WCR
CURDIE-1
W768

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BEACH PETROLEUM N.L.

CURDIE No.1

W768

WELL COMPLETION REPORT

PART A - (TEXT & APPENDICES)

Prepared by :

A. Tabassi
July 1982

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PART B:

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SUMMARY

Curdie No. 1 was drilled over a 47 day period from the 10th February to 28th March, 1982, as a wildcat exploration well in the Otway Basin, Permit No. P.E.P. 93, Victoria.

The well was plugged and abandoned after reaching a total depth of 2600 metres in Otway Group sediments. The principal anticipated reservoir section, the Waarre Formation, was developed but had low porosity which was interpreted from Schlumberger logs to be water filled.

No significant hydrocarbons were encountered. Minor gas was associated with thin coal seams in the lower part of the Upper Cretaceous Waarre Formation.

Unexpectedly, the sandstone of the Base Tertiary Pebble Point Formation showed fluorescence/cut fluorescence and oil staining. This has provided significant incentive to carry out further studies on this formation. A 100 metre thick Pebble Point Formation was intersected and consisted mainly of loose to friable coarse sandstone with good visual porosity. A drill stem test over the interval 929.0 m to 996.0 m recovered 113 m of mud and muddy water.

A 99 m thick Waarre Formation was intersected and was dominantly sandstone with minor interbedded/interlaminated siltstone and/or shale. A drill stem test over the interval 2454-2518 m was considered inconclusive as there was no flow when the tool was apparently opened and subsequent fishing operation obliterated all pressure data. Approximately 11 days were lost during this fishing operation attempting to recover the testing tool. These attempts were eventually successful.

With the dipmeter exhibiting structural dips between 22° and 24° within the Waarre Formation, re-evaluation of all seismic data will be required before drilling is again attempted in this area.

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The well was drilled with Richter Drilling's Rig 7, a National 610 drilling rig with following contract services:-

Baroid Australia Pty. Ltd.	: Mud Engineering
Exploration Logging of Australia Ltd.	: Mud Logging
Halliburton Manufacturing and Services Ltd.	: Testing and Cementing
Schlumberger Seaco Inc.	: Petrophysical Logging
Velocity Data Pty. Ltd.	: Velocity Survey

Beach Petroleum N.L. was the operator.

1. PURPOSE OF WELL

The Curdie No. 1 well was proposed as a test of the Waarre Formation sandstone in an area where limited available source rock data suggested oil rather than gas could be anticipated. The well was programmed to intersect the Waarre Formation deeper than previous wells drilled by Beach Petroleum N.L. In all these wells the Waarre Formation sandstone has good porosity and permeability.

The Beach Petroleum Boggy Creek Seismic Survey shot in 1981 indicated the presence of a number of structures in the Curdie Trough, the largest and best defined of these being the Curdie Structure.

The Boggy Creek Seismic Survey also confirmed the presence of the NW-SE trending Boggy Creek Fault with a substantial downthrown Upper Cretaceous section particularly Belfast Mudstone. It was anticipated that in this area this mudstone would be mature and would have generated different hydrocarbons to those found in the relatively shallow Port Campbell High wells.

2. WELL HISTORY

2.1. Location (See Figure 1)

(i)	Co-Ordinates (approx.)	:	38° 33' 14" S 142° 49' 19" E
(ii)	Geophysical Control	:	Shot Point 185. Line BC81-109. Beach 1981 Boggy Creek Seismic Survey.
(iii)	Real Property Description	:	Parish of Narrawaturk Shire of Warrnambool County of Heytesbury
(iv)	Property Owner	:	G.R. Parsons Great Ocean Road (RSD) Nirranda. Vic.
(v)	District	:	Port Campbell Sheet 7420 100,000 map sheet.

2.2. General Data (See Figure 2)

(i)	Well Name and Number	:	Curdie No. 1
(ii)	Tenement	:	Victoria Petroleum Exploration Permit No. 93.
(iii)	Elevation	:	Ground Level 36 m ASL (approx.) Kelly Bushing 42.8 m ASL (approx.) (All depths are referred to K.B.)
(iv)	Total Depth	:	Drillers 2600 m Schlumberger 2596 m
(v)	Date Drilling Commenced	:	10th February, 1982 at 0100 hours.
(vi)	Date Total Depth Reached	:	22nd March, 1982 at 0800 hours.
(vii)	Date Rig Released	:	28th March, 1982 at 0100 hours.
(viii)	Drilling Time to Total Depth	:	40 days (See Figure 3)
(ix)	Status	:	Plugged and Abandoned

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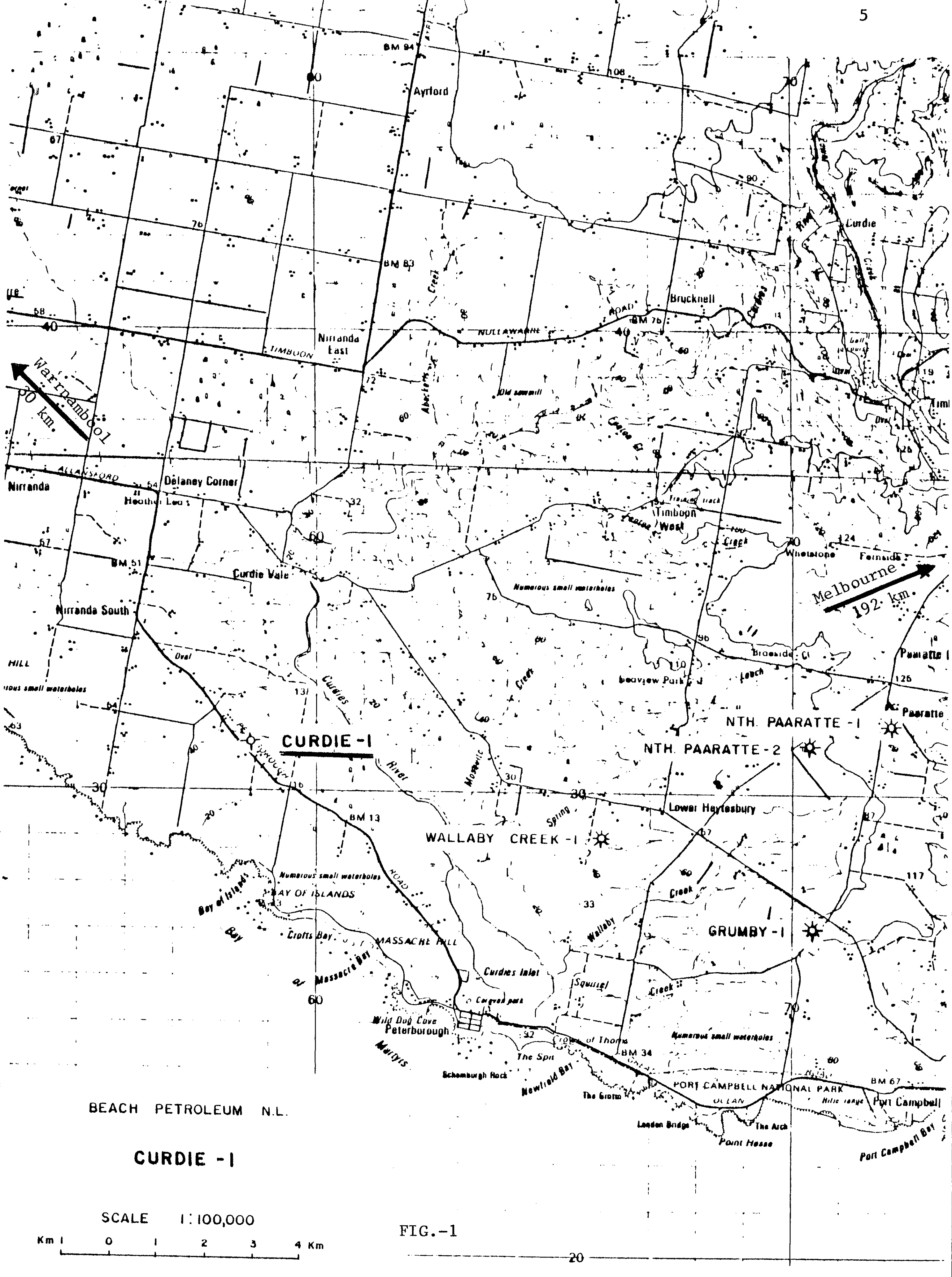
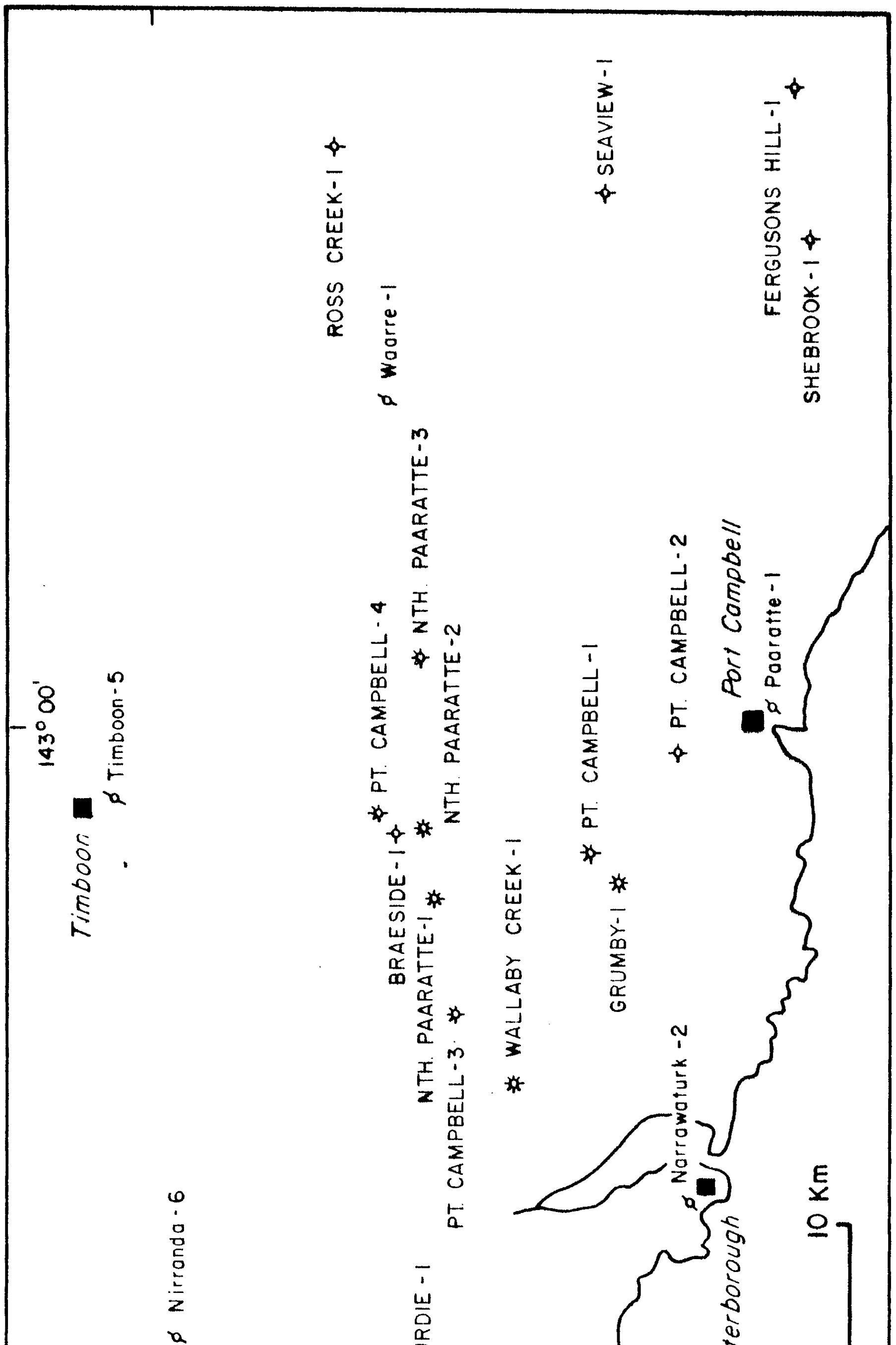

CURDIE -1
NTH. PAARATTE -1
NTH. PAARATTE -2
WALLABY CREEK -1
GRUMBY -1
Warrnambool 30 km.
Melbourne 192 km.
Ayrford
Curdie
Brucknell
Nirranda East
Nirranda
Delaney Corner
Curdie Vale
Nirranda South
Timboon West
Whetstone
Fernside
Paaratte
Lower Heytesbury
BAY OF ISLANDS
Bay of Islands
Crofts Bay
MASSACRE HILL
Massacre Bay
Curdies Inlet
Wild Dog Cove
Peterborough
Schomburgh Rock
The Spit
Newfield Bay
The Grotto
London Bridge
The Arch
Point Hesse
Port Campbell
Port Campbell Bay
PORT CAMPBELL NATIONAL PARK
Numerous small waterholes
Curdies River
Mosquito Creek
Spring Creek
Wallaby Creek
Squirrel Creek
BEACH PETROLEUM N.L.
CURDIE -1
SCALE 1:100,000
Km 1 0 1 2 3 4 Km

FIG.-1



143° 00'
38° 30'
Timboon
Timboon-5
Port Campbell
Peterborough
Nirranda-6
Narrawaturk-2
Paaratte-1
Waarre-1
ROSS CREEK-1
SEAVIEW-1
FERGUSONS HILL-1
SHEBROOK-1
PT. CAMPBELL-4
NTH. PAARATTE-3
NTH. PAARATTE-2
PT. CAMPBELL-1
PT. CAMPBELL-2
BRAESIDE-1
NTH. PAARATTE-1
WALLABY CREEK-1
GRUMBY-1
PT. CAMPBELL-3
CURDIE-1
FLAXMANS-1
0
5
10 Km

FIG. - 2

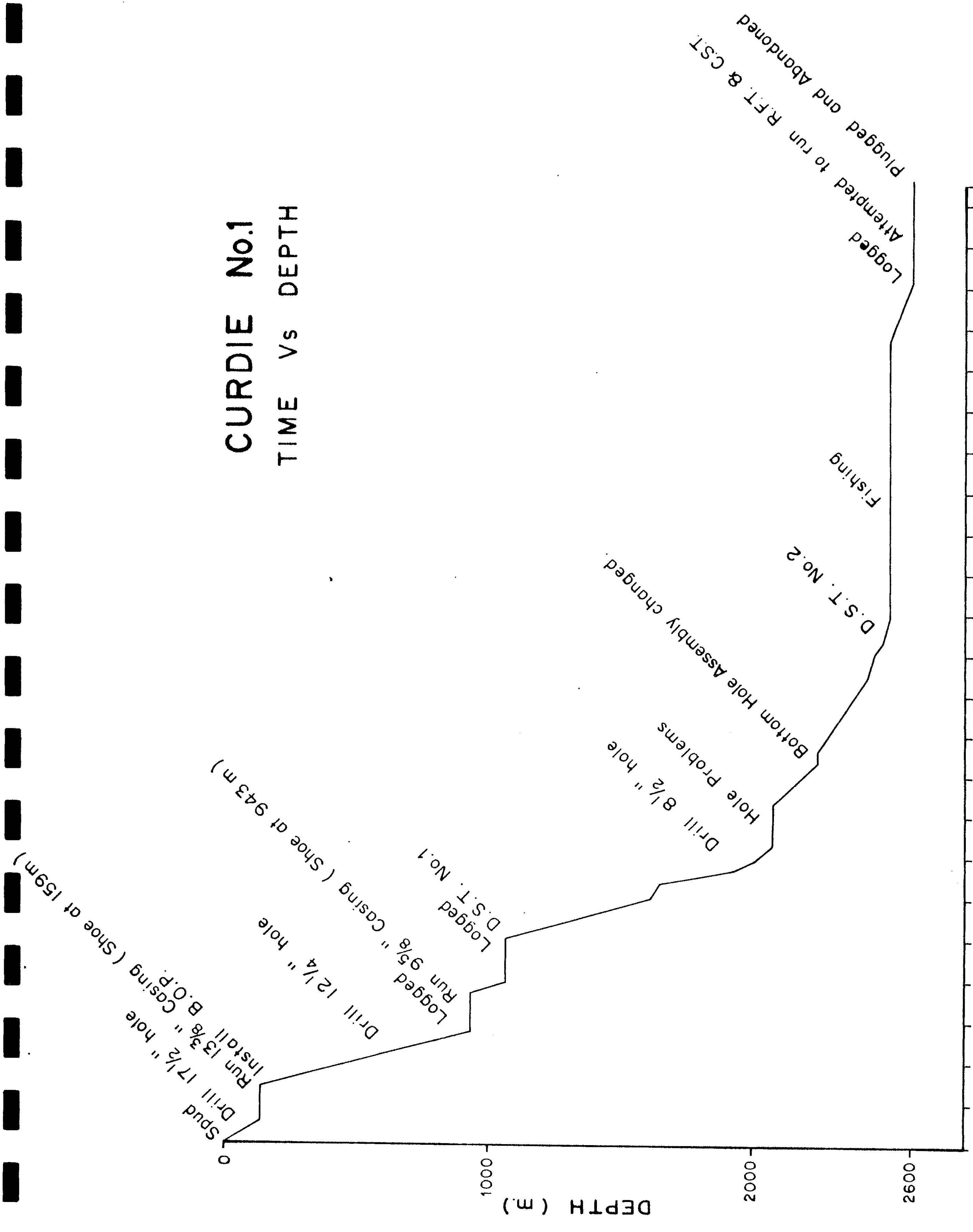

CURDIE No.1
TIME Vs DEPTH
DAYS FROM SPUD
DEPTH (m.)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
46
47
0
1000
2000
2600
Spud
Drill 17½" hole
Run 13⅜" Casing (Shoe at 159m)
Install B.O.P.
Drill 12¼" hole
Logged
Run 9⅝" Casing (Shoe at 943 m)
Logged
D.S.T. No.1
Drill 8½" hole
Hole Problems
Bottom Hole Assembly changed
D.S.T. No.2
Fishing
Logged
Attempted to run R.F.T. & C.S.T.
Plugged and Abandoned

FIG. - 3

2. WELL HISTORY - Cont'd

2.3. Drilling Data

2.3.1. Drilling Contractor

: Richter Drilling Pty. Ltd.,
11th Floor,
43 Creek Street,
BRISBANE, Qld. 4000

2.3.2. Drilling Rig

The specifications of the rig used to drill this hole are:-

DRAWWORKS	National 610M, 750 HP rating 1-1/8" Drilling Line. National B2 catheads. Satellite Automatic Drilling Control. Parmac 281 Hydromatic brake.
COMPOUND	National two section DT-18-¼ T Drive.
ENGINES	2 Caterpillar 3408 Turbocharged Diesel industrial engines. National C195-80F torque converters.
MUD PUMPS	2 National 8P-80 triplex single acting slush pumps each with: Hydril K20-3000 pulsation dampers. Cameron B2 reset relief valves. Cameron Tp. D pressure gauges. Integrally mounted charging pumps.
MUD PUMP DRIVE	2 National L shaped single engine V-belt independent pump drive each with Caterpillar D398 TA series B diesel industrial engine National C300-64 FH. torque conv.
MAST	Dreco 133ft by 21ft leg spread mast stem with accessories including; Working cluster of five 42" sheaves and one 42" fastline sheave Decard casing stabbing board.
SUBSTRUCTURE	Dreco 20ft self elevating substructure complete.
ROTARY TABLE	National C275
BLOCK	National TP 540G250
SWIVEL	National P300
KELLY DRIVE	Varco Type HDS
MIXING PUMP	Warman 6/4 centrifugal with 50hp. Newman electric motor.
MUD AGITATORS	4 Brandt Model M.A.7.5. HP

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2. WELL HISTORY - Cont'd

2.3. Drilling Data - Cont'd

2.3.2. Drilling Rig - Cont'd

MUD TANKS	3 Fabricated 34' x 10' x 6' 8" - Total 750 bbl.
SHALE SHAKER	Brandt Dual Tandem.
DESANDER DEGASSER DESILTER	Demco Model 122 SWACO Pioneer T12-E4HV economaster
GENERATING PLANT	2 Caterpillar 3408 Turbocharged Diesel Industrial Engines. 275 KW prime 200/480 V 3 PH 60HZ mounted in utility house.
RIG LIGHTING	System of twin 48" 60W fluorescents and 8 400W mercury vapour floodlights.
UTILITY HOUSE	Fabricated skid mounted containing generator sets and switch gear.
B.O.P.'s & ACCUMULATOR	1 Hydril GK-12"-3000 psi Annular 1 12"-3000 Cameron 'U' hydraulic double ram preventor 1 Hydril 5½in. 5000 P.S.I. upper kelly cock 1 Hydril lower kelly guard 1 Grey inside B.O.P. 1 wettrol Model 108-10S
AIR SYSTEM	1 Sullair series 10-30LAC package compressor 1 Atlas Copco LT930 1 27 cu. ft. air receiver 1 40 cu. ft. air receiver 1 Ingersoll-Rand KU air winch
CHOKE MANIFOLD	C.I.W. 2" 5000 psi CHOKE 3" Valves
DRILL PIPE	10,000 ft. 4½in. O.D.,X-Hole connections.
DRILL COLLARS	12 8in x 30ft long 30 6½in x 30ft long
KELLEYS	1 Drilco 5¼in hexagonel
STABILIZERS	Grant 12¼ in. Grant 8½ in.
FISHING TOOLS	To suit pipe and collars being run.
HANDLING TOOLS	Lamb power tong Spinner-hawk drill pipe spinner Tools to suit pipe, collars, casing being run.
SUBSTITUTES	To suit drill string connections.

2. WELL HISTORY - Cont'd

2.3. Drilling Data - Cont'd

2.3.2. Drilling Rig - Cont'd

INSTRUMENTATION	Martin Decker Type 'D' weight indicator with type 'D' anchor and E80 sensator. Martin Decker MVTX4AK-3A mud volume totalizer. Martin Decker MFSX2A mud flow, fill and stroke system. Geolograph 6-Pen "Drill Sentry". Totco Operating Unit No. 6.
TOOL HOUSE	Fabricated, skid mounted.
DOG HOUSE	" " "
MECHANIC SHACK	" " "
FUEL TANKS	Fabricated, skid mounted, twin 10,000 L.
PIPE RACKS	6 sets fabricated.
CAT WALKS	1 set fabricated.
WATER TANK	400 bbl fabricated, skid mounted.
JUNK BOXES	2 fabricated, skid mounted.
MUD TESTING	Baroid No. 821 rig laboratory.

2.3.3. Casing and Cementing Details

(i) Conductor

Size	20"
Set at	10 m
Cement	Construction (25 sacks)

(ii) Surface Casing

Size	13-3/8"
Weight	54.5 Pound
Grade	J55
Range	3
Coupling	S T & C
Centralisers	-
Float Collar	152 m

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2. WELL HISTORY - Cont'd

2.3. Drilling Data - Cont'd

2.3.3. Casing and Cementing Details - Cont'd

(ii) Surface Casing - Cont'd

Shoe	at 159 m
Cement	380 Sacks Class 'A' followed by 150 Sacks Class 'A' plus 1% calcium chloride.
Cemented to	Surface
Method	Displacement
Equipment	HT400 Halliburton

(iii) Intermediate Casing

Size	9-5/8"
Weight	36/40 Pounds
Grade	77 joints K55 - 2 joints N80.
Range	3
Coupling	Buttress
Centralizer	at 940 m, 930 m, 919 m
Float Collar	at 931 m
Shoe	at 943 m
Cement	380 Sacks Class 'A' and 215 Sacks 20% POZMIX/Class 'A' all with 1.7% prehydrated bentonite followed by 100 Sacks Class 'A' neat.
Cemented to	385 m (calc.)
Method	Displacement
Equipment	HT400 Halliburton

(iv) Plugs

Plug No. 1

Interval	2400 to 2570 m (170 m)
Cement	165 Sacks Class 'A'
Method	Balanced
Tested	No.

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2. WELL HISTORY - Cont'd

2.3. Drilling Data - Cont'd

2.3.3. Casing and Cementing Details - Cont'd

(iv) Plugs - Cont'd

Plug No. 2

Interval	1800 to 1900 m (100 m)
Cement	165 Sacks Class 'A'
Method	Balanced
Tested	No.

Plug No. 3

Interval	920 to 1020 m (100 m)
Cement	150 Sacks Class 'A'
Method	Balanced
Tested	Felt at 929 m

Plug No. 4

Interval	6 to 16 m (10 m)
Cement	25 Sacks Class 'A'
Method	Hand
Tested	Yes

2.3.4. Drilling Fluid (See also Appendix No. 1)

(i) 17½" Hole

Surface to 164 m

Well was spudded with a high PH Gel Spud Mud. At 100 m mixing gel stopped in order to minimise the previously experienced highly dispersive Gellibrand Marl's "mud rings" problem. Drilling continued to 164 m by adding large quantities of water to control viscosity and mud weight.

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2. WELL HISTORY - Cont'd

2.3. Drilling Data - Cont'd

2.3.4. Drilling Fluid - Cont'd

(ii) 12½" Hole

164 m to 943 m

The remaining Gellibrand Marl down to Dilwyn sands drilled with the same fluid as above with some additional CONDET to minimise bit balling. The Dilwyn Formation was drilled by mixing AQUAGEL for viscosity but still maintaining low PH to minimise hydration of the already drilled marl.

(iii) 8½" Hole

943 m to 2600 m

This section was drilled with a fresh water gel mud with gradually increasing water loss control towards T.D. The anticipated overpressure and shale hydration of the Belfast Mudstone was prevented by increasing mud weight from 1.08 S.G. to 1.16 to 1.18 S.G. at the beginning of the Belfast Mudstone and gradually increased to 1.34 S.G. at the bottom of the Section where the water loss decreased to less than 7 ccs. Once through the Belfast Mudstone the mud weight was graudally reduced to 1.25 S.G. (For more details see Appendix No. 1)

Shale factors analysis for a composite sample from the Belfast Mudstone (between 2000 m and 2100 m) was carried out.(For details see Appendix No. 2)

2.3.5. Water Supply

Drilling water was obtained partly from the Peterborough Town Bore and partly from the nearby waterwells drilled by Beach Petroleum N.L.

2. WELL HISTORY - Cont'd

2.4. Formation Sampling and Testing

2.4.1. Cuttings

Lagged samples of cuttings were collected from the shale shaker at the following intervals:-

Surface to 1900 m - at 10 m frequency
1900 m to 2600 m - at 5 m frequency

Four splits were made from the cuttings:-

- one air dried,
- the other three were washed clean of drilling mud and oven dried, from which one is for the Victorian Department of Minerals and Energy. The other two are stored by Beach Petroleum.

Cores

(i) Conventional

Nil.

(ii) Sidewall

Due to deteriorating hole conditions, it was not possible to run the CST tool.

2.4.2. Formation Tests

(i) Conventional

A. Drill Stem Test No. 1 (See Appendix No. 3)

Interval Tested	: 929-996 metres
Formation Tested	: Pebble Point Sandstone
Packer Set at	: 929 m with no Cushion
Valve Open (1)	: 17 minutes - strong air blow
Well Shut-In	: 29 minutes
Valve Open (2)	: 80 minutes - strong blow decreasing to zero after 75 minutes.
Well Shut-In	: 59 minutes

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2. WELL HISTORY - Cont'd

2.4. Formation Sampling and Testing - Cont'd

2.4.2. Formation Tests - Cont'd

(i) Conventional - Cont'd

Pressures:

Flow Period One	Bottom Recorder (995 m)	Top Recorder (924 m)
Initial Hydrostatic Pressure	1395 PSI	1499 PSI
Initial Flow Pressure	93 PSI	226 PSI
Initial Final Flow Pressure	110 PSI	230 PSI
Initial Shut In Pressure	992 PSI	1088 PSI
Flow Period Two		
Initial Flow Pressure	132 PSI	262 PSI
Final Flow Pressure	173 PSI	301 PSI
Final Shut In Pressure	1076 PSI	1181 PSI
Final Hydrostatic Pressure	1392 PSI	1496 PSI

Bottom Hole Temperature 124°F

Recovery 113 m of mud and muddy water

Samples collected from the drill string were as follows:-

Sample	(1)	(2)	(3)	(4)
Location	Top of the fluid column	Intermediary	Base of the column	Drilling mud
Mud weight lb/gal.	8.97	8.85	8.40	8.80
Chlorides PPM	400	400	400	400
Color of Filtrate	Brown	Brown	Brown	Brown
Rmf	1.17 @ 22.5°C	1.12 @ 22.0°C	1.165 @ 22.5°C	1.11 @ 22.0°C
Oil fluorescence	Pipe dope contamination only in all samples.			

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2. WELL HISTORY - Cont'd

2.4. Formation Sampling and Testing - Cont'd

2.4.2. Formation Tests - Cont'd

(i) Conventional - Cont'd

B. Drill Stem Test No. 2 (See Appendix No. 4)

Interval Tested	: 2454-2518 m
Formation Tested	: Waarre Formation Sandstone
Packer Set At	: 2454 m - no cushion
Valve Open (1)	: 30 minutes - moderate blow, decreasing to zero after 5 minutes.
Well Shut-In	: 60 minutes.
Valve Open (2)	: 15 minutes - zero below

Upon commencing to pull out of the hole, the tool was found to be stuck. Fishing operation was carried on over an eleven day period. No recovery was possible and the pressure charts were destroyed in the fishing operation (See Appendix No. 5 for day by day fishing operation).

(ii) Wireline

An attempt was made to run the RFT to evaluate Waarre Formation sandstone but the tool failed to pass Top Waarre Formation due to poor hole conditions.

2.5. Logging and Surveys

2.5.1. Mud Logging

A trailer mounted Exploration Logging (EXLOG) unit was used to provide penetration rate, continuous mud gas monitoring, intermittent mud and cuttings gas analyses, pump rate and mud volume data and cuttings descriptions.

The Mud Log is enclosed as Enclosure 1 .

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2. WELL HISTORY - Cont'd

2.5. Logging and Surveys - Cont'd

2.5.2. Petrophysical Logging

Schlumberger recorded the following logs in open hole:-

Run 1

Dual Laterolog (DLL-SP-GR-CAL)	158.0- 942.9
Sonic Log (BHC-GR)	158.0- 942.9
Neutron Density (FDC-CNL-GR-CAL)	943.2-1061.0
Dipmeter (HDT)	944.0-1096.0 2016.0-2583.0

Run 2

Dual Laterolog (DLL-SP-GR-CAL)	943.2-1061.0
Sonic Log (BHC-GR)	943.2-2509.2

Run 3

Dual Laterolog (DLL-SP-GR-CAL)	1025.0-2509.2
Sonic Log (BHC-GR-CAL)	2300.0-2592.5

Run 4

Dual Laterolog (DLL-SP-GR-CAL)	(943.0-1100.0 2300.0-2595.0

These Logs are enclosed as Enclosure 2.

2.5.3. Velocity Survey

Velocity Data Pty. Ltd. recorded a velocity survey at the depth of 2505 m. The results of this survey are in Enclosure 3.

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2. WELL HISTORY - Cont'd

2.5. Logging and Surveys - Cont'd

2.5.4. Deviation Surveys

The results of deviation surveys with a TOTCO instrument were:-

1/4°	@	32 m	1/2°	@	1400 m	4-1/4°	@	2233 m
3/4°	@	65 m	1°	@	1582 m	5°	@	2263 m
1/2°	@	94 m	1°	@	1741 m	5°	@	2291 m
1/2°	@	131 m	2-3/4°	@	1891 m	5°	@	2328 m
1°	@	161 m	1-1/4°	@	1929 m	6°	@	2356 m
1/2°	@	313 m	2°	@	1995 m	7°	@	2393 m
1/2°	@	461 m	3-1/2°	@	2089 m	7°	@	2427 m
0°	@	612 m	6°	@	2149 m	8°	@	2446 m
3/4°	@	930 m	6-1/2°	@	2177 m	8-1/2°	@	2471 m
1/2°	@	962 m	4-1/2°	@	2204 m	9°	@	2509 m
1°	@	1060 m						

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3. RESULTS OF DRILLING

3.1. Formation Tops

The following formation tops have been picked using cutting and description, mud log and electric log data (all depth in metres).

GROUP	FORMATION	KB(m)	SUBSEA(m)	THICKNESS(m)
Heytesbury	Port Campbell	Surface	+ ~~42.8~~ 36	119.2+
	Gellibrand	126.0	- ~~83.2~~ 90	346.0
	Clifton	472.0	- 429.2	13.6
Nirranda	Narrawaturk	485.6	- 442.8	78.7
	Mepunga	564.3	- 521.5	30.7
Wangerrip	Dilwyn	595.0	- 552.2	332.0
	Pember	927.0	- 884.2	68.0
	Pebble Point	995.0	- 964.2	100.0
Sherbrook	Paaratte	1095.0	-1052.2	798.0
	Belfast	1893.0	-1850.2	434.0
	Flaxman (Unit "A"	2327.0	-2284.2	90.0
	Flaxman (Unit "B"	2417.0	-2374.2	38.0
	Waarre	2455.0	-2412.2	99.0
Otway	Eumeralla	2554.0	-2511.2	46.0+
	T.D.	2600.0	-2557.2	

3.2. Lithologic Description

The lithologies encountered in the well are generalised as follows:- (All depths are in metres below K.B.)

HEYTESBURY GROUP

Port Campbell Formation: Surface - 126.0 m

CALCARENITE, white to yellow brown, light to medium grey, firm to hard, fine to coarse, dominant medium grained, minor argillaceous

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3. RESULTS OF DRILLING - Cont'd

3.2. Lithologic Description - Cont'd

Port Campbell Formation:- Cont'd

matrix, common shell fragments, echinoid spines, sponge spicules, forams and coral detritus, minor bryozoa, fair intergranular porosity. In depth with minor glauconite and trace of very fine rhomboidal dolomite crystals within the matrix of the calcarenite.

Gellibrand Formation:

126.0-472.0 m

MARL, medium grey-medium green, olive green, very soft, sticky, dispersive in part, common forams, shell fragments, bryozoa, echinoid spines, sponge spicules, gastropods, rare brachiopods with depth, rare pyrite (framboidal in part), trace glauconite.

Clifton Formation: 472.0-485.6 m

CALCARENITE, yellow brown-red brown, light green brown, friable to hard, fine grained, abundant, very coarse, well rounded, iron stained frosted quartz sand grains and other lithic particles, iron oxide concretions, strong silica and calcareous cement, abundant coral debris, bryozoa, echinoid spines, gastropods, common forams, poor to fair visual porosity.

NIRRANDA GROUP

Narrawaturk Formation:

485.6-564.3 m

MARL, medium brown, olive green, soft, sticky dispersive in part, abundant glauconite, decreasing with depth, bryozoa increasing with depth, rare pyrite.

.../

3. RESULTS OF DRILLING - Cont'd

3.2. Lithologic Description - Cont'd

Mepunga Formation: 564.3-595.0

From 564.3 to 575.0:

WACKESTONE off white, cream brown, very hard, occasional fine to very fine quartz sand grains and other dark green lithic fragments in amorphous to cryptocrystalline calcite matrix, trace glauconite, common partially altered fossil fragments.

From 575.0 to 595.0 grading to:

MARL medium-dark brown, soft, sticky, dispersive in part, abundant fine glauconite pellets, common fossil fragments, trace pyrite.

WANGERRIP GROUP

Dilwyn Formation: 595.0-927.0 m

SANDSTONE, yellowish orange to dark brown grading to clear to light grey with depth, loose to friable, fine to coarse, dominant medium, angular to sub-rounded, dominant sub-angular, poor to moderate sorting, dominantly quartz, fine silt matrix in part, weak calcareous cement, trace pyritic cement, trace to common glauconite, trace pyrite, moderate to good visual porosity. Interbedded with Siltstone and Claystone, light-medium-dark grey, medium dark brown-grey, soft dispersive in part, slightly calcareous and arenaceous in part, argillaceous in part.

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3. RESULTS OF DRILLING - Cont'd

3.2. Lithologic Description - Cont'd

Pember Mudstone: 927.0-995.0 m

SILTY CLAYSTONE, dark grey, soft, very dispersive, (carbonaceous and argillaceous material completely washed out and dispersed in mud system, dominantly clear to white, loose, silty to very fine angular quartz grains remaining), trace of calcareous cement in part, trace pyrite.

Pebble Point Formation: 995.0-1095.0 m

SANDSTONE, clear to yellowy orange to medium brown, loose, medium to very coarse, dominant coarse, sub-angular to sub-rounded, moderate to well sorted quartz, trace pyrite cement and dispersive silt matrix increasing with depth, good visual porosity. This section commences with a lateritic cap followed by 30 m of Sandstone with fluorescence.

Note: This Sandstone shows 20% patchy dull - moderate bright yellow-orange natural fluorescence giving a bright rapid streaming pale yellow white cut fluorescence, with a weak light straw natural cut colour. 20% of the Sandstone had patchy medium dark brown oil staining. For DST result see Section 2.4.2. (See Appendix 3 and 6).

SHERBROOK GROUP

Paaratte Formation: 1095.0-1893.0 m

From 1095.0 to 1190.0 m :-

SILTY CLAYSTONE/SHALE, medium dark grey - black, firm to hard, dispersive in part, arenaceous, common pyrite, trace glauconite, interbedded with

.../

3. RESULTS OF DRILLING - Cont'd

3.2. Lithologic Description - Cont'd

Paaratte Formation - Cont'd

SANDSTONE, clear, pale to dark yellow, loose, medium to very coarse, dominant coarse grained, angular to sub-rounded, dominant angular, moderate to well sorted quartz, weak siliceous cement, trace pyritic cement, pale green - moderate reddish brown, angular lithic fragments, fair visual porosity.

From 1190.0 to 1275.0 m :-
SANDSTONE, clear to white to light grey, loose, medium to very coarse, angular to sub-rounded, moderate to well sorted quartz, weak siliceous cement, trace pyritic cement, fine, dispersive silt matrix in part, trace pyrite, moderate to good visual porosity. Interbedded with minor Claystone/Silty Claystone, medium grey to black, soft to firm, arenaceous in part.

From 1275.0 to 1336.0 m :-
CLAYSTONE, dark grey - dark green grey, soft, dispersive, moderately glauconitic, trace carbonaceous detritus, finely micaceous, finely arenaceous, rare pyrite, trace Amber, medium brown, hard, brittle, translucent, giving a brilliant white natural fluorescence. Interbedded with minor Sandstone clear-off white pale orange, loose, medium to coarse, dominant coarse grained, angular to sub-rounded, moderate to well sorted quartz, minor Siltstone and Claystone matrix, minor dark lithic fragments, trace glauconite, good visual porosity.

.../

3. RESULTS OF DRILLING - Cont'd

3.2. Lithologic Description - Cont'd

Paaratte Formation-Cont'd

From 1336.0 to 1621.0 m :-
SANDSTONE, clear-off white, becoming light brown-grey to medium grey with depth, loose, becoming friable to hard toward the base, medium to very coarse, dominant coarse grained, becoming dominant fine to medium with depth, angular to sub-rounded, dominant sub-angular, well sorted, becoming poorly sorted at the base, dominantly quartz with minor medium grey lithic fragments, trace clay and fine silt matrix, rare pyritic and siliceous cement, trace carbonaceous cement in part, trace Carbonaceous detritus and muscovite flakes, trace of Coal, black, firm, subvitreous - earthy, argillaceous in part, poor to fair visual porosity. Interbedded with Silty Claystone/ Claystone, dark green-grey, light to medium brown, soft, dispersive, sticky in part, common glauconite, decreasing with depth, finely micaceous in part, common carbonaceous detritus, trace nodular pyrite fragments.

From 1621.0 to 1893.0 m :-
CLAYSTONE/SILTSTONE, light-medium-dark grey, soft to firm, dispersive, subfissile in part, finely micaceous, common carbonaceous detritus, common dolomite nodules in part, common nodular pyrite fragments, decreasing with depth, rare glauconite in part, rare very finely arenaceous in part, trace Coal in part, trace Amber in part. Interbedded with Sandstone, clear, off white, light to medium grey, friable to hard, very fine to grit size, dominant very coarse, becoming

3. RESULTS OF DRILLING - Cont'd

3.2. Lithologic Description - Cont'd

Paaratte Formation-Cont'd	gradually finer with depth, angular to sub-rounded, dominant sub-angular, poorly sorted quartz, common calcareous cement and matrix in part, trace siliceous cement in part, trace glauconite, trace pyrite in part, poor-fair visual porosity.
Belfast Mudstone:	1893.0-2327.0 m From 1893.0 to 2225.0 m :- SILTY CLAYSTONE, medium to dark grey, firm dispersive, subfissile in part, common carbonaceous detritus decreasing with depth, finely micaceous, common fine arenaceous material, decreasing with depth, trace glauconite in part, minor cryptocrystalline dolomite, decreasing with depth, trace ankerite and crystalline calcite, trace shell fragments in part, trace of Inoceramus at the base, rare pyrite in part. From 2225.0 to 2327.0 m :- SILTY SHALE, medium-dark grey, firm to hard, sub-fissile to fissile, finely micaceous, minor dispersive carbonaceous material, minor glauconite, increasing with depth, trace pyrite, trace crystalline calcite, with trace coarse-grit, sub-rounded, clear-frosted-orange quartz sand grains at the base, trace shell fragments and forams in part.

.../

3. RESULTS OF DRILLING - Cont'd

3.2. Lithologic Description - Cont'd

Flaxman Formation: 2327.0-2455.0 m :-

Unit "A" from 2327.0 to 2417.0 m :-
SILTY SHALE, medium-dark grey, firm to hard, moderately dispersive, sub-fissile, common glauconite, minor carbonaceous detritus, trace fine kaolin clay mineral, trace quartz sand grain in part, trace pyrite, trace Inoceramus are rare Belemnites? at the base. Interbedded with Sandstone, greyish to dusky green becoming orange brown with depth, firm to hard, fine to coarse, dominant medium, angular to sub-rounded becoming rounded with depth, poorly sorted quartz grains, grey green to multi-color lithic fragments, trace iron oxide grains at the base, bluish grey to medium brown clay to silt size matrix, extremely dispersive becoming less dispersive with depth, minor siliceous cement in part, strong iron oxide cement at the base, trace pyrite, trace chlorite in part, poor visual porosity, (sand grains are tectonically polished).

Unit "B" from 2417.0 to 2455.0 m :-
SANDSTONE, medium green grey, becoming light grey with depth, friable to hard, very fine to very coarse, dominant bimodal distribution of fine and coarse quartz grains with abundant green, yellow and brown lithics, sub-rounded, moderately sorted, abundant green matrix (chlorite?), trace pyrite and silica cement, very poor to poor visual poristy, with minor

.../

3. RESULTS OF DRILLING - Cont'd

3.2. Lithologic Description - Cont'd

Flaxman Formation-Cont'd

COAL, dark brown to black, brittle, subvitrious - earthy, concoidal fracture in part, the coal has no natural fluorescence, but gives a very slow streaming yellow-white cut fluorescence.

- minor Claystone, medium grey firm.

Waarre Formation:

2455.0-2554.0 m :-

SANDSTONE, light grey, very hard, very fine to grit, dominant very coarse, sub-angular, poorly sorted quartz with minor feldspars, partly altered trace carbonaceous detritus, trace chlorite, abundant quartz overgrowths, very strong siliceous and calcareous cement, occasional pyrite cement, trace pyrite, poor visual porosity, trace Coal, black. Interbedded with minor Silty Shale, medium grey, firm to hard, common carbonaceous material.

Note: The Sandstone from 2525.8 to 2526.0 m has 5% patchy moderate bright, very pale yellow-white fluorescence, giving a very weak pale yellow-white crush cut fluorescence. No free oil, oil straining.

OTWAY GROUP

Eumeralla Formation:

2554.0-2600.0$^+$ m (T.D.)

SILTY CLAYSTONE, light medium green grey, firm, dispersive in part, sub-fissile in part, finely micaceous and carbonaceous, trace very fine white clay minerals, trace pyrite. Interbedded with minor:-

.../

3. RESULTS OF DRILLING - Cont'd

3.2. Lithologic Description - Cont'd

Eumeralla Formation-Cont'd	Sandstone, light grey to greenish grey, friable in part, firm in part, very fine to medium, dominant fine, sub-angular, moderately sorted quartz grains with abundant grey lithic fragments and abundant altered feldspars, trace carbonaceous detritus, trace pyrite, trace chlorite, trace fine kaolin matrix, trace siliceous cement, poor visual porosity.

4. GEOLOGY

4.1. Stratigraphy

The stratigraphic table (on page 30) gives details of the section penetrated. Although the well was drilled on a structure within a trough and not on the Port Campbell High, the sequence drilled is generally similar to that found in the Port Campbell High wells. Few minor but significant variations occur:- (see also comparison table on page 31).

1. The mudstone of the Pember Formation is better developed and contains less sandstone here than in wells drilled at the Port Campbell High. Its thickness is important since the underlying Pebble Point Formation appears to be a potential hydrocarbon reservoir in this area. It is, therefore, an important regional seal.

2. The Pebble Point Formation appears to be well developed in this well. This, together with its ideal reservoir characteristics (see Section 3.3) makes it a favourable hydrocarbon target. A laterite cap indicating a period of weathering was intersected at the top of this formation. The sandstone in this formation showed fluorescence with cut and oil staining immediately below the lateritic cap where a higher porosity was encountered.

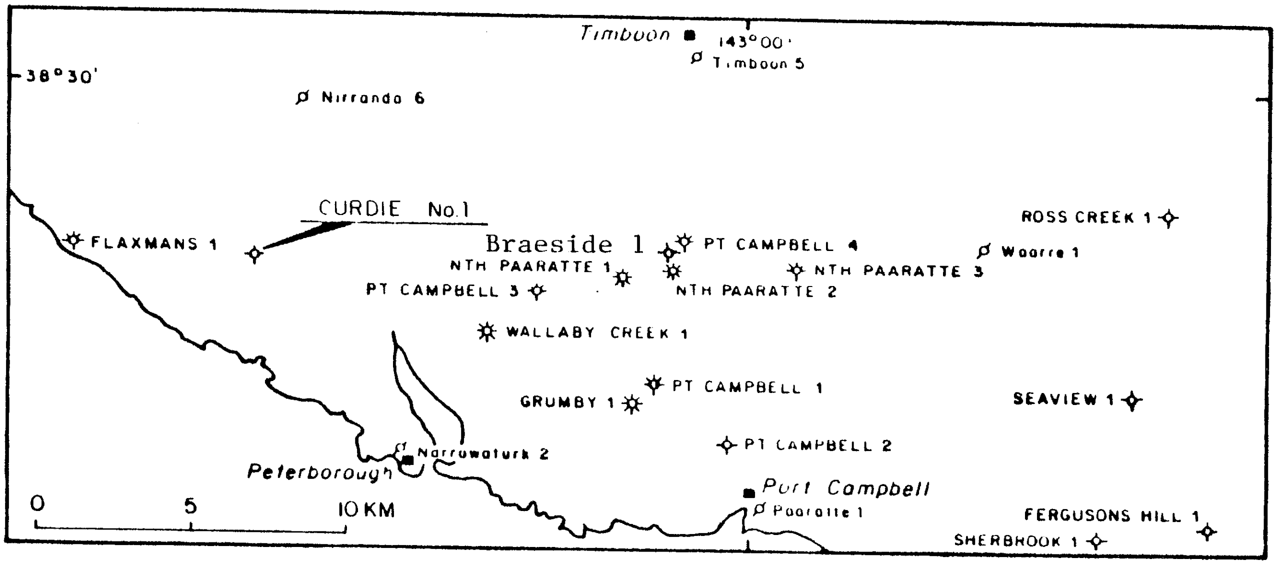
3. The Paaratte Formation in Curdie No. 1 is thicker than that found in any other well as shown in the comparison Table. This could be indicative of a longer period in which the Paaratte Formation, considered a marginal marine regime, was established within the basin. It is seen as a series of transgressive-regressive cycles.

.../

CURDIE NO. 1 STRATIGRAPHIC TABLE

GENERAL AGE			GROUP	FORMATION / MEMBER		K.B. (m)	SUBSEA (m)	THICK-NESS (m)	VERTICAL* THICK-NESS (m)	LITHOLOGY
TERTIARY	Pl.		HEYTESBURY	Port Campbell		Surface	+42.8	119.2+	—	Calcerenite, fossiliferous, minor glauconite in depth
TERTIARY	Mi.		HEYTESBURY	Gellibrand		126.0	-83.2	346.0	—	Marl, fossiliferous, trace glauconite
TERTIARY	Ol.		HEYTESBURY	Clifton		472.0	-429.2	13.6	—	Calcarenite, iron stained quartz sand grains, other lithics, fossiliferous
TERTIARY	Eo.		NIRRANDA	Narrawaturk		485.6	-442.8	78.7	—	Marl, abundant glauconite, some fossils
TERTIARY	Eo.		NIRRANDA	Mepunga		564.3	-521.5	30.7	—	Wackestone, trace glauconite and fossil. Marl, glauconite, fossiliferous
TERTIARY	Pc.		WANGERRIP	Dilwyn		595.0	-552.2	332.0	—	Sandstone, interbedded with Siltstone and Claystone
TERTIARY	Pc.		WANGERRIP		Pember	927.0	-884.2	68.0	—	Silty Claystone, soft, dispersive
TERTIARY	Pc.		WANGERRIP	Pebble Point		995.0	-952.2	100.0	99.0	Sandstone, conglomeratic in part
MESOZOIC	CRETACEOUS	UPPER	SHERBROOK	Paaratte		1095.0	-1052.2	798.0	—	Silty Claystone/Shale, interbedded with Sandstone, glauconite
MESOZOIC	CRETACEOUS	UPPER	SHERBROOK		Belfast	1893.0	-1850.2	434.0	399.0	Silty Claystone/Shale, glauconite, trace Inoceramus
MESOZOIC	CRETACEOUS	UPPER	SHERBROOK	Flaxman	Unit "A"	2327.0	-2284.2	90.0	82.0	Silty Shale, glauconite, interbedded with Siltstone and Sandstone, multicolor lithics
MESOZOIC	CRETACEOUS	UPPER	SHERBROOK	Flaxman	Unit "B"	2417.0	-2374.2	38.0	34.0	Sandstone, chloritic matrix, minor Coal and Claystone
MESOZOIC	CRETACEOUS	UPPER	SHERBROOK	Waarre		2455.0	-2412.2	99.0	91.0	Sandstone, very hard, strong siliceous cement, feldspatic minor Silty Shale and Coal
MESOZOIC	CRETACEOUS	L.	Otway	Eumeralla		2554.0	-2511.2	46.0+	—	Silty Claystone, micaceous, carbonaceous, interbedded with Sandstone
				T.D.		2600.0	-2557.2			

* Based on the Dipmeter , run between 994 - 1096 & 2016 - 2583m.



Location Map

WELL NAME & NO.	Pt. Campbell	Gellibrand	Clifton	Narrawaturk	Mepunga	Dilwyn	Pember	Pebble Point	Paaratte	Belfast	Flaxmans Unit "A"	Flaxmans Unit "B"	Waarre	T.D.
CURDIE #1	119$^+$	346	13	79	31	332	74	100	798	434	90	38	99	2600
Flaxmans #1	158$^+$	353	8	66	30	284	101	(698)		280	65	53	114	3514
P. Campbell 1	—	320$^+$	31	79	(350)		(229)		491	202	22		64	1818
" " 2	—	262$^+$	6	98	(622)		(78)		695	640	78		106	2696
" " 3	88$^+$	291	11	28	50	369	37	67	362	107	9		61	1686
" " 4	72$^+$	208	52	61	43	198	(122)		585	136	38		111	2597
N. Paaratte 1	71$^+$	243	28	35	38	246	82	50	531	116	—		78	1545
N. Paaratte 2	83$^+$	205	24	22	62	301	51	72	578	95	35		95	1603
N. Paaratte 3	—	137$^+$	32	28	29	241	74	42	509	65	20		79	1516
Wallaby Crk 1	108$^+$	327	17	80	7	247	45	11	371	271	28		56	1763
Grumby #1	88$^+$	238	15	35	80	363	52	68	587	190	25		89	1811
Braeside #1	60$^+$	245	22	75	49	224	56	22	557	98	60		102	2300

GENERAL COMPARISON BETWEEN FORMATION THICKNESSES OF DIFFERENT WELLS WITH THOSE OF THE CURDIE NO. 1. (All figures are in metres.)

Note : Figures in bracket indicate that the contact between the formations is not yet resolved .

The regressive cycles appear to be dominantly longer in the upper part and quite short in the lower part of the formation. Hence, the presence of thicker sand bodies in the former and thicker shale beds in the latter.

The Skull Creek and Nullawarre Members of the Paaratte Formation are not recognized in this well either from lithology description and/or logs.

4. With one exception (Port Campbell No. 2) the Belfast Mudstone in Curdie No. 1 is thicker than other wells (see comparison table). It consists of silty shale at the bottom and Silty Claystone on the top. This could be due to slight changes in the environment of depositions. The silty shale would then have been deposited a quieter, reasonably undisturbed, consequently deeper marine environment in comparison with that of the Silty Claystone. In this case, a gentle marine regression could be inferred. The thickness of the Belfast Mudstone in Curdie No. 1 is attributed to the fact that it is located on the downthrown side of the Boggy Creek Fault which must have, therefore, been active at the time of the deposition of the Belfast Mudstone.

5. Flaxman Formation appears to consist of two different units. The term Unit "A" and Unit "B" are used here informally for upper and lower units respectively. The Unit "A" is recognized on the basis of its lithology and log similarities to those of the Flaxmans No. 1 well. This is not recognized on the Port Campbell High. The Unit "B" is recognized in all the Port Campbell High wells and at Flaxmans No. 1 by its log characteristics. The lithologic differences between these two units are marked by dominant silty shale in

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the Unit "A" and sandstone in the Unit "B" as well as abundant glauconite in the former and complete lack of it in the latter. These differences in the Curdie Trough can be attributed to:-

(a) deposition of the Unit "B" in a littoral environment followed by,
(b) marine transgression and deposition of the Unit "A" in a shallow marine environment.

During the deposition of (b) the Port Campbell High would then have probably been uplifted.

6. The Waarre/Eumeralla break in this well appears to be a significant unconformity, although this is suggested principally by limited reflectance data. This break elsewhere is considered a major unconformity.

4.2. Structure

The well was drilled on the Curdie Structure located within the Curdie Trough on the downthrown side of the Boggy Creek Fault. The structure, as mapped on the Top Waarre Sandstone Time Structure Map was developed by a number of faults (see map on page 34). Two of these faults, one trending northeast-southwest and the other north-south, produced a horst-like structure whilst the other, trending east-west, closes part of the northern side of the closure. A limited minor culmination extends to the north of the main structural high.

The velocity function used for depth estimates was based on the velocity survey in Flaxmans No. 1. This proved to be in error in the formations below the Paaratte Formation where tops were encountered higher than predicted. The maximum difference was at Top Eumeralla level which was found 348 m higher than predicted (see Appendix 7).

PE905722

This is an enclosure indicator page.
The enclosure PE905722 is enclosed within the container PE902668 at this location in this document.

The enclosure PE905722 has the following characteristics:

ITEM_BARCODE =	PE905722
CONTAINER_BARCODE =	PE902668
NAME =	Time Structure Map
BASIN =	OTWAY BASIN
PERMIT =	PEP/93
TYPE =	SEISMIC
SUBTYPE =	HRZN_CNTR_MAP
DESCRIPTION =	Time Structure Map (from WCR) for Curdie-1
REMARKS =	
DATE_CREATED =	31/07/82
DATE_RECEIVED =	27/09/82
W_NO =	W768
WELL_NAME =	CURDIE-1
CONTRACTOR =	
CLIENT_OP_CO =	BEACH PETROLEUM PTY LTD.

(Inserted by DNRE - Vic Govt Mines Dept)

The result of the High Resolution Dipmeter, run over two intervals (944-1096 m and 2016-2583 m) is summarized as follows:-

- Structural dip in the Pebble Point Formation ranges between 6^o to 8^o and has a variable direction.
- The presence of a fault, possibly a down to the north-east normal fault, with a northwest to southeast directed fault plane in the middle of the Belfast Mudstone is postulated. The section above the fault plane appears to have a structural dip to the north with no reliable data to measure the amount of dip accurately. The section below the fault plane has structural dip between 22^o to 24^o with south westerly direction. An unconformity surface at which the fault may have terminated is suggested by seismic at a level close to the top of the Belfast Mudstone.
- Flaxman's Unit "A" appeared to have structural dip of approximately 24^o to 26^o in a south westerly direction while there was no reliable data to measure the structural dip in the Unit "B".
- A minor angular unconformity between the Waarre and the Eumeralla Formations has been shown with very little difference between structural dips of the two formations. The structural dip in the Waarre Formation ranges between 22^o to 24^o in south westerly direction and in the Eumeralla Formation it ranges between 20^o to 22^o in a north westerly direction. Reflectance data suggests that a significant time break may occur at this unconformity level.

.../

4.3. Porosity and Permeability

Although a number of significant sandstone units were intersected in Curdie No. 1, two formations only have or could have reservoir potential, i.e. Pebble Point Formation and the Waarre Formation. However, porosity details in each are vague with only the sonic log available for porosity determination through most of the well. A short section of the density/neutron log is available across the (upper most) section of the Pebble Point Formation. Hole conditions prevented the taking of conventional or sidewall cores.

4.3.1. Pebble Point Formation

Log porosities of in excess of 35% are seen in the upper section of this formation. These very high and probably optimistic figures can be explained by the unusual log character of this section. This character suggests approx. 12 metres of a typical laterite profile. The upper section had very low permeability as shown by DST No. 1 (929-996 m) although the Density Neutron Log values suggest porosities in excess of 20%. It is anticipated that it is only the upper section where porosity cannot be determined with confidence and that below the proposed laterite zone a quartz rich section is present. Porosity through this is generally in the order of 25%.

4.3.2. Waarre Formation

This was the primary target and is known to have porosities in excess of 30% in wells located on the Port Campbell High. Porosity can only be measured by the Sonic Log in Curdie No. 1 and this indicates a maximum porosity of 17% with the average significantly lower (approximately 10%). Detailed examination of cuttings suggest that the low porosity was due to increased amounts of silica and carbonate cement.

4.4. Indications of Hydrocarbon

4.4.1. Source Rock Studies

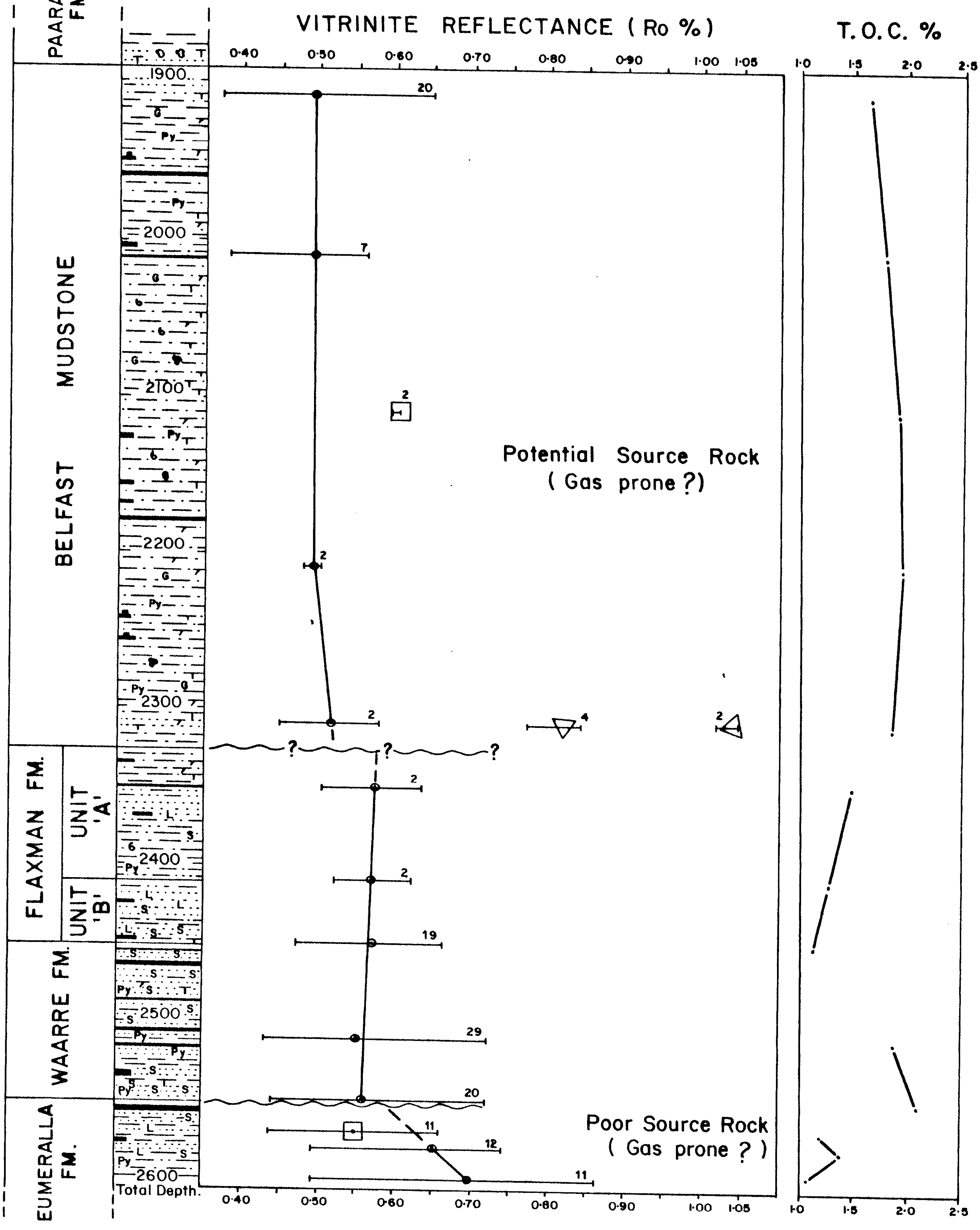
Thirteen samples from the cuttings from the interval 1895-2600 m were analysed for specific source rock related properties including Kerogen content, total organic carbon and vitrinite reflectence. The result is summarized as follows:- (See Appendix 8).

- As can be seen from Vitrinite Source Rock Maturity Profile (on page 38) the Belfast Mudstone is immature and contains predominantly gas producing organics. However, its total organic carbon is moderately high, thus it can be classified as gas prone Potential Source Rock. The analysed samples from Belfast Mudstone appear to be representative of its entire section.

- Although no unconformity was detected between Belfast Mudstone and Flaxman Formation by means of wireline logs, Dipmeter and seismic, the Vitrinite Reflectance revealed a pronounced break between the above formations. Two populations of recycled vitrinite are associated with the analysed sample immediately above the unconformity surface.

- The overall trend of Vitrinite Reflectance in Flaxman and Waarre Formations is slightly declining. This abnormal declination could partly be due to caving. The total organic carbon in these two formations do not follow the same trend. The higher organic carbon

VITRINITE SOURCE ROCK MATURITY PROFILE — CURDIE No.1



: Rv max, Range and No. of Vitrinite in the sample.

: Recycled Vitrinite

: Spurious Data .

DRG No. 1866

in the Waarre Formation is probably due to the prescence of coal seams. Kerogen examination of all these samples indicate a predominance of vitrinite and inertinite. At best therefore, these units are potential source rocks for gas.

- Reflectance values of samples collected from within the Eumeralla Formation confirm
  - (a) An unconformity exists between the Eumeralla and Waarre Formations
  - (b) The Eumeralla Formation appears to have just reached an optiminum stage of maturity (Ro 065).

Only 46 m of the Eumeralla Formation was drilled which means that the organics seen in the samples analysed are probably not representative. Organic carbon content is moderate, but an examination of the kerogen present indicate very little oil prone material.

4.4.2. Oil Show

The first and major show in the well was encountered at the upper section of the Pebble Point Sandstone Formation. The sandstone showed 20% patchy dull-moderately bright yellow-orange natural fluorescence giving a bright rapid streaming pale yellow-white cut fluorescence, with a weak slight straw natural cut colour. 20% of the sandstone had patchy medium-dark brown live oil staining. A DST of the uppermost section of the Pebble Point and immediately above the fluorescence and staining recovered a very minor amount of watery mud only confirming that the section tested was impermeable.

.../

The second show was encountered in a short interval of the Waarre Sandstone between 2525.8 and 2526.0 m. The sandstone had 5% patchy moderate bright very pale yellow - white fluorescence giving a very weak pale yellow - white crush cut fluorescence. No free oil or oil staining was observed. The section was not tested.

4.5. GEOLOGICAL CONTRIBUTIONS

The Curdie No. 1 well was the first to be specifically located within one of the distinct depositional lows flanking the Port Campbell High. Its results are considered particularly relevant to any further exploration in similar structure areas both in onshore and offshore Otway Basin. The important findings of the well are:-

1. The significance of the Pember Mudstone as a substantial cap rock for much of the area is now accepted. The sealing potential of this section appears to be enhanced by a lateritic cap at the top of the Pebble Point Formation.

2. The confirmation of a potential hydrocarbon reservoir with variable porosity at the top of the Pebble Point Formation.

3. Major movement of the Boggy Creek Fault occurred during the time of deposition of the Belfast Mudstone.

4. The division of the Flaxman Formation into two distinct units, "Unit A" and "Unit B". Lithology and log examination indicate that each has a different environment of deposition and that a minor sedimentary break may occur between the two.

.../

5. The Belfast Mudstone is immature and contains predominantly gas generating organics. Reflectance values greater than 0.65 in the Eumeralla Formation indicate that it is mature and is at an optimum stage of hydrocarbon generation. The organics seen in the limited section of Eumeralla Formation penetrated appear to be predominantly gas prone.

6. The silicification and calcification of the Waarre Formation sandstones have substantially reduced the primary porosities of this unit to the point where it can be considered as only a secondary target.

7. The high dips found continuously below the intersection of what appears to be a fault penetrated within the Belfast Mudstone at 2125 metres could significantly down-grade the Waarre Sandstone as a potential reservoir.

APPENDIX 1

BEACH PETROLEUM NL

DRILLING FLUID RECAP

CURDIE # 1

May, 1982

CONTENTS

BAROID AUSTRALIA PTY. LIMITED

NL INDUSTRIES

WELL SUMMARY

Baroid Engineers: A. Searle
M. Olejniczak

Operator	:	Beach Petroleum NL
Well Number	:	Braeside # 1
Location	:	Otway Basin
Contractor	:	Richter
Rig	:	Rig 7
Total Depth	:	2600m
Water Depth/KB to Ocean Floor	:	-
Arrived on Location	:	February 9, 1982
Spud Date	:	February 10, 1982
* Date Reached T.D.	:	March 23, 1982
* Total Days Drilling	:	26
Date off Location	:	March 27, 1982
Total Days on Well	:	46 days
* Total Cost of Mud Materials	:	$39,794.25
* Mud Costs/m	:	$15.35
* Mud Costs/day	:	$1,530.55
Engineer Service (46 days) @ $ 275	:	$12,650.00
Total Cost Materials and Engineer Service	:	$52,444.25
Mud Materials not Charged to Drilling	:	Nil
Engineer Service Not Charged to Drilling	:	Nil
Casing Program	:	13.3/8" @ 158.6m 9.5/8" @ 943m

* Calculated as from actual spud to P and A or final casing run and testing program started etc.

DISCUSSION BY INTERVAL

17½" Hole

Surface to 164m

Well was spudded in at 0130 hours on February 10, 1982 with a high pH Gel Spud Mud. Drilled through the surface limestone mixing gel with minor mud losses to the formation of less than $10m^3$. At 100m stopped mixing gel in anticipation of drilling the highly dispersive Gellibrand Marl which was encountered at 126m. As previous wells had had problems with "mud rings" and high viscosity, continued drilling adding only large quantities of water to control viscosity and mud weight. pH was minimised by not adding Caustic and no thinners were added to reduce clay dispersion. At 164m, after a wiper trip, the 13.3/8" casing was run and cemented to 158.6m.

DISCUSSION BY INTERVAL (Cont'd)

12¼" Hole
164m to 943m.

After testing B.O.P.'s, ran in and drilled out the cement from 146m through the shoe into new formation to 171m using water thinned mud. Ran a leak off test to 200 psi with 1.08 S.G. mud, then continued drilling through the Gellibrand Marl using only water as before, with some additional CONDET to minimise bit balling. Had to dilute at rates approximating 100 bbl/hr but had no problems with mud rings or bit balling, although shaker screens required constant washing off of sticky clay.

Once through the marl and into the top of the sands at 496m, ran a wiper trip to check hole condition before drilling further. On circulating out after the trip, had to clear out a blocked flow line and pump mud rings out of the hole over the bell nipple. This was the only mud ring problem experienced with the Gellibrand Marl, so the procedure of just using larger amounts of water without any additional chemicals and low pH should be considered as successful. Then drilled through the Dilwyn sands mixing AQUAGEL for viscosity but still maintaining low pH to minimise hydration of the already drilled marl. Had to add water at a rate of 50 bbl/hr to compensate for frequent mud losses over the shakers caused by sand blocking the screens. At 943m had apparently reached the Pember Mudstone casing point, indicated by slower drilling rate and almost no sample return, as mudstone dispersed into mud almost totally. So ran a wiper trip which indicated the hole was in good condition, then circulated and conditioned the mud to a higher pH and reduced water loss by adding CAUSTIC and CMC-LV prior to logging. Ran

.../Cont'd

DISCUSSION BY INTERVAL (Cont'd)

12¼" Hole (Cont'd)

·ıe Schlumberger logs without problem and then ran and cemented the 9.5/8" ·asing to 943m immediately following the logging.

DISCUSSION BY INTERVAL (Cont'd)

8½" Hole

943m to 2600m

The 8½" hole was drilled with a fresh water gel mud with gradually increasing water loss control towards T.D.

Initially the 9.5/8" casing shoe was drilled out with the mud from the previous section, diluted and treated for cement contamination. After encountering an oil show at 1060m ran logs, set a cement plug back to 996m and ran a drill stem test from 929 - 996m which failed. Drilling continued using the fresh water gel mud, unweighted, with water loss of < 15 ccs.

Hole stability problems were anticipated through the Belfast Formation from 1900 to 2325m due to expected overpressure and shale hydration. From 1939m began getting connection gas of 2 - 3 units so the weight was [illegible]creased to 1.16 to 1.18 S.G. from 1.08. This reduced the connection [illegible] to less than 1 unit with a background of 2 - 3 units. On a trip at [illegible]0m had to pump out of the hole from 1920 to 1779m and then had to ream [illegible]n 1400m to bottom on RIH. From this depth began reducing water loss [illegible] less than 10 ccs with additions of CMC. The mud weight was gradually increased in response to more connection gas up to a maximum of 1.34 S.G. by 2298m, with water loss of less than 7 ccs. The hole remained relatively stable during this period with reaming of only between 11 to 56m required to get back to bottom.

Once through the Belfast Formation the mud weight was gradually reduced back to 1.25 by 2490m, with a water loss of less than 6 ccs, as it was felt that the 1.34 S.G. weight was more than required for hole stability.

.../Cont'd

DISCUSSION BY INTERVAL (Cont'd)

8½" Hole (Cont'd)

A D_c exponent plot through the Belfast Formation indicated pressure of approximately 1.26 S.G.

At 2518m it was decided to T.D. the well. After logging a drill stem test from 2454 to bottom was run which failed. On trying to P.O.H. the packer stuck. 9 days were spent fishing the test tool before it was finally returned after completely washing over the test string. During this period the mud was maintained at about 1.25 S.G. and less than 6 ccs water loss, and the hole remained very stable with few cavings. This supported the view that this mud weight was sufficient to control any overpressure present.

After recovering the fish drilling resumed, as it had been decided to drill further. The mud weight was further reduced to 1.24 S.G. but Belfast Formation cavings started becoming a larger part of the samples collected, indicating instability so the weight was increased to 1.25 S.G.

Drilling continued to a total depth of 2600m. The well was circulated and conditioned and an attempt made to run Schlumberger logs. Problems were experienced, with Schlumberger unable to get their tool below 2449m, it was thought the tool was hanging up on a ledge. R.I.H. with bit and reamed tight hole from 2440 - 2452m, then washed and reamed all the way to bottom. Schlumberger logs were then run, although hole still sticky. Prior to making Schlumberger R.F.T. and C.S.T. runs it was decided to do another clean out trip. R.I.H. with bit and reamed from 2461 - 2489m. I.H. to 2495m, pipe became stuck but pulled free. Circulated and added

.../Cont'd

DISCUSSION BY INTERVAL (Cont'd)

8½" Hole (Cont'd)

DIESEL in an attempt to improve hole conditions; DIESEL content raised from 1% to 3%. Washed and reamed to bottom. Attempted to run Schlumberger .F.T. however, tool became hung up at 1914m. It was then decided that rther logging attempts were not justified and the well was plugged and andoned March 27, 1982.

BAR[illegible]SION N.L. INDUSTRIES
DRILLING FLUID PROPERTY RECAP

Company BEACH PETROLEUM NL
Well CURDIE # 1
Contractor/Rig RICHTER RIG 7

date 1982	depth m.	hole size "	temp. °C.	wt. sg.	vis. sec.	P.V.	Y.P.	gels		w.l. a.p.i	cake mm	w.l. hpht	°C	filtrate anal.			sand %	retort anal.%			mbc kg/m³	PH	activity	form
								10 sec	10 min					pf	Cl.ppm	Ca.		oil	wat.	sol.				
10/2	32	17½	-	1.05	40	10	10	15	20	8	3	-		.2	800	100	.5	-	96	4	-	12.0	Drilling	
11/2	164	17½	-	1.06	38	8	10	15	28	NC	-	-		.3	600	100	.25	-	93	7	-	12.5	Running Casing	
12/2	164	17½	-	1.05	33	6	6	8	15	NC	-	-		.2	500	60	.25	-	94	6	-	10.5	Nippling up	
13/2	389	12¼	-	1.08	200	15	30	35	85	12.0	8	-		.01	1000	TR	TR	-	89	11	-	8.5	Drilling	
14/2	802	12¼	-	1.08	36	7	10	12	17	15	4	-		.01	300	TR	.25	-	93	7	-	8.5	Drilling	
15/2	943	12¼	-	1.06	41	11	10	15	27	11.6	3	-		.3	850	20	TR	-	94	6	-	10.5	Logging	
16/2	943	12¼	-	1.06	41	11	10	15	27	11.6	3	-		.3	850	20	TR	-	94	6	-	10.5	Casing	
17/2	1060	8½	-	1.05	37	12	7	6	23	12.8	3	-		.6	400	TR	.25	-	94	6	-	11.0	Drilling	
18/2	1060	8½	-	1.05	37	12	8	6	24	13.5	3	-		.6	400	40	TR	-	94	6	-	11.0	Prepare to Test	
19/2	1060	8½	-	1.05	38	11	8	5	18	15.2	4	-		.6	400	TR	TR	-	94	6	-	11.0	"	
20/2	1278	8½	-	1.08	37	9	8	14	26	14.2	3	-		.7	600	TR	0.5	-	94	6	-	12.5	Test, drill Cmt. & form.	
21/2	1608	8½	-	1.08	38	13	9	7	32	11.5	3	-		.9	500	TR	.1	-	94	6	-	11.0	Drill	
22/2	1624	8½	-	1.08	38	12	9	7	28	13.9	3	-		.6	600	TR	.1	-	94	6	-	10.5	Fishing	
23/2		8½	-	1.09	37	12	8	6	26	14.5	3	-		.3	400	TR	TR	-	93	7	-	9.5	Drilling	
24/2	2008	8½	49	1.16	42	16	11	5	21	12.5	2	-		.3	350	40	.1	-	93	7	-	9.5	Drilling. Raised Wt. due to connection gas	
25/2	2090	8½	53	1.15	40	14	8	4	25	12.2	2	-		.3	300	80	.1	-	92	8	-	9.5	Trip at 2090m. Tight hole 1920 - [illegible]	

BAROID DIVISION N.L. INDUSTRIES
DRILLING FLUID PROPERTY RECAP

Company ·LEUM NL
Well CURDIE #1
Contractor/Rig RICHTER RIG 7

date 1982	depth m.	hole size "	temp. °c.	wt. sg.	vis. sec.	P.V.	Y.P.	gels 10 sec	gels 10 min	w.l. api	cake mm	w.l. hpht	°c	filtrate anal. pf	filtrate anal. Cl.ppm	filtrate anal. Ca.	sand %	retort anal.% oil	retort anal.% wat.	retort anal.% sol.	mbc kg/m³	PH	activity	form
26/2	2090	8½	42	1.17	61	22	18	7	35	8.4	2	-	-	.3	450	80	TR	-	93	7	-	9.0	Circulated at s reduced filtrat with CMC. Rea	
27/2	2095	8½	50	1.20	95	28	30	15	58	7.5	1	-	-	.3	500	40	.15	-	91	9	-	9.5	Reamed to 2090m. Drill ahead	
28/2	2185	8½	50	1.23	46	20	14	6	24	7.8	2	-	-	.35	1100	40	TR	-	90	10	-	9.5		
1/3	2236	8½	40	1.31	69	32	24	7	25	7.8	1	-	-	.5	800	40	.25	-	88	12	-	10.0		
2/3	2298	8½	-	1.34	70	32	25	6	27	7.0	1	-	-	.6	950	40	.1	-	87	13	-	10.0	Raised weight according to connection gas.	
3/3	2337	8½	53	1.33	58	23	21	7	36	6.2	1	-	-	.7	1100	40	.1	-	86	14	-	10.0		
4/3	2395	8½	55	1.28	45	19	17	5	23	6.6	1	-	-	.9	1200	40	.1	-	88	12	-	10.5		
5/3	2422	8½	53	1.27	41	15	15	5	20	6.2	1	-	-	1.2	1300	40	TR	-	88	12	-	11.0		
6/3	2456	8½	53	1.28	47	20	18	6	22	6.0	1	-	-	1.1	1300	40	TR	-	87	13	-	10.5		
7/3	2492	8½	56	1.25	46	19	18	5	18	5.9	1	-	-	1.2	1400	40	TR	-	89	11	-	10.5		
8/3	2518	8½	-	1.25	49	20	18	7	24	5.7	1	-	-	.85	1500	40	TR	-	88	12	-	10.0	Decision to T.D. Start Logging	
9/3	2518	8½	-	1.27	47	20	20	5	-	5.4	1	-	-	.9	1100	40	.25	-	87	13	-	10.0		
10/3	2518	8½	-	1.26	46	18	20	6	12	5.2	1	-	-	1.1	1400	40	.1	-	87	13	-	10.0	Ran open hole test. Tool stuck	
11/3	2518	8½	-	1.26	43	19	18	6	13	5.3	1	-	-	-	1400	40	.1	-	87	13	-	10.0	Fishing Test Tool	
12/3	2518	8½	-	1.25	45	20	18	6	12	5.2	1	-	-	1.0	1400	40	.1	-	87	13	-	10.0		
13/3	2518	8½	-	1.26	48	20	20	7	14	5.3	1	-	-	1.0	1400	TR	.1	-	87	13	-	10.0	Fishing Test Tool	

BAROID DIVISION N.L. INDUSTRIES
DRILLING FLUID PROPERTY RECAP

Company BEACH PETROLEUM NL
Well CURDIE # 1
Contractor/Rig RICHTER RIG 7

date 1982	depth m.	hole size "	temp. °C.	wt. sg.	vis. sec.	P.V.	Y.P.	gels 10 sec	gels 10 min	w.l. a.p.i	cake mm	w.l. hpht	°C	filtrate anal. pf	filtrate anal. Cl. ppm	filtrate anal. Ca.	sand %	retort anal.% oil	retort anal.% wat.	retort anal.% sol.	mbc kg/m³	PH	activity	form
14/3	2518	8½	-	1.25	50	23	20	8	16	5.8	1	-	-	1.5	1400	TR	.1	-	87	13	-	10.5	Fishing test tool	
15/3	2518	8½	-	1.27	50	23	19	8	16	6.2	1	-	-	.8	1400	TR	.1	-	87	13	-	9.5	"	
16/3	2518	8½	-	1.27	50	23	19	8	18	6.0	1	-	-	1.0	1400	TR	.2	-	87	13	-	10.0	"	
17/3	2518	8½	-	1.25	44	21	19	8	18	6.0	1	-	-	1.1	1500	20	¼	1.5	85.5	13	-	10.0	"	
18/3	2518	8½	-	1.25	48	21	20	8	19	5.8	1	-	-	1.0	1500	20	.1	1.5	86.5	12	-	10.0	"	
19/3	2518	8½	-	1.25	46	20	19	8	17	5.8	1	-	-	1.0	1500	20	.1	2.0	86	12	-	10.0	Retrieved fish	
20/3	2518	8½	-	1.24	43	20	18	7	17	4.8	1	-	-	1.4	1500	20	¼	2.0	87	11	-	10.5	Mill junk	
21/3	2543	8½	-	1.25	48	21	15	6	20	5.2	1	-	-	1.1	1500	20	¼	2.0	87	11	-	10.0	Drilling	
22/3	2575	8½	-	1.24	51	23	22	8	26	5.4	1	-	-	1.1	1500	TR	¼	1.5	87.5	11	-	10.0	Drilling	
23/3	2600	8½	-	1.26	48	24	19	9	29	5.3	1	-	-	1.4	1500	TR	¼	1.5	86.5	12	-	10.5	Drilling	
24/3	2600	8½	-	1.26	49	23	19	5	22	4.8	1	-	-	.8	1500	20	¼	1.5	85.5	13	-	10	Logging	
25/3	2600	8½	-	1.27	45	19	18	4	20	5.4	1	-	-	.8	1500	20	.1	1	88	11	-	9.5	Wiper Trip Logging	
26/3	2600	8½	-	1.27	49	20	18	4	18	4.8	1	-	-	.85	1500	20	.2	3	85	12	-	10	Wiper Trip Logging	
27/3	2600	8½																					P & A	

BIT RECORD

COUNTRY	AUSTRALIA
STATE	VICTORIA
FIELD	OTWAY BASIN
LOCATION	PETERBOROUGH
WELL	CURDIE # 1
CONTRACTOR	RICHTER DRILLING
RIG	NO. 7
OPERATOR	BEACH PETROLEUM
TOOL PUSHERS	C. BERG
SPUD	FEBRUARY 10, 1982
REACHED T.D.	MARCH 7, 1982
UNDER SURFACE	
UNDER INTER.	
PUMP NO.1 LINER	6x8½
PUMP NO.2 LINER	6x8½
PIPE	4½
COLLARS	6½
MUD	FW/GEL/CMC

no.	size	make	type	jets 32nd	depth out(m)	mtrs.	hours	m/h	accum. drlg. hours	tonne wt.	rpm	ver. dev.	pump pres. psi.	spm 1	spm 2	mud wt.	mud vis.	mud w.l.	formation, remarks
1	17½	HTC	OSC 3AJ	3x24	164	164	17¼		17¼	.5 - 1.4	75 - 120	½	600	150	90				
2	12¼	HTC	X3A	3x15	943	779	39.3/4		57	4.5	100	3/4	1700	100	100				
3	8½	HTC	J22	3x12	1060	117	5.3/4		62.3/4	7.0 - 7.3	80	1	925	100	-				
3RR	8½	HTC	J22	3x12	1617	651	33		95.3/4	7 - 9	80-90	1	1100	110	-				651m includes drilling c cement
4	8½	HTC	J22	3x12	2089	472	52.3/4		148½	7 - 8	80	2	1350	-	110				
5	8½	HTC	J22	3x12	2236	147	28½		177	7	85	4¼	1400	-	110				
6	8½	HTC	JD3	3x12	2298	62	17.3/4		195¼	4.5	100	5	2500	110	-				
7	8½	HTC	J22	3x12	2400	102	37		232¼	7	80	7	1600	-	110				
8	8½	HTC	J33	3x12	2447	47	14½		246.3/4	7	80-100	8	1550	-	110				
9	8½	HTC	J33	3x12	2518	71	38		284.3/4	5.5 - 6.5	75	9	1600	-	113				
10	8½	HTC	JD3	3x12	2563	45	-		-										
11	8½	HTC	JD3	3x12	2600	37	-												

BAROID MATERIAL RECAP SUMMARY

COMPANY BEACH PETROLEUM
LOCATION Peterborough, Vic
WELL NAM urdie #1
CONTRACT Richter
COST/DAY $1,530.55
COST/M $15.35
COST/M/D $0.59
COST/M^3 $33.14
COST/M^3/DA $1.27
RECAPPED BY
A. Searle
M. Olejniczak

MUD TYPES
1. Freshwater/gel
2. Freshwater/gel/native clay
3. Freshwater/gel/CMC

TOTAL DEPTH 2600m (RKB)
TOTAL ROTATING HRS.
TOTAL DAYS ON HOLE 45
DATE
DATE OF RECAP

	AMOUNT	
HOLE SIZE	HOLE DRILLING	DRILLING DAYS
17½"	157.2m	2
12¼"	779m	4
8½"	1657m	20
TOTAL	2593.2m	26

WELL AVERAGE
MUD CONSUMPTION

MATERIALS	UNIT	COST UNIT	QUANTITY				TOTAL COST	
			ESTIMATE	KG/m^3	ACTUAL	KG/m^3	ESTIMATE	ACTUAL
AQUAGEL	100 lb	$15.35			722			$11,082.70
CAUSTIC SODA	40 kg	$30.32			69			$2,092.08
CMC-LV	25 kg	$53.40			110			$5,874.00
CONDET	208 lt	$209.25			1			$209.25
Q-BROXIN	25 kg	$32.91			86			$2,830.26
SODA ASH	40 kg	$15.25			19			$289.75
SODIUM BICARB	40 kg	$17.11			23			$393.53
CALCIUM CHLORIDE	25 kg	$13.83			2			$27.66
BAROID	100 lb	$7.50			2266			$16,995.00
CHEMICAL	m^3				53.5			
SALVAGE MUD								
DIESEL OIL	m^3				5.9			
FRESH WATER	m^3				1141.4			
SEA WATER								
TOTAL MUD MADE	m^3				1200.8			
COST LESS BARYTES								$22,799.23
COST WITH BARYTES								$39,794.23

COMMENTS Barite used to raise weight to 1.25 - 1.27 S.G. to control gas and cavings from Belfast Formation.

BAROID MATERIAL RECAP

COMPANY BEACH PETROLEUM NL
LOCATION Peterborough, Victoria
WELL Curdie # 1
COST/DAY $873.62
COST/M $11.11
COST/M/DAY $5.56
COST/M³ $12.48
COST/M³/DAY $6.24

MUD TYPE Freshwater/gel
CONTRACTOR Richter
DRILLING DAYS/PHASE 2
ROTATING HRS/PHASE 17½
TOTAL DRILLING 157.2m
MUD CONSUMPTION FACTOR 0.89m³/m
DATE

PHASE HOLE SIZE 17½"
INTERVAL TO 164m
FROM surface
(6.78m - RKB)

MATERIAL	UNIT	COST UNIT	QUANTITY				TOTAL COST	
			ESTIMATE	KG/M³	ACTUAL	KG/M³	ESTIMATE	ACTUAL
AQUAGEL	100 lb	$15.35	100		100			$1,535.00
CAUSTIC SODA	40 kg	$30.32	6		7			$212.24
SODA ASH	40 kg	$15.25	6		-			
CHEMICAL	m³							
DIESEL					8			
FRESH WATER	m³							
SEA WATER					132			
TOTAL MUD MADE	m³							
COST LESS BARYTES					140			
COST W/BARYTES								$1,747.24
								$1,747.24

COMMENTS No SODA ASH used, local water supply very soft - only 40 ppm hardness. Mud making marl below 126m. Required heavy dilution to control viscosity.

BAROID MATERIAL RECAP

COMPANY BEACH PETROLEUM NL
LOCATION Peterborough, Victoria
WELL Curdie # 1
COST/DAY $854.66
COST/M $4.39
COST/M/DAY $1.10
COST/M³ $7.94
COST/M³/DAY $1.99

MUD TYPE Freshwater/gel/ native clay
CONTRACTOR Richter
DRILLING DAYS/PHASE 4
ROTATING HRS/PHASE 39.3/4
TOTAL DRILLING 779m
MUD CONSUMPTION FACTOR $0.553 m^3/m$
DATE

PHASE HOLE SIZE 12¼"
INTERVAL TO 943m
FROM 164m

MATERIAL	UNIT	COST UNIT	QUANTITY				TOTAL COST	
			ESTIMATE	KG/M³	ACTUAL	KG/M³	ESTIMATE	ACTUAL
AQUAGEL	100 lb	15.35	120		150			2,302.50
CAUSTIC SODA	40 kg	30.32	–		8			242.56
CMC (LV)	25 kg	53.40	10		10			534.00
CONDET	208 lt	209.25	2		1			209.25
SODA ASH	40 kg	15.25	15		–			–
SODIUM BICARB	40 kg	17.11	5		6			102.66
CALCIUM CHLORIDE	25 kg	13.83	–		2			27.66
CHEMICALS	m³				4.5			
DIESEL								
FRESH WATER	m³				426			
SEA WATER								
TOTAL MUD MADE	m³				430.5			
COST LESS BARYTES								3,418.63
COST W/BARYTES								3,418.63

COMMENTS 10 sacks AQUAGEL and 2 sacks CALCIUM CHLORIDE used for 9.5/8" casing cement job. Heavy dilution with water while drilling Gumbo Clay.

BAROID MATERIAL RECAP

COMPANY BEACH PETROLEUM NL
LOCATION Peterborough, Victoria
WELL Curdie # 1
COST/D[illegible] $1,731.42
COST/M[illegible] $20.90
COST/M[illegible] $1.04
COST/M[illegible] $54.94
COST/M[illegible]AY $2.75

MUD TYPE Freshwater/gel/ CMC
CONTRACTOR Richter
DRILLING DAYS/PHASE 20
ROTATING HRS/PHASE -
TOTAL DRILLING 1657m
MUD CONSUMPTION FACTOR 0.38m³/m
DATE

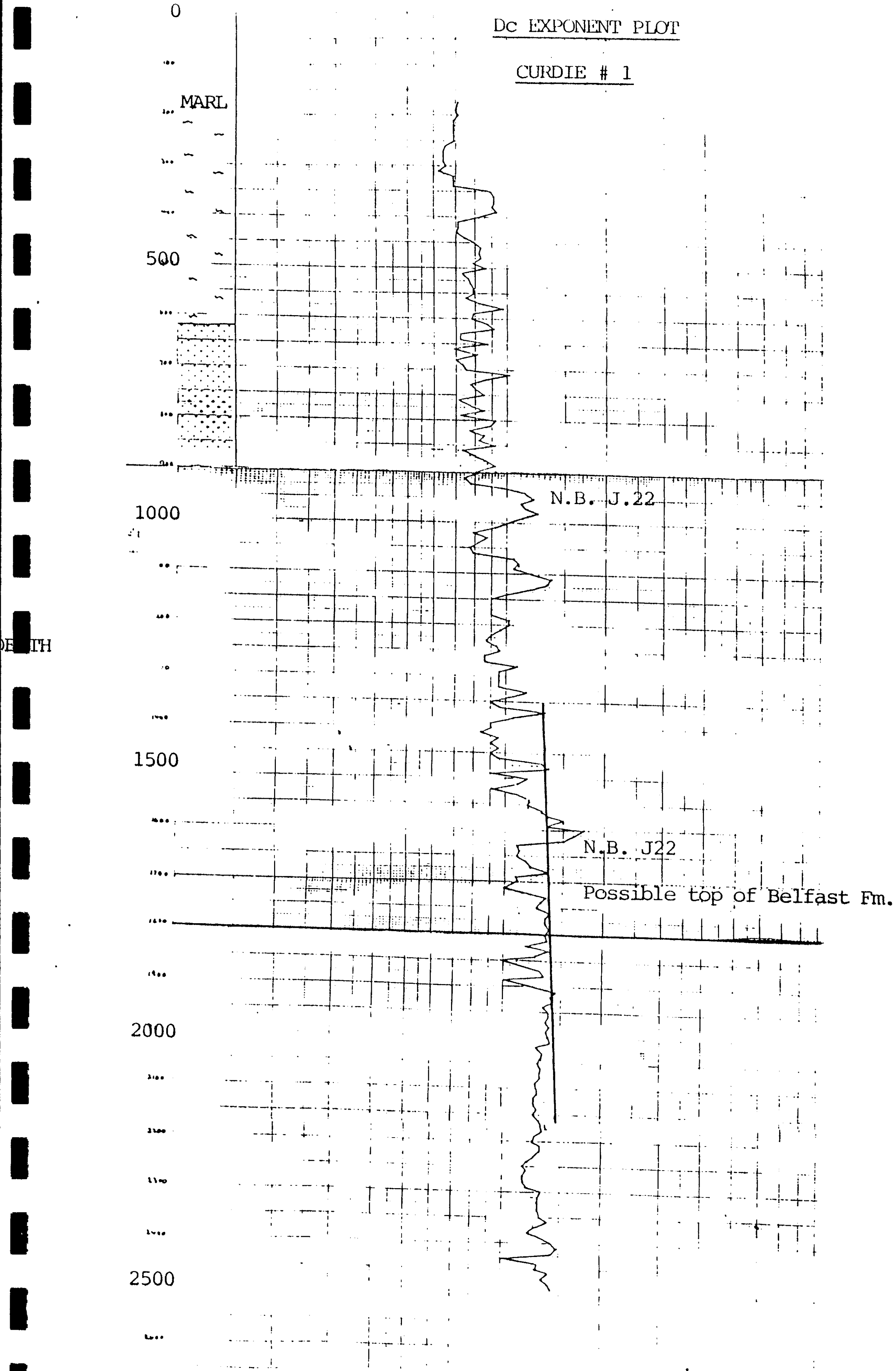
PHASE HOLE SIZE 8½"
INTERVAL TO 2600m
FROM 943m

MATERIAL	UNIT	COST UNIT	QUANTITY ESTIMATE	KG/M³	ACTUAL	KG/M³	TOTAL COST ESTIMATE	ACTUAL
AQUAGEL	100 lb	15.35			472			$7,245.20
CAUSTIC SODA	40 kg	30.32			54			$1,637.28
CMC LV	25 kg	53.40			100			$5,340.00
Q-BROXIN	25 kg	32.91			86			$2,830.26
SODA ASH	40 kg	15.25			19			$289.75
SODIUM BICARB.	40 kg	17.11			17			$290.87
BAROID	100 lb	7.50			2266			$16,995.00
CHEMICAL	m³							
DIESEL	m³				41			
FRESH WATER	m³				5.9			
SEA WATER					583.4			
TOTAL MUD MADE	m³							
COST LESS BARYTES					630.3			
COST W/BARYTES								$17,633.36
								$34,628.36

COMMENTS Raised mud weight to 1.25 - 1.27 S.G. while drilling Belfast Formation. Stuck test [illegible]ing while attempting D.S.T. at 2518m, spent 12 days recovering fish and milling up ju[illegible] T.D. at 2600m, unable to run complete set of electric logs due to hole condition. Plugg[illegible] and abandoned.

Dc EXPONENT PLOT

CURDIE # 1



APPENDIX 2

SHALE FACTOR ANALYSIS

Baroid Australia PTY. LTD./ NL INDUSTRIES INC.
2nd Floor, 189 St. George's Terrace, Perth, West Australia
Mail Correspondence: P.O. Box 7114, Cloister Square, Perth, 6000
Telephone: (09) 321 2355
Telex: AA 92840

REF: BA116/82:DP:sgv

April 21, 1982

Mr Gary Scott
Drilling Manager
Beach Petroleum
360 Collins Street
MELBOURNE Vic 3000

Dear Gary,

We received some samples of the Belfast Member from your Curdies No. 1 well taken from between 2,000m and 2,100m.

Shale factors run on all these samples ranged between 6 and 6.5. The inference is that these mudstones do contain significant quantities of reactive clays and can therefore be regarded as potentially troublesome.

I am sure this is no revelation to you but it at least puts a number to your observations. It may be of interest also when analysing the benefits of the KCl mud system run on Braeside No. 1.

I look forward to seeing you again before too long.

Best regards.

Yours faithfully,

Dave Parry

D.E. Parry
DISTRICT OPERATIONS
SUPERVISOR

RECEIVED
22 APR 1982

BEACH PETROLEUM

CURDIES NO. 1

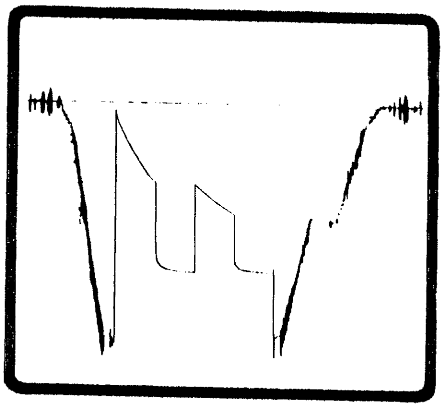
Composite Belfast 2,000 - 2,100m	6.5	S.F.	(m.e.q. of methylene blue/ 100 gms of sample)
Continued (large bag)	6.5	S.F.	(m.e.q. of methylene blue/ 100 gms of sample)
Continued (small bag)	6	S.F.	(m.e.q. of methylene blue/ 100 gms of sample)

APPENDIX 3

FORMATION TESTING SERVICE REPORT

D . S . T . NO. 1 RESULT

FORMATION TESTING SERVICE REPORT



HALLIBURTON
SERVICES

Duncan, Oklahoma 73536

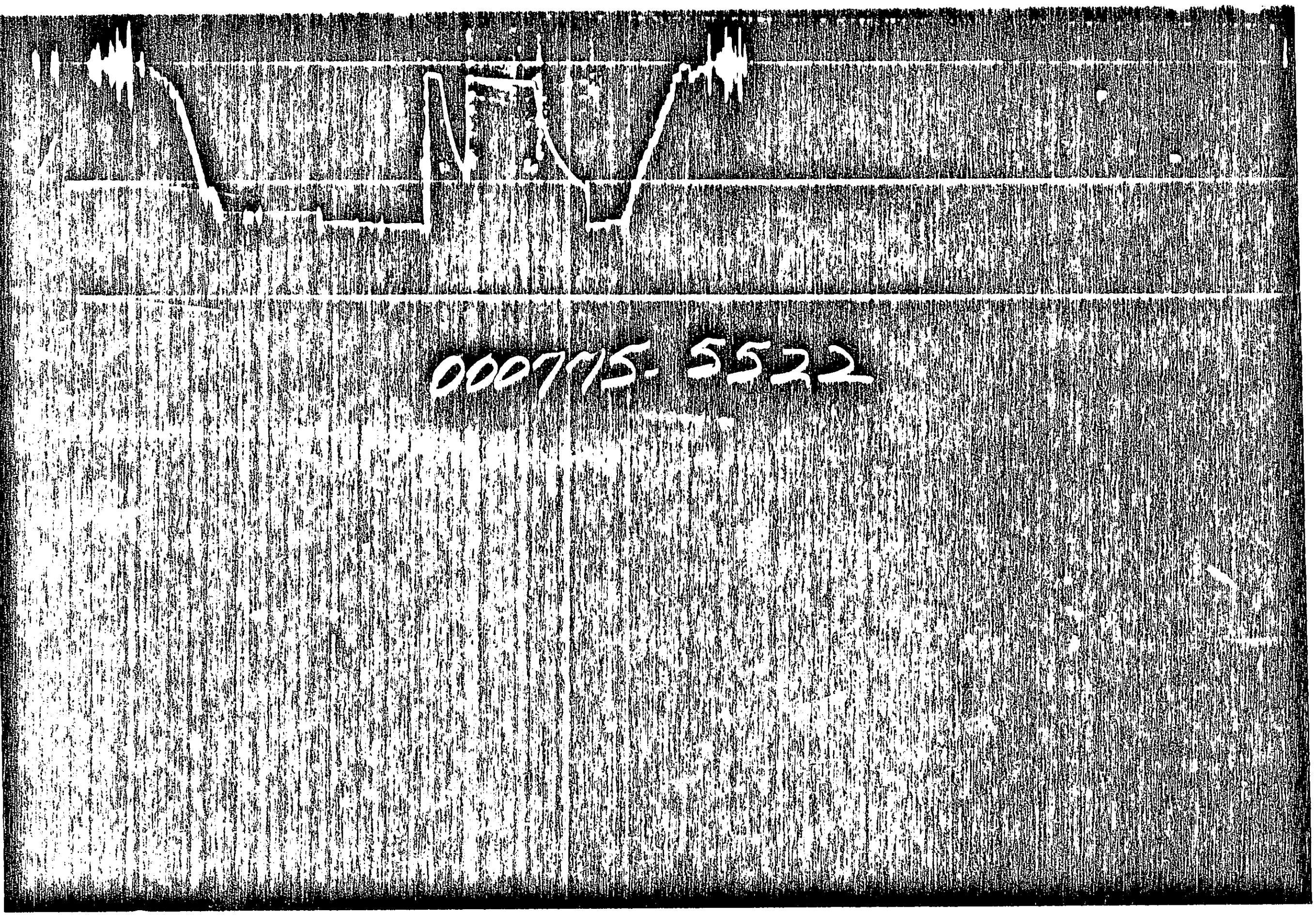
A Halliburton Company

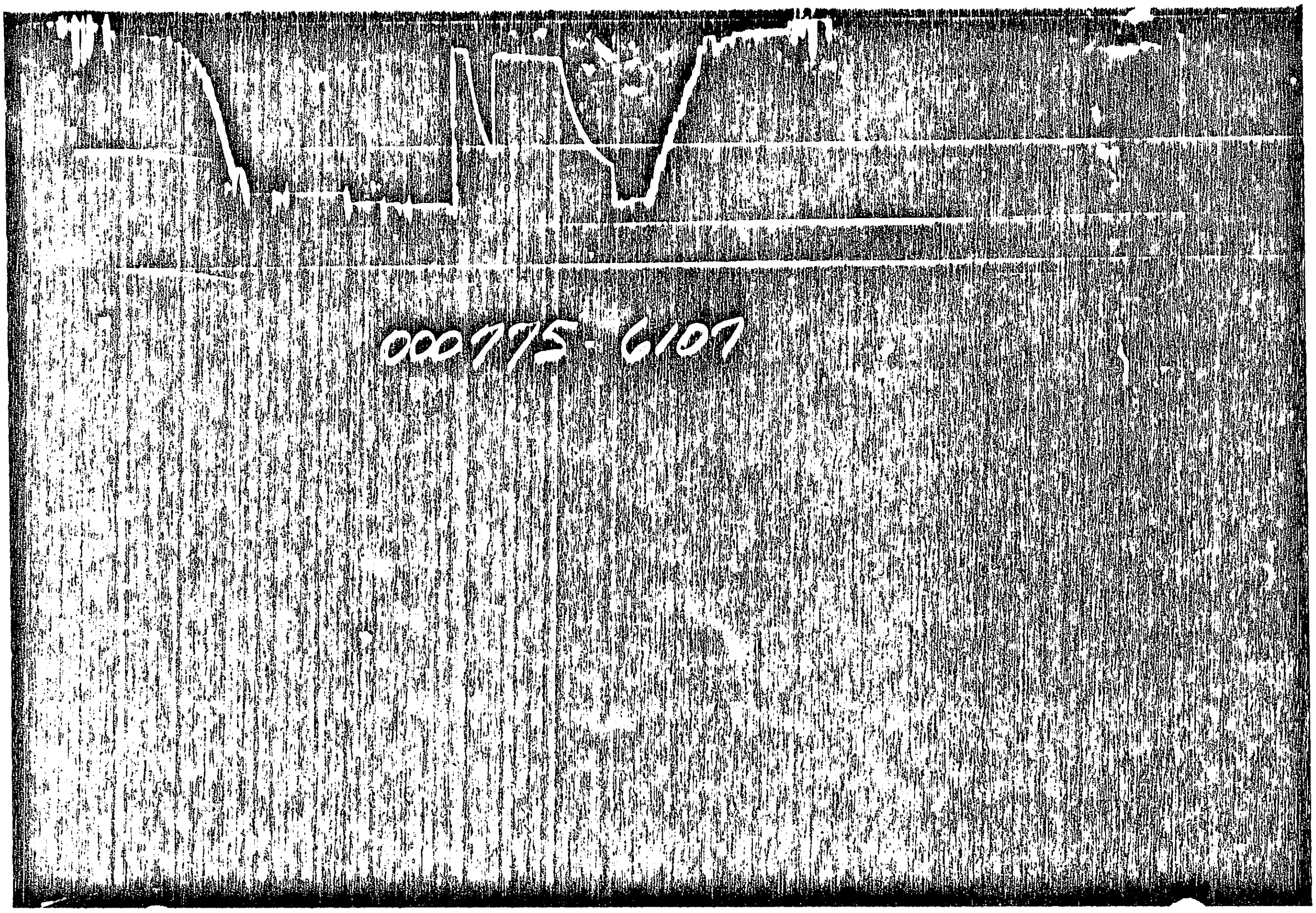
CURDIE 1

1

3048 - 3269'

BEACH PETROLEUM N.L.


000775-5522


000775-6107

CURDIE	1	1	3048 - 3269'	BEACH PETROLEUM N.L.
Lease Name	Well No.	Test No.	Tested Interval	Lease Owner/Company Name

000775	ADELAIDE	2-19-82	5522 6107
Ticket Number	Camp	Date	Gauge Number(s)

3

HALLIBURTON
SERVICES

TICKET NO. 000775 DATE 2-19-82 HALLIBURTON CAMP ADELAIDE

LEASE OWNER BEACH PETROLEUM N.L. IC/sm

LEASE NAME CURDIE WELL NO. 1 TEST NO. 1

LEGAL LOCATION LAT 38° - 33' 14 LONG 142° - 49 19 FORMATION TESTED PEBBLE POINT

FIELD AREA WILDCAT COUNTY VICTORIA STATE AUSTRALIA

TYPE OF D.S.T. CASED HOLE

TESTER(S) P. LARKINS - L. TREVEROR

WITNESS DRILLING CONTRACTOR RICHTER RIG # 7

DEPTHS MEASURED FROM ROTARY KELLY BUSHING CASING PERFS (FT.)

TYPE AND SIZE OF GAS MEASURING DEVICE 5" SURFACE CHOKE

CUSHION DATA

TYPE AMOUNT WEIGHT (lb./gal.)

TYPE AMOUNT WEIGHT (lb./gal.)

RECOVERY (ft. or bbl.):

372 FEET OF MUD

FLUID PROPERTIES

SOURCE	RESISTIVITY	CHLORIDES (PPM)	SOURCE	RESISTIVITY	CHLORIDES (PPM)
	@ °F			@ °F	
	@ °F			@ °F	
	@ °F			@ °F	

REMARKS:

TICKET NO. 000775 DATE 2-19-82 ELEVATION (FT) +32

TOP OF TESTED INTERVAL (ft.) 3048 BOTTOM OF TESTED INTERVAL (ft.) 3269

NET PAY (ft.) 10 TOTAL DEPTH (ft.) 3269

HOLE OR CASING SIZE (in.) 8.5 MUD WEIGHT (lb./gal.) 8.8 VISCOSITY (sec.) 40

SURFACE CHOKE (in.) .5 BOTTOM CHOKE (in.) .75

OIL GRAVITY ____ @ ____ °F GAS GRAVITY—ESTIMATED ____ ACTUAL ____

SAMPLER DATA

PRESSURE (P.S.I.) ____ CUBIC FT. OF GAS ____

C.C.'s OF OIL ____ C.C.'s OF WATER ____

C.C.'s OF MUD ____ TOTAL LIQUID C.C.'s ____

GAS/OIL RATIO (cu. ft. per bbl.)

FROM SAMPLER ____ OTHER ____

TEMPERATURE (°F)

ESTIMATE 120

ACTUAL 124

DEPTH (ft.) 3264

H.T.-500 ☐; THERMOMETER ☒; T.E. OR R.T.-7 ☐; OTHER ☐

SERIAL NO. ____

RECORDER AND PRESSURE DATA

CHARTS READ BY P. LARKIN DATA APPROVED BY ____

RECORDERS	GAUGE NUMBER	5522	6107		
	GAUGE TYPE	1	2		
	GAUGE DEPTH (ft.)	3033	3266		
	CLOCK NUMBER	26294	9474		
	CLOCK RANGE (HR.)	24	24		
PRESSURES	INITIAL HYDROSTATIC	1394.6	1498.7		
1st.	INITIAL FLOW	92.7	226.1		
1st.	FINAL FLOW	110.1	230.6		
1st.	CLOSED-IN	991.6	1088.1		
2nd.	INITIAL FLOW	131.5	262.7		
2nd.	FINAL FLOW	172.7	301.3		
2nd.	CLOSED-IN	1076.3	1181.3		
3rd.	INITIAL FLOW				
3rd.	FINAL FLOW				
3rd.	CLOSED-IN				
	FINAL HYDROSTATIC	1391.5	1495.8		

TIMES (00:00-24:00 HRS.)

TOOL OPENED 0715

DATE 2-19-82

BYPASS OPENED 1021

DATE 2-19-82

PERIOD	MINUTES
XXX	XXX
1st. FLOW	16.8
1st. C.I.P.	29.3
XXX	XXX
2nd. FLOW	79.6
2nd. C.I.P.	59.3
XXX	XXX
3rd. FLOW	
3rd. C.I.P.	
XXX	XXX

Casing perfs.______ Bottom choke______ Surf. temp.______ °F Ticket No. 000775

as gravity______ Oil gravity______ GOR______

pec. gravity______ Chlorides______ ppm Res.______ @______ °F

INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED______

te me a.m. p.m.	Choke Size	Surface Pressure psi	Gas Rate MCF	Liquid Rate BPD	Remarks
400					Made up tools and ran in hole.
0315-0330					Made up head.
345-0500					Waited on daylight.
0500					Ran in hole.
0600					Head up.
715	.5				Opened hydrospring.
0718					Hydrospring opened with strong blow.
733					First CIP-no surface pressure.
0735					Closed DCIP.
805					DCIP opened with strong blow.
921					Closed tool.
1021					Came out of hole.
					(No surface PSI encountered.)
1330					Tools out of hole.

PRODUCTION TEST DATA

INCREMENTAL PRESSURES FOR TICKET NUMBER 000775

B. T. No. 5522 Depth 3033'			B. T. No. 6107 Depth 3266'			B. T. No. Depth		
Time Defl (minutes)	Log (t + θ)/θ	PSIG Temp Corr	Time Defl (minutes)	Log (t + θ)/θ	PSIG Temp Corr	Time Defl (minutes)	Log (t + θ)/θ	PSIG Temp Corr
FIRST FLOW			FIRST FLOW					
0		92.7	0		226.1			
3		92.7	3		220.0			
6		96.7	6		220.7			
9		99.8	9		223.1			
12		103.5	12		225.9			
15		107.9	15		228.9			
16.8		110.1	16.8		230.6			
FIRST CIP PERIOD			FIRST CIP PERIOD					
0		110.1	0		230.6			
3		298.7	3		414.9			
6		432.8	6		553.7			
9		545.2	9		670.0			
12		650.0	12		771.6			
15		730.4	15		849.1			
18		801.1	18		911.2			
21		861.0	21		969.6			
24		913.9	24		1017.0			
27		958.4	27		1063.9			
29.3		991.6	29.3		1088.1			
SECOND FLOW			SECOND FLOW					
0		131.5	0		262.7			
15		135.0	15		267.9			
30		150.7	30		273.3			
45		155.3	45		281.5			
60		162.8	60		290.5			
79.6		172.7	79.6		301.3			
SECOND CIP PERIOD			SECOND CIP PERIOD					
0		172.7	0		301.3			
5		359.0	5		487.9			
10		504.4	10		631.0			
15		619.2	15		740.5			
20		712.6	20		831.7			
25		787.9	25		905.0			
30		851.8	30		965.9			
35		906.6	35		1018.3			
40		958.8	40		1064.5			
45		998.0	45		1102.3			
50		1032.9	50		1135.5			
55		1059.0	55		1163.3			
59.3		1076.3	59.3		1181.3			

Remarks:

81-350

TICKET NO. 000775

Tool Description	O.D.	I.D.	Length	Depth
DRILL PIPE	4.5"	3.826"	2644.3'	
DRILL COLLARS	6.5"	2.81"	280.46'	
REVERSING SUB	6.125"	2.875"	1'	2924.76'
DRILL COLLARS	6.5"	2.81"	91.92'	
X/O	5.75"	3"	.67'	
HANDLING SUB	5.75"	2.3"	2.65'	
DUAL CIP VALVE	5"	.87"	5'	
HYDROSPRING TESTER	5"	.75"	5'	3031'
AP RUNNING CASE	5"	3.06"	4'	3033'
JARS	5"	1.75"	5'	
VR SAFETY JOINT	5"	1"	2.9'	
PACKER	7.75"	1.68"	6'	3048'
FLUSH JOINT ANCHOR	5"	2.37"	10'	
X/O	5.75"	2.375"	1.04'	
DRILL COLLARS	6.5"	2.81"	184.24'	
X/O	5.75"	2.5"	.66'	
FLUSH JOINT ANCHOR	5"	2.37"	20'	
BLANKED OFF BT RUNNING CASE	2.44"	-	4'	3266'
TOTAL DEPTH				3269'

EQUATIONS FOR DST LIQUID WELL ANALYSIS

Transmissibility	$\frac{kh}{\mu} = \frac{162.6\ QB}{m}$	$\frac{md\text{-}ft}{cp}$
Indicated Flow Capacity	$kh = \frac{kh}{\mu}\mu$	md-ft
Average Effective Permeability	$k = \frac{kh}{h}$	md
Damage Ratio	$DR = .183\ \frac{P^* - P_f}{m}$	—
Theoretical Potential w / Damage Removed	$Q_1 = Q\ DR$	BPD
Approx. Radius of Investigation	$r_i = 4.63\sqrt{kt}$	ft

EQUATIONS FOR DST GAS WELL ANALYSIS

Indicated Flow Capacity	$kh = \frac{1637\ Q_g\ T}{m}$	md-ft
Average Effective Permeability	$k = \frac{kh}{h}$	md
Skin Factor	$S = 1.151\left[\frac{m(P^*) - m(P_f)}{m} - LOG\ \frac{kt}{\phi\ \mu\ c_t r_w^2} + 3.23\right]$	—
Damage Ratio	$DR = \frac{m(P^*) - m(P_f)}{m(P^*) - m(P_f) - 0.87\ mS}$	—
Indicated Flow Rate (Maximum)	$AOF_1 = \frac{Q_g\ m(P^*)}{m(P^*) - m(P_f)}$	MCFD
Indicated Flow Rate (Minimum)	$AOF_2 = Q_g\sqrt{\frac{m(P^*)}{m(P^*) - m(P_f)}}$	MCFD
Approx. Radius of Investigation	$r_i = 0.032\sqrt{\frac{kt}{\phi\mu c_t}}$	ft

APPENDIX 4

(D.S.T. NO. 2)

BEACH PETROLEUM NL | CURDIE No. 1 | DRILLSTEM TEST No. 2

INTERVAL: 2454-2518m | DATE: 8/3/1982 | LOGGING GEOLOGIST: A.Rivett

The packer was set at 2454 metres with no cushion. Tool opened initially for 25 minutes with a moderate blow, decreasing to zero after 5 minutes. Well shut in for 10 minutes. Tool reopened for 7 minutes with a zero blow.

Upon commencing to POOH, the tool was found to be stuck. After repeated jarring was unsuuccessful in releasing the tool, it was backed off at the safety joint. The tool was eventually fished on 19/3/82.

No recovery was possible and the pressure chart destroyed in the fishing operation.

APPENDIX 5

FISHING OPERATION

CURDIE NO. 1

FISHING OPERATIONS FOR HALLIBURTON DST TOOLS

8TH MARCH, 1982

Schlumberger logged Curdie No. 1 using the Dual Laterologs/Caliper, Borehole Compensated Sonic/Gamma Ray and Velocity Survey tool. The results of these surveys justified the running of an open-hole drill stem test tool to further evaluate the formation.

9TH MARCH, 1982

In preparations for running the drill stem test a bit was run into the well hole to check that the hole was in good condition and circulate the well clean prior to running the test tools. DST tools were picked up an run into the well to test the interval 2455-2518m. The test tool was opened for an initial period of 30 minutes with a weak blow to surface which died after 25 minutes. The tool was then shutin for 60 minutes and reopened for a further 15 minute flow period. This flow period indicated that the well was not producing any fluid at all and it was decided to terminate the drill stem test at that point in time. Upon attempting to remove the DST tools it became apparent that they had become firmly stuck in the hole. Attempts to recover the drill stem test tools by using the hydraulic jars, a type of down hole hammer included in the tool assembly, moved the test tools approximately 2 ½ metres during the first half hour. Further attempts to jar the tools out of the hole were unsuccessful and after an additional 4¼ hours of jarring the jars finally failed to function anymore.

10TH MARCH, 1982

At this point in time it was decided to release the upper part of the DST tool assembly at a piece of equipment called the safety joint, which is located immediately above the rubber packer elements which are used to seal the tool assembly within the hole. The safety joint successfully backed off and the upper part of the test tool assembly was recovered. The next phase of the operation involved running an overshot and a larger set of hydraulic jars. The overshot is designed to go over the top of the fish and latch on by a taper assembly. It was expected with the aid of the larger jars that a successful jarring operation could be carried out. Considerable difficulty was experienced in trying to work the overshot over the top of the fish. Surface indications suggested that the packing element of the upper packer had been extruded up above it's normal location and was now adjacent to the lower part of the safety joint. Indications of rubber were seen on surface and high torque also confirmed the presence of the rubber packing element in this area making the operation of trying to go over the top of the fish and latch on very difficult.

.../

11TH MARCH, 1982

The overshot assembly was removed from the hole and a washover assembly picked up and run in the hole. Tight spots were experienced at 1250 metres, 1360 metres and 1630 metres. At 1630 metres little progress was being made and it was decided to pull the assembly out of the hole and run a drilling bit.

12TH MARCH, 1982

Light reaming was required at 1400 metres and from 1600 to 1700 metres. The bit was then run to bottom, the well circulated clean and the drilling bit pulled out prior to rerunning the washover assembly. The washover assembly was picked up and run in the hole encountering a tight area from 1350 to 1395 metres.

13TH MARCH, 1982

After working through this tight area the washover assembly once again held up at 1630 metres and the assembly was pulled out of the hole. A drilling bit was once again run to bottom and the hole circulated clean prior to pulling out to run the washover assembly. The washover assembly was picked up and successfully run to bottom. The top packer was washed over and the lower packer confirmed to be in its correct location.

14TH MARCH, 1982

The washover assembly was recovered and a 5" overshot run back in the hole with the object of latching onto the fish and jarring the assembly out of the hole. The 5" overshot was successfully worked over the fish but, after two jars unlatched from the fish and we were unable to relatch the mechanism. Upon recovery from the hole it is apparent that the overshot had been fully engaged and hence it was decided to run a slightly small overshot of 4-7/8" ID and attempt to latch on with this assembly. The 4-7/8" overshot also jarred off after one jarring action.

15TH MARCH, 1982

The 4-7/8" overshot assembly was recovered and a 4-3/4" overshot assembly run. The 4-3/4" overshot assembly jarred freed after 35 jarring attempts at an overpull of 30,000 kilograms. No movement occured during this jarring operation. The 4-3/4" overshot could not be relatched and hence the assembly was pulled out of the hole. At this point in time it was decided to washover the remaining section of the DST tool. A 7-5/8" washover assembly was run into the hole.

16TH MARCH, 1982

The special washover milling assembly was worked over the fish and the lower packer at 2457m. was milled up. This assembly was then recovered.

17TH MARCH, 1982

An extra long washover assembly was made up and run in the hole. The fish was then washed over all the way down to 2516.4 metres, approx. 1.6 metres short of the bottom of the well.

.../

18TH MARCH, 1982

The well was circulated and conditioned and the washover assembly pulled out. An extra long 5" overshot was then assembled and run in the hole. The overshot was worked over the fish and after 3 hours of jarring the fish came free.

19TH MARCH, 1982

The fish was recovered from the hole and layed down at surface. A magnet was then run in the hole to pick up steel junk which had been lost during the fishing operation. The magnet encountered an obstruction at 2514.5 metres, which caused considerable difficulty and hence, needed to be removed prior to drilling on. The magnet was pulled out of the hole.

20TH MARCH, 1982

A flat bottomed mill was run in the hole and the obstruction at 2514.5 metres was milled back and the hole cleaned down to 2518.8 metres which in effect deepened the well approximately .8 of a metre. The well was then circulated clean and the flat bottomed mill pulled out. At 1430 hours on the 20th March, 1982, normal drilling ahead operations resumed with the commencement of running a new bit into the hole to proceed with drilling ahead.

EXPLORATION LOGGING

HYDROCARBON SHOW EVALUATION REPORT

COMPANY: BEACH PETROLEUM NL
WELL: CURDIE # 1

DATA

SHOW INTERVAL 1006m-1015m DATE: 17/2/82

MUD PROPERTIES DEPTH 1060m W 1·05s.g. V 37 F 12·8 Cl 400 OIL nil

DRILLING PARAMETERS	BEFORE	DURING	AFTER
GPM PP	WOB 15 RPM 80 TORQ	WOB 15 RPM 80 TORQ	WOB 15 RPM 80 TORQ
DRILL RATE	25-30m/hr	60m/hr (% INCR 100%	70m/hr
MUD SALINITY (ppm Cl)	400	400	400

LITHOLOGY: SANDSTONE(100%),clear-yellow orange-brown,loose,medium-coarse,dominantly medium,subangular to subrounded,well sorted,quartz grains,with up to 5% iron oxide grains,minor iron oxide cement and matrix, fair to good visual porosity and permeability

GAS (1 UNIT - 200 PPM CH_4 IN AIR) LAST CARBIDE: DEPTH UNITS MW V

	BEFORE		DURING		AFTER	
DITCH GAS (UNITS)	TOTAL trace	PV trace	TOTAL trace	PV trace	TOTAL trace	PV trace
CUTTING GAS (UNITS)	TOTAL nil	PV nil	TOTAL trace	PV nil	TOTAL trace	PV nil
CHROMATOGRAPH	PPM	% Cn/ΣC	PPM	% Cn/ΣC	PPM	% Cn/ΣC
METHANE C_1	10 ppm	100%	10 ppm	100%	10 ppm	100%
ETHANE C_2	0		0		0	
PROPANE C_3	0		0		0	
ISO BUTANE iC_4	0		0		0	
N-BUTANE nC_4	0		0		0	
PENTANE C_5	0		0		0	
TOTAL ΣC	10 ppm		10 ppm		10 ppm	
NON COMBUSTIBLE GAS TYPE, %	none detected		none detected		none detected	

OIL

ODOUR nil SAMPLE nil BLENDOR nil

OIL IN MUD sample contam by pipe dope-no distinction possible. BLENDOR SAMPLE OIL nil

LIVE OIL IN UNWASHED CUTTINGS IMMERSED IN WATER SURFACE APPEARANCE As above % OF SURFACE ---

OIL STAIN OF WASHED RESERVOIR SAMPLE % 20 DISTRIBUTION patchy COLOR medium-dark brown

FLUORESCENCE OF WASHED RESERVOIR SAMPLE % 20 DISTRIBUTION patchy COLOR yellowish/orng COLOR INTENSITY dull-mod bri

CUT, FLUORESCENT RATE rapid TYPE streaming COLOR yellowish/white COLOR INTENSITY mod bright

CUT, NATURAL: COLOR light straw COLOR INTENSITY weak

EVALUATION REMARKS: From the fluorescence and solvent reaction,this section appears to contain some live oil saturation. The exact depth intervals are uncertain due to the rapid penetration rate,combined with no associated gas readings. The gas detection equipment was checked by Calcium Carbide tracer after the oil show and was operative. A blender on the drilling mud,during the show interval,gave no gas.

SHOW EVALUATION CONCLUSIONS This unit appears to have oil saturation,with good flow characters.

FLUID TYPE Oil

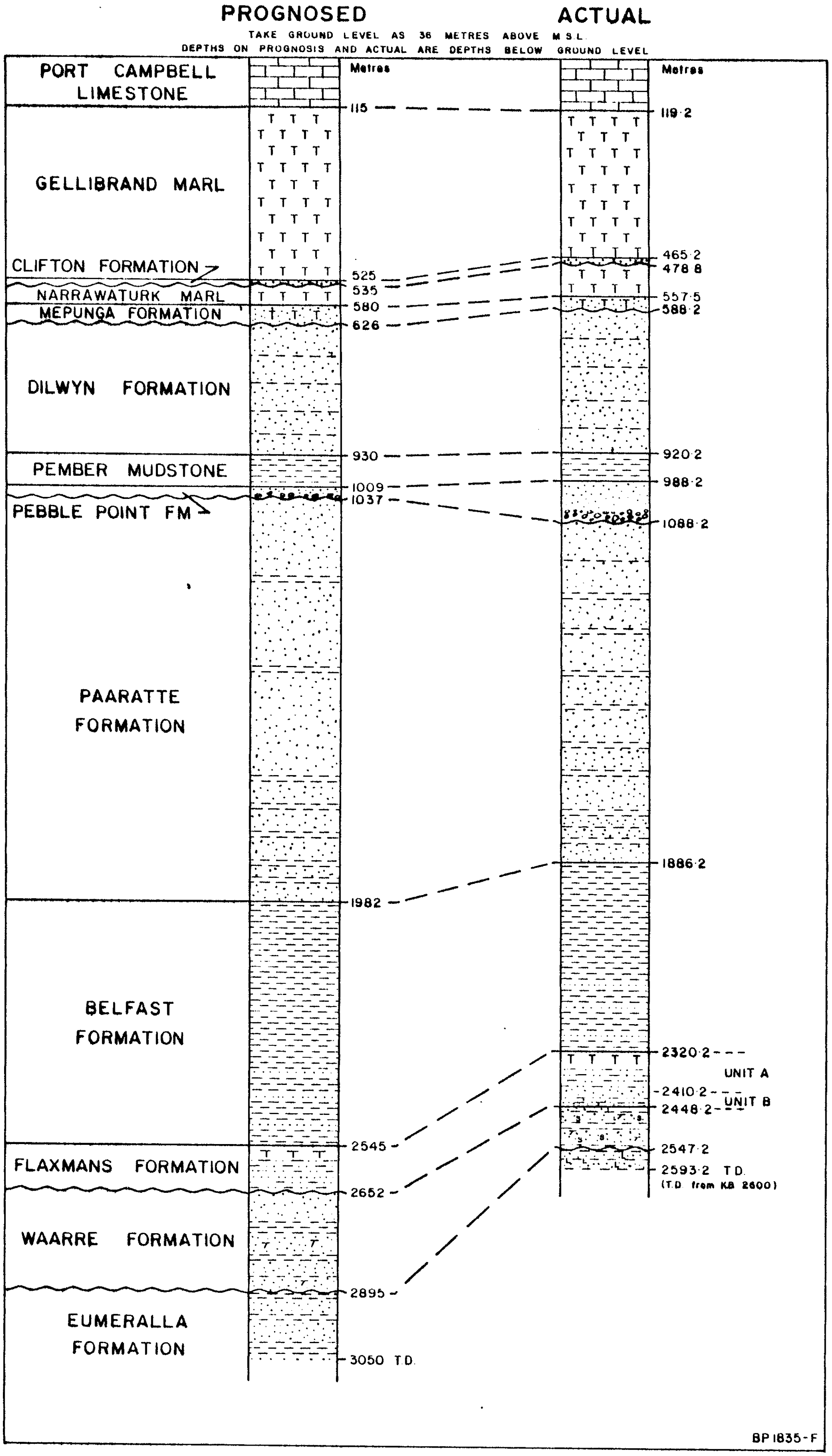
PRODUCTION POTENTIAL Recommended testing to ascertain degree of oil saturation. Flow properties should be good.

LOGGING GEOLOGIST A.Rivett

APPENDIX 7

CURDIE No.1

FORMATION TOPS



APPENDIX 8

SOURCE ROCK STUDIES

RESULT

BY : A. C. COOK

CURDIE No. 1

K.K. No.	Depth (m)	$\bar{R}_v max$	Range	N	Exinite Fluorescence (Remarks)
					BELFAST MUDSTONE 1893m
15488	1895-1915 Ctgs	0.49	0.37-0.65	20	Rare sporinite, cutinite, dinoflagellates and resinite, yellow orange to orange. (Siltstone with some carbonate and rare coal. D.o.m. sparse tending common, I>E=V. Vitrinite rare. Pyrite sparse.)
15489	1990-2010 Ctgs	0.49	0.38-0.56	7	Rare sporinite and dinoflagellates, yellow to orange. (Siltstone, calcareous microfossils, ?glauconite pellets. D.o.m. sparse, I>E>V. Vitrinite rare. Pyrite sparse to common.)
15490	2090-2110 Ctgs	0.60	0.59-0.60	2	Rare liptodetinite, yellow to orange. (Claystone and mudstone, d.o.m. sparse, I>E>V. Inertinite sparse, vitrinite very rare.)
15491	2190-2210 Ctgs	0.49	0.48-0.50	2	Rare dinoflagellates, greeinsh yelow to orange. (Mudstone, d.o.m. sparse to common, I>>E>V. Inertinite sparse to common, vitrintie very rare. Pyritized foraminifers present. Sparry calcite is present, some of this has bright orange fluorescence.)
15492	2290-2310 Ctgs	0.82 0.52 1.04	0.77-0.84 0.45-0.58 1.02-1.05	4 2 2	Rare dinoflagellates, yellow to orange, ?sporinite orange. (Siltstone, d.o.m common, I>E>V. Inertinite common. Vitrinite population poorly defined. The modes with higher reflectance appear to be oxidized or heat altered. The lowest of the modes is most likely to be representative of the horizon sampled. Pyrite common.)
					FLAXMAN UNIT A. 2327m
15493	2330-2350 Ctgs	0.57	0.50-0.63	2	Rare sporinite cutinite and dinoflagellates, yellow orange to orange. (Mudstone, some sandy, rare claystone. D.o.m. sparse, I>E>V, Inertinite sparse, vitrinite very rare. Pyrite sparse.)
15494	2390-2410 Ctgs	0.57	0.52-0.62	2	Rare cutinite yellow to orange and dinoflagellates, orange. (Siltstone>claystone, d.o.m. I>E>V. Inertinite rare to sparse, vitrinite very rare. Pyrite rare to sparse)
					FLAXMAN UNIT B. 2417m
15495	2430-2450 Ctgs	0.57	0.47-0.66	19	Rare sporinite, dinoflagellates, and resinite, orange, cutinite, yellow to orange. (Siltstone>sandstone, d.o.m., sparse I>V>E. Inertintie sparse, vitrintie rare. Pyrite sparse, carbonates present, possibly siderite.)
					WARRE FORMATION 2455m
15496	2500-2510 Ctgs	0.55	0.43-0.72	29	Rare sporinite and cutinite, orange. (Siltstone>sandstone, d.o.m., sparse, I>V>E. Inertinite sparse, vitrinite rare to sparse. Pyrite sparse. Micrinite present in some of the band vitrinite.)
15497	2530-2550 Ctgs	0.56	0.44-0.72	20	Rare sporinite and cutinite, yellow to dull orange. ?Dinoflagellates also present, yellow orange. (Siltstone=sandstone>claystone, d.o.m., sparse, I>V>E. Inertinite sparse, vitrinite rare. Rare large nodules of pyrite.)

CURDIE No. 1

K.K. No.	Depth (m)	$\bar{R}_V max$	Range	N	Exinite Fluorescence (Remarks)
					EUMERALLA FORMATION 2558m
15498	2560-2570 Ctgs	0.55	0.44-0.66	11	Rare sporintie and cutinite, orange to dull orange. (Claystone=siltstone>sandstone, d.o.m., rare to sparse, I>V>>E. Inertinite, rare, vitrinite rare.)
15499	2570-2580 Ctgs	0.65	0.49-0.74	12	Rare sporinite and cutinite, yellow orange to orange. (Siltstone>claystone, d.o.m. rare, I>V>E. Inertinite rare, vitrinite rare. Pyrite rare to very abundant, common overall.)
15500	2590-2600 Ctgs	0.70	0.49-0.86	11	Rare sporinite and cutinite, yellow orange to orange. (Siltstone>sandstone>claystone, d.o.m. rare to sparse, I>E=V. Inertinite rare, vitrinite rare. The large range in the reflectance reported for the vitrinite may be due to a number of factors. Some of the vitrinite has been oxidized and is transitional to inertinite, whereas some may contain suberinite-like tissue which cannot be resolved with an optical microscope. Additionally some contamination from cavings may be present. The opposite nature of some of these effects suggests that the mean as reported is likely to be close to that of the first generation vitrinite from this horizon.)

Organic Carbon Data

Sample No.	Depth	Organic carbon %, corrected for carbonate
	Curdie No. 1.	
15488	1895-1915	1.65
15489	1990-2010	1.78
15490	2090-2110	1.90
15491	2190-2210	1.91
15492	2290-2310	1.84
15493	2330-2350	1.47
15494	2390-2410	1.26
15495	2430-2450	1.10
15496	2500-2510	1.82
15497	2530-2550	2.05
15498	2560-2570	1.19
15499	2570-2580	1.35
15500	2590-2600	1.06