



PEP 118 10 FEB 1988
OTWAY BASIN

SQUATTER No. 1

WELL COMPLETION REPORT
TEXT & APPENDICES

BY

A. BUFFIN
JANUARY
1988

DEPT. NAT. RES. & ENV.



TEXT AND APPENDICES

BEACH PETROLEUM N.L.

(Incorporated in South Australia)

W966. Squatter-1. W.C.R. Vol. 1.

16 FEB 1988

PETROLEUM DIVISION

BEACH PETROLEUM N.L.

SQUATTER NO. 1.

PEP 118 - OTWAY BASIN

WELL COMPLETION REPORT

BY:

A. BUFFIN,
January, 1988.

CONTENTS

	<u>Page Number</u>
SUMMARY	1
1. INTRODUCTION	2
2. WELL HISTORY	
2.1 Location	3
2.2 General Data	3
2.3 Drilling Data	6
2.3.1 Drilling Contractor	6
2.3.2 Drilling Rig	6
2.3.3 Casing and Cementing Details	6
2.3.4 Drilling Fluid	8
2.3.5 Water Supply	8
2.4 Formation Sampling and Testing	9
2.4.1 Cuttings	9
2.4.2 Cores	9
2.4.3 Tests	9
2.5 Logging and Surveys	10
2.5.1 Mud Logging	10
2.5.2 Wireline Logging	10
2.5.3 Deviation Surveys	10
2.5.4 Velocity Survey	11
3. RESULTS OF DRILLING	
3.1 Stratigraphy	12
3.2 Lithological Descriptions	12
3.2.1 Quaternary	12
3.2.2 Post Heytesbury	15
3.2.3 Heytesbury Group	15
3.2.4 Nirranda Group	16
3.2.5 Wangerrip Group	16
3.2.6 Sherbrook Group	19
3.2.7 Otway Group	22

3.3	Hydrocarbon	22
3.3.1	Mud Gas Readings	22
3.3.2	Sample Fluorescence	22
4.	GEOLOGY	
4.1	Squatter #1 Structure	24
4.2	Porosity and Water Saturation	24
	- Pebble Point	
	- Paaratte Formation	
	- Intra-Belfast Sandstone Unit	
	- Waarre Formation	
	- Eumeralla Formation	
4.3	Maturation and Source Rock Analysis	29
4.4	Relevance to Occurrence of Hydrocarbons	31

FIGURES

	<u>Page Number</u>
1. Regional Location Map	4
2. Detailed Location Map	5
3. Prognosed and Actual Stratigraphy	13
4. Stratigraphy of the Otway Basin	14
5. Seismic Line GL-250	25
6. Time Structure Map Near Top Pebble Point Formation	26
7. Time Structure Map Top Otway Group	27
8. Vitrinite Reflectance and Total Organic Carbon Profile	30
9. Schematic Relationship Between Squatter No. 1 and Mumbannar No. 6	33
10. Actual Penetration Profile	Appendix 2

APPENDICES

1. Details of Drilling Plant
2. Summary of Wellsite Operation
3. Drilling Fluid Recap
4. Velocity Survey
5. Palynology
6. Maturation and Source Rock Analysis
7. Surveyors Location Map

ENCLOSURES

1. Composite Well Log
2. Exlog Mud Log
3. Schlumberger Wireline Logs

Dual Laterlog - Resistivity Logs (DLL/SP/CAL/GR)	1488 - 324 m
Micro-spherically Focused Log (MSLF)	1488 - 700 m
Sonic Log (BHC/GF)	1498 - 324 m (GR to surface)
Litho-Density/Compensated Neutron Log (LDL/CNL/GR)	1492 - 700 m
Cyberlook (Pass I and II)	1490 - 700 m
Check Shot Survey	20 levels

4. Seismic Horizon Contour Map & Cross-Section
(added by DNRE 21/6/99)

APPENDIX 6

Maturation and Source

Rock Analysis

SQUATTER NO. 1

A1/1

K.K. No.	Depth (m)	\bar{R}_v max	Range	N	Description Including Exinite Fluorescence
x7373	630-640 Ctgs	0.35	0.28-0.44	27	Rare to sparse liptodetrinite, greenish yellow to dull yellow, rare sporinite, greenish yellow to yellow, rare cutinite, yellow rare suberinite, weak brown. Siltstone >sandstone. Dom abundant, V>I>E. Vitrinite and inertinite common, exinite sparse. Most siltstones are iron stained Spare free oil droplets, yellow in mounting medium and siltstone. Iron oxide sparse to common. Pyrite abundant.)
x7374	780-790 Ctgs	0.36	0.2709,46	27	Rare ?phytoplankton/liptodetrinite greenish yellow to dull yellow, rare sporinite, yellow, rare cutinite, yellow. (Siltstone>sandstone>carbonate. Dom common, V>I>E. Vitrinite common, inertinite sparse, exinite rare. Most siltstones are iron stained. Iron oxide sparse. Pyrite common to abundant, mostly framboidal.)
x7375	990-1000 Ctgs	0.38	0.31-0.52	28	Rare to sparse ?phytoplankton/liptodetrinite, greenish yellow to dull yellow, rare sporinite, yellow. (Siltstone>sandstone>carbonate>coal. Coal rare, V. Vitrite. Dom abundant, I>V>E. Inertinite abundant, vitrinite sparse to common, exinite sparse. Diffuse humic organic matter present. Dom mainly consists of fine inertodetrinite. Iron oxide sparse. Pyrite common.)
x7376	1330-1340 Ctgs	0.40	0.31-0.55	29	Rare ?phytoplankton/liptodetrinite, greenish yellow and orange to dull orange, rare sporinite, dull orange. (Siltstone>claystone>coal. Coal rare, V. Vitrinite. Dom common, I>V>E>. Inertinite common, vitrinite sparse, exinite rare to sparse. Diffuse humic organic matter present. Dom mainly consists of fine inertodetrinite. Pyrite common.)
x7377	1380-1390 Ctgs	0.41	0.34-0.47	25	Rare phytoplankton/liptodetrinite, yellow to dull orange, rare sporinite, orange. (Siltstone>sandstone>claystone>coal. Coal rare, V=I. Vitrite=inertite. Dom abundant, I>V>E. Inertinite abundant, vitrinite sparse, exinite rare to sparse. Rare bright orange fluorescing bitumen in siltstone. Dom mainly consists of fine inertodetrinite. Pyrite common to abundant.)
x7378	1420-1430 Ctgs	0.47	0.36-0.56	24	Rare ?phytoplankton/liptodetrinite, yellow, rare sporinite, yellow to orange. (Sandstone>siltstone>claystone>coal. Coal sparse, V. Vitrite. Dom common, I>V>E. Inertinite common, vitrinite sparse, exinite rare. Micrinite abundant in come coals. Common fine specks of ?dead oil orange, in fine clastics. Sandstone lithologies mostly barren. Iron oxide rare. Pyrite sparse to common.)
x7379	1490-1500 Ctgs	0.47	0.35-0.58	15	Rare liptodetrinite, yellow to dull orange. (Siltstone>sandstone>coal. Coal sparse, V. Vitrite. Dom common, I>V>E. Inertinite sparse to common, vitrinite sparse, exinite rare. Pyrite sparse.)

VITRINITE REFLECTANCE WORKSHEET

WELL NAME. Squatta #1

SAMPLE NO. X7373

DEPTH. 630-640m

TYPE. etc1

FGV = First Generation Vitrinite - I = Inertinite

Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type
.10				.46				.82				1.18				1.54				1.90			
.11				.47				.83				1.19				1.55				1.91			
.12				.48				.84				1.20				1.56				1.92			
.13				.49				.85				1.21				1.57				1.93			
.14				.50				.86				1.22				1.58				1.94			
.15				.51				.87				1.23				1.59				1.95			
.16				.52				.88				1.24				1.60				1.96			
.17				.53				.89				1.25				1.61				1.97			
.18				.54				.90				1.26				1.62				1.98			
.19				.55				.91				1.27				1.63				1.99			
.20				.56				.92				1.28				1.64				2.00			
.21				.57				.93				1.29				1.65							
.22				.58				.94				1.30				1.66							
.23				.59				.95				1.31				1.67							
.24				.60				.96				1.32				1.68							
.25				.61				.97				1.33				1.69							
.26				.62				.98				1.34				1.70							
.27				.63				.99				1.35				1.71							
.28	2	↑		.64				1.00				1.36				1.72							
.29	1			.65				1.01				1.37				1.73							
.30	1			.66				1.02				1.38				1.74							
.31	2			.67				1.03				1.39				1.75							
.32				.68				1.04				1.40				1.76							
.33	3			.69				1.05				1.41				1.77							
.34	1			.70				1.06				1.42				1.78							
.35	2			.71				1.07				1.43				1.79							
.36	6			.72				1.08				1.44				1.80							
.37	3			.73				1.09				1.45				1.81							
.38	1	PGV		.74				1.10				1.46				1.82							
.39				.75				1.11				1.47				1.83				0.2		0	
.40	1			.76				1.12				1.48				1.84							
.41	1			.77				1.13				1.49				1.85				Vitrinite		Inertinite	
.42	2			.78				1.14				1.50				1.86							
.43				.79				1.15				1.51				1.87				1.2		0.7	
.44	1	✓		.80				1.16				1.52				1.88							
.45				.81				1.17				1.53				1.89							

VITRINITE REFLECTANCE WORKSHEET

WELL NAME Squatter No.1

SAMPLE NO. x7374

DEPTH 780-790m

TYPE etgs

FGV = First Generation Vitrinite - I = Inertinite

Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type
.10				.46	1	↓		.82				1.18				1.54				1.90			
.11				.47				.83				1.19				1.55				1.91			
.12				.48				.84				1.20				1.56				1.92			
.13				.49				.85				1.21				1.57				1.93			
.14				.50				.86				1.22				1.58				1.94			
.15				.51				.87				1.23				1.59				1.95			
.16				.52				.88				1.24				1.60				1.96			
.17				.53				.89				1.25				1.61				1.97			
.18				.54				.90				1.26				1.62				1.98			
.19				.55				.91				1.27				1.63				1.99			
.20				.56				.92				1.28				1.64				2.00			
.21				.57				.93				1.29				1.65							
.22				.58				.94				1.30				1.66							
.23				.59				.95				1.31				1.67							
.24				.60				.96				1.32				1.68							
.25				.61				.97				1.33				1.69							
.26				.62				.98				1.34				1.70							
.27	2	↑		.63				.99				1.35				1.71							
.28	1			.64				1.00				1.36				1.72							
.29				.65				1.01				1.37				1.73							
.30	1			.66				1.02				1.38				1.74							
.31	1			.67				1.03				1.39				1.75							
.32	2			.68				1.04				1.40				1.76							
.33				.69				1.05				1.41				1.77							
.34	3			.70				1.06				1.42				1.78							
.35	4			.71				1.07				1.43				1.79							
.36	5			.72				1.08				1.44				1.80							
.37	1			.73				1.09				1.45				1.81							
.38		FGV		.74				1.10				1.46				1.82							
.39				.75				1.11				1.47				1.83				0.1		0	
.40	2			.76				1.12				1.48				1.84							
.41	3			.77				1.13				1.49				1.85							
.42	1			.78				1.14				1.50				1.86				Vitrinite		Inertinite	
.43				.79				1.15				1.51				1.87				0.7		0.4	
.44				.80				1.16				1.52				1.88							
.45				.81				1.17				1.53				1.89							

VITRINITE REFLECTANCE WORKSHEET

WELL NAME Squatter No.1

SAMPLE NO. x 7375

DEPTH 990-1000m

TYPE ctg

FGV = First Generation Vitrinite - I = Inertinite

Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type
.10				.46	1			.82				1.18				1.54				1.90			
.11				.47				.83				1.19				1.55				1.91			
.12				.48				.84				1.20				1.56				1.92			
.13				.49				.85				1.21				1.57				1.93			
.14				.50				.86				1.22				1.58				1.94			
.15				.51				.87				1.23				1.59				1.95			
.16				.52	1	↓		.88				1.24				1.60				1.96			
.17				.53				.89				1.25				1.61				1.97			
.18				.54				.90				1.26				1.62				1.98			
.19				.55				.91				1.27				1.63				1.99			
.20				.56				.92				1.28				1.64				2.00			
.21				.57				.93				1.29				1.65							
.22				.58				.94				1.30				1.66							
.23				.59				.95				1.31				1.67							
.24				.60				.96				1.32				1.68							
.25				.61				.97				1.33				1.69							
.26				.62				.98				1.34				1.70							
.27				.63				.99				1.35				1.71							
.28				.64				1.00				1.36				1.72							
.29				.65				1.01				1.37				1.73							
.30				.66				1.02				1.38				1.74							
.31	3	↑		.67				1.03				1.39				1.75							
.32	1			.68				1.04				1.40				1.76							
.33	2			.69				1.05				1.41				1.77							
.34				.70				1.06				1.42				1.78							
.35	2			.71				1.07				1.43				1.79							
.36	2			.72				1.08				1.44				1.80							Organic matter Comp. (%)
.37	2			.73				1.09				1.45				1.81							Exinite
.38	4			.74				1.10				1.46				1.82							Alginite
.39	3			.75				1.11				1.47				1.83							0.2
.40	3	FGV		.76				1.12				1.48				1.84							0
.41	1			.77				1.13				1.49				1.85							Vitrinite
.42				.78				1.14				1.50				1.86							Inertinite
.43	1			.79				1.15				1.51				1.87							0.5
.44	2			.80				1.16				1.52				1.88							2.0
.45				.81				1.17				1.53				1.89							

VITRINITE REFLECTANCE WORKSHEET

WELL NAME Squatter - 1

SAMPLE NO. X7376

DEPTH 1330-1340m

TYPE etgs

FGV = First Generation Vitrinite - I = Inertinite

Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type
.10				.46				.82				1.18				1.54				1.90			
.11				.47				.83				1.19				1.55				1.91			
.12				.48				.84				1.20				1.56				1.92			
.13				.49	1			.85				1.21				1.57				1.93			
.14				.50				.86				1.22				1.58				1.94			
.15				.51				.87				1.23				1.59				1.95			
.16				.52				.88				1.24				1.60				1.96			
.17				.53				.89				1.25				1.61				1.97			
.18				.54	1			.90				1.26				1.62				1.98			
.19				.55	2	↓		.91				1.27				1.63				1.99			
.20				.56				.92				1.28				1.64				2.00			
.21				.57				.93				1.29				1.65							
.22				.58				.94				1.30				1.66							
.23				.59				.95				1.31				1.67							
.24				.60				.96				1.32				1.68							
.25				.61				.97				1.33				1.69							
.26				.62				.98				1.34				1.70							
.27				.63				.99				1.35				1.71							
.28				.64				1.00				1.36				1.72							
.29				.65				1.01				1.37				1.73							
.30				.66				1.02				1.38				1.74							
.31	1	↑		.67				1.03				1.39				1.75							
.32				.68				1.04				1.40				1.76							
.33	2			.69				1.05				1.41				1.77							
.34	2			.70				1.06				1.42				1.78							
.35	3			.71				1.07				1.43				1.79							
.36	1			.72				1.08				1.44				1.80							
.37	4			.73				1.09				1.45				1.81							
.38	4			.74				1.10				1.46				1.82							
.39				.75				1.11				1.47				1.83							
.40	3	FGV		.76				1.12				1.48				1.84					0.1	0	
.41	3			.77				1.13				1.49				1.85					Vitrinite	Inertinite	
.42				.78				1.14				1.50				1.86							
.43	1			.79				1.15				1.51				1.87							
.44	1			.80				1.16				1.52				1.88							
.45				.81				1.17				1.53				1.89							

VITRINITE REFLECTANCE WORKSHEET

WELL NAME SquaHer

SAMPLE NO. x7377

DEPTH 1388-1390m

TYPE ctgs

FGV = First Generation Vitrinite - I = Inertinite

Ro %	No. Read	Pop Rng	Pop Type	Ro %	No. Read	Pop Rng	Pop Type	Ro %	No. Read	Pop Rng	Pop Type	Ro %	No. Read	Pop Rng	Pop Type	Ro %	No. Read	Pop Rng	Pop Type	Ro %	No. Read	Pop Rng	Pop Type
.10				.46	3	↓		.82				1.18				1.54				1.90			
.11				.47	2	↓		.83				1.19				1.55				1.91			
.12				.48				.84				1.20				1.56				1.92			
.13				.49				.85				1.21				1.57				1.93			
.14				.50				.86				1.22				1.58				1.94			
.15				.51				.87				1.23				1.59				1.95			
.16				.52				.88				1.24				1.60				1.96			
.17				.53				.89				1.25				1.61				1.97			
.18				.54				.90				1.26				1.62				1.98			
.19				.55				.91				1.27				1.63				1.99			
.20				.56				.92				1.28				1.64				2.00			
.21				.57				.93				1.29				1.65							
.22				.58				.94				1.30				1.66							
.23				.59				.95				1.31				1.67							
.24				.60				.96				1.32				1.68							
.25				.61				.97				1.33				1.69							
.26				.62				.98				1.34				1.70							
.27				.63				.99				1.35				1.71							
.28				.64				1.00				1.36				1.72							
.29				.65				1.01				1.37				1.73							
.30				.66				1.02				1.38				1.74							
.31				.67				1.03				1.39				1.75							
.32				.68				1.04				1.40				1.76							
.33				.69				1.05				1.41				1.77							
.34	2	↑		.70				1.06				1.42				1.78							
.35				.71				1.07				1.43				1.79							
.36	3			.72				1.08				1.44				1.80							
.37	3			.73				1.09				1.45				1.81							Organic matter Comp. (%)
.38	1			.74				1.10				1.46				1.82							Exinite
.39	3			.75				1.11				1.47				1.83							Alginite
.40	2			.76				1.12				1.48				1.84							0.1
.41	2			.77				1.13				1.49				1.85							0
.42		FGV		.78				1.14				1.50				1.86							Vitrinite
.43	1			.79				1.15				1.51				1.87							0.3
.44	1			.80				1.16				1.52				1.88							2.0
.45	2			.81				1.17				1.53				1.89							

VITRINITE REFLECTANCE WORKSHEET

WELL NAME Squatter - 1

SAMPLE NO. X7378

DEPTH 1420 - 1430m

TYPE ctgs

FGV = First Generation Vitrinite - I = Inertinite

Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type
.10				.46				.82				1.18				1.54				1.90			
.11				.47	1			.83				1.19				1.55				1.91			
.12				.48	2			.84				1.20				1.56				1.92			
.13				.49	1			.85				1.21				1.57				1.93			
.14				.50	1			.86				1.22				1.58				1.94			
.15				.51	2			.87				1.23				1.59				1.95			
.16				.52				.88				1.24				1.60				1.96			
.17				.53	4			.89				1.25				1.61				1.97			
.18				.54	1			.90				1.26				1.62				1.98			
.19				.55	1			.91				1.27				1.63				1.99			
.20				.56	1	✓		.92				1.28				1.64				2.00			
.21				.57				.93				1.29				1.65							
.22				.58				.94				1.30				1.66							
.23				.59				.95				1.31				1.67							
.24				.60				.96				1.32				1.68							
.25				.61				.97				1.33				1.69							
.26				.62				.98				1.34				1.70							
.27				.63				.99				1.35				1.71							
.28				.64				1.00				1.36				1.72							
.29				.65				1.01				1.37				1.73							
.30				.66				1.02				1.38				1.74							
.31				.67				1.03				1.39				1.75							
.32				.68				1.04				1.40				1.76							
.33				.69				1.05				1.41				1.77							
.34				.70				1.06				1.42				1.78							
.35				.71				1.07				1.43				1.79							
.36	1	↑		.72				1.08				1.44				1.80							Organic matter Comp. (%)
.37				.73				1.09				1.45				1.81							Exinite
.38				.74				1.10				1.46				1.82							Alginite
.39	1			.75				1.11				1.47				1.83							<0.1
.40	2			.76				1.12				1.48				1.84							0
.41	1	FGV		.77				1.13				1.49				1.85							Vitrinite
.42				.78				1.14				1.50				1.86							Inertinite
.43	2			.79				1.15				1.51				1.87							0.4
.44	1			.80				1.16				1.52				1.88							0.6
.45	2			.81				1.17				1.53				1.89							

VITRINITE REFLECTANCE WORKSHEET

WELL NAME Squatter - 1

SAMPLE NO. X7379

DEPTH 1490 - 1500 m

TYPE etgs

FGV = First Generation Vitrinite - I = Inertinite

Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type
.10				.46				.82				1.18				1.54				1.90			
.11				.47				.83				1.19				1.55				1.91			
.12				.48	1			.84				1.20				1.56				1.92			
.13				.49				.85				1.21				1.57				1.93			
.14				.50				.86				1.22				1.58				1.94			
.15				.51	1			.87				1.23				1.59				1.95			
.16				.52				.88				1.24				1.60				1.96			
.17				.53	2			.89				1.25				1.61				1.97			
.18				.54				.90				1.26				1.62				1.98			
.19				.55				.91				1.27				1.63				1.99			
.20				.56	1			.92				1.28				1.64				2.00			
.21				.57				.93				1.29				1.65							
.22				.58	2	V		.94				1.30				1.66							
.23				.59				.95				1.31				1.67							
.24				.60				.96				1.32				1.68							
.25				.61				.97				1.33				1.69							
.26				.62				.98				1.34				1.70							
.27				.63				.99				1.35				1.71							
.28				.64				1.00				1.36				1.72							
.29				.65				1.01				1.37				1.73							
.30				.66				1.02				1.38				1.74							
.31				.67				1.03				1.39				1.75							
.32				.68				1.04				1.40				1.76							
.33				.69				1.05				1.41				1.77							
.34				.70				1.06				1.42				1.78							
.35	1	↑		.71				1.07				1.43				1.79							
.36				.72				1.08				1.44				1.80							Organic matter Comp. (%)
.37				.73				1.09				1.45				1.81							Exinite
.38	1			.74				1.10				1.46				1.82							Alginite
.39	1			.75				1.11				1.47				1.83							<0.1
.40				.76				1.12				1.48				1.84							0
.41	2			.77				1.13				1.49				1.85							Vitrinite
.42	1	FGV		.78				1.14				1.50				1.86							Inertinite
.43	1			.79				1.15				1.51				1.87							0.3
.44	1			.80				1.16				1.52				1.88							0.5
.45				.81				1.17				1.53				1.89							

SQUATTER NO. 1

KK No.	Depth (m)	TOC
x7373	630-640	1.10%
x7374	780-790	1.26%
x7375	990-1000	1.73%
x7376	1330-1340	1.39%
x7377	1380-1390	1.57%
x7378	1420-1430	0.64%
x7379	1490-1500	0.91%