WCR (VOL. 1)
GREENSLOPES

(W924)

PHOENIX OIL & GAS N.L.

PEP 101
GREENSLOPES 1
Well Completion Report

Volume 1

L.P.MITCHELL
January 1986

GREENSLOPES NO. 1

WELL COMPLETION REPORT

L. MITCHELL

PHOENIX OIL & GAS N.L.

JUNE 1986

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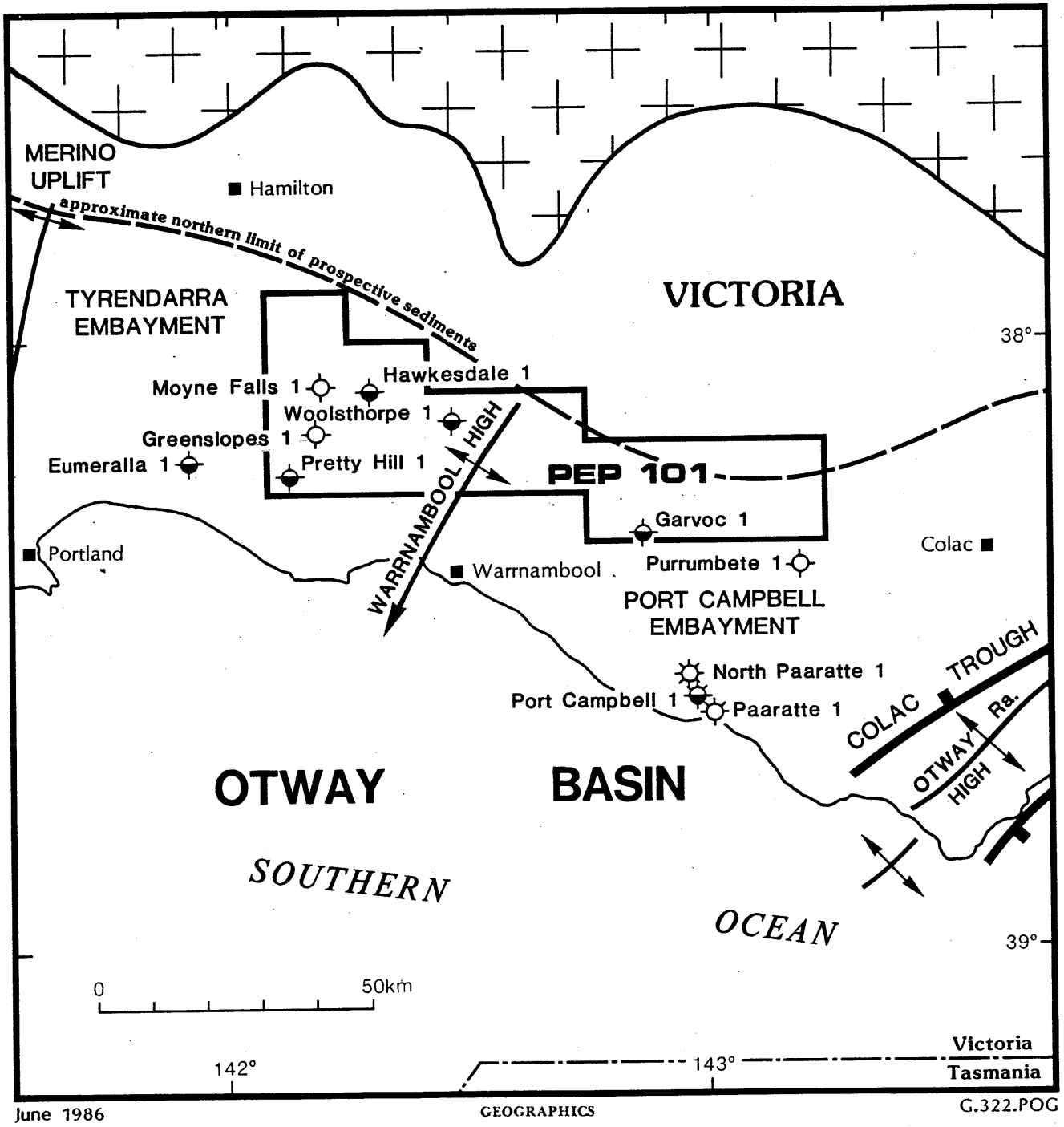


June 1986 GEOGRAPHICS G.322.POG

- gas well
- show of gas
- show of oil and gas
- show of oil
- dry well
- basement

PEP 101

Otway Basin, Onshore Victoria

LOCATION

Figure 1

I INTRODUCTION

Greenslopes No. 1 was drilled by Phoenix Oil & Gas N.L. in PEP 101 in the Eastern part of the Otway Basin, Southwestern Victoria (Fig. 1).

The well was located in the Western portion of the PEP 101 permit and situated some 40 kms Northwest of the Warrnambool township and 28 kms North of the Port Fairy township.

The well was spudded at 1100 hrs on 17/12/85 and reached a total depth of 2608 m at 2200 hrs on 8/1/86 and after electric logging the well was plugged and abandoned at 1930 hrs on 11/1/86. The rig was released at 1930 hrs on the 11/1/86.

Greenslopes No. 1 was located on shot point 890 on line OPX – 84B – 24 of the Greenslopes Seismic Survey, as a structural test of sedimentary drape of the Upper Cretaceous sequence over a basement faulted anticline. At the Base Cretaceous horizon, closure was exhibited by dip to the east, west and north along with a large down to the south fault which was expected to displace the Eumeralla formation into such a position as to act as lateral seal in this direction.

The penetrated section recorded a sequence similar to that as encountered in the nearby wells Pretty Hill No. 1, Woolesthorpe No. 1 and the upper portions of Hawkesdale No. 1 as predicted.

The sequence in Greenslopes consisted of a thinned Tertiary section unconformably overlying the Upper Cretaceous Otway Group. A major hiatus occurs between the Upper and Lower Tertiary units where the mid Tertiary Nirranda Group and part of the Lower Tertiary Wangeripp Group are absent and/or eroded. This hiatus had been mapped previously as the Base Tertiary Unconformity, however it is less pronounced than the mid Tertiary Unconformity and is possibly conformable at this locality.

The Upper Cretaceous sequence rests unconformably on the Lower Cretaceous through to a lower paralic shale, here termed the Basal Shale Unit, resting on a metabasaltic Basement at 2582 metres.

The lower section through to economic basement was encountered at depths higher than predicted. This was due in part to velocity variations within the basement caused by the layering giving rise to an anomalous predicted depth to basement on seismic.

The well drilled to a total depth of 2607.5 m loggers and 2608m drillers depth without encountering significant hydrocarbons.

II SUMMARY

1. DRILLING

Greenslopes No. 1 was spudded at 1100 hrs on 17 December 1985 using G.D.S.A. Rig No. 2 and was drilled to a total depth of 2608 metres in 23 days. Logging and plugging took 2 days and the rig was released at 1930 hours on 11 January 1986.

The 20" conductor pipe was set at 9.5 metres, the rat-hole drilled and the cellar constructed with no problems. A 17 1/2" hole was then drilled to 132 metres where the 13 3/8" casing was run and cemented.

Due to loss of circulation, the cement failed to return to surface. A successful top cement job was done using 75 metres of 1 1/2 " water pipe in the annulus.

After testing surface pressure control equipment and B.O.P.'s the cement was drilled out with 6% KCL Brine and the 12 1/4" hole was extended to 151 metres using a 6% KCL polymer mud system to keep viscosity high as this section consisted of mostly clays and calcitic stringers.

At this depth a Formation Integrity test was performed to an equivalent mud weight of 15.0 lbs/gal and drilling continued to 409 metres.

Throughout this interval large sections of lost circulation were encountered and approximately 200 bbls of lost circulation material (nut plug mica) were mixed and circulated whilst drilling in the interval from 151 to 409 metres.

At 416 metres a further 250 bbls of mud were lost to the formation and 250 bbls of hi-vis polymer, gel, nut plug, mica were mixed and circulated whilst drilling two singles and then circulated for 2 hours. This appeared to solve the problem and drilling recommenced at 0430 hours on 22 December and a depth of 895 metres was reached at 2400 hours on the same day. Intermediate electric logs were to be run before running 9 5/8" casing however the Gearhart logging crew did not arrive in time.

Prior to running and cementing 9 5/8" casing a further 6 metres was drilled to a depth of 901 metres. The 9 5/8" casing was run to 890 metres with a slight hangup at 560 metres.

The casing was cemented one stand short due to a miscount when running in, and was not picked up until the electric logs were being run back to the shoe.

II SUMMARY (Cont'd)

This caused various problems with the mud system where total washout of cement returns occurred from the uncased section for approximately 300 metres. At the time it was believed that the section must be drilling a sand with very high calcium content which then caused high carbonate-bicarbonate muds. These were keeping the rheology of the polymer gels low.

To combat this problem slugs of prehydrated gels were added to bring viscosities over 33 and premixed polymers were also added to keep the mud weights down to 9.5 lbs/gal.

The mud cleaner was used as a desilter at this stage as there was not a motor available to drive the screens.

After 1200 metres the mud system stabilised and drilling continued. A tight spot at 1720 metres caused a few minor problems but this was reamed and worked whilst drilling and then again when running back in with a new bit assembly. Drilling continued very slowly from 1720 metres onwards.

On changing the bit at 1834 metres it was found that the section from 1720 to 1834 metres had been drilled undergauge and this section was reamed again on the way backin. At 2131 metres the bit was changed again and it was found that the section from 1834 to 2131 metres had been drilled with an overgauge stabiliser. After reaming the section again the well drilled ahead to 2541 metres. The bit was found to be 1/2" undergauge and the section from 2541 to 2608 metres was drilled with a 7 7/8" bit.

A total depth of 2608 metres driller (2607.5 m logger) was reached at 2200 hours on 8 January 1986.

Electric logging took place from 0500 hours on 9 January to 1030 hours on 10 January 1986.

Three cement plugs were set using 60 sacks of class "A" cement, from 2250 to 2300 metres, 890 to 898 metres and 20 to 70 metres respectively.

The well having been plugged and abandoned the rig was released at 1930 hours on 11 January 1986.

II SUMMARY (Cont'd)

2. GEOLOGICAL

The Greenslopes No. 1 well was drilled from 17th December 1985 to January 9th 1986 in the western portion of PEP 101. The well is situated in the eastern part of the Otway Basin, South West Victoria.

Joint Venture participants in the Greenslopes No. 1 well are:

Phoenix Oil & Gas N.L.	50%
National Oil N.L.*	20%
Lakes Oil N.L.*	5%
Santos*	25%

* Subject to farmout by Phoenix Oil & Gas N.L.

The Greenslopes prospect was interpreted as being a basement faulted anticline with sedimentary drape at the early to late Cretaceous level. Four way dip closure was exhibited throughout the entire Early Cretaceous to Tertiary section.

The sediments penetrated range from Upper Tertiary through to Early Cretaceous with a basal sequence of interbedded carbonaceous shales and volcanoclastic debris of Lower Cretaceous age resting on economic Basement at 2582 metres. The metabasaltic Basement was encountered 198 metres higher than prognosis. This difference is considered to be due to the occurrence of a number of prominent seismic reflectors within the upper basement causing a layering effect probably due to basaltic flows and tuffs. These were interpreted pre-drilling to be due to sedimentary layering on basement and consequently depth to basement was prognosed to occur at 2780 metres.

2.1 THE PRETTY HILL SANDSTONE

The primary reservoir objective was considered to be the Pretty Hill Sandstone which had exhibited good to excellent reservoir characteristics in other wells. The formation had previously been intersected in four out of five exploration wells drilled within the permit and was believed to occur extensively over the permit but be laterally discontinuous.Porosities averaged 20% and permeabilities ranged from 200 to 500 millidarcies.

At the Greenslopes locality the Pretty Hill Sandstone was found to consist of an almost continuous good quality reservoir sand with porosities ranging from 10 to 23%.

II SUMMARY (Cont'd)

Secondary objectives in this well were in ascending stratigraphic order as follows:

2.2 THE EUMERALLA FORMATION

This formation directly overlies the Pretty Hill Sandstone and can be divided into an Upper and Lower Unit separated by a disconformity mapped as the Intra-Eumeralla Seismic Red Horizon.

Previously drilled wells showed a marked change in dip direction from Unit 1 to Unit II (Upper and Lower respectively). Strong oil and gas shows of up to 4.5 bbls/day and 160 MCF/day were recorded in Port Campbell No. 4.

This formation was expected to provide a substantial seal over the Pretty Hill Sandstone as well as to provide a potential source. Intraformationally sealed sandstones within the formation were also considered as potential reservoirs.

At the Greenslopes location the Upper Eumeralla Formation (Unit I) provided a thick and monotonous sequence of siltstones and mudstones without significant sands.

The Lower Eumeralla Formation (Unit II) provided a thick and monotonous sequence of siltstones and sandstones with only minor clays. Towards the base of Unit II good quality reservoir sandstones became dominant.

At this locality the Upper Eumeralla or Unit I provided a thick seal to the Lower Eumeralla or Unit II, which also exhibited good to excellent reservoir characteristics with very little seal intraformationally. This being the case the Eumeralla Unit II did not vertically seal the Pretty Hill Sandstone at the Greenslopes locality.

Porosities ranged from 15 to 30% with a low to moderate clay fraction in Eumeralla Unit II.

Minor pinprick fluorescences were noted at 2001, 2079 to 2082 and 2277 to 2286 metres. Log analysis between 2287 and 2303 metres showed a possibility of minor residual hydrocarbons.

2.3 THE SHERBROOK GROUP

The upper portion of this group was expected to occur over the Greenslopes locality and sands within the Paaratte and Flaxmans Formations were considered potential secondary targets.

The Waare sandstone was not expected to occur this far north and was not encountered at the Greenslopes well.

Although the Paaratte and Flaxmans formations were encountered in Greenslopes No. 1 they consisted of a reduced sequence of interbedded fossiliferous siltstones and sandstones grading into mudstones through the Belfast mudstone member and the Flaxmans Formation and they lacked good reservoir character.

2.4 THE TERTIARY

Good sandstone reservoirs encountered as hydrocarbon bearing within various Tertiary sections further to the south in the Otway Basin were considered here as marginal secondary objectives. These included sands of the Clifton, Dilwyn and Pebble Point formations.

At the Greenslopes location the Dilwyn Formation including the Pember Mudsone member and part of the Upper Pebble Point formation were absent and/or eroded.

A sequence of ironiferous, fossiliferous limestones of the Clifton Formation rest unconformably and disconformably on a muddy sand sequence of the Pebble Point Formation.

III WELL HISTORY

1. GENERAL DATA

Well Name	:	Greenslopes No. 1
Operator	:	Phoenix Oil & Gas N.L. 44 Ord Street WEST PERTH WA 6005
Permit Holder	:	Phoenix Oil & Gas N.L.
Permit	:	PEP 101
District	:	Otway Basin, 40 kms North of Warrnambool and 28 kms North of Port Fairy
Location	:	Latitude: 38°~~07'~~ 09 04.92 ~~48.72"~~ S Longitude: 142°~~12'~~ ~~39.81~~ 11 37.96" E EF Easting: 604658.79 Northing: 5776678.05
Elevation	:	GL: 76.9m AHD KB: 82.9m
Total Depth	:	2608m
Well Spudded	:	1100 Hrs 17/12/85
Total Depth Reached	:	2130 Hrs 8/1/86
Well Plugged & Abandoned	:	1930 Hrs 11/1/86
Rig Released	:	1930 Hrs 11/1/86
Total Time	:	24 days

III WELL HISTORY (Cont'd)

2. DRILLING DATA

Drilling Contractor	:	Gearhart Drilling Services (Australia) Pty. Ltd.
Rig	:	Rig No. 2 Superior Model 700 ESCR 7
Draw Works	:	Superior 700 E
Rated Capacity	:	3650m
Power	:	4 x Cat 3412 PCTA
Generators	:	4 x 600 V, 3 phase, 6 Hz AC
Mast	:	Dreco Design – Hook load – 410,000 lbs – 10 lines
Pumps	:	Gardner Denver P2–8–750
BOP	:	Spherical annular 13 5/8" x 300 psi 2 x 13 5/8" x 5000 psi RAMS
Hole Sizes + Depths	:	17 1/2" hole to 133m 12 1/2" hole to 901m 8 1/2" hole to 2541m 7 7/8" hole to 2608m
Drilling Fluid	:	17 1/2" hole drilled with fresh water allowing native solids to build up system. 20 bbl hi vis spud mud slugs used to flush hole. 12 1/4" hole drilled with KCL polymer with viscosity in range of 35–42 sec/gt. 8 1/2" hole drilled with low solids – KCL polymer viscosity 35–43 sec/gt. MW 9.4–9.7 ppg. 7 7/8" hole drilled with low solids – KCL polymer, viscosity 46 sec/gt. MW 9.4 ppg.

For a complete mud and bit recap, see Appendix 8.

III WELL HISTORY (Cont'd)

2. DRILLING DATA

Casing and Cement Details

Size	13 3/8"	9 5/8"
Weight (lb/ft)	48	36
Grade	–	J 55
Range	H40	H40
Thread	8 Round	8 Round
Setting Depth	132m	890m
Float Collar	122m	869m
Lead Slurry	440	555 sacks
Tail Slurry		204 sacks
Cement Top	surface	surface

WATER:

Both potable and drilling water were drawn from nearby creeks which were full after substantial rains prior to drilling. These supplied adequate, but muddy supplies until depleted when local water was hauled daily from the nearby Warrnabool township to replenish stocks.

PLUG & ABANDONMENT:

180 sacks class "A" cement with 3% Prehydrated Gel were mixed to 12.7 ppg slurry using 50 barrels mixing water.

Cement Plug No. 1 was set from 2250 to 2300 metres and tagged 20,000 lbs weight.

Cement Plug No. 2 was set from 840 to 890 metres and tagged 20,000 lbs weight.

Cement Plug No. 3 was set from 20 to 70 metres and tagged 2,000 lbs weight.

38 09 4.92
142 11 37.96

GREENSLOPES 1

DRILL CURVE

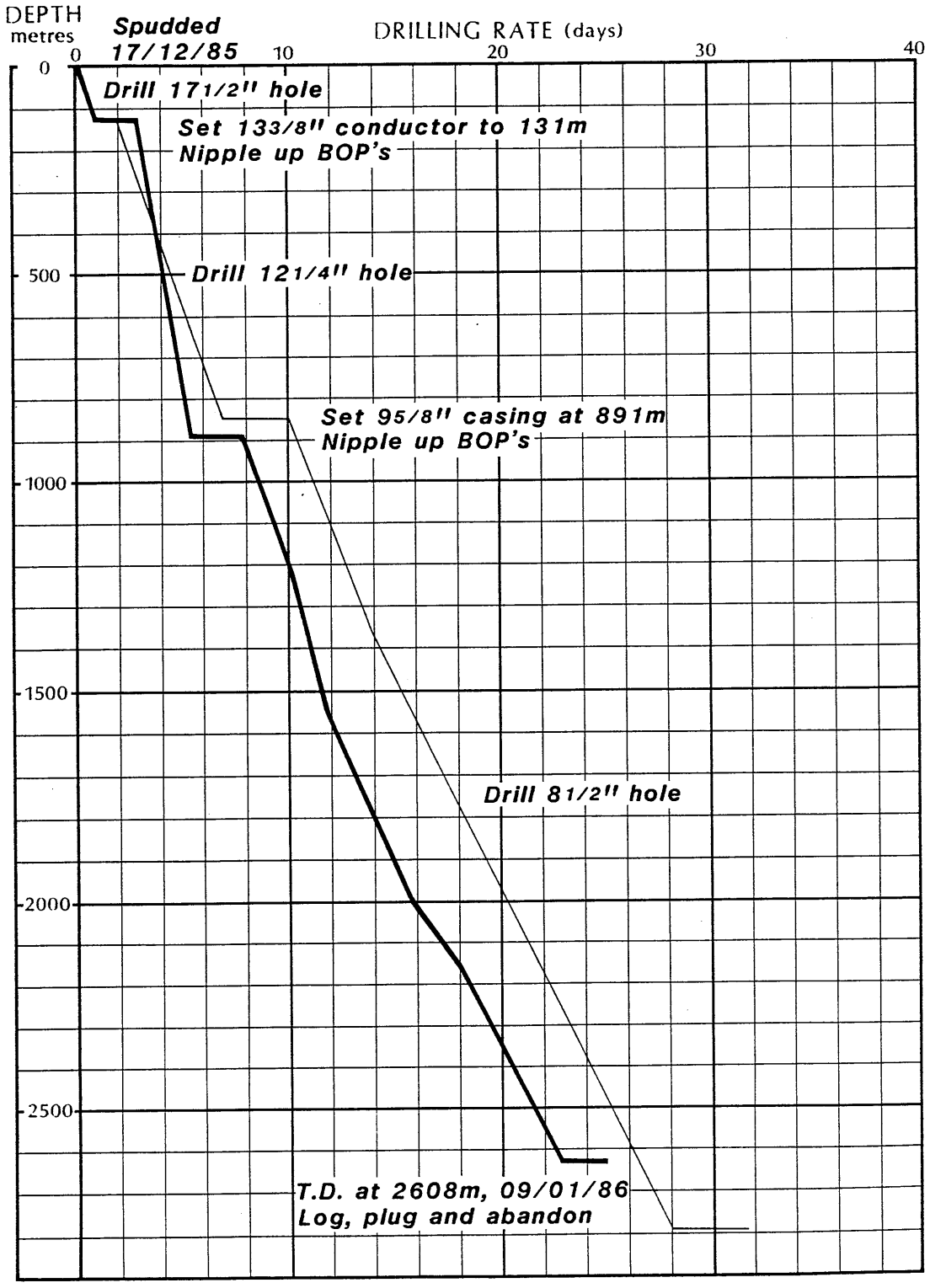
——— planned
━━━ actual

Location

GEOGRAPHIC	Latitude	38° 07' 48.72"S
	Longitude	142° 12' 39.81"E
A.M.G.	Easting	604 658.79mE
	Northing	5 776 678.05mN
ELEVATION	K.B.	82.9m
	G.L.	76.9m

Total Depth 2608m
Type New Field Wildcat
Status Plugged & Abandoned
Date

WELL SPUDDED	17th Dec 1985
T.D. REACHED	19th Jan 1986
RIG RELEASED	11th Jan 1986



May 1986 GEOGRAPHICS G.323.POG

Figure 2

III WELL HISTORY (Cont'd)

3. FORMATION SAMPLING

DITCH CUTTINGS:

Representative ditch cuttings were collected from a sample tray placed immediately below the shale shaker outfeed. The collected samples were then sieved to remove cavings and coarse cuttings, carefully washed to remove drilling mud so as not to remove formation clays, and taken to the mudlogging unit for drying, splitting and examination.

Samples were taken at 10 metre intervals from 10 m to 880 m, at 5m intervals from 880m to 900m and at 3m intervals from 900m to T.D. 2608m.

Composite canned geochemical samples were collected at 30 metre intervals from 10m to total depth to be used for headspace gas analysis if necessary as well as for any further geochemical analysis.

A complete set of cuttings has been deposited at each of the following locations:

2 sets at
Phoenix Oil & Gas N.L.
44 Ord Street
WEST PERTH WA 6005

1 set at
Victorian Institute of Technology & Resources
140 Bourke Street
MELBOURNE VIC 3000

CONVENTIONAL CORES:

None were cut.

SIDEWALL CORING:

One 24 bullet gun was run for accurate palynological dating and source rock/maturity data (see Appendix 2 & 6).

III WELL HISTORY (Cont'd)

4. LOGGING AND TESTING

WIRELINE LOGGING:

Gearhart Wireline Logging Ltd were contracted to run the following suite of logs at total depth:

Run 1: Suite 1. DLL/MSFL/GR/SP/CAL
Suite 2. MEL/BCF/GR
Suite 3. FED/GR

Suites 1 and 2 logs were run from total depth to the casing shoe at 890m and the Gamma Ray of suite 2 was then run to surface through the casing. Suite 3 was run from total depth to 1146m.

Intermediate logs were be to run prior to running 9 5/6" casing however failure to arrive necessitated the move to run the gamma ray log through casing after reaching T.D.

MUDLOGGING:
The following parameters were logged and presented in the form of a "Graphalog: by Gearhart Mudlogging Inc.

1. Rate of penetration together with bit data.

2. Cuttings lithology by percentage and interpretive lithology, description and mud data.

3. Continuous ditch gas - where 1 unit is equivalent to 100 ppm equivalent methane.

4. Chromatograph analysis of the ditch gas at each sample point as well as mud level and total gas levels.

5. Pit levels in the active system.

6. RPM + WOB

A copy of the mud log "Grapholog" is included in the report as Enclosure 2.

DEVIATION SURVEYS:

A Totco survey tool was used to obtain deviation from the vertical at regular intervals.

Results are shown in Table 1.

III WELL HISTORY (Cont'd)

TABLE 1

HOLE DEVIATION

DEPTH	HOLE SIZE	DEVIATION
133m	17 1/2"	0^{o}
901m	12 1/4"	0^{o}
1327m	8 1/2"	2^{o}
1614m	8 1/2"	1^{o}
1726m	8 1/2"	1^{o}
1997m	8 1/2"	$1/2^{o}$
2131m	8 1/2"	$1/2^{o}$
2278m	8 1/2"	$1/2^{o}$
2541m	8 1/2"	$3\ 1/4^{o}$
2608m	7 7/8"	5^{o}

VELOCITY SURVEY:

Velocity Data Ltd conducted a well shoot using an airgun source between total depth and 380 metres.

Results were recorded for 24 different levels and the data from this survey is included as Enclosure 2 of this report.

TEMPERATURE SURVEY:

The bottom hole temperature was recorded on each of the Wireline Logging tools reaching total depth.

By using a bottom hole temperature extrapolation nomograph the stabilised bottom hole temperature would be $110^{o}C$ or $230^{o}F$.

Using an estimated mean annual surface temperature of $13^{o}C$ ($55.4^{o}F$) the geothermal gradient for this section at the Greenslopes locality is $3.72^{o}C/100m$ or $2.04^{o}F/100ft$.

Details of the bottom hole temperatures and the extrapolation nomograph are included in this report as Appendix No.3.

TESTING:

There were no drillstem tests or formation tests carried out.

IV GEOLOGY

1. SUMMARY OF PREVIOUS INVESTIGATIONS

Prior to the granting of the present permit, only sparse regional seismic coverage of poor quality had been conducted over the Otway Basin between 1967 to 1975 by Shell Development (Aust) Pty. Ltd. During this time five exploration wells were drilled in what is now the PEP 101 permit area.

The first exploration well drilled within the permit, Pretty Hill No. 1 (1962) intersected a previously unknown basal sandstone unit with excellent reservoir qualities now known as the Pretty Hill Sandstone Formation. Although the well failed to encounter significant hydrocarbons, subsequent drilling of a further four wells in the permit indicated an extensive but laterally discontinuous distribution of Pretty Hill Sandstone.

Minor oil shows were recorded in four out of the five wells with porosities and permeabilities ranging from fair to excellent. One of these wells, Woolesthorpe No. 1, recorded live oil in a core taken from the Pretty Hill Sandstone Formation.

In 1980 the permit was granted to Siberia Oil & Gas N.L. (now known as Phoenix Oil & Gas N.L.).

In 1981 a 3.5 kilometre test shoot using the Mini-Sosie technique was conducted. The data was of poor quality and consequently the 175 line kilometre Camperdown vibroseis programme was conducted in early 1982.

Interpretation of the Camperdown Seismic survey together with re-interpretation of all previous seismic data delineated several leads over the permit.

The Terang 1984 seismic survey was conducted early in 1984 and served to downgrade and upgrade respectively the several leads previously defined.

The Greenslopes detail seismic survey was conducted in December 1984 to mature the Greenslopes prospect for drilling, and the data was subsequently processed, interpreted and mapped as mature for drilling.

Greenslopes No. 1 was spudded during mid December 1985 and plugged and abandoned in mid January 1986 without encountering significant hydrocarbons.

Numerous hydrocarbon shows have been recorded in wells in adjacent areas although until recently only those four of the five wells drilled previously within PEP 101 had drilled through the Pretty Hill Sandstone and of these, three are now not considered to have been valid tests of the Pretty Hill Sandstone following subsequent and recent remapping of the area.

IV GEOLOGY (Cont'd)

North Paaratte No. 1 drilled in November 1979 was the first major discovery in the vicinity. Located some 20 kilometres south of PEP 101 the well sustained a gas flow of 9.6 mmcfd and 6 BOPD before pressures declined.

In the same area POA Campbell No. 4 drilled in 1964 recorded a small oil flow of 4.5 bbls/day and an unsaturated gas flow of 160 to 219 MCF pd.

These discoveries are reservoired mainly in the Waare Sandstone member of the Upper Cretaceous Sherwood Group which is considered mostly absent over the PEP 101 block.

The POA Campbell wells No.'s 2 and 3 produced small amounts of oil, gas and gas cut water from sediments ranging from the Upper Otway Group to the Waare Sandstone of the Sherwood Group.

Flaxmans No. 7 had gas shows in the Paaratte Formation, Waare Sandstone and the Otway Group with a small show of condensate in the Otway Group.

An offshore well, Pecten No. 1A produced 0.3 BCF per annum, commercial and almost pure carbon dioxide gas within the Eumeralla and about 1% associated hydrocarbons from the Waare Sandstone.

Lyndon No. 1 drilled to the west of PEP 101 recorded minor oil shows in the Lower Tertiary and Upper Cretaceous Section.

Wallaby Creek and Grumby No. 1 drilled by Beach in the early 1980's tested 6,500 MCF and 7200 MCFD gas respectively from the Waare Sandstone.

Breaksea Reef No. 1 drilled by Ultramar to a total depth of 4,469m in 1984 recorded very minor hydrocarbon shows in the Pretty Hill Sandstone.

A summary of the well data for wells drilled nearby is presented as Table 2.

TABLE 2

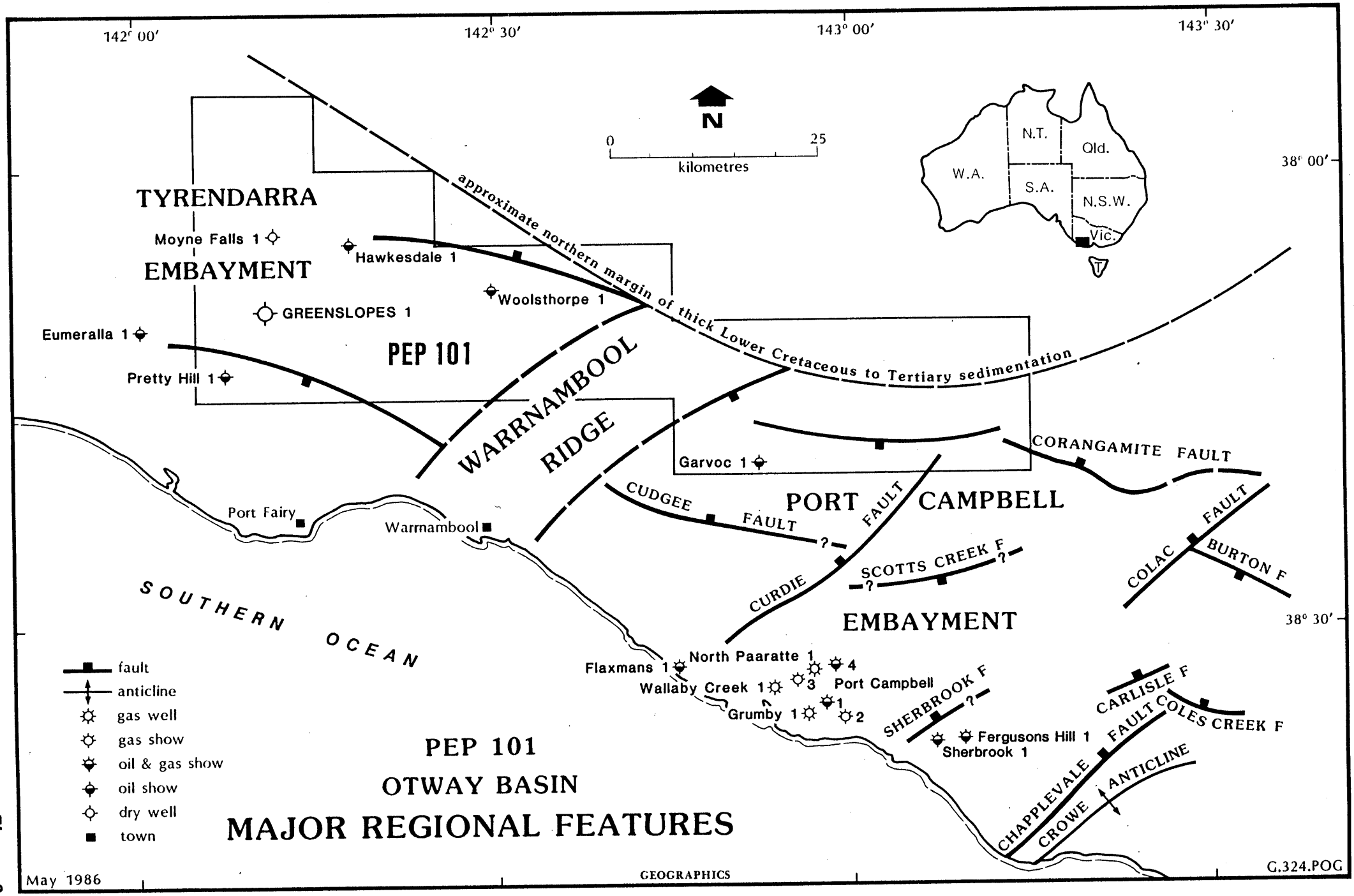
PETROLEUM EXPLORATION WELLS

ADJACENT TO PEP 101 DECEMBER 1985

WELL DATA SUMMARY – WELLS WITH SHOWS

WELL	DATE	OPERATOR	T.D.M.	AGE TD'd	SHOWS
CRAYFISH No.1*	1967	(ESSO)	2718	Pretty Hill (KL)	V minor gas
GELTWOOD BEACH NO.1	1963	Beach	3740	Eumeralla (KL)	Strong; minor gas
KALANGADOO NO.1	1965	Alliance	2686	Basement	V minor gas plus CO2
ROBERTSON NO.1	1967	Alliance	1741	Basal sst (KL)	minor gas
TULLUCH NO.1	1964	Planet	1556	Basal sst (KL)	minor gas
HEATHFIELD NO.1	1964	Planet	2212	Eumeralla (KL)	minor gas
CAROLINE NO.1	1967	Alliance	3334	Eumeralla (KL)	V strong gas CO2 producer
EUMERALLA NO.1	1963	F.B.H.	3091	L. Otway (KL)	minor oil + Fluor
PRETTY HILL NO.1	1962	F.B.H.	2416	Basal sst (KL) Pretty Hill	minor oil + Fluor
HAWKESDALE NO.1	1962	Shell	1635	Basement	minor oil + Fluor
WOOLESTHORPE NO.1	1968	Interstate	1846	Basal sand (KL)	minor oil + Fluor
GARVOC NO.1	1968	Interstate	1424	Basement	minor oil + Fluor
FLAXMANS NO.1	1961	F.B.H.	3447	Eumeralla (KL)	247 MCFD + strong cond.

WELL	DATE	OPERATOR	T.D.M.	AGE TD'd	SHOWS
PECTEN NO.1A*	1967	Shell	2817	Eumeralla (KL)	160 MCFD strong gas
PORT CAMPBELL NO.1	1959	F.B.H.	1712	Waare (KU)	4130 MCFD + strong cond shows
PORT CAMPBELL NO.2	1960	F.B.H.	2610	Eumeralla (KL)	minor gas
PORT CAMPBELL NO.3	1961	F.B.H.	1621	Eumeralla (KL)	strong gas
PORT CAMPBELL NO.4	1964	F.B.H.	2463	Eumeralla (KL)	160 MCFD + strong oil shows
LYNDON NO.1	1984	Beach	?	Eumeralla (KL)	strong oil shows
N PAARATTE NO.2	1981	Beach	1603	Waare	6000 MCFD
N PAARATTE NO.1	1980	Beach	7576	Sherbrook GP	6400 MCFD
PAARATTE NO.1	1979	Beach	1545	Sherbrook GP	6400 MCFD
SHERBROOK NO.1	1963	F.B.H.	1510	Eumeralla (KL)	minor oil + Fluor
FERGUSONS HILL NO.1	1964	F.B.H.	2463	Eumeralla (KL)	minor oil + gas
HINDHAUGH CREEK NO.1	1969	Pursuit	2296	Eumeralla (KL)	minor gas
	1983	Gas & Fuel	1066	Basement	minor oil
WALLABY CREEK NO.1	79–81	Beach	?	Waare sst	6500 MCFD
GRUMBY	79–81	Beach	?	Waare sst	7200 MCFD
BREAKSEA REEF NO.1	1984	Ultramar	4469	?	shows in PH sst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kilometres
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S.A.
N.S.W.
Vic.
TYRENDARRA
EMBAYMENT
Moyne Falls 1
Hawkesdale 1
Woolsthorpe 1
GREENSLOPES 1
Eumeralla 1
Pretty Hill 1
PEP 101
approximate northern margin of thick Lower Cretaceous to Tertiary sedimentation
WARRNAMBOOL RIDGE
Garvoc 1
CORANGAMITE FAULT
CUDGEE FAULT
PORT CAMPBELL FAULT
CURDIE FAULT
SCOTTS CREEK F
COLAC FAULT
BURTON F
EMBAYMENT
Port Fairy
Warrnambool
SOUTHERN OCEAN
Flaxmans 1
North Paaratte 1
Wallaby Creek 1
Port Campbell
Grumby 1
SHERBROOK F
Fergusons Hill 1
Sherbrook 1
CARLISLE F
COLES CREEK F
CHAPPLEVALE ANTICLINE
CROWE FAULT
fault
anticline
gas well
gas show
oil & gas show
oil show
dry well
town
PEP 101
OTWAY BASIN
MAJOR REGIONAL FEATURES
May 1986
GEOGRAPHICS
G.324.POG

Figure 3

IV GEOLOGY (Cont'd)

2. SUMMARY OF REGIONAL GEOLOGY

The Otway Basin, a major west-north-west trending trough which previously extended eastwards over what are now the Gippsland and Bass Basins, was formed by numerous syndepositional faults sub-parallel to the basin axis. The basin was initiated during the Upper Jurassic to Lower Cretaceous when the continental breakup of Australia with Antarctica commenced.

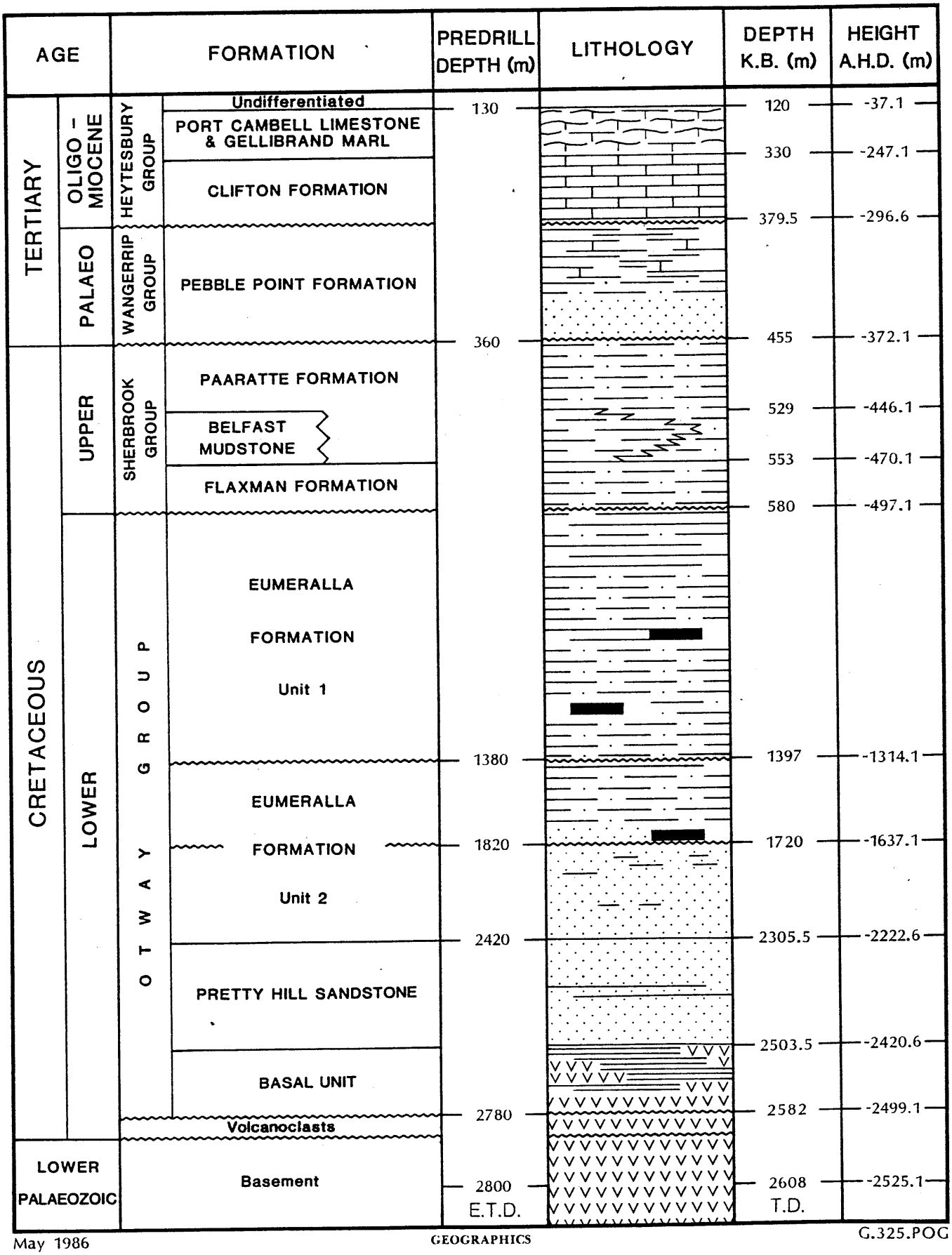
The onset of rifting with associated right-lateral wrenching resulted in the development of several intra-basinal highs separating the Otway Trough into three discrete basins i.e. The Otway, Gippsland and Bass Basins. Consequent compressional forces caused en-echelon folding as in the Otway Ranges High. Block faulting and tilting of the basement superimposed a number of north-east trending highs on the Otway Basin which later divided the area into four sub-basins. These from west to east are: The Gambier, The Tyrendarra, The Port Campbell and The Torquay Embayments. See Figure 3

Following post-rifting erosion, progressive downwarping at the beginning of the Upper Cretaceous gradually allowed access to the sea. Deposition of a "Rift Valley Type" sequence followed and the basin became a peri-cratonic or open marginal basin. At this time a number of marine incursions occurred along the northern edge of the basin margin. Deposition of a series of transgressive - regressive sedimentary cycles continued into the Tertiary with the northern limit of the transgressions occurring within the permit area.

The Otway Basin remained a pericratonic feature throughout Tertiary times.

GREENSLOPES 1

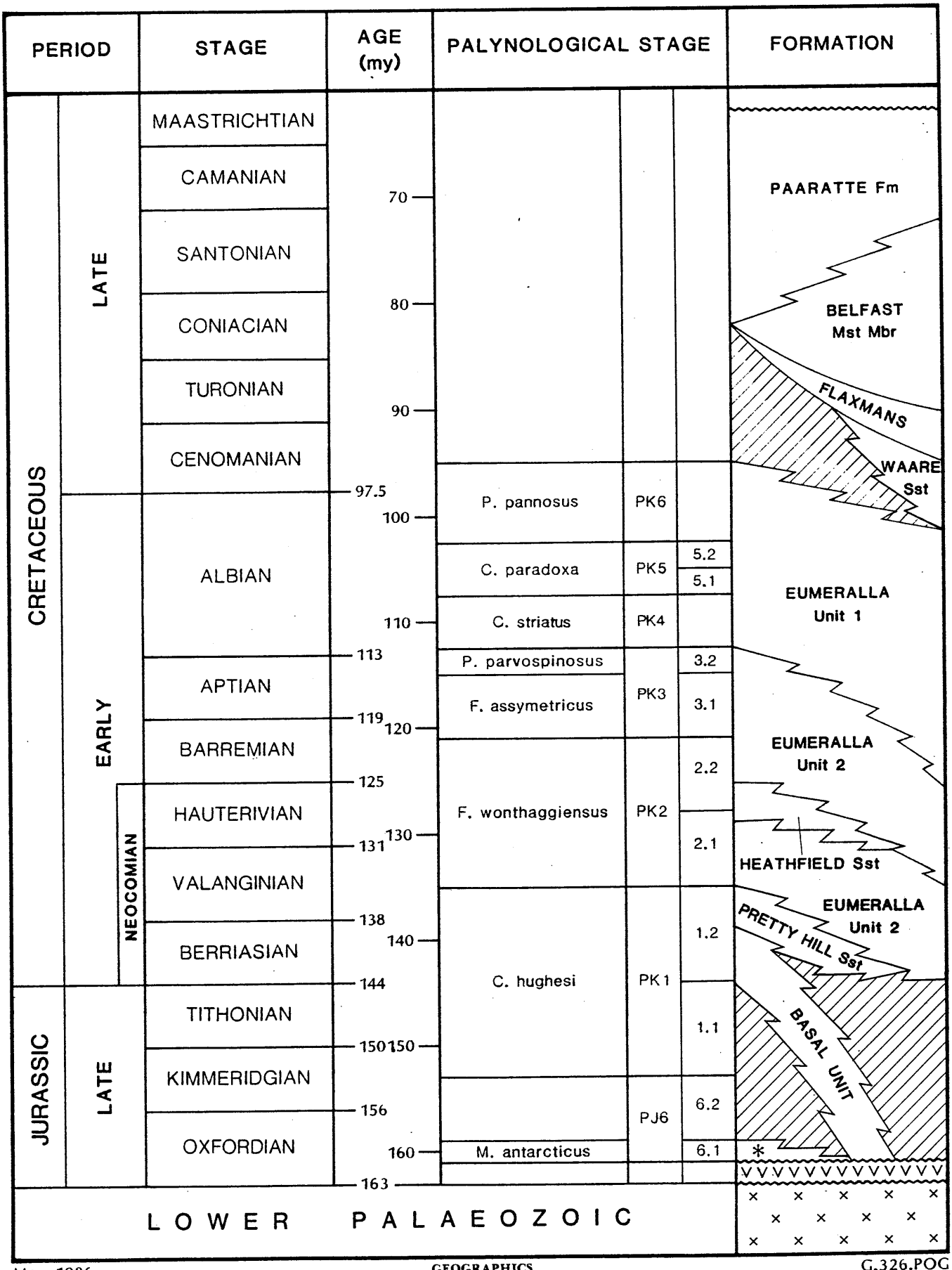
STRATIGRAPHIC COLUMN



May 1986 GEOGRAPHICS G.325.POG

Figure 4

GENERALISED PALYNOSTRATIGRAPHIC COLUMN



May 1986 GEOGRAPHICS G.326.POG

One sample only from Woolesthorpe 1

Figure 5

3. STRATIGRAPHY

The section in this well ranged in age from Early Cretaceous through to Late Tertiary.

A stratigraphic column constructed from various sources was utilised for this well and is included in this report as Figure 4.

Lithologies have been determined by examination of ditch cuttings in conjunction with wireline log interpretation.

Formation Tops were picked using correlations between Pretty Hill No. 1, Woolesthorpe No. 1, Hawkesdale No. 1, Moyne Falls No. 1 and Eumeralla No. 1 utilising various parameters such as lithology, drill rates, log character and dipmeter.

Age dating of the zones of interest was carried out by palynological examination of sidewall cores by Dirk Hos of ECL. This report is included as Appendix 6 and this has also been used to define formation boundaries. A generalised palynostratigraphic column is included in this report as Figure 5.

Detailed lithological descriptions are outlined in Appendix 1 of this report while the interpreted lithology is shown on the composite log included in this report as Enclosure 4.

The stratigraphy encountered in Greenslopes No. 1 is summarized below with all depths being relative to KB height above sea level.

3.1 UPPER TERTIARY - RECENT UNDIFFERENTIATED (SURFACE to 120M)

Lithology was not recorded in this section while drilling.

3.2 TERTIARY

Heytesbury Group

Gellibrand Marl (120-330m) Mid Miocene

Towards the top of this section the Port Campbell limestones are probably included in the sequence. The Gellibrand Marl Formation in this locality consisted of bioclastic and calcareous mudstones, which are occasionally arenaceous and silty towards the base. The unit is typically olive grey to light or medium grey, blocky, amorphous and consistently fossiliferous and occasionally limonitic. The occasional calcite fragments probably occur as secondary veining within the mudstones which grade to calc-argillites.

IV GEOLOGY (Cont'd)

Traces of glauconite, carbonaceous specks and free quartz grains occur throughout with increasing frequency towards the base. The abundant fossil fragments include shell fragments from bivalves, brachiopods, fragments of coral and spicules together with complete microgastropod shells.

These sediments indicate marginal marine conditions during deposition. Towards the base of the sequence the fossil fragments decrease and the frequency of glauconite grains increases indicating a deepening to more marine conditions and a more typically shallow marine environment.

Clifton Formation (330-379.5m) Miocene-Oligocene

Conformably underlying the Gellibrand Marl is the Clifton formation.

This formation consists predominantly of interbedded and intercalated limestones and bioclastic mudstones resting on a band of ferruginous sandstones and phosphatic conglomerates.

The limestones are typically yellow to brown occasionally white to grey, limonitic, microcrystalline to granular, occasionally pyritic and arenaceous containing carbonaceous specks and fragments.

Occasional occurrences of glauconite were recorded which indicates a move to more marine environmental deposition.

The mudstones are light grey to olive grey, blocky, extremely calcareous and bioclastic grading to a lime mud with occasional gritty free quartz and carbonaceous specks.

These sediments are considered to be marginal to shallow marine with a slight sporadic movement towards a transgressive unit as evidenced by the interbedding and intercalation of muds and limestones within this section.

Marginal marine conditions appear to have given way to a more littoral and restricted environment below 350m.

The sandstone section consists of orange-brown, fine to coarse grained sands with variable calcitic cement and dirty limonitic clay matrix. The sands are increasingly gritty and fossiliferous with shell fragments and spicules apparent. They are abundantly limonitic with pyrite fragments, nodules and pyritization of the fossil fragments.

These sands are interbedded with minor siltstones and contain ferruginous phosphatic bands, conglomeratic nodules and pebbles.

The occasional siltstones are light to dark grey, variably argillaceous, occasionally grading to calcareous mudstone with carbonaceous specks and are occasionally pyritic with rare glauconite grains. The occurrence of fossil fragments increases with depth grading to a bioclastic mudstone.

Below 370m thin stringers of dolomite are recorded which grade to dolomitic siltstone and bioclastic mudstone.

The conglomerates are black, amorphous nodules and fragments, shiny, brittle also black to dark brown fragments and fossil replacements. Some exhibit pyritic shiny lustre and occasional resinous to glossy lustre.

These appear to have been deposited in a restricted marine environment and reworked and redeposited in a littoral environment.

Mineral fluorescence is recorded throughout the section and the sands are tight with poor to nil visual porosity.

The Clifton Formation unconformably overlies the Pebble Point Formation of the Wangerrip Group. This hiatus at mid Tertiary level saw the erosion or non-deposition of the Upper Wangerrip Group and the non-deposition of the Nirranda and Lower Heytesbury Groups before a marine incursion gradually brought more marginal and open marine conditions further northwards through to Upper Tertiary times.

Wangeripp Group

Pebble Point Formation (379.5–455m) Paleocene

This formation consists of interbedded siltstones, sandstones and minor mudstones.

Siltstones in this section are typically medium to dark grey, occasionally dark brown grading to mudstone in parts, very fine grained, occasionally argillaceous, pyritic, carbonaceous and bioclastic rarely grading to mudstone.

The sandstones consist of clear to multi-coloured sand grains, very fine to very coarse grained grading to occasional gritty bands, some grains are pitted and ocluded.

The sands are limonitic and pyritic, often with calcitic cement and argillaceous matrix. They are occasionally fossiliferous and often contain abundant lithic-granitic wash.

Below 420m the carbonaceous specks give way to coally streaks within the siltstone beds possibly as minor coal stringers. These are black to dark brown, soft to friable with a resinous lustre, usually lignitic to sub-bituminous and occasionally subvitrinous fragments.

The siltstones below 420 m are interbedded and interlaminated with the sandstones and consist of light to medium and dark grey, occasionally dark brown and green silts which are arenaceous, argillaceous,and very calcareous, very fossiliferous, pyritic and slightly carbonaceous.

The unit is considered to be transgressive marine and in this locality probably represents a littoral to marginal marine facies, although the abundant coloured lithic material which suggests granitic wash may indicate that the deposition is close to the source area. Therefore this locality may be more delto-fluvial than littoral. This is also suggested by the abundant carbonacous fragments and this area would be considered to be located in a prograding deltaic system with more marine influences coming into play as the sequence is deposited. However a major unconformity exists at the top Pebble Point and part of the sequence is absent suggesting either non-deposition or erosion. In this locality the Pebble Point has probably been eroded before the transgressive phase of the Heytesbury Group has inundated the area and deposition of the Clifton Formation commenced.

3.3 MESOZOIC

Sherbrook Group - Upper Cretaceous

Paaratte Formation (455-553m)

This formation is normally divided into several members which are intercalated within the sands of the Paaratte Formation. At this locality the formation is segregated into the Paaratte Formation (455-529m) and the Belfast Mudstone Member (529-553m). These will be dealt with separately.

(a) Paaratte Formation (455-529m)

This section consists of a monotonous sequence of interbedded siltstones and mudstones with minor sandstones.

The siltstones range from light and dark grey to green, olive and brown in colour and textures range from fine to sucrosic. They are often arenaceous, fossiliferous, soft to friable and occasionally grade to calcareous mudstones.

The mudstones are light to medium grey, dark brown, green occasionally arenaceous and generally amorphous to blocky, soft to plastic and becoming increasingly calcareous with depth.

Occasional bands of volcanic detritus and coloured lithic fragments occur sporadically through the section with cherty conglomerate or grits occurring towards the base.

The sandstones are yellow to orange, very fine to coarse grained, gritty, dirty and ferruginous to limonitic with frequent coloured lithic grains and volcanic debris. There are traces of pyritic nodules and chert pebbles with occasional pyritization of calcitic clay-cement and fossil fragments. The sands are hard and cemented with rare to no visible porosity.

Below 520 metres minor coal bands occur as fragmented and carbonaceous shales and partings.

The Paaratte Formation is considered the main paralic regressive phase of the Upper Cretaceous Sherbrook Group. At this locality the lithology suggests a sequence deposited in a restricted coastal marine to littoral marine facies with minor sporadic influx of fluvial debris across a paralic and restricted delta top environment.

(b) Belfast Mudstone Member (529-553m)

This section probably exists as an inter-fingered member within the Paaratte Formation and possibly represents a minor transgressive to regressive pulse.

The Belfast mudstone member consists of a band of siltstones and arenaceous mudstones with black lignitic specks and carbonaceous mudstones.

The siltstones are variably grey, green to light brown slightly arenaceous, chloritic and pyritic grading to mudstone and occasionally black shaley carbonaceous claystone.

The mudstones are multicoloured, blocky, firm to plastic, calcareous and with traces of carbonaceous material and coaly fragments grading to a more arenaceous mudstone.

Minor sandstone interbeds occur which are typically light grey to white, fine to medium grained with occasional secondary silicification and calcitic cement. Sporadic dark coloured lithic grains and feldspar fragments along with rare fossil fragments, lignitic coals and pyritic nodules indicate a return, upwards through the member, to a more restricted or littoral marine facies from a more coastal marine facies.

Flaxmans Formation (552–580m)

Conformably underlying the Paaratte Formation is the Flaxmans Formation. This unit consists of a thin sequence of interbedded and interlaminated mudstones, sandstones and siltstones with sporadic occurrences of volcanic detritus in the form of dark lithic fragments.

The sandstones are generally light grey to light brown, fine to medium grained, occasionally gritty with frequent pyritic and carbonaceous inclusions. The matrix is of a calc–argillite composition and the sands are occasionally silica cemented.

The siltstones predominantly consist of grey-green to brown coloured arenaceous to argillaceous silts frequently grading to mudstones. The silts are often chloritic, pyritic and occasionally calcitic with increasing fossil fragment content towards the base.

The mudstones are variably multicoloured, soft and carbonaceous grading to lignitic coals.

This formation is considered regionally to be the initial marine transgressive phase of the Lower Sherbrook Group.

Otway Group – Lower Cretaceous

Eumeralla Formation (580–2305.5m) Albian – Neocomian

The Eumeralla Formation can be divided into two discrete units seperated by a seismically defined disconformity. It is believed that the Upper Unit (Unit I) has a widespread distribution and is probably continuous with the Otway Group in other areas of the Otway Basin, whereas the Lower Unit (Unit II) appears to be confined to low areas such as the Robe and Penola Troughs.

On a regional scale the segregation between the units is not always distinct and sometimes one or other of the units is absent.

At the Greenslopes locality the two units are distinctly divisible into Unit I (Upper) (560–1397m) and Unit II (Lower) (1397–2505m) by a marked change in dip direction which is consistent with the Seismic horizon picked at this level.

These two units will be described in this report separately.

a) Eumeralla Formation Unit I (580–1397m) Albian

This section consists of a sequence of green to grey chloritic and carbonaceous siltstones finely interbedded with mudstones and green to grey lithic sandstones or greywackes. Interlaminations of coals and carbonaceous shale stringers occur sporadically throughout the section. Volcanic detritus, greenish minerals and quartz fragments are common.

The sequence is generally finely interbedded with occasional thicker beds and probably cross-bedded with some graded bedding as interpreted from dipmeter results and cuttings' descriptions.

The sequence between 580 to 900 metres was not recorded on electric logs except for the Gamma Ray log which was run through the casing from T.D. to surface. This was used along with the mudlog and sample descriptions to identify formation boundaries.

The Eumeralla Formation Unit II lies unconformably beneath the Belfast Mudstone member of the Paaratte Formation in the Sherbrook Group.

The upper section above the casing point predominantly consists of a sequence of interbedded chloritic siltstones and bioclastic mudstones with minor interbeds of dirty and cemented sandstones towards the base.

The siltstones are variably either light grey/green, chloritic and slightly calcareous through to black carbonaceous and argillaceous, grading to mudstones in parts. The silts are blocky to occasionally subfissile, soft to friable and occasionally bioclastic with some dark volcanic rock fragments. Frequent free quartz grains are scattered throughout with occasional chert fragments and occasionally the silts become arenaceous to silicic.

The mudstones grade from light grey/green, dark grey and black to light grey and white/buff with depth. The upper muds are chloritic to carbonaceous with black lignitic specks and occasional free quartz grains. They are soft to friable, silicic and slightly calcareous with occasional microlaminations within the matrix.

The lower muds are multicoloured, soft to firm, blocky to amorphous and grading to dispersive. They grade from slightly calcareous to very calcareous, very chloritic and occasionally carbonaceous with depth.

The sandstones are finely interlaminated with the siltstones and mudstones in the upper portion, often grading to arenaceous siltstones.

Towards the base of the Section, the sandstones become finely interbedded and more pronounced.

The sandstones in the upper section are generally white to grey/green, very fine to fine grained, moderately to well sorted with occasional free quartz grains/pebbles and slightly calcareous with argillaceous to calcitic cement. They are occasionally sublithic, fossiliferous and slightly carbonaceous, often grading to siltstones. These grade to interbeds of multicoloured, dirty, poorly sorted sandstones with a chloritic to argillaceous matrix and occasionally grading to siltstone. Abundant lithic fragments, carbonaceous inclusions and coatings, coloured rock fragments, fossil fragments and pyrite nodules and aggregates occur

increasingly with depth. Frequently grain shatter, fracture, frosting and pitting occur with secondary silicification apparent in parts.

Fragmentary coals appear throughout the Section, ranging from sub-bituminous to lignitic pieces.

Occasional very faint yellow fluorescences occur on cut and crush of the sub-bituminous matter. Slight mineral fluorescence occurs interspersed throughout associated with the calcite.

Visible porosities range from NIL TO POOR throughout.

This Section is continuous upwards from the section below the casing, grading upwards to a more marginal marine depositional environment as suggested by the bioclastic silts and muds, with the lower sandstones probably representing littoral reworking and redeposition of more paralic deposits.

Below 900 metres, the Section consists of a sequence of interbedded chloritic and carbonaceous siltstones and mudstones with minor interbeds of lenticular sandstones and mudstones, dirty and cemented lithic crossbedded sandstones and carbonaceous mudstones with coal stringers towards the base of the unit.

Large quantities of cement contamination occurred throughout the portion of the well from 900 to 1150 metres due to increased washout from the uncased Section. This has tended to mask some of the interpretive lithology in this portion of the well, possibly giving a higher recording of calcareous muds than would be expected.

The siltstones towards the top of the section are generally light grey through to green, chloritic, slightly micromicaceous and variably calcareous and occasionally grading to calcareous mudstones in the upper Section, with occasional calcareous fragments and microfossils. The silts become increasingly carbonaceous and less calcareous with depth and variably chloritic, occasionally grading to carbonaceous shale and mudstone. Below 1268 metres, the silts become microlaminated with argillaceous siltstones and contain common carbonaceous flecks and lignitic partings. Pyritic nodules and large orange, cherty fragments become more common with depth.

In the upper Section, lime muds predominate. They are generally interlaminated with carbonaceous shale bands and consist of light to dark, chloritic, pyritic, very carbonaceous, calcareous muds. These give way with depth to occasional mudstones and carbonaceous claystones with minor coally bands or microlaminations grading to thin black coal stringers. The mudstones often occur as thin laminations within the silts and sands and towards the base of the unit, the mudstones are occasionally white and green, and very carbonaceous grading to muddy coal.

From 1150 to 1200 metres, there is a dominant structural dip of 2 to 8 degrees to the north north west with variable bedding dips ranging 2 to 48 degrees from northwest to southwest. These dips are either indicative of lenticular to irregular bedding or shallow turbulent water.

Below 1200 metres, the dipmeter shows an upwardly coarsening cycle with the main dips increasing with depth, indicating cross-bedded units grading into an upwardly fining cycle with the main dips indicating lower energy and laminated bedding.

The sandstones in the upper portion are finely bedded, lithic quartzose and limonitic, frequently light grey to white, fine to medium grained and occasionally coarse with some angular fragments and pink grains. These sandstones grade with depth to lenticular and irregularly bedded, through massively cross-bedded to finely interbedded sands towards the base. The sands become dirty and lithic, with occasional coloured grains, rose quartz fragments, pyrite nodules, chert and large clear free quartz fragments. They first become coarser with depth then grade finer with depth towards the base. Occasional angular grains exhibit fracture, pitting and occlusions, and some large grains show carbonaceous inclusions and sub-bituminous coatings. These often give a very faint yellow fluorescence on cut and crush.

The matrix grades from kaolinitic towards the top through silty to argillaceous grading with depth to a tight calc-cemented sand below 1245 metres, with little visible matrix.

Between 1212 to 1215 metres, there is a good quality sand with fair to good porosity, but exhibiting grain shatter, pitting and frosting, with very large angular clear quartz grains. At this point on the dipmeter, there is a break in the dips and more variable dip azimuths and angles occur which could indicate a minor fault or slump feature.

Below 1268 metres, the sands are tight, lithic, very fine to fine grained, and well cemented. Frequent coloured rock fragments, large orange fragments and nodular pyrite occur increasingly with depth. Feldspar fragments and very large, shattered and frosted quartz grains, opaque, red and green grains, and intergranular aggregates of carbonaceous, pyritic and dark rock fragments occur, with the sands occasionally becoming more carbonaceous with depth.

The coals are generally fragmented or stringers and are often argillaceous, grading to carbonaceous shales and interlaminated with mudstones. They occur more frequently with depth, and between 1341 to 1344 metres, there is a good coal band, which is black to dark brown, hard to firm, blocky to subfissile, subvitrinous to sub-bituminous, occasionally lignitic to earthy, silty to arenaceous, grading to carbonaceous shale in parts.

Traces of dolomite occur as minor stringers towards the top of the unit.

Occasional patchy yellow mineral fluorescence associated with calcite is interspersed throughout the samples and visible porosities range from Poor to Fair in the Section down to 1245 metres, and becoming poor to tight below this depth.

Towards the base of the Section, there is a dominant dip direction of 12 to 20 degrees to the north of northeast, with more variable dips towards the base at the unconformity surface.

Minor faults and/or slumping are indicated at various intervals on the dipmeter throughout the sequence, i.e. at 1354 metres, at 1250 metres, and at 1302 metres there is also some evidence of slickensliding in the samples.

The sequence suggests a distributary channel with a gradual change from a more restricted and paralic depositional environment to a less restricted tidal flat or delta top with gradual and sporadic deepening of water to more marginal marine conditions. Through this are minor pulses of fluvial deposition, sporadic influx of coarser detritus and turbulence giving rise to the range of sands and silts from laminated, cross-bedded to lenticular and irregularly bedded with the movement of the distributary channel.

On analysis of the dipmeter, sediment flow is predominantly to the northwest with the main distributary channel axis to the northeast of the well.

b) Eumeralla Formation Unit II (1397–2305.5M) Aptian – Valanginian

The top of this unit in Greenslopes No. 1 has been identified from the marked change in dip direction on the dipmeter from 12 – 20° to the northeast in Unit I to 10 – 40° to the southeast in Unit II indicating a major unconformity or disconformity. At this point there is no apparent change in lithological character of the beds but this change in dip has also been mapped regionally as a major seismic horizon.

Within 20 metres the lithological character changes and the sequence becomes more sandy until after 150 metres below the disconformity the sequence consists predominantly of sandstones.

Generally the Unit is a lithic and feldspathic quartzose sandstone with fine interbeds of grey to green siltstones and mudstones.

Within the sequence are several minor disconformities apparent on the dipmeter and one which is more prominent than the rest was seismically mapped as the Intra-Eumeralla Unit II unconformity. This occurs at 1816 metres as picked on the dipmeter where dips are widely variable from 12 – 20° south west to 8 – 30° to the northeast and at this point on the composite restivity logs a marked change is also apparent. This pick is consistent with the palynology which records the Hauterivian stage of the Lower Cretaceous as absent from the section at this locality.

Unit II of the Eumeralla Formation essentially consists of tight, sublithic-silty sandstone with thinly laminated silts interbedded with clean quartzose sandstones and occasional coal stringers and bands. There is a thin siltstone band marking the top of the unit between 1397 to 1416 m, thereafter the sequence becomes sandier and more cemented with depth. The clean sandstones are generally interbanded fine grained and coarse grained sands, variably blue/grey to white, and occasionally yellow. The very fine to fine grained and well sorted sands, become coarser and poorly sorted with depth. Rose quartz and red to pink garnets are common throughout and the sands are generally uncemented with a kaolinitic matrix, coal and rock fragments.

The sublithic-silty thinly laminated sandstones are predominantly very carbonaceous, argillaceous, limonitic and yellow with a dirty brown silty to argillaceous matrix. The sands are angular, with some shattering and fracture of grains, very calc-cemented and some silicification. They are hard to brittle, poorly sorted with some pyritization of the cement and matrix towards the unconformity at 1820 metres.

The yellow limonitic sandstones are thinly laminated with siltstones, mudstones and some coal fragments.

The cleaner sands contain frequent good coal fragments, probably as stringers. Pyrite inclusions and pyritic nodules occur sporadically throughout, particularly with the silty and yellow sands and more increasingly with depth.

Towards the base of the sequence the sandstones become very well calc-cemented, chloritic and often silicified with some indications of banded quartz veins, cherts, large quartz pebbles and very large red to brown rock fragments.

Angular shattered grains are common within these cemented sands which often exhibit pyritic and carbonaceous inclusions in the grains and secondary silicification.

The sands at the base of the unit become increasingly affected by diagenetic alteration and are tight and cemented at 2305.5 m.

The siltstones are variably grey, green through to brown and black. They are resinous to blocky, soft, occasionally firm, carbonaceous, chloritic and arenaceous with depth. The silts often grade to and are microlaminated with chloritic and carbonaceous mudstones and shale, particularly at the top of the section.

Above 1820 metres, the silts are occasionally interlaminated with very thin coal beds and grade to carbonaceous and arenaceous shale.

Just below 1820 metres, buff to light orange silts occur which are calcareous grading to silty limestone and calc-argillite (possibly altered tuff).

In some samples, there are traces of micro-bedding on siltstone fragments. The occurrence of siltstone decreases with depth to little or none.

The trace mudstones are generally light to medium grey, white and occasionally green. They are calcareous, slightly to very chloritic with depth and grade to argillaceous coal in parts.

The occasional coals occur sporadically throughout the section as fragments or stringers and consist of hard, black, subvitrinous fragments, often microlaminated with sandstone and siltstone as thin carbonaceous shales, occasionally occurring as large fragments in the clean sands below the unconformity at 1820 metres.

Traces of dolomite, calcite and pyrite fragments occur sporadically throughout and cherts, lithic fragments and large quartz pebbles occur increasingly towards the base.

Palynology suggests a sequence of non-marine or fluvial deposition with minor pulses of brackish deposition.

The sequence shows a series of upwardly fining pulses with occasional siltstone bands. The dipmeter shows various ranges of dips from widely variable dip angles and azimuths indicating shallow turbulent depositional environments to dips consistent with cross-beds and graded beds on large and small scales in a progradational fluvio-deltaic sequence. The main axis is variable over short distances but generally trends southeast to northwest with the position of the main axis lying to the east or northeast of the well.

This sequence continues prograding upwards until a tidal flat or delta top environment is reached below the unconformity surface at 1397 metres.

Between 1397 to 1816 metres, the dominant structural dip is 10^{o} to 20^{o} to the northeast. Several minor unconformities and/or faults or slumps are apparent throughout the section with dips ranging 2^{o} to 50^{o} from northeast to southeast. These possibly indicate erosion surfaces or scouring where the channel has moved and the beds were exposed and eroded.

Below 1820 metres, the dominant structural dip ranges from 8^{o} to 15^{o} to the northeast and apparent cross-bedding and shallow turbulent depositional phases are indicated.

The dips indicate a range of laminated, cross-bedded to irregularly bedded bands and together with the interbanded characteristic of the sands and silts from clean, quartzose, lithic, fluvial sand to limonitic, argillaceous sands, indicate a progradational fluvial to deltaic sequence with minor pulses of shallow, paralic and restricted deposition, with the movement of the channel across the delta top or mud flat causing crevassing and slumping.

Diagenetic alteration within the sediments has since occurred.

Occasional patchy mineral fluorescences occur throughout the sequence associated with the calcite. There are no indications of hydrocarbon fluorescence above the Intra Unit II unconformity.

Between 1947 m to 2193 m there are very minor pin prick faint yellow fluorescences with no trace in the sample. Instant yellow-white cut and crush occur. These were possibly either minor indications of residual oil and/or contamination in the samples. There were no indications of hydrocarbons on the logs.

Between 2270 to 2286 metres, a very faint trace of brown stain was recorded around some grains which gave a faint yellow fluorescence and yellow-white streaming cut. The logs indicated a possibility of very minor residual hydrocarbons.

Visible porosities in the sands range from tight to good in the interbanded sections and become very poor towards the base of the sequence as the sands become diagenetically altered.

Pretty Hill Sandstone - (2305.5-2503M) Valanginian-Berriasian (Neocomian)

The Pretty Hill Sandstone Formation has only been intersected in relatively few wells drilled in the Otway Basin. It is believed to be a laterally discontinuous well-washed fluvial sand having been deposited only in topographic lows on a dissected land surface.

At the Greenslopes No. 1 locality, the Pretty Hill Sandstone is belived to lie conformably beneath the Eumeralla Formation Unit II.

The sequence consists predominantly of a series of sandstones (100%) with a thin siltstone band marking the top of the formation, with very minor, sporadic, thinly-bedded siltstones and coals lower down.

Palynology has indicated that the sandstones were deposited in non-marine or fluvial conditions with the thin capping siltstone deposited in a brackish environment, and this indicates a minor transgressive pulse before the fluvio-deltaic phase of Unit II.

The sandstones predominantly consist of thickly bedded clean white sands with multi-coloured grains and lithic fragments, thinly interbanded with yellow limonitic sandstones.

The white sands are generally fine to medium grained, moderately sorted with occasional large quartz fragments in a calcareous matrix. They grade to very clean and white sands with depth, becoming well cemented and often have a green clay matrix.

The yellow limonitic sands are very fine to coarse, occasionally pebbly, poorly sorted with a very calcareous to silty matrix. Frequent aggregates of intergranular quartz, coloured grains, dark rock fragments, cherts and rare pyrite nodules occur.

Very large quartz pebbles occur with depth, occasionally exhibiting secondary silicification and often with carbonaceous coating around the grains.

Visible porosities range from fair to excellent in white sands and poor to fair in yellow sands.

The sequence becomes silicified and diagenetically altered with depth to become well cemented to tight at the base.

Garnets and multi-coloured grains occur increasingly with depth and occasional traces of orange zeolitic-cement can be seen on some grains.

The siltstones occur as thin laminations and fragments and are light to dark grey in the upperband and are white, green, multi-coloured and laminated with depth. They are occasionally arenaceous to argillaceous, chloritic in part, occasionally carbonaceous grading to carbonaceous and marly mudstone at depth.

Towards the base are traces of microlaminated buff to black, shaley siltstone to calcareous mudstone or tuff.

The rare mudstones are light grey to brown and buff, occasionally carbonaceous, chloritic and kaolinitic, often grading to coal.

The coals occur as thin, vitrinous fragments and stringers and microlaminated, carbonaceous muds.

The dipmeter shows a sequence of upwardly fining cycles within an overall pattern of downwardly increasing dips. This sequence is generally indicative of a cross-bedded or current bedded fluvial sand with sporadic and turbulent influx of coarse detritus in the form of pebbly, lithic sands, prograding upwards to a lower energy delta top or brackish environment of deposition.

The sporadic influxes of coarse detritus are identified by the variable dips on the dipmeter within this sequence, indicating the range of sands from turbulent, massively bedded, irregularly bedded and cross-bedded with the movement of the distributary channel. There are indications on the dipmeter of several small faults, slumps or erosion surfaces throughout the section.

The dipmeter generally shows a distributory channel flowing southeast to northwest with the channel axis located to the northeast of the well.

Between 2391 to 2472 m one or two grains in the samples recorded very faint fluorescence with very faint cut. There were no traces of hydrocarbons in the samples and none were recorded on the logs.

Basal Unit - (2503.5-2582) Berriasian

This unit appears to lie conformably beneath the Pretty Hill Sandstone and from palynology has been classified as Lower Cretaceous.

The section consists of interbedded quartzose sandstones, and siltstones with minor mudstones and coal grading to black fissile shales, basalts, tuffs and some volcanoclastics.

In Greenslopes No. 1, the sandstones are very calcareous with zeolitic and feldspathic fragments and consist predominantly of light grey to yellow occasionally multi-coloured grains. They are fine to coarse grained, angular to subrounded, poorly sorted and well cemented sands with no visible porosity. There is abundant silicic and very calcitic cement with trace of a green matrix, and abundant aggregates and flakes of quartz with re-crystallised, interlocking quartz overgrowths.

The Siltstones are light to dark grey-green, blocky, subfissile, resinous to sucrosic, firm to hard, occasionally brittle, carbonaceous, pyritic, occasionally micromicaceous, chloritic, and microlaminated with multi-coloured clays.

The Mudstones are light to dark grey-green, silicic, arenaceous to argillaceous grading to carbonaceous shale in part.

The shale is generally black, argillaceous, fissile and microlaminated, often grading to coals and carbonaceous mudstones.

The Tuffs are variably black, brown, dark grey, light grey, grey/green, blue/grey, white to buff, blocky, soft to firm, amorphous to occasionally dispersive, silicic to argillaceous grading to shale and mudstone. There is a trace of grey/green vesicular tuff with glassy sherds, serpentine and dolerite fragments.

Volcanoclastic debris and basaltic fragments become increasingly more frequent with depth. The rock fragments and volcanoclastic debris are generally weathered porphyritic basalts with light to dark grey/green, phenocrysts in a light grey/green matrix and are occasionally serpentinised.

Towards the base of the unit quartz veins and banded quartz veins, cherts and calcite veins occur becoming predominantly more basaltic towards the basement. The basalt is red, brown, black and grey with phenocrysts of orange to red possibly Zeolite or Jasper.

The sequence is classified by palynology to be predominantly non-marine with a minor marginal marine pulse between 2550 to 2560 m which is correspondingly recorded on the dipmeter and composite resistivity logs.

Below 2560 m, the dips show a dominant structural dip of 30° to the northwest with variable angles and azimuths in a shaley, volcanoclastic sequence.

Above 2550 m, the dips show a dominant structural dip of 12° to the northeast with very little dip magnitude variation within the beds of sandstone and siltstones, ranging from 8 to 10° to the northeast.

PRE-CRETACEOUS

Basement (2582-2608M)

Economic Basement was intersected at 2582 metres and consisted predominantly of a metabasaltic layering of reworked basalts, tuffs and volcanoclastic debris with vitric sherds.

Petrographic analysis (Appendix 7) gave the composition as porphyritic basic lava fragments characterised by phenocrysts of augite and chloritised phenocrysts of olivine in a ground mass of clinopyroxene, plagioclase and secondary products such as shale, quartz and lava.

This is classified as a basic tuff.

IV GEOLOGY (Cont'd)

4. STRUCTURE

Greenslopes No.1 was drilled to test four way dip closure on a basement faulted anticline with sedimentary drape at the early to late Cretaceous level. At the base Cretaceous horizon this anomaly exhibits a dip to the east, west and north along with a large down to the south fault. (Figure 6).

The Greenslopes prospect was defined as a drillable structure by the Greenslopes 1984 Detail Seismic Survey after the structure was initially outlined during the Terang 1984 Seismic survey.

As closure appeared from interpretation and mapping, to be present throughout the lower Cretaceous sequence all interbedded sand units within the section were considered as possible targets.

The large down to the south fault was expected to place the Eumeralla Formation in a position to act as a lateral seal to the intraformational reservoir sands within Unit II and more particularly the Pretty Hill Sandstone.

The mapping and interpretation also anticipated intersection of a large fault zone between 960 to 1150metres and a smaller fault between 2100 to 2200metres.

Apart from a small amount of silicification and grain shatter recorded between 980 to 990 metres there is very little other indication of a fault zone.

Between 2100 to 2124 metres there is a small brecciated, silicified and pyritized sandstone zone with some grain fracture and pyritization of the matrices.

Table 3 compares the seismically predicted tops to those of the post drill formations and Figure 7 indicates the two way time depth relationship pre and post drilling.

TABLE 3

PREDICATED vs ACTUAL FORMATION TOPS

FORMATION	PREDICATED		ACTUAL	
	KB M	SUBSEA M	KB M	SUBSEA M
Base Tertiary	360	- 278	379.5	- 296.6
Intra-Eumeralla U/C	1380	- 1298	1397	- 1314.1
Within Unit II Eumeralla	1820	- 1738	1710	- 1627.1
Near Top Pretty Hill SSt	2470	- 2388	2305.5	- 2420.6
Basement	2780	- 2698	2582	- 2499.1
TD	2800	- 2718	2608.7	- 2525.8

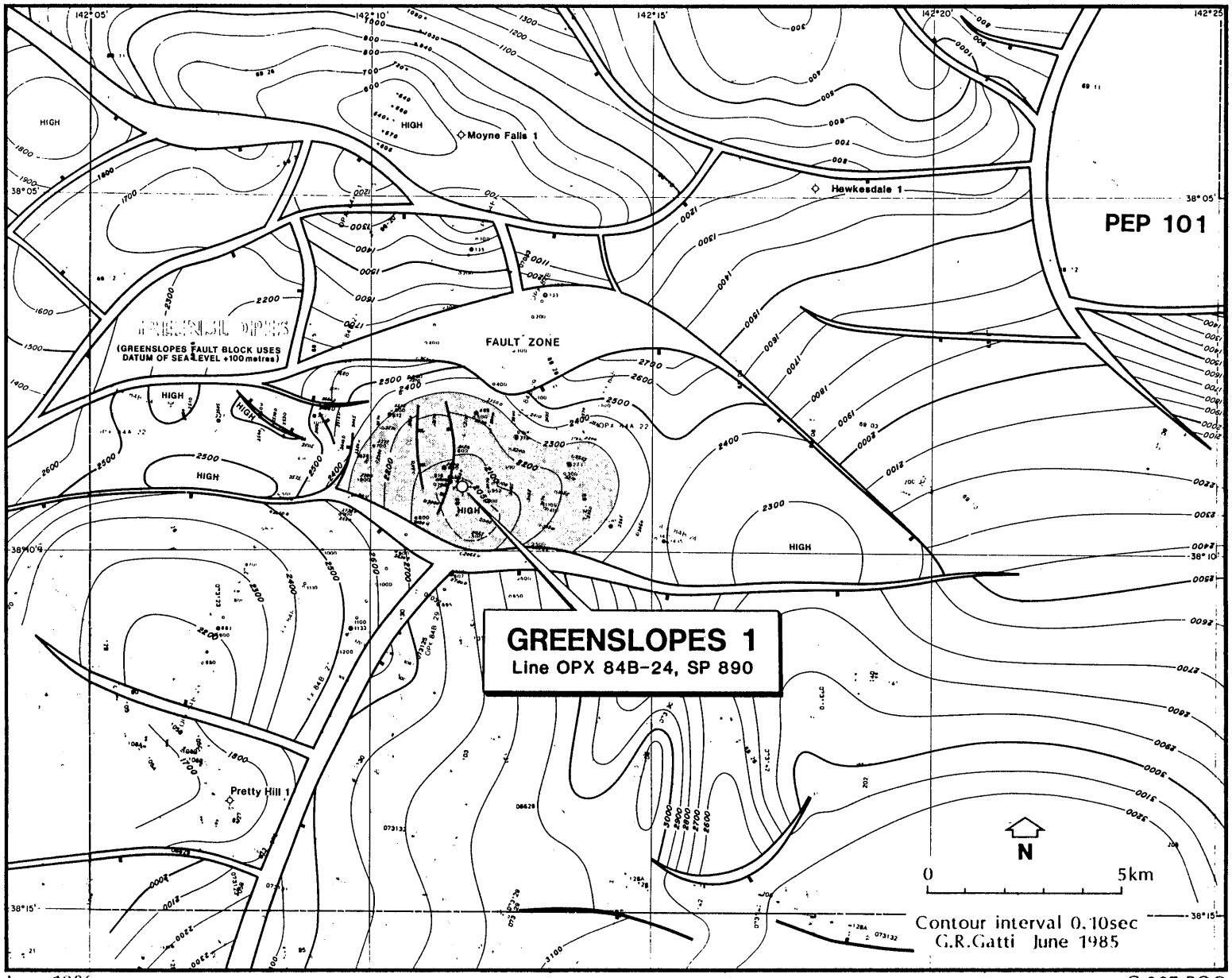


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Figure 6

Part of Greenslopes 1984 Seismic Survey, PEP 101

WELL LOCATION ON NEAR TOP STRUCTURE BASEMENT

GREENSLOPES 1

TIME - DEPTH RELATIONSHIP

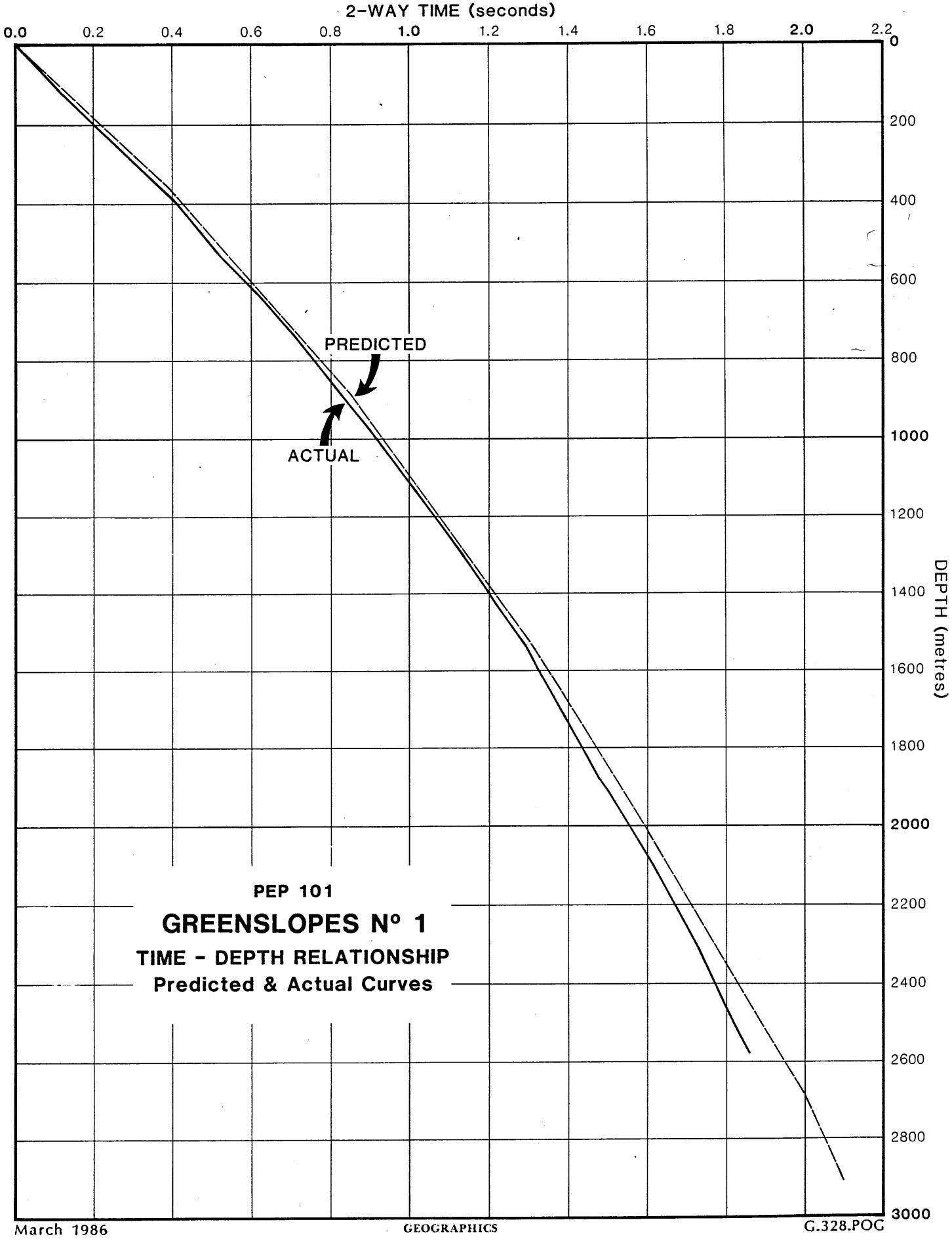

Figure 7

IV GEOLOGY (Cont'd)

5. POROSITY AND PERMEABILITY

These parametres are based on wireline log data and all reservoirs were evaluated within the lower Eumeralla Formation through to the Pretty Hill Sandstone Formation.

The log evaluation report is presented as Appendix 4.

Values of Permeability have been calculated and presented in Table 4. Values of Porosity, SW and Vcl are log derived and taken from the log evaluation report.

Irreduscible Water Saturation (SWirr) has been derived using the assumption:- SWirr (30 + 0.7Vcl) using those values of Sw less than or equal to 100% water Saturation. All values of Sw greater than 100% have been disregarded for these calculations and it has been assumed that all values less than 15% Vcl indicate a water wet clean sand.

Permeability values have been calculated using the Indonesia Equation as follows:-

$$K(MD) = \frac{20{,}000 \times \emptyset^{4.5}}{(Swirr)^2}$$

TABLE 4

POROSITY + PERMEABILITY WRT DEPTH AND FORMATION

DEPTH M	FORMATION	SW%	SWirr	%	Vcl%	K (MD)
1461.5	Eumeralla Unit II	92	0.342	27.3	6	169.72
1527.0	Eumeralla Unit II	96	0.433	23.0	19	61.99
1546.5	Eumeralla Unit II	91	0.433	24.3	19	62.42
1583.2	Eumeralla Unit II	94	0.349	25.4	7	118.10
1622.5	Eumeralla Unit II	100	0.314	25.2	2	128.94
1674.6	Eumeralla Unit II	99	0.342	20.4	6	45.74
1799.5	Eumeralla Unit II	95	0.433	22.3	19	53.90
1813.7	Eumeralla Unit II	100	0.377	30.5	11	253.54
1829.5	Eumeralla Unit II	98	0.475	27.1	25	118.22
1861.7	Eumeralla Unit II	100	0.475	22.7	25	53.27
1888.5	Eumeralla Unit II	94	0.384	28.1	12	172.14
1919.5	Eumeralla Unit II	100	0.377	28.3	11	181.10
1985.5	Eumeralla Unit II	93	0.538	20.5	34	29.73
1992.0	Eumeralla Unit II	96	0.384	28.8	12	192.29
2043.0	Eumeralla Unit II	91	0.384	25.6	12	113.18
2110.8	Eumeralla Unit II	95	0.349	24.7	7	106.01
2158.0	Eumeralla Unit II	94	0.321	23.6	3	93.89
2161.0	Eumeralla Unit II	94	0.321	22.8	3	80.39
2209.0	Eumeralla Unit II	88	0.321	25.1	3	123.90
2289.5	Eumeralla Unit II	90	0.433	20.8	19	39.43
2294.3	Eumeralla Unit II	88	0.321	23.6	3	93.89
2301.5	Pretty Hill Sandstone	88	0.363	22.8	9	71.09
2315.0	Pretty Hill Sandstone	93	0.393	19.7	14	33.59
2385	Pretty Hill Sandstone	97	0.398	12.9	1	6.48
2432.5	Pretty Hill Sandstone	96	0.363	13.9	9	7.67
2498.3	Basal Unit	94	0.356	14.1	8	8.34
2564.5	Basal Unit	74	0.524	4.9	32	0.49

TABLE 5

RECORDED OCCURRENCES OF HYDROCARBONS IN CUTTING SAMPLES

Depth (m) kb	Type	Fluorescence	Cut/Crush	Comments
790 - 800	Occasional sub-bituminous coatings + inclusions on some grains.	Nil	Very slight, slow, faint yellow fluorescence on cut and crush.	Immature, carbonaceous material. No ring. No show.
1150 - 1350	Occasional carbon-aceous inclusions + coatings on some grains.	Nil	Very faint yellow fluorescence on cut and crush.	No ring. Immature carbon-aceous material. No show.
1947 - 1950	No trace in sample.	Faint bright yellow.	Instant yellow-white cut	Dries to pale yellow/ brown ring.
1998 - 2001	No trace in sample.	Very slight, bright yellow speckled	Instant yellow-white cut	Dries to a thin yellow ring. Possible contamination.
2079 - 2082	No trace in sample.	Very faint, yellow speckled	Instant yellow-white cut	Dries to a faint yellow ring; one sample only.
2193	No trace in sample.	Faint pale yellow	Pale yellow streaming cut	No ring. Possible contamination.
2277 - 2280	Very minor trace of brown stain around grains within clay matrix; earthy material.	Pale yellow, with occasional bright yellow speckled	Instant bright yellow-white streaming cut; lingering	Dries to a pale yellow ring

../2

TABLE 5

RECORDED OCCURRENCES OF HYDROCARBONS IN CUTTING SAMPLES (continued)

Depth (m) kb	Type	Fluorescence	Cut/Crush	Comments
2280 - 2283	Very minor trace of brown stain on grains within clay matrix; earthy material	Very faint trace, pale yellow spotty speckled fluorescence on some grains	Instant bright yellow-white streaming cut; short-lived	Dries to a pale yellow ring
2283 - 2286	No trace in sample; earthy material. Possible residual oil.	One fragment, pale yellow within clay matrix.	Slow streaming pale yellow cut. Instant bright white/yellow streaming crush; lingering.	Bright yellow ring. Possible - residual hydrocarbons.
2391 - 2394	No trace in sample	Very faint spotty yellow fluorescence.	Very very faint yellow cut - very short-lived.	No ring.
2469 - 2472	No trace in sample	1-2 grains faint pale yellow fluorescence	Slow yellow cut. Instant bright white/ yellow crush.	No. ring.

IV GEOLOGY (Cont'd)

7. CONTRIBUTIONS TO GEOLOGICAL KNOWLEDGE

(1) There were no hydrocarbons encountered at the Greenslopes location.

(2) All potential reservoir objectives encountered in Greenslopes No.1 are water wet.

(3) Weak indications of hydrocarbons were encountered within the lower part of Unit II of the Eumeralla Formation. These possibly indicate residual oil at these localities.

(4) The Pebble Point Formation was not found to be a target at the Greenslopes locality.

(5) The Eumeralla Unit I formation was a thick monotonous siltstone and mudstone and an excellent potential source rock and seal.
The Pretty Hill Sandstone was a very good sand and exhibits good reservoir potential although some characteristics are lost due to compaction at depth. Porosities in the Pretty Hill range from 15–20%.

(6) Dating based on palynology indicates the presence of a Basal Unit within the lower Cretaceous possibly conformable beneath the Pretty Hill Sandstone. This had previously been classified in older wells nearby as Upper Jurassic to Lower Cretaceous.

(7) Palynology and the dipmeter log indicate the contacts between the unconformable units together with the hiatus at Intra-Eumeralla level.

(8) Anaylses of the Dipmeter results were used to pick the interface between Unit I and Unit II of the Eumeralla Formation as there is a marked change in dip direction from northeast in Unit I to southeast in Unit II at this horizon. Interpretation of Dipmeter results also indicates that within the Pretty Hill stratigraphic sequence local structural dip has a dominant northeast component between 10–12 degrees.

(9) Palynology, and source rock maturation data indicates that the Basal unit is mature in-situ for generating hydrocarbons at the present depth of 2505 metres.

The Eumeralla Unit I and Unit II are immature for generation of hydrocarbons at their present depth in Greenslopes but they may be mature at deeper levels elsewhere.

(10) The Eumeralla Unit II Formation was expected to be a thick sequence of mudstones and shales interbedded with sands and silts. However below 1585 metres the unit became predominantly sandstone with minor interbeds of siltstone and mudstones. Porosities ranged from 20 – 30% and as this unit was much sandier then expected it is now considered to have an excellent reservoir potential.

(11) As this unit did not contain significant shale, vertical seal was lost for the Pretty Hill Sandstone and there was probably no lateral seal on the large down to the South fault. Intraformational seal within the unit was possibly only present in the alternately cemented and porous sands.

(12) The indications of residual hydrocarbons in the lower section of the Unit II would suggest that the hydrocarbons have migrated through this section with no sealing barrier. Closure was not exhibited at this location at the Intra-Eumeralla unconformity ie: between Unit I and Unit II at 1397 m.

BIBLOGRAPHY

Mitchell, L & Gatti, G	1984:	Otway Basin Victoria Regional Geology and Farmout Data.
Wopfner, H & Douglas, J.G.	1971:	The Otway Basin of SE Australia Special Bulletin Geological Surveys of South Australia and Victoria.
Price, P.A. et al	1985:	C.S.R. Report 274/25.
Bain, J.S.	1962:	Well completion Report Pretty Hill No.1.
Leslie, R.B. & Sell, B.H.	1962:	Well completion Report Woolesthorpe No.1.
Poll, J.J.K.	1970:	Well completion Report Hawkesdale No.1.

ENCLOSURES:

ENCLOSURE 1

GREENSLOPES 1

WELL SUMMARY SHEET

OPERATOR	Phoenix Oil & Gas N.L.	**LOCATION**	
DRILLING CONTRACTOR	G.D.S.A.	**Latitude**	38° 07'48.72"S
RIG	No.5 National T32	**Longitude**	142° ~~12'39.81"~~E
SPUDDED	18/12/85	**Easting**	~~604~~ 658.79E
COMPLETED	10/01/86	**Northing**	5 776 678.05N
		Seismic	SP 890, Line OPX84B-24
TOTAL DEPTH		**ELEVATION**	
Driller	2608.7m	**G.L.**	76.9m
Logger	2606.8m	**K.B.**	82.9m

STRUCTURE TYPE

Structural basement induced high with four way dip bounded to the south by east-west fault.

MAP	1:250 000 Portland
WELLSITE GEOLOGIST	L.P.Mitchell
PREPARED BY	L.P.Mitchell, 08/05/86

FORMATIONS PENETRATED

AGE	FORMATION	DEPTH	ELEVATION	THICKNESS	CASING (size, depth)
Tertiary/Recent	Undifferentiated	surface	82.9m	120m	13 3/8", 132m
Tertiary	Gellibrand Marl	120m	-37.1m	210m	
	Clifton Formation	330m	-247.1m	49.5m	
	Pebble Point Formation	379.5m	-296.6m	75.5m	
Late Cretaceous	Paaratte Formation	455m	-372.1m	66m	
	Belfast Mudstone	529m	-446.1m	24m	
	Flaxmans Formation	553m	-470.1m	27m	
Early Cretaceous	Eumeralla Formation				
	Unit 1	580m	-497.1m	817m	9 5/8", 890m
	Unit 2	1397m	-1314.1m	908.5m	
	Pretty Hill Sandstone	2305.5m	-2145.1m	198m	
	Basal Shale Unit	2503.5m	-2420.6m	76.5m	
?PreJurassic?	Metabasaltic Basement	2582m	-2499.1m	26m+	
	TOTAL DEPTH (Driller)	2608.7m	-2525.8m		
	TOTAL DEPTH (Logger)	2606.8m	-2523.9m		

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LOGS

LOG TYPE	SUITE	INTERVAL (m)	BHT/T	TIME SINCE CIRCULATION (hours)
DLL/MSFL/GR/SP/CAL	1	2606.8 - 890	203/9.23	9.23hours
MEL/BCF/GR	2	2606.8 - 890	213/15.58	15.58hours
GR	2	2606.8 - surface		
FED/GR	3	2606.8 - 1150	220/21.6	21.60hours

CORES	TESTS
Nil	Nil

PALYNOLOGY & MATURITY

TYPE	DEPTH (m)	DATING	MATURITY
SC	1367	PK3.2	Very Early Oil
SC	1373	PK3.2	Very Early Oil
SC	1381	PK3.2-1	Very Early Oil
SC	1567	PK3.1	Early Oil
SC	1816	PK3.1	Early Oil
SC	1853	PK2.0	Early Oil
SC	1963	PK1.2	Early Oil
SC	1977	PK1.2	Early Oil
SC	2172	PK1.2	Early Oil
SC	2214	PK1.2	Early Oil
SC	2265	PK1.2	Early Oil
SC	2283	PK1.2	Early Oil
SC	2307	PK1.2	Early Oil
SC	2365.5	PK1.2	Early Oil
SC	2436	PK1.2	Early Oil
SC	2443	PK1.2	Early Oil
SC	2490	PK1.2	Peak Oil
SC	2505	PK1.2	Peak Oil
SC	2536	PK1.2	Peak Oil
SC	2556	PK1.2	Peak Oil
SC	2562	PK1.2	Peak Oil

LOG INTERPRETATION

DEPTH (m)	FORMATION	Ø%	SW%
1420.1	Eumeralla Unit 2	10.1	109
1489.5	Eumeralla Unit 2	27.4	107
1513	Eumeralla Unit 2	28.5	101
1583.2	Eumeralla Unit 2	25.4	94
1622.5	Eumeralla Unit 2	25.2	100
1674.6	Eumeralla Unit 2	20.4	99
1720.5	Eumeralla Unit 2	15.5	113
1799.5	Eumeralla Unit 2	22.3	95
1813.7	Eumeralla Unit 2	30.5	100
1888.5	Eumeralla Unit 2	28.1	94
1919.5	Eumeralla Unit 2	28.3	100
1992	Eumeralla Unit 2	28.8	96
2043	Eumeralla Unit 2	25.6	91
2100.8	Eumeralla Unit 2	24.7	95
2178	Eumeralla Unit 2	26.6	104
2209	Eumeralla Unit 2	25.1	88
2294	Eumeralla Unit 2	23.6	88
2301	Eumeralla Unit 2	22.8	88
2385	Pretty Hill Sst	12.9	97
2419	Pretty Hill Sst	10.8	103
2498.3	Pretty Hill Sst	14.1	94
2564.5	Basal Unit	4.9	74
2578.5	Basal Unit	0.0	

NOTE: Three sidewall cores were lost.

G.333.POG GEOGRAPHICS June 1986

ENCLOSURE 2

WELL VELOCITY SURVEY

GREENSLOPES NO. 1

PEP 101

VICTORIA

for

PHOENIX OIL AND GAS N.L.

by

VELOCITY DATA PTY. LTD.

Brisbane, Australia

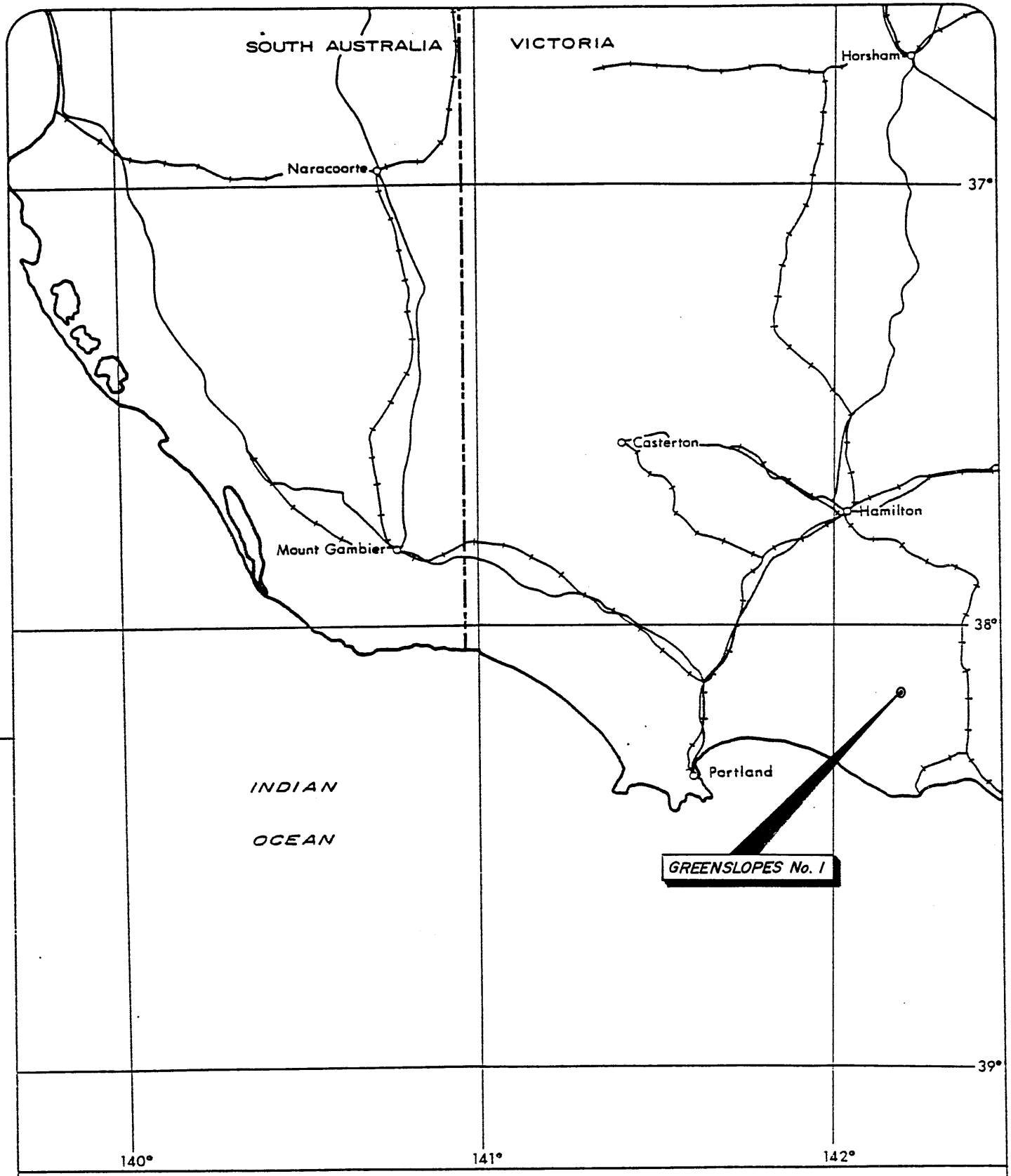
January 10, 1986

CONTENTS

Figures

Tables

Enclosures



PHOENIX OIL AND GAS N. L.

GREENSLOPES No. 1

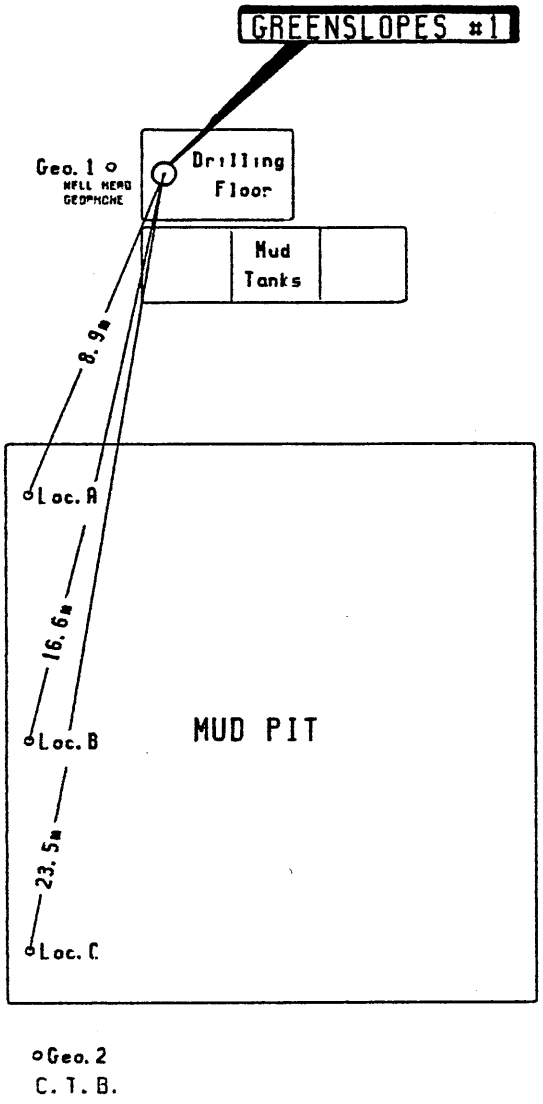
WELL LOCATION MAP

Scale 1:1250000 approx. (1 in. = 20 mi.)

0 5 10 20 30 40 50 MILES

0 5 10 20 30 40 50 60 KILOMETRES

Figure 1



GREENSLOPES #1

PHOENIX OIL AND GAS N. L.

SHOT POINT LOCATION SKETCH

Figure 2

SUMMARY

Velocity Data Pty. Ltd. conducted a velocity survey for Phoenix Oil and Gas N.L. in the Greenslopes No. 1 well, PEP 101, Victoria. The date of the survey was January 10, 1986.

The results of the survey, which are considered to be reliable, have been used to calibrate the sonic log.

Explosives were used as an energy source with shots being fired in the mud pit.

GENERAL INFORMATION

Name of Well	:	Greenslopes No. 1
Location (Figure 1)	:	PEP 101, Victoria
Coordinates	:	Latitude 038°09'05"S Longitude 142°11'38"E
Date of Survey	:	January 10, 1986
Wireline Logging	:	Gearhart - DDL08
Weather	:	Fine
Operational Base	:	Roma
Operator	:	N. Delfos
Client Representative	:	L. Mitchell

EQUIPMENT

Recording Instruments

VDLS 11/10 software controlled digital recording system utilising SIE OPA-10 floating point amplifiers for digital recording and SIE OPA-4 amplifiers for analog presentation. The system includes a DEC LSI-11 CPU, twin cassette tape unit and printer.

Downhole Geophone

Geophone WLS 1050 Wall-lock

Downhole sensors:

6 HSI 4.5Hz 215 ohm, high temperature (300 degrees F.) detectors connected in series parallel. Frequency response 8-300Hz within 3db.

Preamplifier - 48db fixed gain.
Frequency response 5-200hz within 3db.

Reference Geophone

Mark L1 7.5Hz

RECORDING

Energy Source	:	Explosives - AN-60
Shot Location	:	Mud pit
Charge Size	:	1 to 4 (125 gm) sticks
Average Shot Depth	:	1.5 metres
Average Shot Offset	:	23.5 metres
Recording Geometry	:	Figure 2

Shots were recorded on digital cassette tape and later transcribed to nine track tape (SEG-Y format) in Velocity Data's Brisbane centre. Printouts of the shots used are included with this report. (Enclosure 2)

The sample rate was 1 ms with 0.5 ms sampling over a 200 ms window encompassing the first arrivals. The scale of the graphic display varies with signal strength and is noted on each playout.

The times were picked from the printouts using the numerical value of the signal strength. (Enclosure 2)

COMPUTING

Basic Information

Elevation of K.B.	:	88 metres A.S.L.
Elevation of Ground	:	82 metres A.S.L.
Elevation of Seismic Datum	:	100 metres A.S.L.
Depth Surveyed	:	2561 metres below K.B.
Total Depth	:	2606.8 metres below K.B.
Depth of Casing	:	890 metres below K.B.
Sonic Log Interval	:	890 to 2603 metres below K.B.

COMPUTING

Recorded Data

Number of Shots Used	:	30
Number of Levels Recorded	:	25
Data Quality	:	Good
Noise Level	:	Low
Rejected Shots	:	Nil

Correction to Datum

A correction to datum was calculated using a replacement velocity of 1900 metres/second.

Datum Correction Time : -1.3 ms

An instrument lag of 4 ms has been taken into consideration when determining the datum correction. The lag is not of consequence for the remainder of the calculations since it is applied to both the datum and downhole shots.

Calibration of Sonic Log - Method

Sonic times were adjusted to checkshot times using a linear correction of the sonic transit times.

These differences arise as the sonic tool measures the local velocity characteristics of the formation with a high frequency signal, whereas the downhole geophone records the bulk velocity character using a signal of significantly lower frequency.

Additional calibration points were selected between shots where apparent velocity changes were observed on the sonic log.

COMPUTING

Calibration of Sonic Log - Results (Enclosure 1)

The discrepancies between shot and sonic interval velocities were generally small. The largest adjustment was 22.58 microsecs/metre on the interval 1120 to 1182 metres below K.B.

In aggregate, the shot and sonic interval times differed by -7.2 ms over the logged portion of the well.

Trace Playouts (Figure 4)

Figure 4A is a plot of all traces used. No filter or gain recovery has been applied.

Figure 4B is a plot to scale in depth and time of selected traces. No filter or gain recovery has been applied.

Figure 4C is a plot to scale in depth and time of selected traces with a 5Hz - 40Hz filter and a gain recovery function of $t^{2.0}$ applied.

Figure 4D is a plot of selected surface traces. No filter or gain recovery has been applied.

Ken Jenkinson
Geophysicist

VELOCITY DATA PTY LTD

WELL SURVEY CALCULATIONS

Company : PHOENIX OIL & GAS N. L.
Well : GREENSLOPES #1
Elevations : Datum : 100.0 Ground : 82.0 Kelly : 88.0
Shot data : Location Elevation Offset

Location	Elevation	Offset
A	81.5	8.9
B	81.5	16.6
C	81.5	23.5

Latitude : 038 09 05
Longitude : 142 11 38
Rig identification : P.S.D.A. - RIG #5
Energy source : AN-60
Logger : GEARHART - DDL08

Survey date : 10-JAN-86
Survey units : METRES
Times in milliseconds.

SHOT CALCULATIONS

Shot No	Geophone depth Kelly	Geophone depth Datum	Shot Locn	Shot Depth	TIMES Record	TIMES - Corr.	TIMES Avg.	TIMES - Below datum	Check shot interval Distance	Check shot interval Time	Velocities Average	Velocities RMS	Velocities Interval
DATUM (100 METRES)													
	-12.0	0.0					2.7	0.0					
									62.0	32.6			1901.8
4	50.0	62.0	A	0.2	36.0	35.3	35.3	32.6			1901.8	1901.8	
									50.0	25.0			2000.0
5	100.0	112.0	A	0.2	63.0	62.7							
6	100.0	112.0	B	0.5	61.0	60.1							
7	100.0	112.0	C	0.5	60.0	58.2	60.3	57.6			1944.4	1945.1	
									280.0	143.8			1947.1
37	380.0	392.0	C	1.5	204.5	204.1	204.1	201.4			1946.4	1946.5	
									130.0	56.6			2296.8
36	510.0	522.0	C	1.5	261.0	260.7	260.7	258.0			2023.3	2028.6	
									105.0	49.1			2138.5
35	615.0	627.0	C	1.5	310.0	309.8	309.8	307.1			2041.7	2046.5	
									105.0	46.0			2282.6
34	720.0	732.0	C	1.5	356.0	355.8	355.8	353.1			2073.1	2078.8	
									155.0	61.5			2520.3
33	875.0	887.0	C	1.5	417.5	417.3	417.3	414.6			2139.4	2150.0	
									110.0	42.6			2582.2
32	985.0	997.0	C	1.5	460.0	459.9	459.9	457.2			2180.7	2193.9	
									135.0	49.5			2727.3
31	1120.0	1132.0	C	1.5	509.5	509.4	509.4	506.7			2234.1	2251.6	
									62.0	24.0			2583.3
30	1182.0	1194.0	C	1.5	533.5	533.4	533.4	530.7			2249.9	2267.6	
									103.0	37.0			2783.8
29	1285.0	1297.0	C	1.5	570.5	570.4	570.4	567.7			2284.7	2304.8	
									100.0	31.5			3174.6
9	1385.0	1397.0	C	1.0	603.0	602.9							
28	1385.0	1397.0	C	1.5	601.0	600.9	601.9	599.2			2331.4	2358.5	
									30.0	9.5			3157.9
27	1415.0	1427.0	C	1.5	611.5	611.4	611.4	608.7			2344.3	2373.1	
									115.0	36.0			3194.4
26	1530.0	1542.0	C	1.5	647.5	647.4	647.4	644.7			2391.8	2426.3	
									50.0	14.5			3448.3
25	1580.0	1592.0	C	1.5	662.0	661.9	661.9	659.2			2415.0	2453.3	
									130.0	35.5			3662.0
24	1710.0	1722.0	C	1.5	697.5	697.4	697.4	694.7			2478.8	2529.1	
									33.0	8.0			4125.0
23	1743.0	1755.0	C	1.5	705.5	705.4	705.4	702.7			2497.5	2552.9	

Company : PHOENIX OIL & GAS N. L.
Well : GREENSLOPES #1
Elevations : Datum : 100.0 Ground : 82.0 Kelly : 88.0
Shot data : Location Elevation Offset
A 81.5 8.9
B 81.5 16.6
C 81.5 23.5

Latitude : 038 09 05
Longitude : 142 11 38
Rig identification : P.S.D.A. - RIG #5
Energy source : AN-60
Logger : GEARHART - DDL08

Survey date : 10-JAN-86
Survey units : METRES
Times in milliseconds.

SHOT CALCULATIONS

Shot No	Geophone depth Kelly	Geophone depth Datum	Shot Locn	Shot Depth	TIMES Record	TIMES - Corr.	TIMES Avg.	TIMES - Below datum	Check shot interval Distance	Check shot interval Time	Velocities Average	Velocities RMS	Velocities Interval
23	1743.0	1755.0	C	1.5	705.5	705.4	705.4	702.7			2497.5	2552.9	
									117.0	34.5			3391.3
22	1860.0	1872.0	C	1.5	740.0	739.9	739.9	737.2			2539.3	2598.2	
									45.0	14.5			3103.4
20	1905.0	1917.0	C	1.5	754.5	754.4	754.4	751.7			2550.2	2608.9	
									57.0	17.5			3257.1
18	1962.0	1974.0	C	1.5	772.0	771.9	771.9	769.2			2566.3	2625.4	
									130.0	38.7			3359.2
10	2092.0	2104.0	C	1.0	812.0	811.9							
17	2092.0	2104.0	C	1.5	810.0	809.9							
19	2092.0	2104.0	C	1.5	810.0	809.9	810.6	807.9			2604.3	2665.2	
									213.0	57.9			3678.8
16	2305.0	2317.0	C	1.5	868.5	868.5	868.5	865.8			2676.1	2744.7	
									130.0	30.5			4262.3
15	2435.0	2447.0	C	1.2	899.0	899.0	899.0	896.3			2730.1	2809.8	
									67.0	18.0			3722.2
14	2502.0	2514.0	C	1.0	917.0	917.0	917.0	914.3			2749.6	2830.6	
									59.0	14.0			4214.3
13	2561.0	2573.0	C	1.0	931.0	931.0	931.0	928.3			2771.7	2856.5	

Company : PHOENIX OIL & GAS N. L.
Well : GREENSLOPES #1
Elevations : Datum : 100.0 Ground : 82.0 Kelly : 88.0

Latitude : 038 09 05
Longitude : 142 11 38

Survey date : 10-JAN-86
Survey units : METRES
Times in milliseconds.

SONIC DRIFT

Geophone depth Kelly	Geophone depth Datum	Check shot times Average	Check shot times Below datum	Check shot interval Distance	Check shot interval Time	Sonic Int. time	Interval sonic drift usec/m	Interval sonic drift msec	Cumulative drift msec
DATUM (100 METRES)									
-12.0	0.0	2.7	0.0						
				62.0	32.6				
50.0	62.0	35.3	32.6						
				50.0	25.0				
100.0	112.0	60.3	57.6						
				280.0	143.8				
380.0	392.0	204.1	201.4						
				130.0	56.6				
510.0	522.0	260.7	258.0						
				105.0	49.1				
615.0	627.0	309.8	307.1						
				105.0	46.0				
720.0	732.0	355.8	353.1						
				155.0	61.5				
875.0	887.0	417.3	414.6						
				110.0	42.6	43.3	-6.36	-0.7	-0.7
985.0	997.0	459.9	457.2						
				135.0	49.5	49.4	0.74	0.1	-0.6
1120.0	1132.0	509.4	506.7						
				62.0	24.0	22.6	22.58	1.4	0.8
1182.0	1194.0	533.4	530.7						
				103.0	37.0	35.6	13.59	1.4	2.2
1285.0	1297.0	570.4	567.7						
				100.0	31.5	33.4	-19.00	-1.9	0.3
1385.0	1397.0	601.9	599.2						
				30.0	9.5	10.1	-20.00	-0.6	-0.3
1415.0	1427.0	611.4	608.7						
				115.0	36.0	36.3	-2.61	-0.3	-0.6
1530.0	1542.0	647.4	644.7						
				50.0	14.5	15.5	-20.00	-1.0	-1.6
1580.0	1592.0	661.9	659.2						
				130.0	35.5	37.0	-11.54	-1.5	-3.1
1710.0	1722.0	697.4	694.7						
				33.0	8.0	8.3	-9.09	-0.3	-3.4
1743.0	1755.0	705.4	702.7						
				117.0	34.5	35.3	-6.84	-0.8	-4.2
1860.0	1872.0	739.9	737.2						
				45.0	14.5	14.2	6.67	0.3	-3.9
1905.0	1917.0	754.4	751.7						
				57.0	17.5	17.1	7.02	0.4	-3.5
1962.0	1974.0	771.9	769.2						
				130.0	38.7	38.7	0.00	0.0	-3.5
2092.0	2104.0	810.6	807.9						

Company : PHOENIX OIL & GAS N. L.
Well : GREENSLOPES #1
Elevations : Datum : 100.0 Ground : 82.0 Kelly : 88.0

Latitude : 038 09 05
Longitude : 142 11 38

Survey date : 10-JAN-86
Survey units : METRES
Times in milliseconds.

SONIC DRIFT

Geophone depth Kelly	Datum	Check shot times Average	Below datum	Check shot interval Distance	Time	Sonic Int. time	Interval sonic drift usec/m	msec	Cumulative drift msec
2092.0	2104.0	810.6	807.9						
				213.0	57.9	59.8	-8.92	-1.9	-5.4
2305.0	2317.0	868.5	865.8						
				130.0	30.5	32.6	-16.15	-2.1	-7.5
2435.0	2447.0	899.0	896.3						
				67.0	18.0	16.6	20.90	1.4	-6.1
2502.0	2514.0	917.0	914.3						
				59.0	14.0	15.1	-18.64	-1.1	-7.2
2561.0	2573.0	931.0	928.3						

Company : PHOENIX OIL & GAS N. L.
Well : GREENSLOPES #1
Elevations : Datum : 100.0 Ground : 82.0 Kelly : 88.0

Latitude : 038 09 05
Longitude : 142 11 38

Survey date : 10-JAN-86
Survey units : METRES
Times in milliseconds.

SONIC CALIBRATION

Geophone depth Kelly	Geophone depth Datum	Interval Distance	Original sonic times Interval	Original sonic times Cumulative	Adjusted sonic times Interval	Adjusted sonic times Calibrated	Velocities Average	Velocities RMS	Velocities Interval
DATUM (100 METRES)									
-12.0	0.0								
		62.0					1901.8	1901.8	1901.8
50.0	62.0								2000.0
		50.0					1944.4	1945.1	
100.0	112.0								1947.1
		280.0					1946.4	1946.5	
380.0	392.0								2296.8
		130.0					2023.3	2028.6	
510.0	522.0								2138.5
		105.0					2041.7	2046.5	
615.0	627.0								2282.6
		105.0					2073.1	2078.8	
720.0	732.0								2520.3
		155.0					2139.4	2150.0	
875.0	887.0								2582.2
		110.0	43.3	43.3	42.6	457.2	2180.7	2193.9	
985.0	997.0								2727.3
		135.0	49.4	92.7	49.5	506.7	2234.1	2251.6	
1120.0	1132.0								2583.3
		62.0	22.6	115.3	24.0	530.7	2249.9	2267.6	
1182.0	1194.0								2783.8
		103.0	35.6	150.9	37.0	567.7	2284.7	2304.8	
1285.0	1297.0								3174.6
		100.0	33.4	184.3	31.5	599.2	2331.4	2358.5	
1385.0	1397.0								3157.9
		30.0	10.1	194.4	9.5	608.7	2344.3	2373.1	
1415.0	1427.0								3194.4
		115.0	36.3	230.7	36.0	644.7	2391.8	2426.3	
1530.0	1542.0								3448.3
		50.0	15.5	246.2	14.5	659.2	2415.0	2453.3	
1580.0	1592.0								3662.0
		130.0	37.0	283.2	35.5	694.7	2478.8	2529.1	
1710.0	1722.0								4125.0
		33.0	8.3	291.5	8.0	702.7	2497.5	2552.9	
1743.0	1755.0								3391.3
		117.0	35.3	326.8	34.5	737.2	2539.3	2598.2	
1860.0	1872.0								3103.4
		45.0	14.2	341.0	14.5	751.7	2550.2	2608.9	
1905.0	1917.0								3257.1
		57.0	17.1	358.1	17.5	769.2	2566.3	2625.4	
1962.0	1974.0								3359.2
		130.0	38.7	396.8	38.7	807.9	2604.3	2665.2	
2092.0	2104.0								

Company : PHOENIX OIL & GAS N. L.
Well : GREENSLOPES #1
Elevations : Datum : 100.0 Ground : 82.0 Kelly : 88.0

Latitude : 038 09 05
Longitude : 142 11 38

Survey date : 10-JAN-86
Survey units : METRES
Times in milliseconds.

SONIC CALIBRATION

Geophone depth Kelly	Geophone depth Datum	Interval Distance	Original sonic times Interval	Original sonic times Cumulative	Adjusted sonic times Interval	Adjusted sonic times Calibrated	Velocities Average	Velocities RMS	Velocities Interval
2092.0	2104.0			396.8		807.9	2604.3	2665.2	
		213.0	59.8		57.9				3678.8
2305.0	2317.0			456.6		865.8	2676.1	2744.7	
		130.0	32.6		30.5				4262.3
2435.0	2447.0			489.2		896.3	2730.1	2809.8	
		67.0	16.6		18.0				3722.2
2502.0	2514.0			505.8		914.3	2749.6	2830.6	
		59.0	15.1		14.0				4214.3
2561.0	2573.0			520.9		928.3	2771.7	2856.5	

FIGURE 3

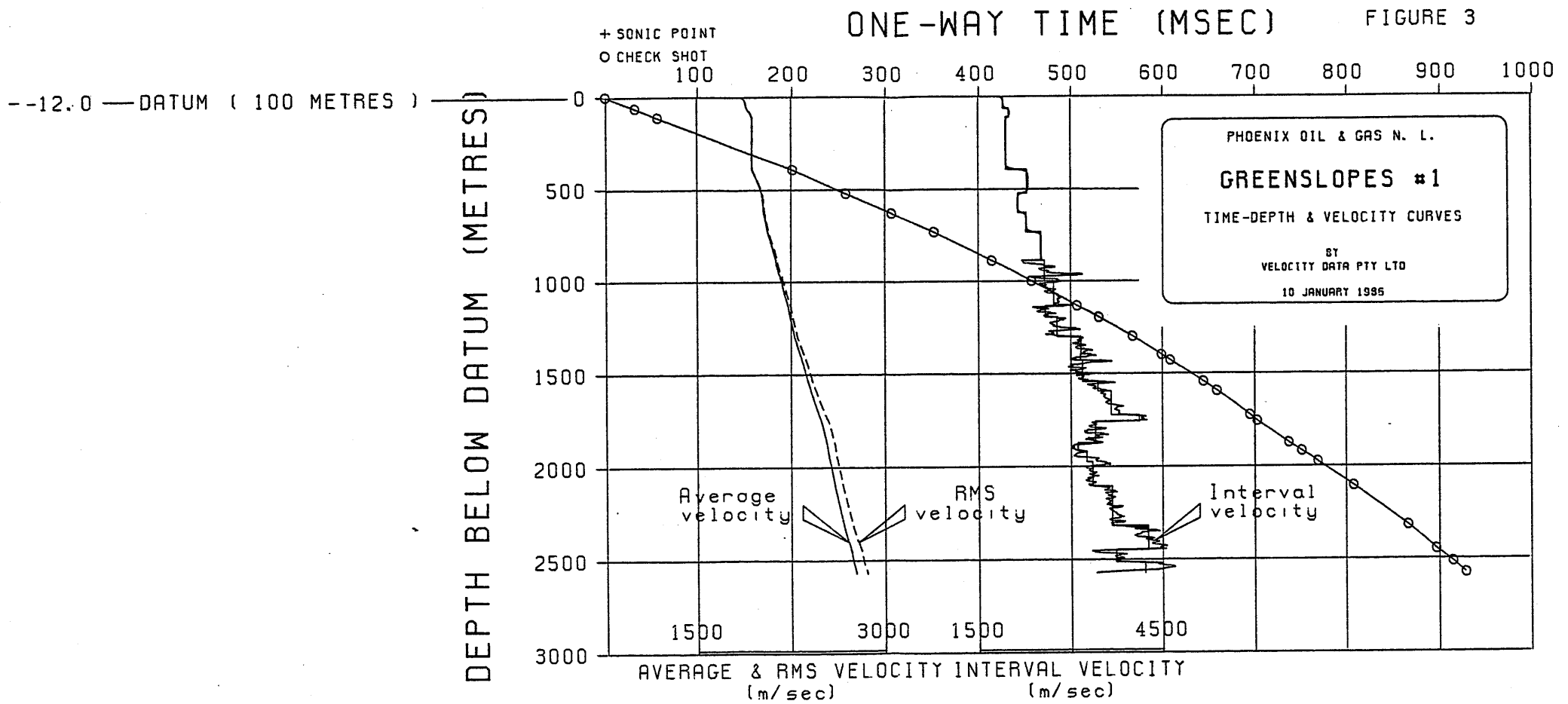

ONE-WAY TIME (MSEC)
+ SONIC POINT
O CHECK SHOT
100
200
300
400
500
600
700
800
900
1000
--12.0 — DATUM (100 METRES)
DEPTH BELOW DATUM (METRES)
0
500
1000
1500
2000
2500
3000
PHOENIX OIL & GAS N. L.
GREENSLOPES #1
TIME-DEPTH & VELOCITY CURVES
BY
VELOCITY DATA PTY LTD
10 JANUARY 1985
Average velocity
RMS velocity
Interval velocity
1500
3000
1500
4500
AVERAGE & RMS VELOCITY (m/sec)
INTERVAL VELOCITY (m/sec)

TABLE 1. Time-Depth curve values

Well : GREENSLOPES #1
Survey units : METRES
Client : PHOENIX OIL & GAS N. L.
Datum : 100.0
Calibrated sonic interval velocities used from 895.0 to 2570.0

Datum Depth	One-way time(ms)	-----VELOCITIES----- Average	RMS	Interval
5.0	2.7	1866	1866	1866
10.0	5.3	1875	1875	1884
15.0	8.0	1881	1881	1893
20.0	10.6	1885	1885	1898
25.0	13.2	1888	1888	1900
30.0	15.9	1890	1890	1901
35.0	18.5	1892	1892	1902
40.0	21.1	1893	1893	1903
45.0	23.8	1895	1895	1905
50.0	26.4	1896	1896	1908
55.0	29.0	1898	1898	1915
60.0	31.6	1900	1900	1930
65.0	34.1	1905	1905	1959
70.0	36.6	1910	1911	1986
75.0	39.1	1916	1916	2000
80.0	41.6	1921	1922	2006
85.0	44.1	1926	1927	2009
90.0	46.6	1931	1931	2010
95.0	49.1	1935	1936	2010
100.0	51.6	1938	1939	2008
105.0	54.1	1941	1942	2004
110.0	56.6	1944	1944	1994
115.0	59.1	1945	1946	1975
120.0	61.7	1946	1946	1958
125.0	64.2	1946	1946	1950
130.0	66.8	1946	1946	1946
135.0	69.4	1946	1946	1944
140.0	72.0	1946	1946	1943
145.0	74.5	1946	1946	1943
150.0	77.1	1945	1946	1943
155.0	79.7	1945	1946	1943
160.0	82.2	1945	1946	1943
165.0	84.8	1945	1946	1943
170.0	87.4	1945	1946	1942
175.0	90.0	1945	1946	1942
180.0	92.5	1945	1945	1942
185.0	95.1	1945	1945	1942
190.0	97.7	1945	1945	1942
195.0	100.3	1945	1945	1942
200.0	102.8	1945	1945	1942

Datum Depth	One-way time(ms)	-----VELOCITIES---- Average	RMS	Interva
205.0	105.4	1945	1945	194
210.0	108.0	1945	1945	194
215.0	110.6	1945	1945	194
220.0	113.1	1945	1945	194
225.0	115.7	1944	1945	194
230.0	118.3	1944	1945	194
235.0	120.9	1944	1945	194
240.0	123.4	1944	1945	194
245.0	126.0	1944	1945	194
250.0	128.6	1944	1945	194
255.0	131.2	1944	1945	194
260.0	133.7	1944	1945	194
265.0	136.3	1944	1944	194
270.0	138.9	1944	1944	194
275.0	141.5	1944	1944	194
280.0	144.0	1944	1944	194
285.0	146.6	1944	1944	194
290.0	149.2	1944	1944	194
295.0	151.7	1944	1944	194
300.0	154.3	1944	1944	194
305.0	156.9	1944	1944	194
310.0	159.5	1944	1944	194
315.0	162.0	1944	1944	194
320.0	164.6	1944	1944	194
325.0	167.2	1944	1944	194
330.0	169.8	1944	1944	194
335.0	172.3	1944	1944	194
340.0	174.9	1944	1944	194
345.0	177.5	1944	1944	194
350.0	180.1	1944	1944	194
355.0	182.6	1944	1944	194
360.0	185.2	1944	1944	194
365.0	187.8	1944	1944	194
370.0	190.3	1944	1944	194
375.0	192.9	1944	1944	195
380.0	195.5	1944	1944	196
385.0	198.0	1945	1945	198
390.0	200.4	1946	1946	202
395.0	202.8	1948	1948	212
400.0	205.1	1951	1951	221

TABLE 1. Time-Depth curve values

Well : GREENSLOPES #1
Survey units : METRES
Client : PHOENIX OIL & GAS N. L.
Datum : 100.0
Calibrated sonic interval velocities used from 895.0 to 2570.0

Datum Depth	One-way time(ms)	-----VELOCITIES----- Average	RMS	Interval
405.0	207.3	1954	1955	2266
410.0	209.4	1958	1959	2290
415.0	211.6	1961	1962	2302
420.0	213.8	1965	1966	2308
425.0	215.9	1968	1970	2311
430.0	218.1	1972	1974	2312
435.0	220.3	1975	1977	2313
440.0	222.4	1978	1981	2313
445.0	224.6	1981	1984	2314
450.0	226.8	1985	1988	2314
455.0	228.9	1988	1991	2314
460.0	231.1	1991	1994	2314
465.0	233.2	1994	1998	2314
470.0	235.4	1997	2001	2314
475.0	237.6	2000	2004	2314
480.0	239.7	2002	2007	2314
485.0	241.9	2005	2010	2313
490.0	244.0	2008	2013	2313
495.0	246.2	2011	2015	2312
500.0	248.4	2013	2018	2311
505.0	250.5	2016	2021	2308
510.0	252.7	2018	2023	2301
515.0	254.9	2020	2026	2288
520.0	257.1	2023	2028	2261
525.0	259.4	2024	2030	2211
530.0	261.7	2025	2031	2168
535.0	264.0	2027	2032	2147
540.0	266.3	2027	2033	2137
545.0	268.7	2028	2034	2133
550.0	271.0	2029	2035	2130
555.0	273.4	2030	2035	2129
560.0	275.7	2031	2036	2129
565.0	278.1	2032	2037	2128
570.0	280.4	2033	2038	2128
575.0	282.8	2033	2039	2128
580.0	285.1	2034	2039	2128
585.0	287.5	2035	2040	2128
590.0	289.8	2036	2041	2128
595.0	292.2	2036	2042	2129
600.0	294.5	2037	2042	2129

Datum Depth	One-way time(ms)	-----VELOCITIES---- Average	RMS	Interva
605.0	296.9	2038	2043	2130
610.0	299.2	2039	2044	2132
615.0	301.6	2039	2044	2137
620.0	303.9	2040	2045	2147
625.0	306.2	2041	2046	2167
630.0	308.5	2042	2047	2206
635.0	310.7	2044	2049	2244
640.0	312.9	2045	2050	2263
645.0	315.1	2047	2052	2272
650.0	317.3	2049	2054	2277
655.0	319.5	2050	2055	2279
660.0	321.7	2052	2057	2280
665.0	323.9	2053	2059	2280
670.0	326.1	2055	2060	2280
675.0	328.3	2056	2062	2281
680.0	330.4	2058	2063	2281
685.0	332.6	2059	2065	2281
690.0	334.8	2061	2066	2281
695.0	337.0	2062	2068	2281
700.0	339.2	2064	2069	2281
705.0	341.4	2065	2071	2282
710.0	343.6	2066	2072	2284
715.0	345.8	2068	2073	2287
720.0	348.0	2069	2075	2294
725.0	350.1	2071	2076	2309
730.0	352.3	2072	2078	2341
735.0	354.3	2074	2080	2404
740.0	356.4	2077	2083	2465
745.0	358.4	2079	2085	2496
750.0	360.4	2081	2088	2511
755.0	362.3	2084	2090	2518
760.0	364.3	2086	2093	2522
765.0	366.3	2088	2095	2523
770.0	368.3	2091	2098	2524
775.0	370.3	2093	2101	2525
780.0	372.3	2095	2103	2525
785.0	374.2	2098	2105	2525
790.0	376.2	2100	2108	2525
795.0	378.2	2102	2110	2525
800.0	380.2	2104	2113	2525

TABLE 1. Time-Depth curve values

Well : GREENSLOPES #1
Survey units : METRES
Client : PHOENIX OIL & GAS N. L.
Datum : 100.0
Calibrated sonic interval velocities used from 895.0 to 2570.0

Datum Depth	One-way time(ms)	-----VELOCITIES----- Average	RMS	Interval
805.0	382.2	2106	2115	2525
810.0	384.1	2109	2117	2525
815.0	386.1	2111	2120	2525
820.0	388.1	2113	2122	2525
825.0	390.1	2115	2124	2525
830.0	392.1	2117	2126	2525
835.0	394.0	2119	2129	2525
840.0	396.0	2121	2131	2525
845.0	398.0	2123	2133	2525
850.0	400.0	2125	2135	2525
855.0	402.0	2127	2137	2525
860.0	403.9	2129	2139	2526
865.0	405.9	2131	2141	2526
870.0	407.9	2133	2143	2527
875.0	409.9	2135	2145	2528
880.0	411.8	2137	2147	2532
885.0	413.8	2139	2149	2539
890.0	416.1	2139	2150	2214
895.0	418.3	2139	2150	2214
900.0	420.6	2140	2150	2214
905.0	422.6	2142	2152	2535
910.0	424.5	2144	2154	2554
915.0	426.5	2145	2156	2553
920.0	428.4	2148	2159	2655
925.0	430.3	2150	2161	2631
930.0	432.3	2151	2162	2406
935.0	434.4	2153	2164	2477
940.0	436.4	2154	2166	2491
945.0	438.2	2157	2168	2732
950.0	440.2	2158	2170	2548
955.0	441.8	2162	2174	3011
960.0	443.6	2164	2177	2776
965.0	445.4	2167	2180	2882
970.0	447.1	2169	2183	2849
975.0	449.2	2170	2184	2360
980.0	451.5	2170	2184	2190
985.0	453.4	2173	2186	2713
990.0	455.2	2175	2189	2713
995.0	457.0	2177	2191	2735
1000.0	458.9	2179	2193	2610

Datum Depth	One-way time(ms)	-----VELOCITIES----- Average	RMS	Interval
1005.0	460.9	2181	2195	2591
1010.0	462.9	2182	2196	2516
1015.0	464.9	2183	2197	2434
1020.0	466.8	2185	2199	2673
1025.0	468.8	2186	2201	2452
1030.0	470.7	2188	2203	2678
1035.0	472.6	2190	2205	2678
1040.0	474.4	2192	2207	2645
1045.0	476.1	2195	2210	2938
1050.0	478.1	2196	2211	2603
1055.0	480.0	2198	2213	2580
1060.0	482.0	2199	2215	2545
1065.0	483.7	2202	2217	2845
1070.0	485.6	2203	2219	2670
1075.0	487.4	2206	2221	2796
1080.0	489.2	2208	2224	2755
1085.0	491.0	2210	2226	2780
1090.0	492.6	2213	2229	3099
1095.0	494.4	2215	2232	2764
1100.0	496.2	2217	2234	2849
1105.0	498.0	2219	2236	2802
1110.0	499.8	2221	2239	2772
1115.0	501.5	2223	2241	2860
1120.0	503.3	2225	2243	2738
1125.0	505.2	2227	2245	2691
1130.0	507.0	2229	2247	2796
1135.0	508.9	2230	2248	2597
1140.0	510.9	2231	2250	2561
1145.0	512.7	2233	2252	2795
1150.0	514.6	2235	2253	2588
1155.0	516.5	2236	2254	2577
1160.0	518.6	2237	2255	2457
1165.0	520.6	2238	2256	2456
1170.0	522.5	2239	2258	2620
1175.0	524.5	2240	2258	2484
1180.0	526.1	2243	2262	3239
1185.0	528.0	2244	2263	2594
1190.0	529.8	2246	2265	2702
1195.0	531.5	2248	2268	3063
1200.0	533.4	2250	2269	2639

TABLE 1. Time-Depth curve values

Well : GREENSLOPES #1
Survey units : METRES
Client : PHOENIX OIL & GAS N. L.
Datum : 100.0
Calibrated sonic interval velocities used from 895.0 to 2570.0

Datum Depth	One-way time(ms)	-----VELOCITIES----- Average	RMS	Interval
1205.0	535.0	2252	2272	3013
1210.0	536.8	2254	2274	2864
1215.0	538.5	2256	2276	2821
1220.0	540.4	2258	2278	2758
1225.0	542.2	2259	2279	2660
1230.0	544.2	2260	2280	2585
1235.0	546.0	2262	2282	2700
1240.0	547.8	2263	2284	2757
1245.0	549.7	2265	2285	2644
1250.0	551.2	2268	2289	3376
1255.0	552.7	2271	2292	3309
1260.0	554.5	2272	2294	2802
1265.0	556.4	2274	2295	2705
1270.0	558.2	2275	2297	2659
1275.0	560.1	2276	2298	2708
1280.0	561.7	2279	2301	3165
1285.0	563.6	2280	2302	2617
1290.0	565.5	2281	2303	2571
1295.0	567.3	2283	2305	2735
1300.0	569.1	2284	2307	2905
1305.0	570.7	2287	2310	3107
1310.0	572.3	2289	2312	3120
1315.0	573.9	2291	2315	3108
1320.0	575.5	2294	2317	3121
1325.0	577.1	2296	2320	3135
1330.0	578.6	2299	2323	3373
1335.0	580.2	2301	2326	3075
1340.0	581.9	2303	2328	2988
1345.0	583.4	2306	2331	3294
1350.0	585.0	2308	2333	3071
1355.0	586.6	2310	2336	3105
1360.0	588.3	2312	2338	3049
1365.0	589.8	2314	2341	3174
1370.0	591.2	2317	2345	3701
1375.0	592.7	2320	2348	3321
1380.0	594.3	2322	2350	3122
1385.0	595.8	2325	2353	3274
1390.0	597.3	2327	2356	3297
1395.0	598.8	2330	2359	3524
1400.0	600.4	2332	2362	3125

Datum Depth	One-way time(ms)	-----VELOCITIES---- Average	RMS	Interva
1405.0	601.9	2334	2365	3272
1410.0	603.5	2336	2367	3157
1415.0	605.1	2339	2369	3097
1420.0	606.8	2340	2371	2935
1425.0	608.4	2342	2373	3140
1430.0	610.0	2344	2375	3015
1435.0	611.5	2347	2378	3431
1440.0	613.1	2349	2381	3194
1445.0	614.6	2351	2384	3343
1450.0	616.2	2353	2386	3029
1455.0	617.8	2355	2388	3137
1460.0	619.5	2357	2390	2962
1465.0	621.1	2359	2392	3049
1470.0	622.8	2360	2394	3081
1475.0	624.4	2362	2395	2971
1480.0	626.1	2364	2397	3052
1485.0	627.7	2366	2400	3154
1490.0	629.4	2368	2401	2957
1495.0	630.9	2370	2404	3296
1500.0	632.5	2372	2406	3052
1505.0	634.2	2373	2407	3031
1510.0	635.7	2375	2410	3219
1515.0	637.2	2378	2412	3367
1520.0	638.8	2379	2414	3081
1525.0	640.4	2381	2416	3134
1530.0	642.0	2383	2418	3091
1535.0	643.5	2385	2421	3398
1540.0	645.1	2387	2423	3078
1545.0	646.5	2390	2426	3675
1550.0	647.9	2392	2429	3620
1555.0	649.4	2395	2432	3290
1560.0	651.0	2396	2434	3164
1565.0	652.4	2399	2437	3519
1570.0	653.9	2401	2439	3362
1575.0	655.3	2403	2442	3521
1580.0	656.8	2406	2444	3267
1585.0	658.1	2408	2448	3844
1590.0	659.6	2410	2450	3351
1595.0	661.0	2413	2453	3608
1600.0	662.4	2415	2456	3491

TABLE 1. Time-Depth curve values

Well : GREENSLOPES #1
Survey units : METRES
Client : PHOENIX OIL & GAS N. L.
Datum : 100.0
Calibrated sonic interval velocities used from 895.0 to 2570.0

Datum Depth	One-way time(ms)	-----VELOCITIES----- Average	RMS	Interval	Datum Depth	One-way time(ms)	-----VELOCITIES---- Average	RMS	Interva
1605.0	663.8	2418	2459	3536	1805.0	718.6	2512	2571	3116
1610.0	665.3	2420	2462	3481	1810.0	720.0	2514	2573	3537
1615.0	666.7	2422	2464	3591	1815.0	721.5	2515	2575	3222
1620.0	668.1	2425	2467	3440	1820.0	723.0	2517	2576	3310
1625.0	669.5	2427	2470	3533	1825.0	724.3	2520	2579	3907
1630.0	670.9	2429	2473	3560	1830.0	725.8	2521	2581	3264
1635.0	672.3	2432	2475	3598	1835.0	727.3	2523	2583	3371
1640.0	673.7	2434	2478	3611	1840.0	728.8	2525	2585	3379
1645.0	675.1	2437	2481	3626	1845.0	730.2	2527	2587	3490
1650.0	676.5	2439	2484	3574	1850.0	731.9	2528	2588	3055
1655.0	677.9	2441	2487	3584	1855.0	733.5	2529	2589	3186
1660.0	679.3	2444	2489	3534	1860.0	734.9	2531	2592	3539
1665.0	680.7	2446	2492	3672	1865.0	736.3	2533	2594	3458
1670.0	682.1	2448	2495	3614	1870.0	737.7	2535	2596	3474
1675.0	683.4	2451	2498	3786	1875.0	739.2	2536	2597	3391
1680.0	684.7	2454	2501	3891	1880.0	740.8	2538	2599	3151
1685.0	686.0	2456	2504	3736	1885.0	742.5	2539	2600	3033
1690.0	687.3	2459	2508	3845	1890.0	744.1	2540	2601	3030
1695.0	688.6	2461	2511	3747	1895.0	745.8	2541	2602	3034
1700.0	689.9	2464	2514	3886	1900.0	747.4	2542	2603	3068
1705.0	691.3	2467	2517	3737	1905.0	749.0	2543	2604	3056
1710.0	692.5	2469	2520	3944	1910.0	750.6	2545	2605	3246
1715.0	693.8	2472	2523	3790	1915.0	752.1	2546	2607	3324
1720.0	695.1	2474	2526	3852	1920.0	753.6	2548	2609	3296
1725.0	696.4	2477	2530	4109	1925.0	755.2	2549	2610	3131
1730.0	697.5	2480	2534	4510	1930.0	756.8	2550	2611	3043
1735.0	698.7	2483	2538	3999	1935.0	758.4	2551	2612	3083
1740.0	699.9	2486	2542	4297	1940.0	760.1	2552	2613	3021
1745.0	701.1	2489	2545	4129	1945.0	761.7	2553	2614	3063
1750.0	702.3	2492	2549	4117	1950.0	763.3	2555	2615	3237
1755.0	703.7	2494	2551	3639	1955.0	764.7	2556	2617	3457
1760.0	705.2	2496	2553	3354	1960.0	766.2	2558	2619	3422
1765.0	706.7	2497	2555	3256	1965.0	767.7	2560	2621	3337
1770.0	708.2	2499	2557	3459	1970.0	769.1	2561	2623	3526
1775.0	709.7	2501	2559	3320	1975.0	770.5	2563	2625	3609
1780.0	711.2	2503	2561	3310	1980.0	771.8	2565	2627	3718
1785.0	712.7	2505	2563	3263	1985.0	773.2	2567	2629	3773
1790.0	714.2	2506	2565	3445	1990.0	774.5	2569	2631	3596
1795.0	715.5	2509	2567	3724	1995.0	776.1	2571	2633	3311
1800.0	717.0	2511	2570	3429	2000.0	777.6	2572	2634	3241

TABLE 1. Time-Depth curve values

Well : GREENSLOPES #1
Survey units : METRES
Client : PHOENIX OIL & GAS N. L.
Datum : 100.0
Calibrated sonic interval velocities used from 895.0 to 2570.0

Datum Depth	One-way time(ms)	-----VELOCITIES----- Average	RMS	Interval
2005.0	779.1	2573	2636	3257
2010.0	780.7	2575	2637	3290
2015.0	782.2	2576	2638	3275
2020.0	783.7	2577	2640	3249
2025.0	785.2	2579	2641	3337
2030.0	786.7	2580	2643	3357
2035.0	788.2	2582	2645	3447
2040.0	789.7	2583	2646	3328
2045.0	791.2	2585	2647	3322
2050.0	792.6	2586	2649	3504
2055.0	794.2	2588	2650	3180
2060.0	795.7	2589	2652	3236
2065.0	797.2	2590	2653	3344
2070.0	798.7	2592	2654	3246
2075.0	800.3	2593	2656	3243
2080.0	801.8	2594	2657	3372
2085.0	803.2	2596	2659	3418
2090.0	804.7	2597	2660	3421
2095.0	806.2	2599	2662	3351
2100.0	807.8	2600	2663	3160
2105.0	809.2	2601	2665	3576
2110.0	810.6	2603	2667	3586
2115.0	811.9	2605	2669	3764
2120.0	813.3	2607	2670	3452
2125.0	814.7	2608	2672	3609
2130.0	816.1	2610	2674	3532
2135.0	817.5	2612	2676	3590
2140.0	818.9	2613	2678	3622
2145.0	820.3	2615	2679	3561
2150.0	821.6	2617	2682	3885
2155.0	823.0	2618	2684	3609
2160.0	824.4	2620	2685	3580
2165.0	825.7	2622	2688	3868
2170.0	827.1	2624	2689	3520
2175.0	828.5	2625	2691	3568
2180.0	829.8	2627	2693	3838
2185.0	831.1	2629	2695	3729
2190.0	832.5	2631	2697	3706
2195.0	833.8	2632	2699	3724
2200.0	835.3	2634	2701	3533
2205.0	836.7	2635	2702	3546
2210.0	837.9	2637	2705	3923
2215.0	839.2	2640	2707	4125
2220.0	840.5	2641	2709	3690
2225.0	841.9	2643	2711	3651
2230.0	843.3	2644	2712	3490
2235.0	844.7	2646	2714	3701
2240.0	846.0	2648	2716	3680
2245.0	847.4	2649	2718	3705
2250.0	848.7	2651	2720	3744
2255.0	850.1	2653	2722	3704
2260.0	851.3	2655	2724	3862
2265.0	852.6	2656	2726	3855
2270.0	854.0	2658	2728	3711
2275.0	855.4	2660	2729	3670
2280.0	856.7	2662	2732	3841
2285.0	858.0	2663	2733	3581
2290.0	859.4	2665	2735	3711
2295.0	860.6	2667	2737	4071
2300.0	861.9	2669	2740	3984
2305.0	863.3	2670	2741	3589
2310.0	864.6	2672	2743	3824
2315.0	865.9	2674	2745	3781
2320.0	867.4	2675	2746	3432
2325.0	868.6	2677	2748	4015
2330.0	869.8	2679	2751	4108
2335.0	871.1	2681	2753	3978
2340.0	872.3	2682	2755	4019
2345.0	873.5	2685	2758	4369
2350.0	874.7	2687	2760	4066
2355.0	875.9	2689	2763	4078
2360.0	877.1	2691	2765	4160
2365.0	878.4	2693	2767	4067
2370.0	879.6	2694	2769	4059
2375.0	880.8	2696	2772	4034
2380.0	882.0	2698	2774	4187
2385.0	883.1	2701	2777	4454
2390.0	884.4	2702	2779	4047
2395.0	885.5	2705	2782	4309
2400.0	886.7	2707	2784	4270

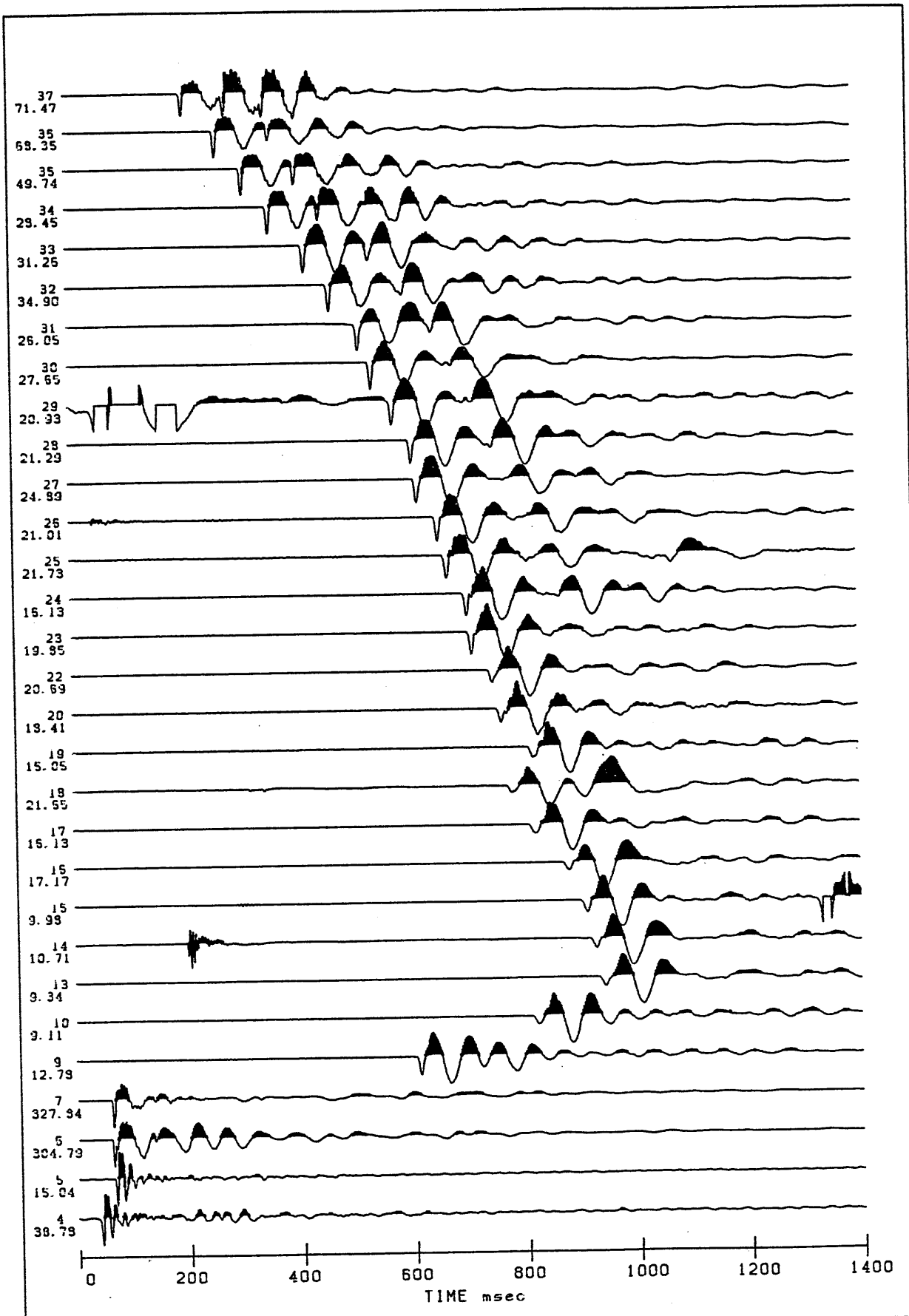
TABLE 1. Time-Depth curve values

Well : GREENSLOPES #1
Survey units : METRES
Calibrated sonic interval velocities used from 895.0 to 2570.0

Client : PHOENIX OIL & GAS N. L.
Datum : 100.0

Datum Depth	One-way time(ms)	-----VELOCITIES----- Average	RMS	Interval
2405.0	887.8	2709	2787	4495
2410.0	889.0	2711	2789	4246
2415.0	890.2	2713	2792	4327
2420.0	891.3	2715	2794	4240
2425.0	892.4	2717	2797	4520
2430.0	893.5	2720	2800	4634
2435.0	894.6	2722	2803	4456
2440.0	895.8	2724	2805	4353
2445.0	896.9	2726	2808	4549
2450.0	898.4	2727	2809	3271
2455.0	899.9	2728	2810	3269
2460.0	901.3	2730	2811	3818
2465.0	902.6	2731	2813	3688
2470.0	903.7	2733	2816	4625
2475.0	905.0	2735	2817	3816
2480.0	906.3	2736	2819	3840
2485.0	907.7	2738	2821	3715

Datum Depth	One-way time(ms)	-----VELOCITIES---- Average	RMS	Interva
2490.0	908.9	2740	2823	4038
2495.0	910.2	2741	2824	3798
2500.0	911.6	2742	2826	3578
2505.0	912.9	2744	2828	3900
2510.0	914.2	2746	2829	3771
2515.0	915.3	2748	2832	4532
2520.0	916.4	2750	2834	4470
2525.0	917.6	2752	2837	4382
2530.0	918.7	2754	2839	4474
2535.0	919.8	2756	2842	4674
2540.0	920.8	2758	2845	4684
2545.0	921.9	2760	2848	4502
2550.0	923.1	2763	2850	4414
2555.0	924.2	2764	2852	4325
2560.0	925.5	2766	2854	3957
2565.0	926.9	2767	2855	3579
2570.0	928.3	2768	2857	3537



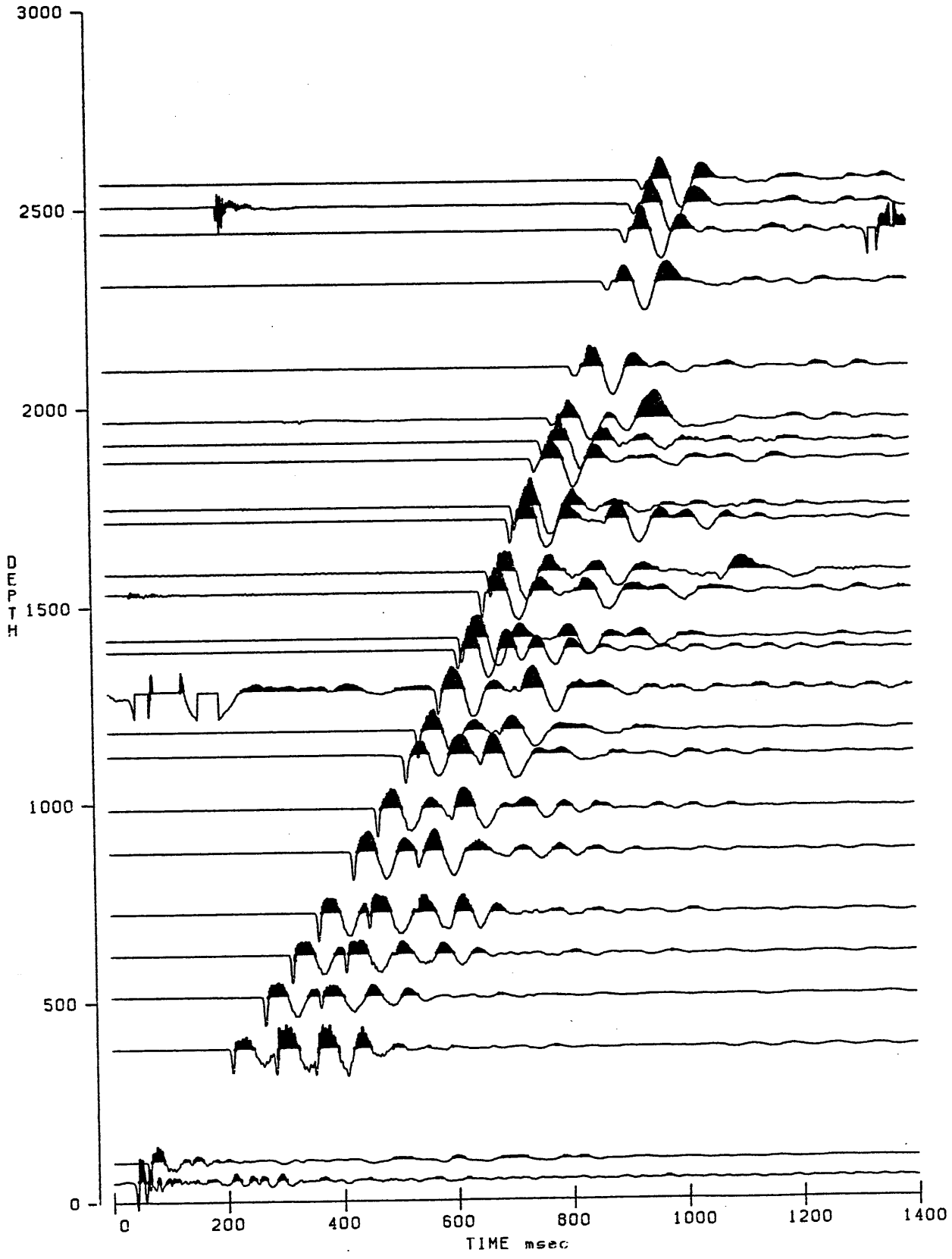
GREENSLOPES #1

VELOCITY SURVEY TRACE DISPLAY

Filter OUT-OUT

No gain recovery

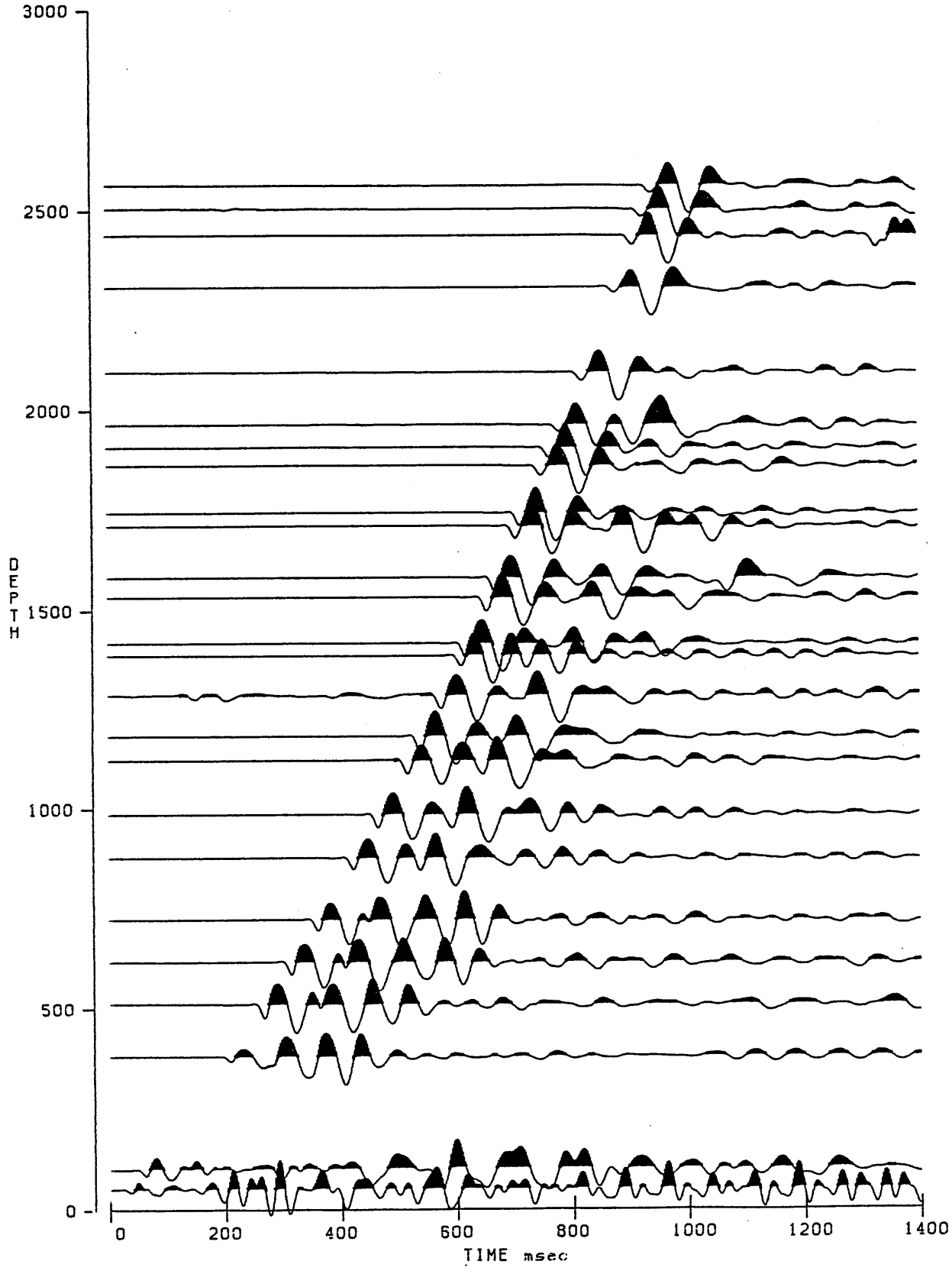
Figure 4A



GREENSLOPES #1

VELOCITY SURVEY TRACE DISPLAY
Filter OUT-OUT
No gain recovery

Figure 4B



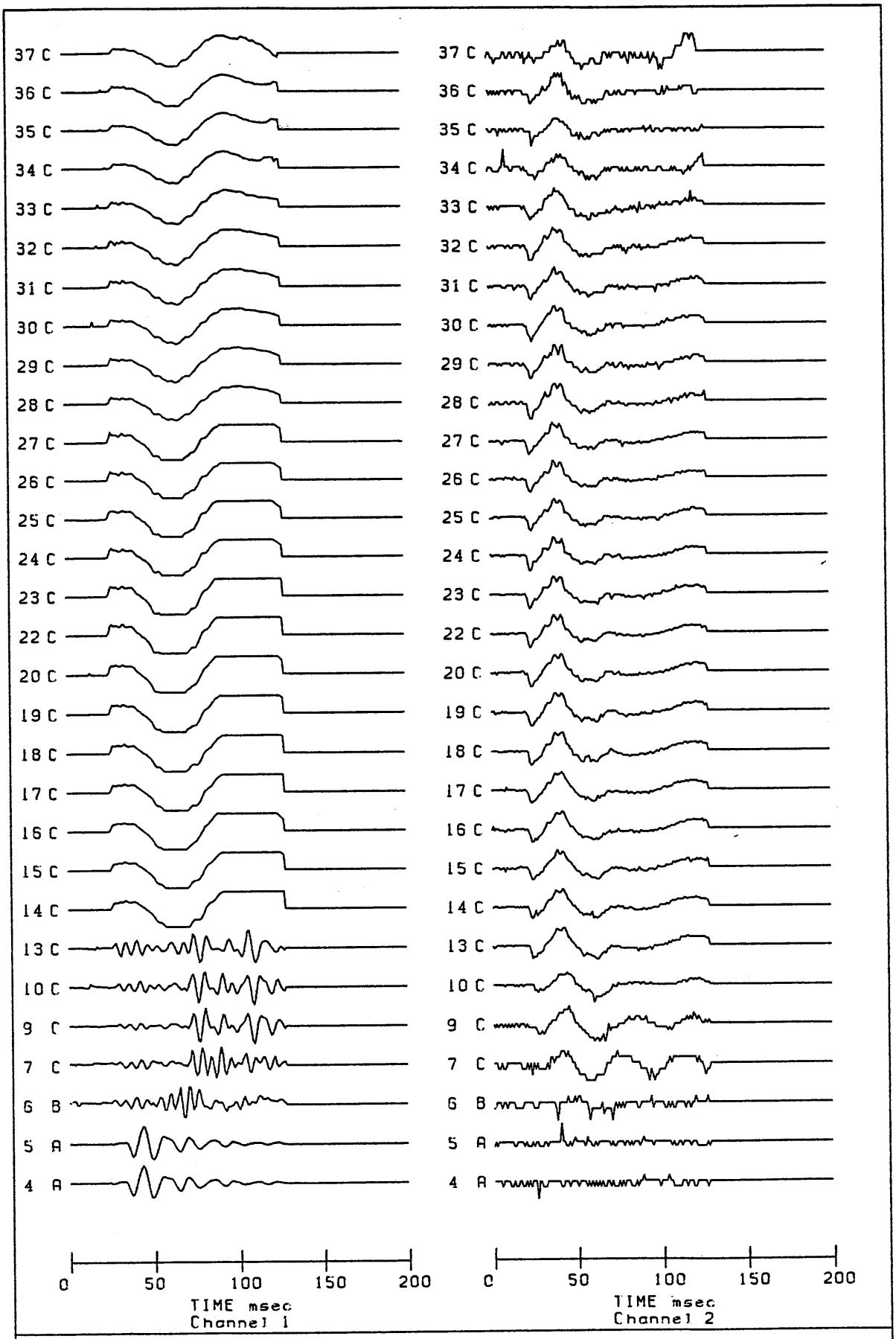
GREENSLOPES #1

VELOCITY SURVEY TRACE DISPLAY

Filter 5-40

Gain $T^{2.0}$

Figure 4C



GREENSLOPES #1

VELOCITY SURVEY TRACE DISPLAY

Auxiliary channels

Filter OUT-OUT

Figure 4D

PE601123

This is an enclosure indicator page.
The enclosure PE601123 is enclosed within the container PE902355 at this location in this document.

The enclosure PE601123 has the following characteristics:

ITEM_BARCODE	= PE601123
CONTAINER_BARCODE	= PE902355
NAME	= Gearhart Mud Log
BASIN	= OTWAY
PERMIT	= PEP 101
TYPE	= WELL
SUBTYPE	= MUD_LOG
DESCRIPTION	= Gearhart Mud Log (enclosure from WCR vol.1) for Greenslopes-1
REMARKS	=
DATE_CREATED	= 10/01/86
DATE_RECEIVED	= 17/07/86
W_NO	= W924
WELL_NAME	= Greenslopes-1
CONTRACTOR	= Gearhart Pty Ltd
CLIENT_OP_CO	= Phoenix Oil & Gas

(Inserted by DNRE - Vic Govt Mines Dept)

PE601122

This is an enclosure indicator page.
The enclosure PE601122 is enclosed within the container PE902355 at this location in this document.

The enclosure PE601122 has the following characteristics:

ITEM_BARCODE	= PE601122
CONTAINER_BARCODE	= PE902355
NAME	= Composite Well Log
BASIN	= OTWAY
PERMIT	= PEP 101
TYPE	= WELL
SUBTYPE	= COMPOSITE_LOG
DESCRIPTION	= Composite Well Log (enclosure from WCR vol.1) for Greenslopes-1
REMARKS	=
DATE_CREATED	= 11/01/86
DATE_RECEIVED	= 17/07/86
W_NO	= W924
WELL_NAME	= Greenslopes-1
CONTRACTOR	= Phoenix Oil & Gas
CLIENT_OP_CO	= Phoenix Oil & Gas

(Inserted by DNRE - Vic Govt Mines Dept)

PE907939

This is an enclosure indicator page.
The enclosure PE907939 is enclosed within the container PE902355 at this location in this document.

The enclosure PE907939 has the following characteristics:

ITEM_BARCODE	= PE907939
CONTAINER_BARCODE	= PE902355
NAME	= Interpreted Seismic Section
BASIN	= OTWAY
PERMIT	= PEP 101
TYPE	= SESIMIC
SUBTYPE	= SECTION
DESCRIPTION	= Interpreted Seismic Section, Line OPX89A-5, (enclosure from WCR vol.1) for Greenslopes-1
REMARKS	= added by DNRE 03/12/99
DATE_CREATED	= 30/04/89
DATE_RECEIVED	= 26/06/89
W_NO	= W924
WELL_NAME	= Greenslopes-1
CONTRACTOR	= Phoenix Oil & Gas
CLIENT_OP_CO	= Phoenix Oil & Gas

(Inserted by DNRE - Vic Govt Mines Dept)