common. Such an assemblage, alternating with intervals near-barren of fauna (such as that at 1360m) suggests a correlation with Taylor's "canyon fill" environment.

At 1670m : Zone D? : Middle Miocene?

This sample consists of a hard limestone with very little fauna. Most of the assemblage is the Middle Miocene to Recent species Orbulina universa. The age and environmental interpretation is essentially the same as for the interval above, but the number of specimens is so low as to cause doubt as to whether they are all emplaced by caving. The assemblage of small cassidulinids seen above is not present here.

1770 - 1880m : indeterminable.

Both these samples consist of hard, silty cemented limestone. The higher one has an appreciable number of siliceous spines, probably sponge spicules. The foraminiferal assemblages are extremely sparse, and appear to consist almost entirely of caved specimens. Both samples are considered undatable on the basis of insufficient fauna.

At 2030m : Zone probable G : probable Early Miocene.

This sample is still within the same hard lithology as the two samples just discussed, but contains a little more fauna. Small specimens in particular, suggest that the very sparse assemblage is in place. The presence of Globorotalia miozea miozea, G. cf. zealandica and Globigerinoides trilobus trilobus indicate an age of Zone G or younger. The virtual absence of Orbulina (one or two specimens only) and its precursor species suggests that the sample is older than Zones E - F. The rare benthonic species consist of Cassidulinoides, Cibicides and Euuvigerina, in insufficient numbers to give a definite environmental interpretation. The situation of very sparse faunas seems similar to that described by Taylor in the Selene-1 Micropalaeontological Report, where there is interpreted to be a thick submarine canyon sequence. Such an interpretation would also be possible for Angler-1 between 1450 and 2030m, but the quality of the samples is inadequate to be certain.

At 2080m : Zone H-1 : Early Miocene.

The sample contains common foraminifera in a silty grey marl. Some caving is evident, as evidenced by the presence of Orbulina spp., Globorotalia scitula, G. praefohsi, G. conoidea, G. miotumida and G. menardii. The age is indicated by the presence of Turborotalia kugleri and Globorotalia peripheroronda. Because of the amount of caving evident from the Late Miocene and Pliocene, the environmental interpretation of outer shelf is extremely tentative.

2170 - 2270m : age indeterminable due to caving.

These two samples contain common foraminifera, but most of the species recorded are of Middle Miocene or younger age. Only at 2270m are very rare specimens of Globigerina tripartita and Globigerina binaiensis recorded. These are long ranging, and although new occurrences in the sequence, they do not assist in determining the age in this context.

2400 - ?2690m : Zone J : Early Oligocene.

The sample at 2400m contains very rare specimens of Globigerina angiporoides and Turborotalia cf. increbescens, indicative of a Zone J age. The sample also contains rare T. opima opima and Globigerina cf. angulisuturalis which may indicate the presence of younger Oligocene above this depth. Massive caving of Miocene foraminifera is evident in this sample. There are almost no benthonic foraminifera present on which to base an environmental interpretation.

The sample at 2460m has little, if any, fauna in place. At 2490m the assemblage again contains some Zone J specimens, in addition to the pervasive caving. Globigerina angiporoides, G. apertura, G. tripartita, Globigerina ciperoensis and Turborotalia cf. increbescens are considered to be in place. Again, the benthonic part of the assemblage is sparse, and affected by the caving problem. The sample at 2590m contains essentially the same fauna, but with the addition of small specimens assigned to Globorotalia scitula (Middle Miocene to Recent). Some of these are indistinguishable from Turborotalia cerroazulensis cocoaensis (Late Eocene), so that problems of homeomorphy and of caving defeat the search for Late Eocene in this well. The Eocene indicator Subbotina linaperta was not seen in this sample.

The sample at 2690m contains an abundant fauna of small Globigerina spp. of Early Miocene to Oligocene type, plus some larger but still long-ranging species: Globigerina praebulloides, G. euapertura, and G. tripartita. The sample contains fewer caved specimens than others in this interval. However, as the in situ fauna consists almost entirely of "background" species, an undifferentiated Oligocene age is assigned to it. As for higher samples, the environmental interpretation is affected by caving of benthonic species. The slope species Karreriella bradyi is perhaps more common here than higher, and may suggest upper slope conditions at the base of the Oligocene section, but this is little more than a suggestion.

?2730 - 2790m : Zone N : Middle Eocene.

The sample at 2730m is, as above, affected by Miocene caving. However, the presence of two specimens of Subbotina linaperta indicates an Eocene age. Also present are two specimens of Acarinina cf. primitiva. A. primitiva is one of the index species for the top of

Zone N, which Taylor correlates approximately with Zones P12 to P14 of the tropical zonation. The remainder of the assemblage consists of sparse Oligocene and common Miocene specimens. The extreme rarity of Eocene indicators, even after prolonged searching, suggests that the Eocene fauna is a sparse one, possibly due to environmental constraints. The next sample at 2740m is of similar character. In that sample the evidence for a Zone N age consists of one specimen of Acarinina collactea, one Planorotalites renzi, one specimen of Turborotalia cerroazulensis cerroazulensis (which as remarked above, could conceivably be a small Globorotalia cf. scitula), and two damaged specimens of Subbotina linaperta. The evidence is hardly impressive. At 2770m very rare specimens of Subbotina linaperta are accompanied by questionable Acarinina primitiva, Globigerinatheka index and G. cf. kugleri. This sample would seem to be definitely Eocene, but the zone is uncertain. There is nothing definitive in the sample at 2780m. At 2790m, one excellent specimen of Globigerinatheka index provides the best evidence in the whole sequence for an Eocene age. Also present are three specimens of Acarinina primitiva which in morphology are transitional to Acarinina pseudotopilensis. The specimens of Subbotina linaperta in this sample are poorly preserved and deformed. Globigerinatheka index ranges from Zone N to the top of the Eocene, but its association with A. primitiva can be considered indicative of Zone N.

Below 2770m the benthonic fauna, despite the continued caving, begins to assume a distinct character. Large arenaceous specimens of the genera Cyclammina, Bathysiphon, Dorothia, Ammodiscus and Haplophragmoides are seen in many of the samples down to 2830m. These are associated with a glauconitic and sandy sediment, and as far as can be seen, there is little associated calcareous benthonic fauna. The assemblages are suggestive of a restricted bottom water circulation, possibly on a poorly oxygenated sea floor. The assemblages may be very similar to those recorded from Zone N in Selene-1 by Taylor (1983), if it is assumed that "Haplophragmoides cf. incisa" of Taylor is identical to Cyclammina sp. identified here (see discussion in Ludbrook, 1977). These assemblages Taylor interpreted from sidewall core material as having lived in a lagoonal situation in proximity to the marine entrance to the system, with a shallow continental shelf beyond. The nature of these ditch cuttings is such that an interpretation of this degree of precision cannot be made for the Angler-1 sequence.

2800 - 2830m : possibly Late to Middle Eocene.

Below 2790m there are no new appearances of species which can be definitely said to be in place. Although rare specimens of the Turborotalia cerroazulensis group continue to be present, the problem of caving remains, and it is not possible to say where the base of the marine Eocene should be drawn from the foraminiferal evidence. The placement of samples down to 2830m as possibly Late to Middle Eocene is based only on the similarity of their faunas to those seen above; and this could result entirely from caving.

2840 - 2945m : age indeterminable.

Below 2840m the foraminiferal specimens become so rare that it seems doubtful that any of the specimens are in place.

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TABLE 1: Time stratigraphic subdivision of the interval 1040-2945m in Angler No.1 based on foraminifera.

Depth	Zone	Age	Environment
At 1040	A-3	Late Pliocene	outer shelf to uppermost slope
At 1160	prob.B-2	probably Late Miocene	" " " " "
1220-1450	D-1?	Middle Miocene	possibly canyon fill
At 1670	D?	?Middle Miocene	?" ?" ?"
1770-1880	?	indeterminable	indeterminable
At 2030	prob.G	probably Early Miocene	"
At 2080	H-1	Early Miocene	??outer shelf?
2170-2270	?	indeterminable due to caving	indeterminable
2400-?2690	J	Early Oligocene	indeterminable
--------------	------probable disconformity------		
?2730-2790	N	Middle Eocene	upper part indet; low oxygen at base (see text)
2800-2830	?	?possibly L.-M.Eocene?	as above?
2840-2945	?	indeterminable (?barren)	?

INTERPRETATIVE

ANGLER NO.1 BENTHONIC FOR

ENCLOSURE 2

BASIC DATA

DESCRIPTION:

DISTRIBUTION OF BENTHONIC FORAMINIFERA IN THE PETROFINA ET AL ANGLER-1 WELL.
LOGGED BY M.APTHORPE 7/89. X=PRESENT 1=NO OF SPECIMENS FOUND <=C.F. C=CAVED
A=ABUNDANT W=REWORKED F=FRAGMENTARY SPECIMEN ?=QUESTIONABLE IDENTIFICATION

CHECKLIST OF OCCURRENCES BY HIGHEST APPEARANCE

Depth	CIBICIDES CF. CYGNORUM	CIBICIDES MEDIOCRIS	CIBICIDES SUBHAIDINGERI	EUUVIGERINA CF. PEREGRINA	GLOBOCASSIDULINA SUBGLOBOSA	NOTOROTALIA CF. MIOCENICA	NOTOROTALIA CLATHRATA	REOPHAX SCORPIURIUS	SPHAEROIDINA BULLOIDES	VAGINULINA SP.	VULVULINA PENNATULA	ANOMALINOIDES COLLIGERUS	ASTRONONION STELLIGERUM	CASSIDULINA CF. CARINATA	CASSIDULINOIDES ORIENTALE	CIBICIDES PSEUDOUNGERIANUS	CIBICIDES REFULGENS	ELPHIDIUM CRISPUM	PSEUDONODOSARIA SP.	PULLENIA CF. BULLOIDES	PULLENIA QUINQUELOBA	SIPHOUVIGERINA CF. PROBOSCIDEA	ANOMALINOIDES GLABRATA	KARRERIELLA BRADYI	LENTICULINA SP.	TEXTULARIA PSEUDOGRAMEN	GYROIDINA SP. CF.SOLDANII
1040M DC	X	<	X	A	X	X	X	X	X	X	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1160M DC	.	<	.	X	X	.	X	.	X	.	X	X	X	X	X	X	X	X	X	X	X	X	.	.	.	.	.
1220M DC	.	.	.	X	.	.	.	.	X	.	X	.	.	X	.	X	.	.	.	.	.	.	X	X	X	X	.
1260M DC	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1360M DC	X	.	.	X	.	.	.	.	X	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	X
1450M DC	X	X	.	X	X	.	.	.	.	.	.	.	.	X	X	.	.	.	.	.	.	.	.	.	X	.	.
1670M DC	X	.	.	.	X	.	.	.	X	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.
1770M DC	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1880M DC	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2030M DC	.	.	.	X	.	.	.	.	.	.	.	.	.	.	X	.	X	.	.	.	.	.	X	.	.	.	.
2080M DC	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.
2170M DC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2270M DC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2400M DC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2460M DC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2490M DC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2590M DC	.	.	.	.	.	.	.	.	X	.	.	.	.	X	.	.	.	.	.	.	.	.	.	X	.	.	.
2690M DC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.
2730M DC	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.
2740M DC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2770M DC	.	.	.	.	.	.	.	.	X	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.
2780M DC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	C	.	.	.
2790M DC	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2800M DC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2810M DC	.	<	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2820M DC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2830M DC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2840M DC	.	<	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2860M DC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2890M DC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Depth	NONION SP.	BAGGINA CF. PHILIPPINENSIS	CHILOSTOMELLA OOLINA	LAGENA SPP.	MARTINOTIELLA COMMUNIS	OSTRACODS	PULLENIA SP.	TEXTULARIA SAGGITULA	UVIGERINA SPP.	GLOBOCASSIDULINA SP.	ASTRONONION SP.	ARENACEOUS SPECIES INDET.	BATHYSIPHON SP.	CYCLAMMINA SP.	AMMODISCUS SP.	HAPLOPHRAGMOIDES SP.	SIPHONINA AUSTRALIS	GLOMOSPIRA SP.	TEXTULARIA SP.	DOROTHIA SP.	TOOTH	BONE CHIPS	TROCHAMMINA SP.	RECURVOIDES SP.	TEXTULARIA PLUMMERAE	UVIGERINAMMINA SP.
1040M DC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
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1670M DC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1770M DC	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1880M DC	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2030M DC	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2080M DC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2170M DC	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2270M DC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2400M DC	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.
2460M DC	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.
2490M DC	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.
2590M DC	.	.	.	.	.	.	.	.	.	.	.	.	.	X	X	X	X	.	.	.	.	.	.	.	.	.
2690M DC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2730M DC	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
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2770M DC	.	.	.	.	.	.	.	.	.	.	.	X	.	X	.	.	.	.	.	X	X	.	.	.	.	.
2780M DC	.	.	.	.	.	.	.	.	.	.	.	X	X	X	.	X	.	.	.	.	.	.	.	.	.	.
2790M DC	.	.	.	.	.	.	.	.	.	.	.	.	.	X	X	X	.	.	.	.	.	X	X	.	.	.
2800M DC	.	.	.	.	.	.	.	.	.	.	.	X	.	6	X	1	.	.	.	.	.	.	.	.	.	.
2810M DC	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	X	.	.	.	1	X	.
2820M DC	.	.	.	.	C	.	.	.	.	.	.	.	X	X	.	.	.	.	.	.	.	.	.	.	.	.
2830M DC	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	?	.	.	.	.	.	.	.	.	.	2
2840M DC	.	.	.	.	.	.	.	.	.	.	.	.	X	X	.	.	.	.	.	.	.	.	.	.	.	.
2860M DC	.	.	.	.	.	.	.	.	.	.	.	.	X	X	.	.	.	.	.	X	.	.	.	.	.	.
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PE900770

This is an enclosure indicator page.
The enclosure PE900770 is enclosed within the container PE902148 at this location in this document.

The enclosure PE900770 has the following characteristics:

ITEM_BARCODE =	PE900770
CONTAINER_BARCODE =	PE902148
NAME =	Distribution of Planktonic Foraminifera
BASIN =	GIPPSLAND
PERMIT =	VIC/P20
TYPE =	WELL
SUBTYPE =	DIAGRAM
DESCRIPTION =	Angler-1Distribution of Planktonic Foraminifera in the Petrofina et al Angler-1 Well. Enclosure from appendix 1 of WCR.
REMARKS =	
DATE_CREATED =	
DATE_RECEIVED =	24/08/89
W_NO =	W993
WELL_NAME =	Angler-1
CONTRACTOR =	
CLIENT_OP_CO =	Petrofina Exploration Australia S.A

(Inserted by DNRE - Vic Govt Mines Dept)

APPENDIX 2

APPENDIX 2

PALYNOLOGY

PALYNOLOGY OF PETROFINA ANGLER-1

BASIC DATA

CONTENTS

BASIC DATA

II INTRODUCTION

Thirty four samples were submitted by Mark Tringham of Petrofina for palynology. Three cuttings samples (3250, 3445, 3500m) were submitted on an urgent basis during drilling to check progress ahead of the logs and were reported by Fax. After well completion, eighteen swcs were initially submitted from the Cretaceous section and were reported by Fax on 16.6.89. Six Cretaceous infill samples (2 swcs, 4 cutts) and seven Tertiary cuttings samples were then processed to complete the breakdown. All this sampling is reported in detail herein. Raw data is presented in Appendix I.

The palynostratigraphic framework for the Cretaceous is most recently reviewed by Helby, Morgan and Partridge (1987), but detailed modifications to this scheme were discussed by Morgan (1988), and detailed taxonomic study of Campanian dinoflagellates of the region is available in Marshall (1988). In the Tertiary, the zonal scheme was most recently published by Partridge (1976), but significant new data exists in privately circulated studies, in Harris (1985), Morgan (1988), and in Marshall and Partridge (1988). The zonal scheme used here is shown in Fig. 1 and is a combination of Helby, Morgan and Partridge (1987) and Partridge (1976). The new data is easily discussed against this framework.

Organic maturity data was generated in the form of the Spore Colour Index and plotted on Fig. 2. The oil and gas windows follow the general consensus of geochemical literature. The oil window corresponds to spore colours of light-mid brown (2.7) to dark brown (3.6). This would correspond to Vitrinte Reflectance values of 0.6% to 1.3%. However, factors such as detailed kerogen type, basin type, basin history and heating curves all affect precise interpretation, and analytical machine-based maturity parameters are probably more reliable.

	AGE		SPORE – POLLEN ZONES	DINOFLAGELLATE ZONES
Early Tertiary	Early Oligocene		P. tuberculatus	
Early Tertiary	Late Eocene		upper N. asperus	P. comatum
Early Tertiary	Late Eocene		middle N. asperus	V. extensa
Early Tertiary	Middle Eocene		lower N. asperus	D. heterophlycta
Early Tertiary	Middle Eocene		lower N. asperus	W. echinosuturata
Early Tertiary	Middle Eocene		P. asperopolus	W. edwardsii
Early Tertiary	Early Eocene		P. asperopolus	W. thompsonae
Early Tertiary	Early Eocene		upper M. diversus	W. ornata
Early Tertiary	Early Eocene		upper M. diversus	W. waipawaensis
Early Tertiary	Early Eocene		middle M. diversus	
Early Tertiary	Early Eocene		lower M. diversus	W. hyperacantha
Early Tertiary	Paleocene		upper L. balmei	A. homomorpha
Early Tertiary	Paleocene		lower L. balmei	E. crassitabulata
Early Tertiary	Paleocene		lower L. balmei	T. evittii
Late Cretaceous	Maastrichtian		T. longus	M. druggii
Late Cretaceous	Campanian		T. lillei	I.korojonense
Late Cretaceous	Campanian		N. senectus	X. australis
Late Cretaceous	Santonian		T. pachyexinus	N. aceras
Late Cretaceous	Santonian		T. pachyexinus	I. cretaceum
Late Cretaceous	Santonian		T. pachyexinus	O. porifera
Late Cretaceous	Coniacian		C. triplex	
Late Cretaceous	Turonian		C. triplex	C. striatoconus
Late Cretaceous	Turonian		C. triplex	P. infusorioides
Late Cretaceous	Cenomanian		A. distocarinatus	
Early Cretaceous	Albian	Late	P. pannosus	
Early Cretaceous	Albian	Middle	upper C. paradoxa	
Early Cretaceous	Albian	Middle / Early	lower C. paradoxa	
Early Cretaceous	Albian	Early	C. striatus	
Early Cretaceous	Aptian		upper C. hughesi	
Early Cretaceous	Aptian		lower C. hughesi	
Early Cretaceous	Barremian		F. wonthaggiensis	
Early Cretaceous	Hauterivian		F. wonthaggiensis	
Early Cretaceous	Valanginian		upper C. australiensis	
Early Cretaceous	Berriasian		lower C. australiensis	
Juras.	Tithonian		R. watherooensis	

FIGURE 1 ZONATION FRAMEWORK

PE905465

This is an enclosure indicator page.
The enclosure PE905465 is enclosed within the container PE902148 at this location in this document.

The enclosure PE905465 has the following characteristics:

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CONTAINER_BARCODE =	PE902148
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BASIN =	GIPPSLAND
PERMIT =	VIC/P20
TYPE =	WELL
SUBTYPE =	DIAGRAM
DESCRIPTION =	Angler 1 Palynology Range Chart
REMARKS =	
DATE_CREATED =	30/06/89
DATE_RECEIVED =	24/08/89
W_NO =	W993
WELL_NAME =	Angler-1
CONTRACTOR =	Roger Morgan Consulting
CLIENT_OP_CO =	Petrofina Exploration Australia S.A

(Inserted by DNRE - Vic Govt Mines Dept)

INTERPRETATIVE

I SUMMARY

2710-2760m (cutts) : mixed P. tuberculatus Zone (Oligocene) with middle Eocene reworking : nearshore marine : immature

2770m (cutts) - lower N.asperus Zone : Middle Eocene : nearshore marine : immature

hiatus corresponding to major episode of canyon formation

2780m (cutts)-2820m (cutts) : lower P.asperopolus - upper M.diversus Zone : Early Eocene : nearshore marine : immature

lower M. diversus Zone (early Eocene) may be present in this unsampled interval

Hiatus apparently corresponding to the entire Paleocene

2925m (cutts)-2952m (swc) : upper T.longus Zone : Late Maastrichtian : marginally marine (I.druggii dinoflagellate Zone) : immature

2980m (cutts)-3050m (swc) middle T.longus Zone : Late Maastrichtian : non-marine : immature

3083m (swc)-3525m (cutts): lower T.longus Zone : Early Maastrichtian : non-marine to brackish : immature

3587m (swc)-4181m : T.lillei Zone : Early to Late Campanian : marginally marine 3587m (I.korojonense dinoflagellate Zone) : non-marine 3689-3956m, nearshore marine 4055 - 4132.5m (I.korojonense dinoflagellate Zone), non-marine 4181m (swc) : immature to marginally mature

4208m (swc) - 4334m (swc) : upper N.senectus Zone : Early Campanian : nearshore marine (I.korojonense dinoflagellate Zone) at 4208m, slightly brackish at 4279.5m, non-marine at 4334m : marginally mature

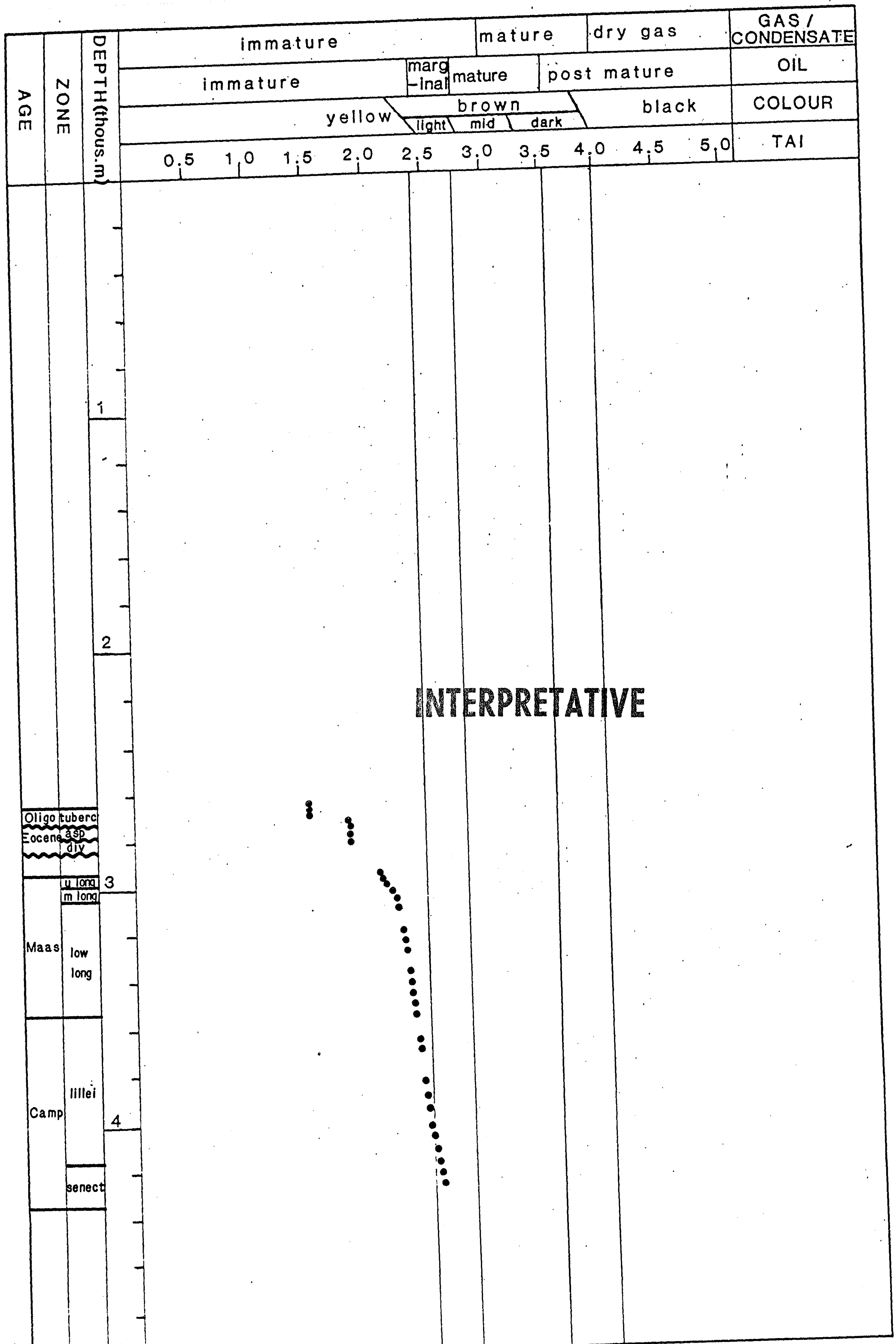

FIGURE 2 MATURITY PROFILE, ANGLER-1

INTERPRETATIVE

III PALYNOSTRATIGRAPHY

A. 2710m (cutts) - 2760m (cutts) : probably P. tuberculatus Zone

These very lean samples contain mixed assemblages. Spores and pollen are scarce and of low diversity, with Nothofagidites spp. and Proteacidites spp. the dominant forms. At 2710m (cutts), Cyatheacidites annulatus is seen, indicating an Oligocene P.tuberculatus Zone assignment. At 2730m, Gambierina rudata implies a Paleocene or older age, but is presumed reworked.

Dinoflagellates are dominant with Operculodinium spp. and Spiniferites spp. the most common, suggesting an Oligocene age. However, Schematophora speciosa is a rare but consistent component of all three samples and suggests a Middle Eocene lower N.asperus (to basal middle N.asperus) Zone assignment. It is presumed to be reworked.

Nearshore marine environments are indicated by the low diversity dinoflagellates and spore-pollen. The Lakes Entrance Formation is normally of Oligocene age, while the Middle Eocene is normally represented by the topmost Latrobe Group and the correlative Turrum and Gurnard Formations.

Colourless palynomorphs indicate immaturity for hydrocarbon generation, although some oxidation may have occurred at the time of deposition.

B. 2770m (cutts) : lower N.asperus Zone
This lean assemblage is assigned on the basis of the dinoflagellates. The spores and pollen are very scarce, of low diversity and long-ranging.

INTERPRETATIVE

Dinoflagellates dominate with Areosphaeridium dictyoplokus and A.arcuatum (s.l.) the most common. This indicates assignment to the W.echinosuturata or D.heterophlycta Dinoflagellate Zones, with assignment to the upper W.echinosuturata Zone the most likely. The presence of Wetzeliella spp. (W.coleothrypta and W.articulata) is consistent with the assignment, while D.phosphoritica may be slightly caved, and W.edwardsii is considered slightly reworked. This dinoflagellate interval occurs in the lower N.asperus spore-pollen Zone.

Nearshore marine environments are indicated by the low diversity dinoflagellates and spores and pollen. Low yields of well preserved palynomorphs are common in greensands. These features are normally seen in the Gurnard Formation or its correlatives the topmost Latrobe Group, Turrum Formation or Flounder Formation. This acme occurs in Helios-1 at 2608m. An unconformity is therefore likely between 2770 and 2780m, corresponding to the major phase of Marlin channel and canyon formation.

Yellow spore colours indicate immaturity for hydrocarbon generation.

C 2780m (cutts) - 2820m (cutts) : lower P.asperopolus - upper M.diversus Zones.

Assignment to the lower Proteacidites asperopolus to upper Malvacipollis diversus Zones is based primarily on the dinoflagellate evidence, but supported by the spores and pollen. The caved or in situ nature of taxa cannot be established from the cuttings, but oldest P.asperopolus (2780m), P.pachypolus (2820m), Myrtaceidites tenuis (2800m) and youngest Proteacidites grandis (2780m), M.tenuis (2800m) and M.diversus (2820m) combine to support the assignment. However, the assemblage could be

INTERPRETATIVE

caved for part of this interval as it is cuttings based.

Dinoflagellates dominate the assemblage, with Homotriblium tasmaniense abundant. Other common elements include the Areosphaeridium spp. discussed above, but these are presumed caved, as they do not normally co-occur. H.tasmaniense normally dominates assemblages from the W.waiparaensis to W.edwardsii Zones. Wetzeliella spp. were seen only at 2820m where W.glabra and W.edwardsii are probably caved. Other obviously caved elements include Phthanoperidinium eocenicum and Schematophora speciosa. No older elements were seen reworked.

Nearshore marine environments are indicated by the low diversity dinoflagellates and spore-pollen. These features are normally seen in the topmost Latrobe Group or correlative Flounder Formation.

Yellow spore colours indicate immaturity for hydrocarbon generation.

D. lower M.diversus Zone

The lower Malvacipollis diversus Zone of Early Eocene age may be present in the well, but its depth is uncertain. The dinoflagellate Hafniasphaera septata occurs as caving at 2925m in the late Cretaceous, but is usually restricted to the lower M.diversus and upper L.balmei Zones in the Gippsland Basin. This interval might be present in the gap 2820 to 2850m where some shales appear to be present on the wireline logs. The interval would therefore be marine and equivalent to the topmost Latrobe Group or Flounder Formation.

E. 2925m (cutts) - 2950m (swc) : upper T.longus Zone

INTERPRETATIVE

This sample is assigned to the upper Tricolpites longus Zone as defined by Morgan (1988) at the top on youngest Quadraplanus brossus, Tricolpites longus, T.waiparaensis, Tricolporites lillei and Triporopollenites sectilis, all of which are restricted to Maastrichtian and older strata. At the base, oldest common Gambierina rudata with rare Nothofagidites spp. indicates the assignment. Proteacidites spp. dominate the palynomorph assemblage, with frequent Cyathidites spp., Gambierina rudata, Phyllocladidites mawsonii and prominent T.sectilis. In the residue, inertinite is very common, with frequent spores and pollen and minor plant debris (cuticle and tracheid). The cuttings at 2925m are heavily contaminated by Eocene caving.

Dinoflagellates are very scarce and fragmentary, but the presence of Manumiella conorata indicates assignment to the M.druggii dinoflagellate Zone.

Marginally marine environments are indicated by the very scarce dinoflagellates (about 1% of palynomorphs) and their low diversity, and the common and diverse spores and pollen. The absence of sapropel and vast cuticle seen below suggests slower deposition and oxidation in a wave reworked situation.

Yellow spore colours indicate immaturity for oil and gas/condensate.

These features are usually seen in the massive sand unit of the Latrobe Group and its correlatives in Vic P20.

F. 2980m (cutts) - 3050m (swc) : middle T.longus Zone

INTERPRETATIVE

These samples are assigned to the middle T.longus Zone in the sense of Morgan (1988) by exclusion from the section above having frequent G.rudata and the section below having frequent N.endurus. Within the interval, Proteacidites spp. are dominant, with N.endurus and G.rudata both equally prominent. In this well, T.waiparaensis and T.sectilis are both frequent at 3050m, and their twin acme may have correlative potential.

Dinoflagellates are absent at 3050m and very scarce (perhaps caved) at 2980m. The residues are dominanted by cuticle fragments and amorphous sapropel, suggesting very rapid deposition in non-marine or slightly brackish environments. The assemblage is not highly diverse due to dilution of palynomorphs by this plant debris.

Dark yellow spore colours indicate immaturity for hydrocarbon generation.

These features are usually associated with the interbedded silt/sand sequence of the Latrobe Group and its part correlative, the upper massive sand in Vic P20.

G. 3083m (swc)-3525m (cutts) lower T.longus Zone

This interval is assigned to the lower T.longus Zone at the top on youngest frequent N.endurus, and at the base on oldest Tricolpites longus (3525m cutts, 3485m swc)and Tetracolporites verrucosus (3485m swc). Within the zone, Proteacidites spp. are consistently common, with Cyathidites, P.mawsonii, Dilwynites spp. and N.endurus frequent. Tricolpites confessus is consistent to frequent in the interval 3204m (swc) to 3276m (swc), but especially at 3276m, and this acme correlates with 3214-66m in Selene-1 and 3352.8m (11,000ft.) in Hapuku-1. T.longus at 3500m and 3525m is in cuttings and could be caved slightly. Oldest T.longus in swc is therefore at 3485m.

The residues are dominated by cuticle fragments and amorphous sapropel, suggesting very rapid deposition in a stagnant environment. Trace dinoflagellates were seen at the top and base of the interval at 3130m (Isabelidinium spp.) and at 3397m (Isabelidinium and Cyclopsiella), 3445m (Heterosphaeridium spp.), 3485m (Trithyrodinium and Cyclopsiella) 3500m (Isabelidinium, O.operculata and O.subtilis) and 3525m (Odontochitina subtilis, Cyclopsiella) and indicate brackish marine conditons at these levels.

Dark yellow to light brown spore colours indicate immaturity, but approaching marginal maturity for oil, and immaturity for gas/condensate.

These features are usually seen associated with coaly facies above the Selene Sandstone in Vic P20.

H. 3587m (swc) - 4181m (swc) : T.lillei Zone

Assignment to the Tricolporites lillei Zone is shown at the top by the absence of younger indicators, and at the base by oldest T.lillei in swcs. Within the zone, Proteacidites, Cyathidites, Dilwynites, P.mawsonii and N.endurus are frequent.

The residues are mostly dominated by cuticle fragments and amorphous sapropel with scarce spores and pollen. This is consistent with rapid deposition in a non-marine stagnant environment. At the top and base of the interval, there is less amorphous material and dinoflagellates occur. At 3587m (swc), scarce dinoflagellates include Odontochitina subtilis (less spiny than O.indigena, more robust and shorter horned than O.spinosa), Isabelidinium pellucidum (cf. I.greenense Marshall unpubl.) and I.cretaceum. These indicate assignment to the I.korojonense dinoflagellate Zone in marginally marine environments. At 4055m (swc), 4132m (swc) and 4208m (swc), a more diverse dinoflagellate assemblage is dominated by I.pellucidum (cf. I.greenense) with Cribroperidinium spp., I.cretaceum, H. glabra and Odontochitina subtilis and O."prolata" Marshall unpubl. This also indicates the I.korojonense dinoflagellate Zone, but in nearshore marine environments. At 4181m (swc) dinoflagellates are absent, indicating non-marine environmenrts.

Dark yellow to light brown spore colours above 4000m indicate immaturity, but light brown spore colours below 4000m indicate marginal maturity for oil, but immaturity for gas/condensate.

These features are usually associated with the coaly section below the Selene Sandstone in Vic P20.

I. 4208m (swc)-4334m (swc) : upper N.senectus Zone

Assignment to the upper Nothofagidites senectus Zone is indicated at the top by the absence of younger indicators and at the base by oldest Gambierina rudata and N.senectus. Proteacidites spp. dominate most assemblages, with Dilwynites , Cyathidites and Nothofagidites intermittently frequent. T.confessus and T.sabulosus occur to the base of the interval.

Dinoflagellates are frequent at 4208m, as discussed above, and indicate nearshore marine environments and the I.korojonense dinoflagellate Zone. At 4279.5m, a single long ranging dinoflagellate was seen, indicating brackish conditions. At 4334m, non-marine conditions are indicated by the absence of dinoflagellates, and presence of common and diverse spores and pollen, and abundant plant debris.

Light brown spore colours indicate marginal maturity for oil, but immaturity for gas/condensate. The abundant organic sapropel suggests rapid deposition.

Section of this age has not previously been drilled in Vic P20.

IV CONCLUSIONS

INTERPRETATIVE

A. GEOLOGY

The studied section appears to consist of Oligocene Lakes Entrance Formation, thin and incomplete Middle and Early Eocene nearshore marine Gurnard Formation and Latrobe Group, a Paleocene hiatus, and a thick Maastrichtrian to Campanian Latrobe Group. The Latrobe Group is not as coaly as elsewhere in the block, and contains significantly marine intervals in the Campanian. Marine Campanian has not previously been seen in the basin except at Pisces-1 and some drag ocean floor samples to the east. This well therefore marks the new westward extent of Campanian marine influence in the Gippsland Basin.

B. PALYNOLOGY

These marine intervals provide a useful means of subdividing the previously indivisible <u>T.lillei</u> Zone into three, as well as providing possible tie points for sequence stratigraphic analysis. These marine episodes would be expected to correlate into nearby wells.

C. MATURITY

Maturity data are disappointing, showing that the section is still not mature at T.D. Considerable potential for mature section therefore exists below this point.

INTERPRETATIVE

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APPENDIX 3

APPENDIX 3

APPENDIX 3

GEOCHEMISTRY

See Addendum

PE903255

APPENDIX 4

APPENDIX 4

CORE ANALYSIS

CORE SERVICES OF AUSTRALIA PTY.LIMITED.
P.O.BOX 523,
STRATHPINE, 4500 Qld.

Telephone: (07) 298 5272

BASIC DATA

CONVENTIONAL CORE ANALYSIS
FINAL DATA REPORT

CLIENT: PETROFINA EXPLORATION AUSTRALIA S.A.
WELL: ANGLER #1
BASS STRAIT, AUSTRALIA

15TH MAY, 1989

BASIC DATA

15th May 1989

Petrofina Exploration Australia S.A.,
Level 2,
476 St.Kilda Rd.,
MELBOURNE, Vic. 3004

FINAL DATA REPORT - ANGLER #1

A total of 8.9m of core was picked up from Bristow Helicopter Base, Port Welshpool, Victoria at approximately 10.30am on the 5th May 1989 by Core Services of Australia Pty.Limited personnel. One core was cut with a recovery of 99% between the interval 3833.0 - 3841.9m.

The core was laid out in it's synthetic inner barrel lengths and checked for depths and continuity. A continuous core gamma was then run.

Fluid saturations and one horizontal plug for porosity and permeability determination were extracted every 30cm throughout the cored interval.

This report contains tabular data, a continuous core gamma log, a core-log plot and a permeability vs porosity plot. Tabular data includes rolling averages for permeability and porosity designed to correlate with down-hole electric logs. Additional arithmetic averages of specific intervals are included.

The data contained in this report has been derived by the following methods:

1. CONTINUOUS CORE GAMMA: is produced by passing the whole core under a gamma radiation detector, shielded inside a lead tunnel, on a continuous belt. The continuous belt is driven at an adjustable speed designed to re-produce the desired vertical log scale. The gamma radiation count is amplified and the signal digitized to reflect the drawn log.

2. SUMMATION OF FLUID POROSITY: determined by the addition of connate water and oil from the retort together with the gas occupied space, determined by mercury injection.

continued/ page #2

3. FLUID SATURATIONS: An automatic thermostatically controlled high temperature retort was utilized for the volumetric determinations of connate water and residual oil saturations.

4. NATURAL DENSITY: derived by measurements utilizing a Boyles Law displacement pump to determine bulk volume, and an analytical balance to determine the wet weight.

5. PERMEABILITY: Measured by "Fluid Transmissibility Darcys Equation for compressible fluids (gas) assuming the lamina flow is the theory on which used.

6. HELIUM INJECTION POROSITY: Measured by helium porosimeter to determine the grain volume and consequently, pore volume. This porosity determination is based on the Boyles Law Equation and uses the helium because of it's minute molecular structure and inert properties.

7. GRAIN DENSITY: Derived by measurements utilizing a Boyles Law displacement pump to determine bulk volume, and an analytical balance to determine weight.

8. ROLLING AVERAGES & SPECIFIED AVERAGES: Please refer to explanations and formulae overleaf.

A total of 31, 1-1/2"diameter plugs were drilled for helium injection porosity and horizontal permeabilities. Eleven of these plugs were drilled with tap water as the lubricating medium and due to the friable nature of the core, 20 of the plugs were drilled with liquid nitrogen as the lubricating medium. The plugs were then cleaned with toluene in solvent extractors and dried in a controlled humidity environment at temperatures not exceeding 105°c. The plugs then attained room temperature in a vacuum dessicator charged with silica gel prior to analysis. Fluid saturation samples were trimmed out with a diamond saw, utilizing compressed air as the lubricating medium to minimize damage from the use of core hammers.

Continued/Page #3

On completion of analysis, the core was slabbed. One quarter of the core was packed and delivered by Core Services personnel to the B.M.R. in Canberra. Another quarter of the core was packed and shipped to the Department of Industry, Technology and Resources in Melbourne. The remaining half of the core was photographed under both white light and ultra-violet light. It was then packed and shipped to Petrofina Exploration Australia S.A. in Melbourne.

Should you have any queries regarding this report, please do not hesitate to contact our Brisbane Laboratory. We have enjoyed working with Petrofina on this project and look forward to working with you again in the near future.

END OF REPORT.

BASIC DATA

DESCRIPTION OF PLUG CUTTING:

"R" PLUGS: (regular plugs) - cut in the horizontal plane along the strike of the bedding to give theoretical maximum permeability into the well bore.

"A" PLUGS: cut in the horizontal plane at 90° to the R-plugs and across the bedding to give a theoretical minimum permeability of the formation into the well bore.

"V" PLUGS: cut in the vertical plane of the core.

ROLLING AVERAGES:

These averages of both Helium injection porosity and permeability are obtained by using a "rolling" three (3) point method. In the case of porosity a weighted arithmetic average is used.

$$\emptyset\, av_{(i+1)} = [\emptyset_i + 2\emptyset_{(i+1)} + \emptyset_{(i+2)}] / 4$$

In the case of permeability a weighted geometric average is used.

$$K\, av_{(i+1)} = 10^{[(\log_{10} K_i + 2\log_{10} K_{(i+1)} + \log_{10} K_{(i+2)}) / 4]}$$

At any sample point, excluding the first and last, a rolling average is obtained by using the value at the specified sample point. The value preceeding it and the value of the sample point subsequent to it. In the cases of the first and last sample points, only 2 sample points were used.

Using porosity as an example, the average of the first data point is obtained from the formula.

$$\emptyset\, av_{(i)} = [2\emptyset_i + \emptyset_{(i+1)}] / 3$$

The average at the final data point is obtained by:

$$\emptyset\, av_{(f)} = [\emptyset_{(f-1)} + 2\emptyset_{(f)}] / 3$$

The same method is used for permeability averages. At any break in the data, the rolling averages are "re-started".

DATA KEY:

- $\emptyset$ = porosity
- K = permeability
- i = initial
- av = average
- f = final

SPECIFIED AVERAGES:

Specified averages are normal arithmetic averages which can be taken over any specified section of the core, as well as over the whole core.

Core Services of Australia Pty. Limited

Petroleum Reservoir Engineering Data

PO Box 523 Strathpine Q 4500 Aust.
Tel : (07) 298-5272

CORE ANALYSIS FINAL REPORT

Company : PETROFINA EXPLORATION AUSTRALIA S.A.
Well : ANGLER #1
Field : W/C
Date : 08/05/89
Core Interval : 3833.00 - 3841.90
Core Interval :
File No. : 5-07
Country : AUSTRALIA
State : VICTORIA

BASIC DATA

Sample No.	Depth	Porosity HeInj	Porosity RollPor	Density Nat	Density Grain	Permeability (md) KH	Permeability (md) Roll KH	Summation of Fluids Por	Summation of Fluids Oil	Summation of Fluids Water	Remarks See Below
1	3833.10	1.3	1.3	2.65	2.66	0.63	1.6	3.3	4.1	48.9	C#
2	3833.30	1.1	1.2	2.66	2.65	10	6.3	2.9	0.0	54.4	
3	3833.60	1.4	1.6	2.63	2.64	23	42	2.8	0.0	46.5	
4	3833.90	2.5	2.1	2.65	2.66	586	105	3.9	3.4	54.4	HF
5	3834.20	2.1	2.4	2.61	2.67	15	38	4.5	0.0	40.7	
6	3834.50	2.7	2.4	2.64	2.68	14	14	3.7	3.6	50.3	
7	3834.80	2.2	2.2	2.66	2.67	12	7.2	2.1	2.5	25.5	HF
8	3835.10	1.6	1.8	2.65	2.67	1.3	2.7	3.6	3.6	51.1	
9	3835.40	1.8	1.8	2.65	2.67	2.5	3.0	2.9	0.0	46.5	
10	3835.70	2.1	2.3	2.65	2.67	9.0	5.9	2.7	0.0	39.9	
11	3836.00	3.3	6.3	2.62	2.67	6.0	36	4.1	0.0	25.5	HF
12	3836.30	16.6	13.0	2.04	2.61	4184	877	21.0	0.5	68.9	
13	3836.60	15.4	16.2	2.32	2.62	3508	2840	20.2	0.6	67.7	
14	3836.90	17.4	17.4	2.28	2.61	995	1311	20.2	0.6	64.3	
15	3837.20	19.3	19.3	2.27	2.61	850	837	21.2	0.5	80.2	
16	3837.50	21.3	20.9	2.24	2.58	683	819	23.5	0.5	83.7	
17	3837.80	21.7	21.0	2.28	2.60	1135	1043	20.6	0.6	90.4	
18	3838.10	19.1	19.9	2.28	2.61	1348	1594	21.0	0.3	81.6	
19	3838.40	19.7	19.7	2.30	2.61	3137	1848	22.9	0.0	72.5	
20	3838.70	20.2	20.2	2.27	2.61	879	1494	23.2	0.0	76.4	
21	3839.00	20.6	20.9	2.24	2.61	2052	1833	21.6	0.2	75.6	
22	3839.30	22.1	21.1	2.23	2.59	3051	2415	22.8	0.0	84.3	
23	3839.60	19.7	20.9	2.30	2.60	1781	1924	19.3	0.6	87.9	
24	3839.90	21.8	21.6	2.26	2.60	1417	1589	21.1	0.3	89.0	
25	3840.20	22.9	22.4	2.24	2.60	1784	1025	25.0	0.0	94.7	
26	3840.50	21.9	21.3	2.23	2.60	2449	421	23.4	0.0	90.6	
27	3840.80	18.6	19.7	2.34	2.61	293	267	20.2	0.0	92.9	
28	3841.10	19.8	19.3	2.29	2.61	243	330	19.1	0.0	92.4	
29	3841.40	19.1	19.8	2.28	2.63	691	561	24.1	0.0	91.8	
30	3841.70	21.4	19.5	2.32	2.61	854	512	19.1	0.0	91.5	
31	3841.90	16.1	17.9	2.24	2.62	137	252	17.9	0.0	90.2	B#

VF = Vertical Fracture; HF = Horizontal Fracture; MP = Mounted Plug; SP= Short Plug
C# = Top of Core; B# = Bottom of Core; OWC = Probable Oil/Water Contact
Tr = Probable Transition Zone; GC = Probable Gas Cap

BASIC DATA

Porosity & Perm Arithmetic Average Specified Interval :5-07

Start Sample	:	1	End Sample	:	31
Depth	:	3833.10	Depth	:	3841.90

POROSITY Average : 13.4 over 31 Samples
0 Samples with a ZERO Porosity Value Ignored

Sample Type :R

PERMEABILITY Average : 1037 over 31 Samples
0 Samples with a ZERO Permeablity Value Ignored

Porosity & Perm Arithmetic Average Specified Interval :5-07

Start Sample	:	1	End Sample	:	11
Depth	:	3833.10	Depth	:	3836.00

POROSITY Average : 2.0 over 11 Samples
0 Samples with a ZERO Porosity Value Ignored

Sample Type :R

PERMEABILITY Average : 61 over 11 Samples
0 Samples with a ZERO Permeablity Value Ignored

BASIC DATA

Porosity & Perm Arithmetic Average Specified Interval :5-07

Start Sample	:	12	End Sample	:	25
Depth	:	3836.30	Depth	:	3840.20

POROSITY Average : 19.8 over 14 Samples
0 Samples with a ZERO Porosity Value Ignored

Sample Type :R

PERMEABILITY Average : 1914 over 14 Samples
0 Samples with a ZERO Permeablity Value Ignored

Porosity & Perm Arithmetic Average Specified Interval :5-07

Start Sample	:	26	End Sample	:	31
Depth	:	3840.50	Depth	:	3841.90

POROSITY Average : 19.4 over 6 Samples
0 Samples with a ZERO Porosity Value Ignored

Sample Type :R

PERMEABILITY Average : 777 over 6 Samples
0 Samples with a ZERO Permeablity Value Ignored

BASIC DATA

LITHOLOGICAL DESCRIPTIONS

CLIENT: Petrofina Exploration Aust. S.A. WELL: Angler #1

1. Sst: lt gry, v crs/pbl, wl rndd, mod sphericity, p srt. Sd Mtrx with sil and calctc Cmt. mnr Biot.
2. As in 1.
3. As in 1.
4. As in 1. Frac parallel to Bdg
5. As in 1.
6. As in 1.
7. As in 1. Frac parallel to Bldg. Irregular Plug.
8. As in 1.
9. As in 1.
10. As in 1.
11. Sst: Lt gry, crs/v crs, sbang, mod srt, sdy Mtrx with abd Calc Cmt. Mnr intstl Cl. Irregular Plug.
12. As in 11 with addit of pbly section.
13. As in 11.
14. As in 11. Intstl Cl more abd.
15. Sst: gry-brn. med/crs, ang-sbang, mod srt. Abd intstl Cl. Presence of Calc Cmt. tr Biot.
16. As in 15.
17. As in 15.
18. As in 15.
19. As in 15.
20. As in 15.
21. As in 15.
22. As in 15.
23. As in 15.

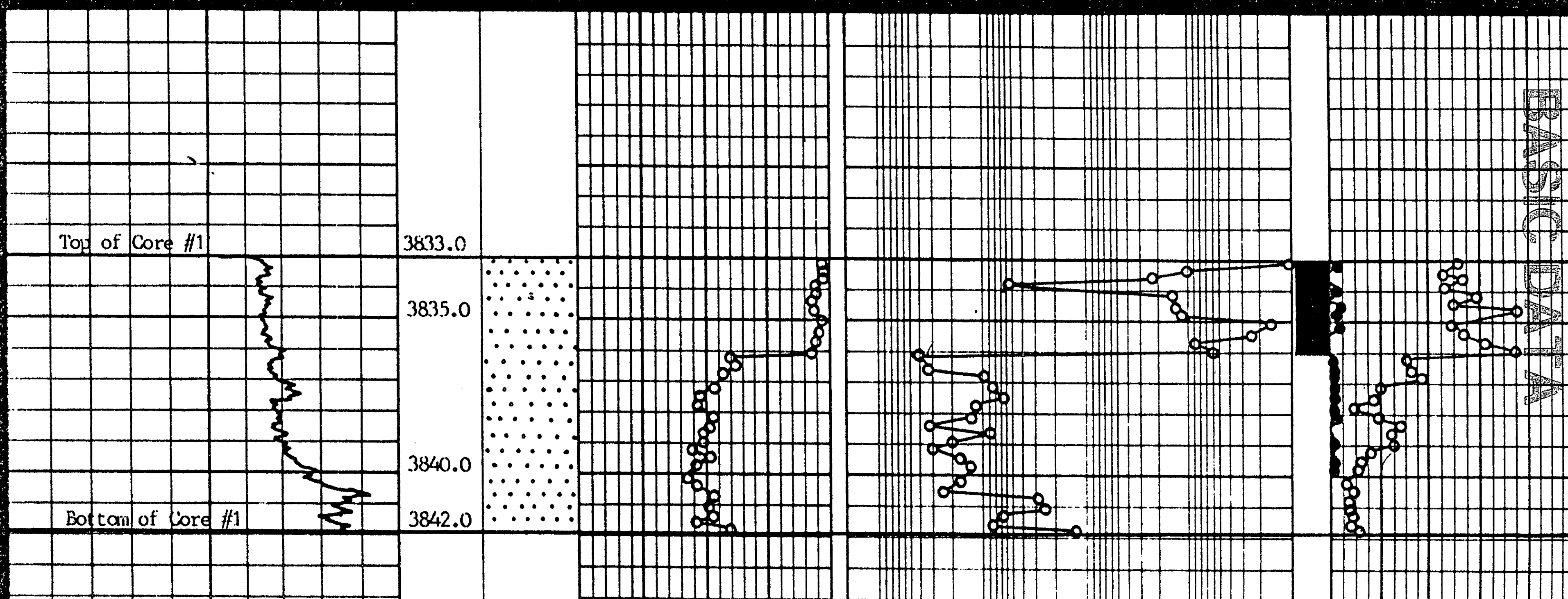
CORE SERVICES OF AUSTRALIA
PETROLEUM RESERVOIR ENGINEERING DATA

CORE LOG

Company: PETROFINA EXPLORATION AUST. S.A.
Well: ANGLER #1
Field: WILDCAT

Country: AUSTRALIA
State: VICTORIA
Location: VIC - P - 20

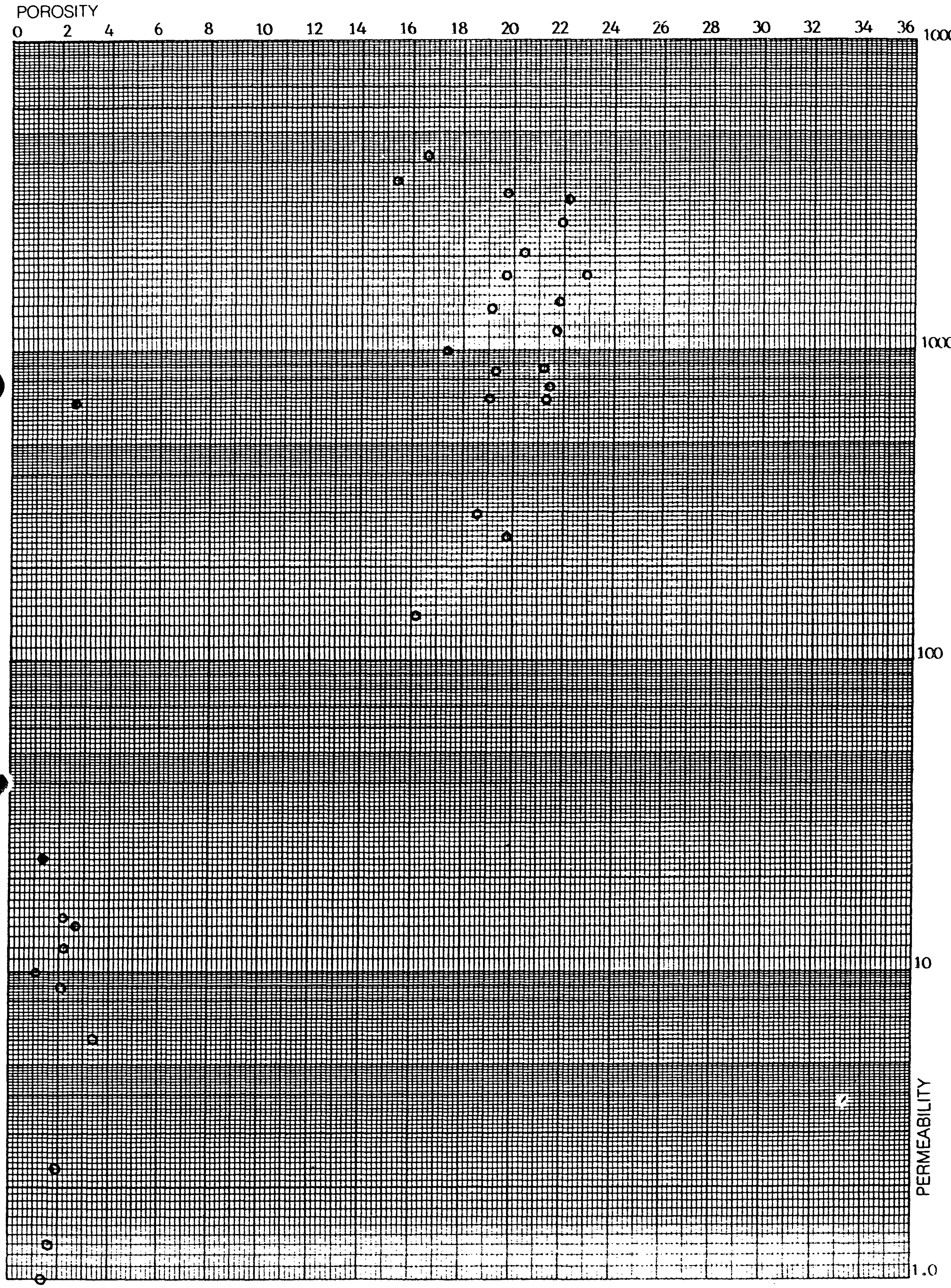
Date: 8th May 1989
Scale: 1 : 200
File No: 5 - 07



Core Services of Australia
Pty Limited

COMPANY PETROFINA EXPL. AUST. S.A. FILE NO 5-07 DATE 8.5.1989

WELL ANGLER #1 FIELD BASIC DATA LOCATION VIC-P-20



APPENDIX 5

APPENDIX 5

APPENDIX 5

FLUID ANALYSIS

47 Woodforde Road, Magill,
South Australia, 5072
P.O. Box 410,
Magill, South Australia, 5072

PETROLAB

Fax: 364 1500
Telex: AA88214
Tel: (08) 364 1500
(08) 333 0787

Reservoir Fluid and Core Services, Laboratory Consulting and Analysis

RECEIVED 8 JUN 1989

BASIC DATA

Adelaide, June 5 1989
P. O. Box 410
Magill
S. A. 5072

Petrofina Exploration Australia S. A.
Level 2
476 St. Kilda Road
Melbourne
Victoria, 3004

Subject: Reservoir Fluid Study
Well : Angler # 1
File : P - 89021

Attention: Mr. Mark Tringham

Dear Sirs,

Petrolab received a bottom hole sample from the subject well in Schlumberger's R F T chamber # R F S - AD 1182 on May 25 1989 and was instructed to transfer the sample into high pressure laboratory storage cylinders.

After this transfer of which the results were facsimiled to Petrofina Australia and which has been summarised on page # 1, we continued with a compositional analysis, by flashing the high pressure gas condensate sample from the working pressure of 7000 psig and room temperature to atmospheric conditions while measuring the quantities of the flashed stock tank products.
The composition of both, stock tank gas and stock tank liquid, were then determined by means of chromatography and by mathematically recombining these products the composition of the bottom hole sample was obtained. On page # 2 this analysis has been reported.

A known volume of the reservoir fluid sample was then charged to a visual P V T cell and thermally expanded to the reservoir temperature of 235 deg F. During a constant mass study at this temperature, a dew point pressure of 5545 psig was observed. Other data obtained during this Pressure - Volume relations experiment including relative volume versus pressure, gas compressibility, specific volume and gas expansion above the dew point and the distribution of retrograde liquid versus pressure below it, can be found on pages 3 and 4. The remainder of this report contains graphical presentations of the data.

We thank Petrofina Exploration Australia S. A. for the opportunity to be of service. Please do not hesitate in contacting us should you require any further information or if we can assist you in any other way.

Yours sincerely,

Jan G. Bon

P E T R O L A B

Company: Petrofina Exploration Australia S. A.
Well : Angler # 1

SUMMARY OF RESULTS

BASIC DATA

TRANSFER:

R F T Chamber # RFS - AD 1182 received May 25 1989 and transferred into Petrolab cylinders # 53, 48 and 32.

Opening pressure @ 17 deg C: 2690 psig

Injected 100 cc's Hg in chamber to stir up hydrocarbons.

Compressed to 7000 psig with 1050 cc's of water behind piston.

Transferred three times 650 cc's into Petrolab cylinders at above 7000 psig.

Flashed remainder of sample to atmosphere recovering back the Hg Hg and an additional 25 cc's of condensate and some 220 cc's of mud/filtrate/formation? water mixture.

CONSTANT MASS:

SATURATED VAPOUR:

Reservoir Temperature (deg F)	:	235
Dew Point Pressure (psig)	:	5545
Gas Formation Volume Factor (Bg)	:	0.00373
Gas Expansion Factor (E)	:	267.79
Gas Deviation Factor (Z)	:	1.057
Specific Volume (cft/lb)	:	0.06301
Density (gm/cc)	:	0.2542
Molecular Weight	:	22.59
Gas Gravity (Air = 1.000)	:	0.782
Gross Heating Value (BTU/ft3)	:	1298

Total Plant Products in Dew Point Fluid (GPMM)

Ethane	:	1788
Propane	:	668
Butanes	:	351
Pentanes Plus	:	1758

BASIC DATA

P E T R O L A B

Company: Petrofina Exploration Australia S.A.
Well : Angler # 1

File: P 89021

COMPOSITIONAL ANALYSIS OF RECOMBINED RESERVOIR FLUID

Transferred from R F T chamber # RFS - AD 1182.

Component		Stock Tank Liquid Mol %	Stock Tank Gas Mol %	Reservoir Fluid Mol %
Hydrogen Sulphide	H2S	0.00	0.00	0.00
Carbon Dioxide	CO2	0.04	2.70	2.65
Nitrogen	N2	0.00	0.19	0.19
Methane	C1	0.52	85.09	83.59
Ethane	C2	0.26	6.82	6.70
Propane	C3	0.36	2.47	2.43
Iso-Butane	iC4	0.15	0.40	0.40
N-Butane	nC4	0.39	0.71	0.70
Iso-Pentane	iC5	0.35	0.23	0.23
N-Pentane	nC5	0.41	0.21	0.21
Hexanes	C6	2.20	0.31	0.34
Heptanes	C7	10.62	0.48	0.66
Octanes	C8	13.07	0.23	0.46
Nonanes	C9	17.53	0.11	0.42
Decanes	C10	10.43	0.03	0.21
Undecanes	C11	6.84	0.01	0.13
Dodecanes Plus	C12+	36.83	0.01	0.68
TOTAL		100.00	100.00	100.00
Ratios				
Molar Ratio	:	0.0177	0.9823	1.0000
Mass Ratio	:	0.1241	0.8759	1.0000
Gas Liquid Ratio	:	1.0000 bbl @ SC	37126 SCF	--
Stream Properties				
Molecular Weight	:	158.0	20.15	22.59
Density obs. (gm/cc)	:	0.7968 @60F	--	--
Gravity (AIR = 1.000)	:	45.9 API @60F	0.698	0.782
GHV (BTU/scf)	:	--	1167.0	--
Hexanes Plus Properties				
Mol %	:	97.52	1.18	2.90
Molecular Weight	:	160.8	97.9	135.1
Density (gm/cc @ 60 F)	:	0.7998	0.6863	0.7633
Gravity (API @ 60 F)	:	45.2	74.5	53.7
Heptanes Plus Properties				
Mol %	:	95.32	0.87	2.56
Molecular Weight	:	162.6	102.9	141.8
Density (gm/cc @ 60 F)	:	0.8014	0.6928	0.7721
Gravity (API @ 60 F)	:	44.9	72.5	51.6
Decanes Plus Properties				
Mol %	:	54.10	0.05	1.02
Molecular Weight	:	202.5	109.8	195.9
Density (gm/cc @ 60 F)	:	0.8257	0.7015	0.8218
Gravity (API @ 60 F)	:	39.7	70.0	40.5
Undecanes Plus Properties				
Mol %	:	43.67	0.02	0.81
Molecular Weight	:	218.9	147.0	213.0
Density (gm/cc @ 60 F)	:	0.8332	0.7400	0.8314
Gravity (API @ 60 F)	:	38.2	59.5	38.5
Dodecanes Plus Properties				
Mol %	:	36.83	0.01	0.68
Molecular Weight	:	232.2	161.0	225.5
Density (gm/cc @ 60 F)	:	0.8387	0.7521	0.8377
Gravity (API @ 60 F)	:	37.1	56.5	37.3

BASIC DATA

P E T R O L A B

Company: Petrofina Exploration Australia
Well : Angler # 1

CONSTANT MASS STUDY
@ 235 deg F

Pressure (psig)	Relative Volume (V/Vsat) (1)	Formation Volume Factor (Bg) (2)	Gas Expansion Factor (E) (3)	Deviation Factor (Z)	Specific Volume (CFT/LB)
7500	0.8700	0.00325	307.79	1.243	0.05482
7215	0.8840	0.00330	302.94	1.215	0.05570
7050	0.8942	0.00334	299.48	1.201	0.05634
6685	0.9162	0.00342	292.28	1.167	0.05773
6336	0.9409	0.00351	284.62	1.136	0.05929
6080	0.9536	0.00356	280.81	1.105	0.06009
5810	0.9762	0.00365	274.33	1.081	0.06151
5545 *	1.0000	0.00373	267.79	1.057	0.06301

* Dew Point Pressure

(1) Cubic feet of gas at indicated pressure and temperature per cubic foot at saturation pressure.

(2) Cubic feet of gas at indicated pressure and temperature per cubic foot at 14.696 psia and 60 deg.F.

(3) Cubic feet of gas at 14.696 psia and 60 deg.F per cubic foot at indicated pressure and temperature.

BASIC DATA

P E T R O L A B

CONSTANT MASS STUDY
@ 235 deg F

Pressure (psig)	Relative Volume (V/Vsat) (1)	Retrograde Liquid Deposit (Bbl/MMSCF) (2)	Retrograde Liquid Deposit (Volume%) (3)
5545 *	1.0000	0.00	0.00
5215	1.0384	6.99	1.36
4955	1.0649	11.20	2.18
4520	1.1254	16.23	3.16
4050	1.2151	19.98	3.89
3510	1.3639	22.29	4.34
3000	1.5577	24.09	4.69
2820	1.6480	25.01	4.87
2510	1.8391	27.58	5.37
2245	2.0570	31.44	6.12
1820	2.5963	--	--

* Dew Point Pressure

(1) Cubic feet of gas at indicated pressure and temperature per cubic foot at saturation pressure.

(2) Barrels of liquid at indicated pressure and temperature per MMSCF of original reservoir fluid.

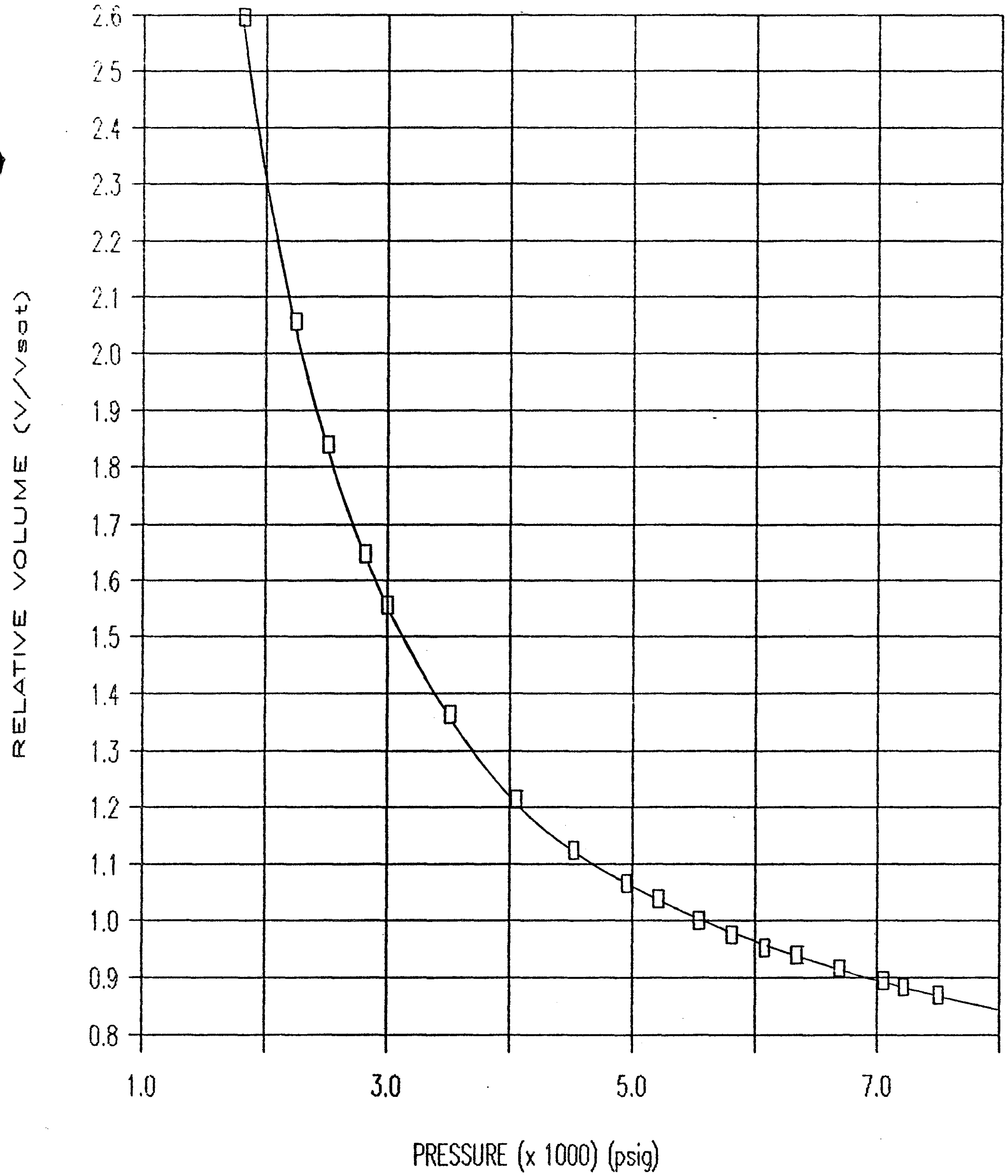
(3) Percent of reservoir hydrocarbon pore space at dew point.

BASIC DATA

P E T R O L A B

Company: Petrofina Exploration Australia S.A.　　Page: 5 of 10
Well : Angler # 1　　File: P 89021

RELATIVE VOLUME

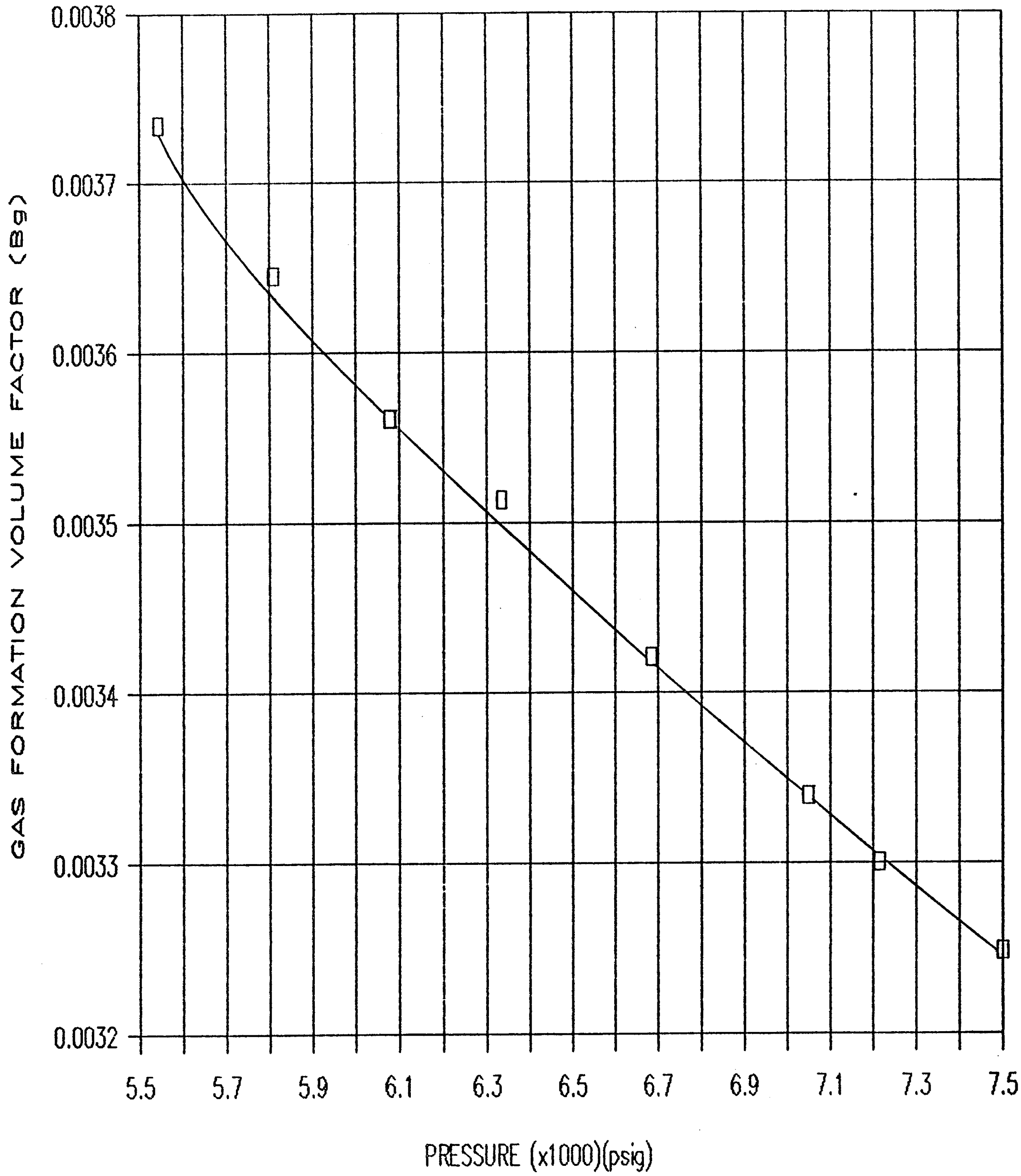


P E T R O L A B

Company: Petrofina Exploration Australia S.A.
Well : Angler # 1

File: P 89021

GAS FORMATION VOLUME FACTOR



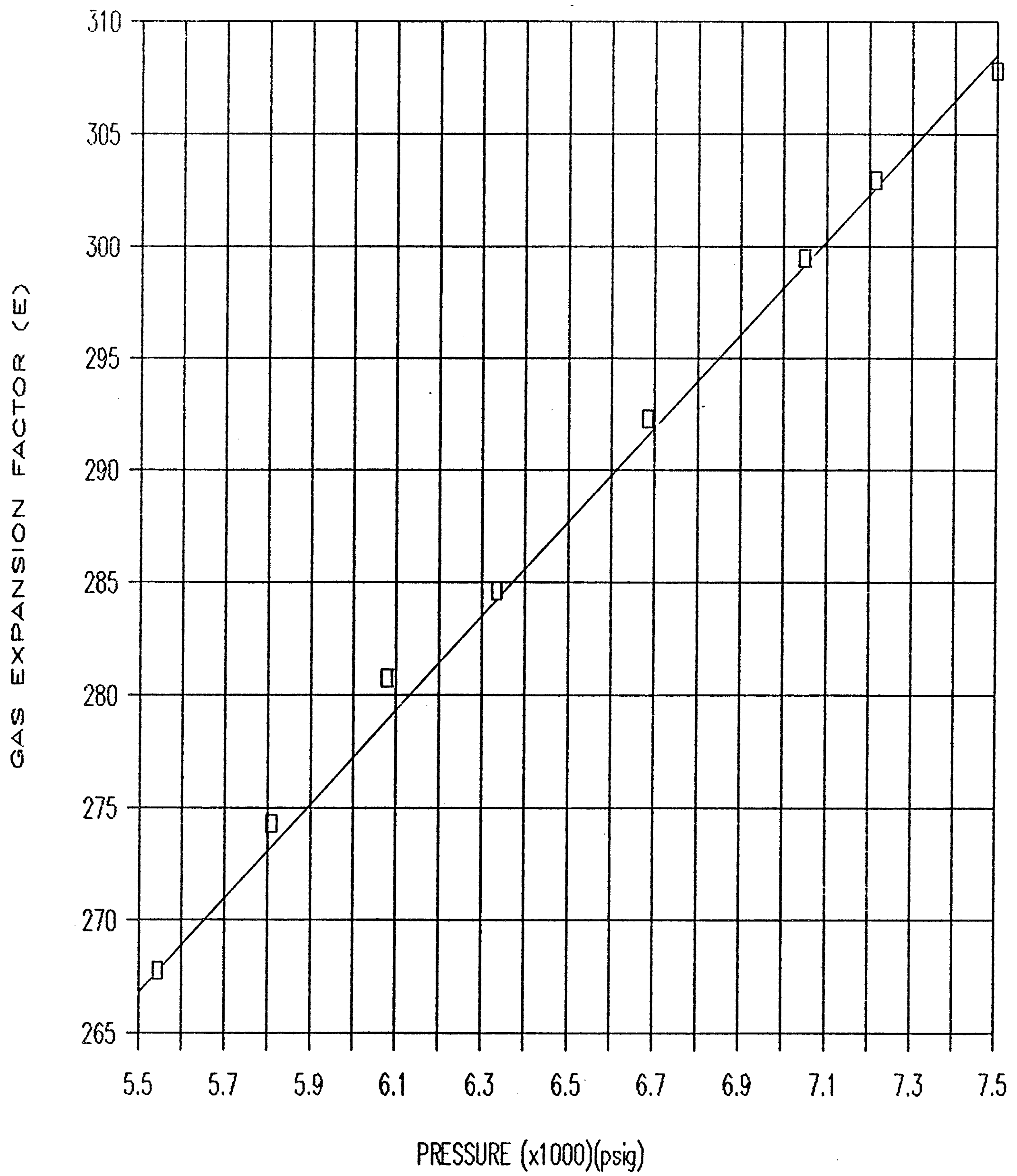
BASIC DATA

P E T R O L A B

Company: Petrofina Exploration Australia S.A.
Well : Angler # 1

File: P 89021

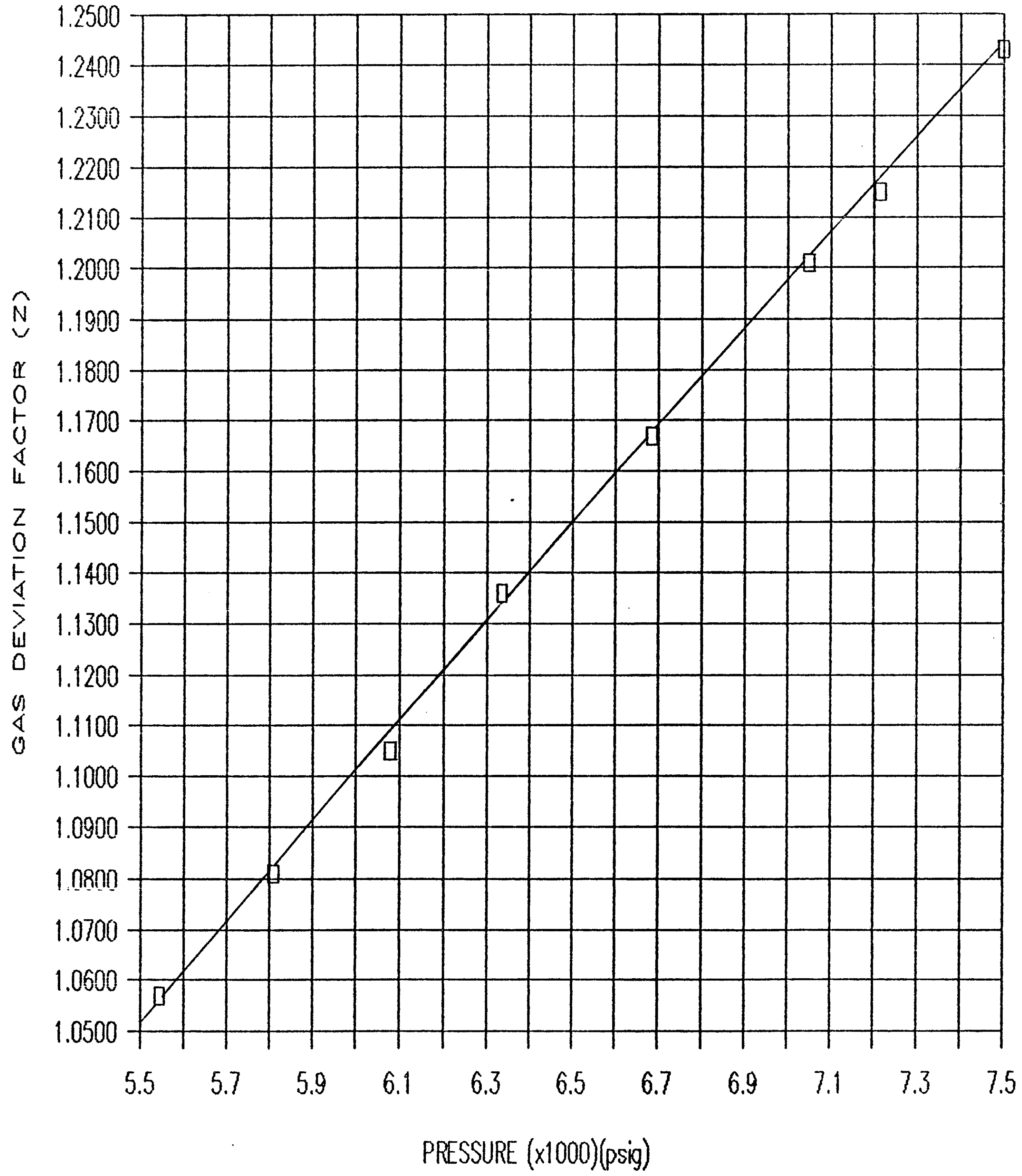
GAS EXPANSION FACTOR



P E T R O L A B

Company: Petrofina Exploration Australia S.A.
Well : Angler # 1

GAS DEVIATION FACTOR



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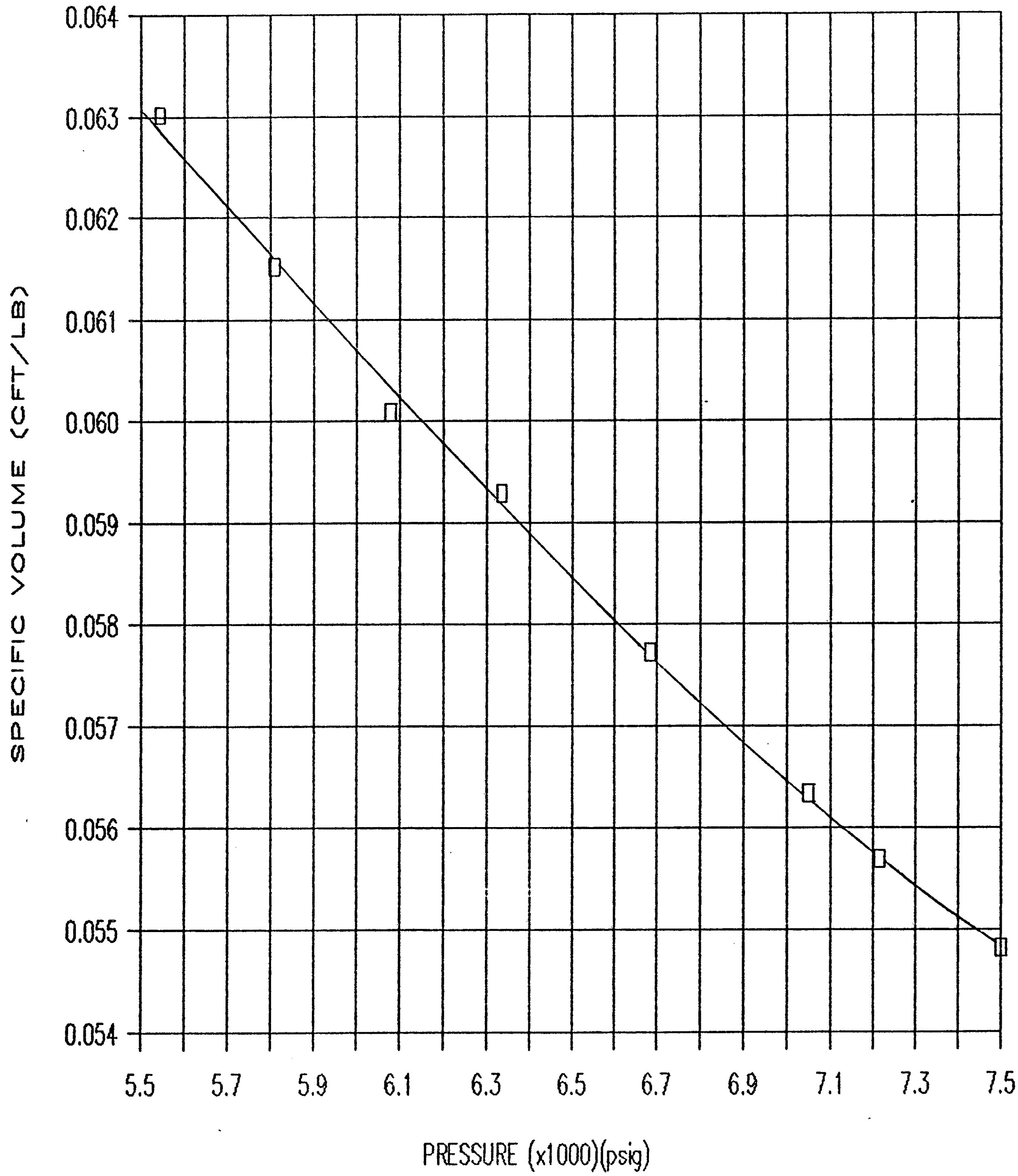
Company: Petrofina Exploration Australia S.A.
Well : Angler # 1

File: P 89021

RESERVOIR FLUID SPECIFIC VOLUME



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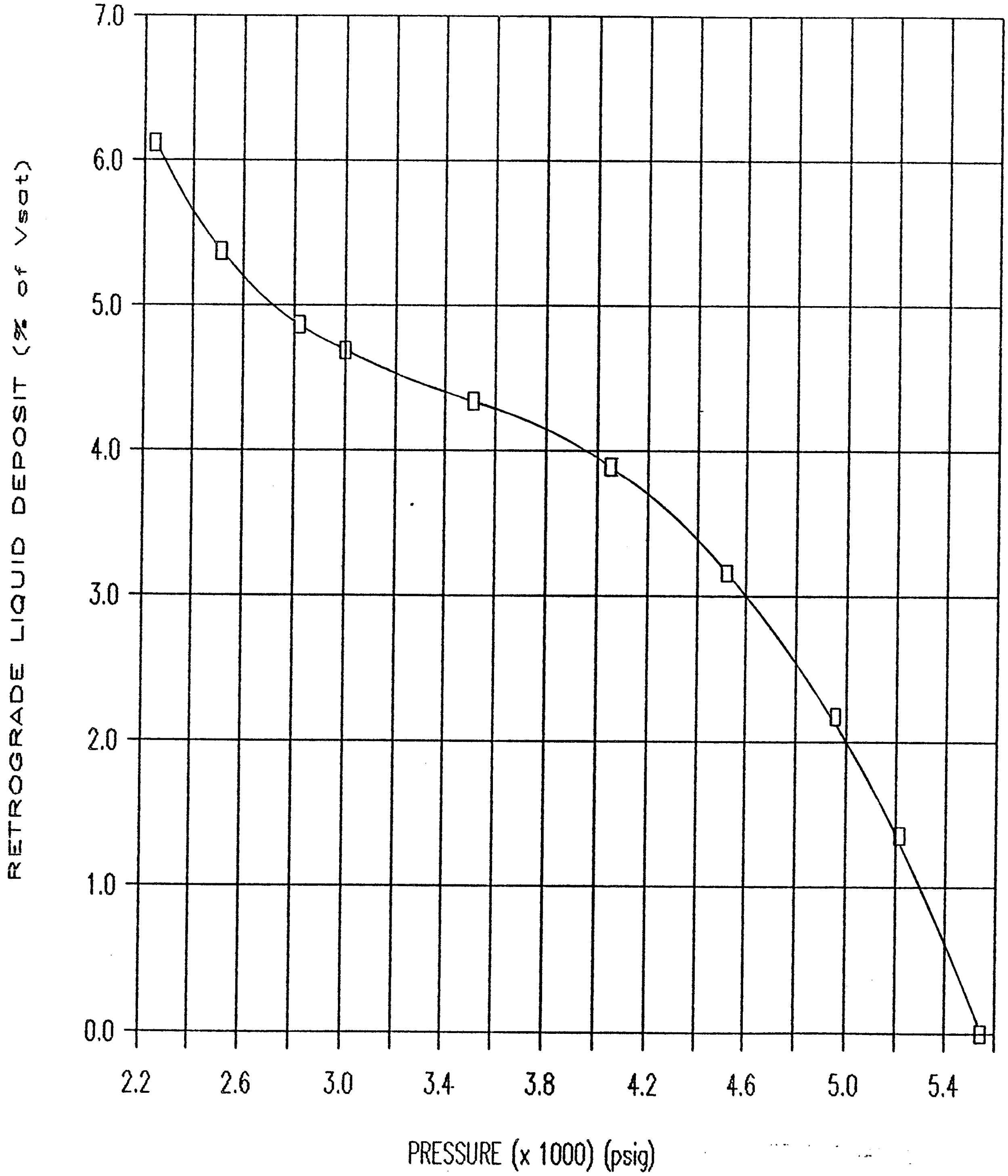
Company: Petrofina Exploration Australia S.A.
Well : Angler # 1

File: P 89021

RETROGRADE CONDENSATION



APPENDIX 6

APPENDIX 6

BASIC DATA

APPENDIX 6

VELOCITY SURVEY VSP RESULTS

LONG DEFINITIONS

GLOBAL

KB	-	ELEVATION OF THE KELLY-BUSHING ABOVE MSL OR MWL
SRD	-	ELEVATION OF THE SEISMIC REFERENCE DATUM ABOVE MSL OR MWL
EKB	-	ELEVATION OF KELLY BUSHING
GL	-	ELEVATION OF USER'S REFERENCE (GENERALLY GROUND LEVEL) ABOVE SRD
UNERTH	-	UNIFORM EARTH VELOCITY (GTRFRM)

ZONE

LOFVEL	-	LAYER OPTION FLAG FOR VELOCITY: -1=NONE; 0=UNIFORM; 1=UNIFORM+LAYER
LAYVEL	-	USER SUPPLIED VELOCITY DATA

SAMPLED

SHOT	-	SHOT NUMBER
DKB	-	MEASURED DEPTH FROM KELLY-BUSHING
DSRD	-	DEPTH FROM SRD
DGL	-	VERTICAL DEPTH RELATIVE TO GROUND LEVEL (USER'S REFERENCE)
SHTM	-	SHOT TIME (WST)
ADJS	-	ADJUSTED SONIC TRAVEL TIME
SHDR	-	DRIFT AT SHOT OR KNEE
REST	-	RESIDUAL TRAVEL TIME AT KNEE
INTV	-	INTERNAL VELOCITY, AVERAGE

(GLOBAL PARAMETERS)		(VALUE)	
ELEV OF KB AB. MSL (WST)	KB	: 27.0000	M
ELEV OF SRD AB. MSL(WST)	SRD	: 0	M
ELEVATION OF KELLY BUSHI	EKB	: 27.0000	M
ELEV OF GL AB. SRD(WST)	GL	: -274.000	M
UNIFORM EARTH VELOCITY	UNERTH	: 1500.00	M/S

(ZONED PARAMETERS)		(VALUE)		(LIMITS)	
LAYER OPTION FLAG VELOC	LOFVEL	: 1.000000		30479.7 -	0
USER VELOC (WST)	LAYVEL	: 2006.000	M/S	600.000 -	301.000
		1500.000		301.000	0

BASIC DATA

COMPANY : PETROFINA EXPLORATION AUSTRA WELL : ANGLER #1

LEVEL NUMBER	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	VERTICAL DEPTH FROM GL M	VERTICAL TRAVEL TIME SRD/GEOPH MS	INTEGRATED ADJUSTED SONIC TIME MS	DRIFT = SHOT TIME - RAW SON MS	RESIDUAL = SHOT TIME - ADJ SON MS	ADJUSTED INTERVAL VELOCITY M/S
1	301.00	274.00	0	182.63	182.63	0	0	1500
2	600.00	573.00	299.00	331.68	331.66	0	.01	2006
3	900.00	873.00	599.00	448.89	447.40	3.49	1.49	2592
4	1000.00	973.00	699.00	483.45	483.47	2.66	-.02	2772
5	1125.00	1098.00	824.00	529.86	530.01	3.38	-.15	2686
6	1250.00	1223.00	949.00	571.52	571.30	4.47	.22	3027
7	1350.00	1323.00	1049.00	601.83	602.12	4.42	-.29	3244
8	1450.00	1423.00	1149.00	631.43	631.65	4.95	-.22	3336
9	1550.00	1523.00	1249.00	659.63	659.83	5.44	-.21	3548
10	1650.00	1623.00	1349.00	687.54	687.79	5.86	-.25	3577
11	1750.00	1723.00	1449.00	714.43	714.74	6.27	-.31	3712
12	1850.00	1823.00	1549.00	739.79	740.57	6.27	-.78	3871
13	1940.00	1913.00	1639.00	761.93	763.29	6.11	-1.36	3961
14	2047.00	2020.00	1746.00	789.03	789.20	7.81	-.17	4130
15	2225.00	2198.00	1924.00	843.95	843.97	9.76	-.02	3250
16	2350.00	2323.00	2049.00	885.97	885.79	11.23	.19	2989
17	2477.00	2450.00	2176.00	930.87	930.63	12.58	.25	2332
18	2600.00	2573.00	2299.00	974.21	973.97	13.82	.24	2837
19	2620.00	2593.00	2319.00	980.93	980.65	14.06	.28	2998
20	2640.00	2613.00	2339.00	987.49	987.21	14.26	.28	3048
21	2660.00	2633.00	2359.00	993.90	993.77	14.31	.13	3045
22	2680.00	2653.00	2379.00	1000.42	1000.28	14.52	.14	3074
23	2700.00	2673.00	2399.00	1007.03	1006.98	14.63	.04	2983
24	2720.00	2693.00	2419.00	1013.81	1013.52	15.07	.29	3060

BASIC DATA

LEVEL NUMBER	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	VERTICAL DEPTH FROM GL M	VERTICAL TRAVEL TIME SRD/GEOPH MS	INTEGRATED ADJUSTED SONIC TIME MS	DRIFT = SHOT TIME - RAW SON MS	RESIDUAL = SHOT TIME - ADJ SON MS	ADJUSTED INTERVAL VELOCITY M/S
25	2740.00	2713.00	2439.00	1020.03	1020.08	14.94	-.05	3049
26	2760.00	2733.00	2459.00	1026.22	1026.26	15.15	-.04	3236
27	2780.00	2753.00	2479.00	1032.83	1032.70	15.53	.14	3106
28	2800.00	2773.00	2499.00	1039.12	1039.22	15.49	-.10	3067
29	2820.00	2793.00	2519.00	1045.86	1045.80	15.85	.05	3037
30	2840.00	2813.00	2539.00	1051.96	1052.06	15.90	-.10	3197
31	2860.00	2833.00	2559.00	1058.12	1058.31	16.02	-.18	3202
32	2880.00	2853.00	2579.00	1064.39	1064.78	16.01	-.39	3087
33	2900.00	2873.00	2599.00	1071.30	1070.96	16.94	.34	3238
34	2920.00	2893.00	2619.00	1077.13	1076.98	16.96	.15	3324
35	2940.00	2913.00	2639.00	1082.82	1082.75	17.07	.07	3464
36	2960.00	2933.00	2659.00	1088.07	1088.33	16.95	-.25	3536
37	2980.00	2953.00	2679.00	1094.24	1094.08	17.57	.16	3476
38	3000.00	2973.00	2699.00	1099.19	1099.37	17.37	-.19	3730
39	3020.00	2993.00	2719.00	1104.09	1105.03	16.73	-.94	3533
40	3040.00	3013.00	2739.00	1110.74	1110.83	17.70	-.09	3444
41	3060.00	3033.00	2759.00	1116.32	1116.72	17.51	-.40	3397
42	3080.00	3053.00	2779.00	1122.50	1122.65	17.88	-.15	3373
43	3100.00	3073.00	2799.00	1127.53	1128.40	17.27	-.87	3479
44	3120.00	3093.00	2819.00	1133.95	1134.05	18.17	-.10	3541
45	3140.00	3113.00	2839.00	1139.66	1139.75	18.30	-.09	3507
46	3160.00	3133.00	2859.00	1145.47	1145.39	18.59	.08	3544
47	3180.00	3153.00	2879.00	1151.18	1151.49	18.32	-.31	3279
48	3200.00	3173.00	2899.00	1157.32	1157.19	18.88	.13	3510

BASIC DATA

LEVEL NUMBER	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	VERTICAL DEPTH FROM GL M	VERTICAL TRAVEL TIME SRD/GEOPH MS	INTEGRATED ADJUSTED SONIC TIME MS	DRIFT = SHOT TIME - RAW SON MS	RESIDUAL = SHOT TIME - ADJ SON MS	ADJUSTED INTERVAL VELOCITY M/S
49	3220.00	3193.00	2919.00	1162.99	1163.11	18.75	-.11	3381
50	3240.00	3213.00	2939.00	1169.06	1168.80	19.24	.26	3512
51	3260.00	3233.00	2959.00	1175.52	1174.56	20.06	.96	3472
52	3280.00	3253.00	2979.00	1181.18	1180.28	20.12	.90	3495
53	3300.00	3273.00	2999.00	1186.59	1185.88	20.06	.71	3576
54	3320.00	3293.00	3019.00	1191.83	1191.52	19.78	.31	3542
55	3340.00	3313.00	3039.00	1196.82	1197.14	19.18	-.31	3563
56	3360.00	3333.00	3059.00	1202.77	1202.60	19.67	.16	3657
57	3380.00	3353.00	3079.00	1207.84	1208.06	19.30	-.22	3665
58	3400.00	3373.00	3099.00	1213.38	1213.38	19.55	0	3763
59	3420.00	3393.00	3119.00	1218.58	1218.83	19.31	-.25	3665
60	3440.00	3413.00	3139.00	1224.74	1224.22	20.11	.52	3714
61	3460.00	3433.00	3159.00	1229.20	1229.70	19.10	-.50	3647
62	3480.00	3453.00	3179.00	1235.65	1234.93	20.35	.72	3826
63	3500.00	3473.00	3199.00	1240.00	1240.03	19.61	-.03	3919
64	3520.00	3493.00	3219.00	1244.27	1245.02	18.91	-.76	4009
65	3540.00	3513.00	3239.00	1249.93	1250.32	19.29	-.39	3773
66	3560.00	3533.00	3259.00	1255.50	1255.61	19.58	-.12	3775
67	3580.00	3553.00	3279.00	1260.88	1260.94	19.66	-.06	3753
68	3600.00	3573.00	3299.00	1265.33	1266.17	18.91	-.83	3830
69	3620.00	3593.00	3319.00	1271.56	1271.40	19.92	.16	3820
70	3640.00	3613.00	3339.00	1277.44	1276.59	20.63	.85	3853
71	3660.00	3633.00	3359.00	1282.84	1281.74	20.90	1.10	3888
72	3680.00	3653.00	3379.00	1287.82	1287.05	20.59	.77	3764

BASIC DATA

COMPANY : PETROFINA EXPLORATION AUSTRA   WELL : ANGLER #1

LEVEL NUMBER	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	VERTICAL DEPTH FROM GL M	VERTICAL TRAVEL TIME SRD/GEOPH MS	INTEGRATED ADJUSTED SONIC TIME MS	DRIFT = SHOT TIME - RAW SON MS	RESIDUAL = SHOT TIME - ADJ SON MS	ADJUSTED INTERVAL VELOCITY M/S
73	3700.00	3673.00	3399.00	1291.98	1292.14	19.67	-.16	3930
74	3720.00	3693.00	3419.00	1295.86	1297.41	18.31	-1.55	3795
75	3740.00	3713.00	3439.00	1301.07	1302.66	18.29	-1.59	3811
76	3760.00	3733.00	3459.00	1307.98	1307.84	20.04	.14	3857
77	3780.00	3753.00	3479.00	1313.62	1313.07	20.47	.56	3828
78	3800.00	3773.00	3499.00	1317.54	1318.21	19.26	-.67	3886
79	3820.00	3793.00	3519.00	1324.00	1323.34	20.62	.66	3899
80	3840.00	3813.00	3539.00	1327.49	1327.91	19.54	-.42	4381
81	3860.00	3833.00	3559.00	1333.33	1332.56	20.76	.77	4301
82	3880.00	3853.00	3579.00	1336.82	1337.49	19.34	-.67	4057
83	3900.00	3873.00	3599.00	1341.47	1342.15	19.35	-.68	4237
84	3920.00	3893.00	3619.00	1346.34	1347.13	19.26	-.79	4018
85	3940.00	3913.00	3639.00	1351.33	1351.69	19.71	-.36	4382
86	3960.00	3933.00	3659.00	1355.78	1356.68	19.20	-.89	4015
87	3980.00	3953.00	3679.00	1361.14	1361.67	19.59	-.52	4007
88	4000.00	3973.00	3699.00	1366.03	1366.57	19.59	-.54	4076
89	4020.00	3993.00	3719.00	1370.78	1371.38	19.55	-.61	4160
90	4040.00	4013.00	3739.00	1376.29	1376.39	20.07	-.10	3996
91	4060.00	4033.00	3759.00	1381.14	1381.47	19.86	-.33	3938
92	4080.00	4053.00	3779.00	1386.30	1386.39	20.12	-.09	4059
93	4100.00	4073.00	3799.00	1390.84	1391.02	20.05	-.18	4325
94	4120.00	4093.00	3819.00	1395.72	1395.87	20.11	-.15	4124
95	4140.00	4113.00	3839.00	1400.73	1400.75	20.25	-.02	4092
96	4160.00	4133.00	3859.00	1405.65	1405.69	20.25	-.04	4053

LEVEL NUMBER	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	VERTICAL DEPTH FROM GL M	VERTICAL TRAVEL TIME SRD/GEOPH MS	INTEGRATED ADJUSTED SONIC TIME MS	DRIFT = SHOT TIME - RAW SON MS	RESIDUAL = SHOT TIME - ADJ SON MS	ADJUSTED INTERVAL VELOCITY M/S
								4180
97	4180.00	4153.00	3879.00	1410.59	1410.47	20.43	.12	
								4074
98	4200.00	4173.00	3899.00	1415.41	1415.38	20.36	.03	
								4070
99	4220.00	4193.00	3919.00	1420.68	1420.30	20.74	.39	
								4152
100	4240.00	4213.00	3939.00	1425.37	1425.11	20.62	.25	
								4242
101	4260.00	4233.00	3959.00	1429.99	1429.83	20.55	.16	
								4214
102	4280.00	4253.00	3979.00	1434.40	1434.57	20.23	-.18	
								4409
103	4300.00	4273.00	3999.00	1438.94	1439.11	20.26	-.17	
								4370
104	4320.00	4293.00	4019.00	1443.31	1443.69	20.07	-.38	
								4145
105	4335.00	4308.00	4034.00	1447.46	1447.30	20.63	.16	

BASIC DATA

ANALYST: M. SANDERS 22-MAY-89 09:00:48 PROGRAM: GADJST 008.E08

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*   SCHLUMBERGER   *
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VELOCITY REPORT

COMPANY : PETROFINA EXPLORATION AUSTRA
WELL : ANGLER #1
FIELD : EXPLORATION
COUNTRY : AUSTRALIA
REFERENCE: SYJ-56344

BASIC DATA

PE601875

This is an enclosure indicator page.
The enclosure PE601875 is enclosed within the container PE902148 at this location in this document.

The enclosure PE601875 has the following characteristics:

ITEM_BARCODE =	PE601875
CONTAINER_BARCODE =	PE902148
NAME =	Angler 1 sedimentary interpretation log 1:500
BASIN =	GIPPSLAND
PERMIT =	VIC/P20
TYPE =	WELL
SUBTYPE =	WELL_LOG
DESCRIPTION =	Angler 1 sedimentary interpretation log 1:500
REMARKS =	
DATE_CREATED =	31/08/89
DATE_RECEIVED =	26/10/89
W_NO =	W993
WELL_NAME =	Angler-1
CONTRACTOR =	Petrofina Exploration Australia S.A
CLIENT_OP_CO =	Petrofina Exploration Australia S.A

(Inserted by DNRE - Vic Govt Mines Dept)

PE601884

This is an enclosure indicator page.
The enclosure PE601884 is enclosed within the container PE902148 at this location in this document.

The enclosure PE601884 has the following characteristics:

ITEM_BARCODE	= PE601884
CONTAINER_BARCODE	= PE902148
NAME	= Angler 1 Geoservices Masterlog
BASIN	= GIPPSLAND
PERMIT	= VIC/P20
TYPE	= WELL
SUBTYPE	= MUD_LOG
DESCRIPTION	= Angler 1 Geoservices Masterlog
REMARKS	=
DATE_CREATED	= 13/05/89
DATE_RECEIVED	= 24/05/89
W_NO	= W993
WELL_NAME	= Angler-1
CONTRACTOR	= Geoservices Overseas S.A
CLIENT_OP_CO	= Petrofina Exploration Australia S.A

(Inserted by DNRE - Vic Govt Mines Dept)

PE601001

This is an enclosure indicator page.
The enclosure PE601001 is enclosed within the container PE902148 at this location in this document.

The enclosure PE601001 has the following characteristics:

ITEM_BARCODE =	PE601001
CONTAINER_BARCODE =	PE902148
NAME =	Composite Well log
BASIN =	GIPPSLAND
PERMIT =	Vic/P20
TYPE =	WELL
SUBTYPE =	well log
DESCRIPTION =	Composite Well log
REMARKS =	
DATE_CREATED =	27/05/1989
DATE_RECEIVED =	04/08/1989
W_NO =	W993
WELL_NAME =	Angler-1
CONTRACTOR =	Petrofina
CLIENT_OP_CO =	Petrofina

(Inserted by DNRE - Vic Govt Mines Dept)