



INTEQ

END OF WELL REPORT

ESSO AUSTRALIA PTY LTD

BEARDIE - 1

JULY - AUGUST 2002

by

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Esso Australia Pty Ltd: Beardie-1

Final Well Report

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Section 1

Operations Summary

1. Operations Summary

1.1 Introduction

Baker Hughes INTEQ Mudlogging provided formation evaluation, drill monitoring and pressure evaluation services for Beardie-1 from spud until P&A. Data was processed and stored using Drillbyte V.2.3.1 software. All depths in this report unless otherwise stated refer to mMDRT - measured distance in metres from the rig's rotary table.

Beardie-1 was planned as a 1905mMD vertical hole to test the oil potential of the Intra Latrobe Group sandstones, with an option to deepen the well to 3075mMD in a success case.

The well was spudded at 17:00 hours on 26 July 2002, drilling the 36" hole with a 26" bit with 36" hole opener from the seabed at 76.2m to 122.5m using seawater and high viscosity prehydrated gel (PHG) sweeps. The 30" conductor casing was run with the casing shoe set at 122.0m.

The 17.5" hole was then drilled riserless with rates of penetration averaging 50m/hr, using seawater with guar gum sweeps every joint and hi-vis sweeps every stand to the section TD of 863m. The 13.375" casing was run smoothly with the shoe at 849.1m. The BOPs were landed and tested as per programme.

Drilling of the 12.25" hole section commenced with a 12.25" Reed Hycalog DSX195DGNW PDC bit, made up on a rotary bottom hole assembly with MWD and ARC tools. After running and testing BOPs and marine riser it was run in the hole, tagging cement at 820m. The hole was displaced to 8.9ppg KCl/PHPA/Glycol mud while drilling out cement, the shoe track and the casing shoe at 849.1m. Three metres of new formation, from 863m to 866m was drilled before circulating bottoms up and pulling the bit back into the casing shoe and performing a Pressure Integrity Test (PIT). A surface pressure of 838psi exerted on the formation with 8.9ppg mud yielded an Equivalent Mud Weight (EMW) of 14.73ppg. Drilling resumed from 866m to 913m. Drilling was halted briefly to change out a backed out saver sub on the TDS. Drilling resumed from 913m and the mud weight was gradually increased to 9.5ppg, and then naturally increased to 9.8ppg by the end of the bit run. A maximum gas of 1.12% was seen at 1405m. The hole was drilled down to 1579m where it was decided to pull out of hole due to slow rates of penetration. Two tight spots were seen on the trip out, both giving 20klbs of overpull at 1282m and 1098m. No other hole problems were noted on the trip out.

After the bit trip drilling of the 12.25" hole section continued with a Reed EHP51HKPRDH tricone insert bit, made up on a rotary drilling assembly with in-string MWD & CDR tools. It was run in the hole, tagging fill at 1572m from where the bit was washed and reamed down to bottom at 1579m. New 12.25" hole was drilled from 1579m to TD at 1905m. A maximum gas of 4.67% was seen at 1675m. On reaching TD a 100bbl Hi-Vis pill was pumped and bottoms up circulated, before conducting a flow check (static) and pulling out of hole for a wiper trip. After 3 stands had been pulled tight hole was encountered with 60K overpull. The drillstring was made up to the top drive and circulation broken to condition the hole. The string was then pumped and rotated out of the hole to the 13.375" shoe and then run back to bottom to complete the wiper trip. 6m of fill was encountered on the trip back to bottom. Bottoms up was circulated twice, large chunks of coal were seen at the shakers, this is suspected as the cause of the hole fill. After a flowcheck the bit was pulled out of hole to run wireline log. After a full suite of wireline logs was run, Beardie-1 was plugged and abandoned. The Ocean Bounty was towed off location on the 10th of August 2002.

1.2 Well and Rig Information

Well Name:	Beardie-1		
Well Type:	Wildcat Exploration		
Operator:	ESSO Australia Pty Ltd.		
Location:	Gippsland Basin, Offshore Victoria, Australia		
Block:	VIC/L2		
Final Coordinates:	Latitude	38° 15' 16.214" S	
	Longitude	147° 48' 24.643" E	
Rig:	Ocean Bounty		
Type:	Semi-submersible MODU		
Rig Floor - Seabed:	76.2 mMDRT		
Rig Floor - MSL	25 m		
Spud Date:	26 July 2002		
Total Depth:	1905 mMDRT		
Status:	Plugged & Abandoned		
Baker Hughes INTEQ:	Data Engineers:	Jeff Wilson Jamie McLeod Rommel Tadiar	
	Logging Geologists:	Elaine Spence Tomasz Zelski Trent Liang Amanda Henson	

Section 2

Drilling and Engineering

2.1 Bit Run Summaries

36" Phase: 26 July 2002

Bit Run 1 Summary

Bit Number	NB 1
Bit Size	26" / 36" hole opener
Bit Type	Security S3SJ4
S/N	SCR 668369
Jets	4x20 (H-O 5x13)
Depth In	76.2m
Depth Out	122.5m
Metres Drilled	46.3
Drilling Hours	1.0
TBR, krevs	6.2
Circulating Hours	2.0
Average ROP, m/hr	47.3
API Condition	2-2-NO-A-E-I-NO-TD(H/O)

Drilling Parameters

WOB, tonnes	3.3	-	8.7
RPM	64	-	83
Torque kft-lbs.	0.9	-	5.6
Pump Pressure, psi	160	-	952
Flow In, gpm	508	-	1083

Mud System

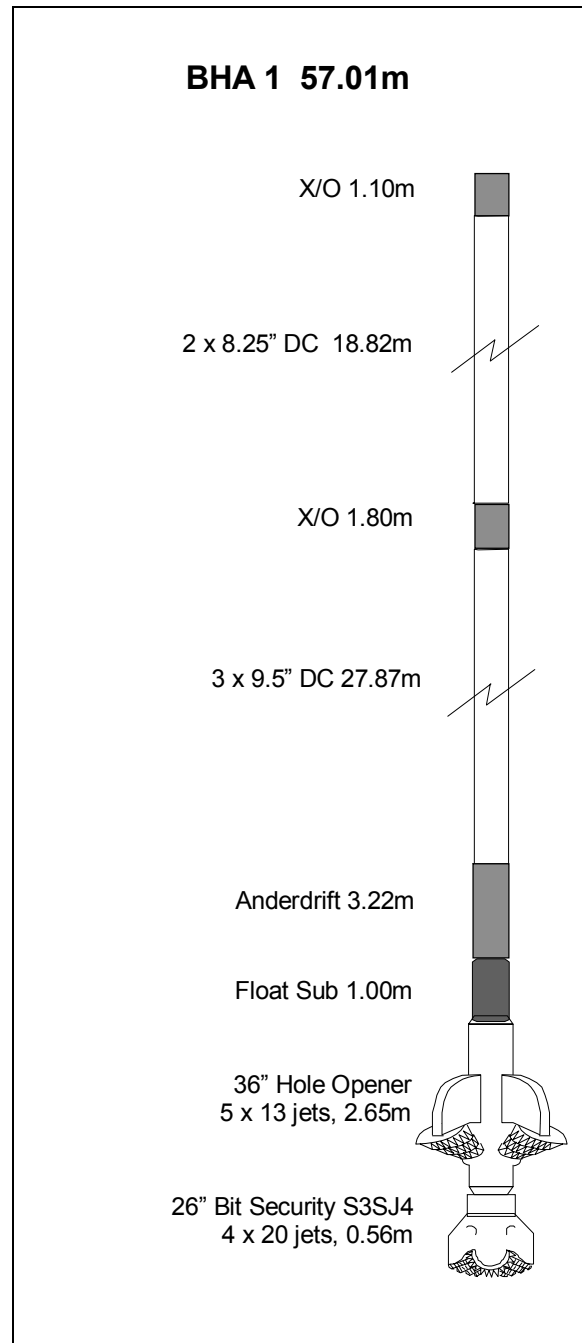
Seawater & hi-viscosity Gel	8.6 ppg
Sweeps	

Lithology

Returns to seabed.

Drilling Summary

After running anchors, a 26" roller bit with 36" hole opener tagged the seabed at 76.2m. Beardie-1 was spudded at 17:00hrs on 26 July 2002. The section was drilled on heavy weight drill pipe using seawater, with 50bbls hi-vis prehydrated gel (PHG) sweeps pumped every 15 metres. At section TD of 122.5m, a 100bbls Guar gum pill was swept around before displacing the hole with 400bbls hi-vis pill. A wiper trip to 84 metres was performed. The bit was then run back to bottom and the hole was displaced with a 400bbls hi-vis pill. The bit was pulled to surface to run the 30" conductor casing.



17.5" Phase : 27 - 28 July 2002**Bit Run 2 Summary**

Bit Number	NB 2
Bit Size	17.5"
Bit Type	Hycalog DS34HF+GN
S/N	244002
Jets	8 x 14
Depth In	122.5m
Depth Out	863m
Metres Drilled	740.5
Drilling Hours	14.8
TBR, krevs	108.35
Circulating Hours	21.0
Average ROP, m/hr	50.0
API Condition	1-1-NO-A-X-I-NO-TD

Drilling Parameters

WOB, klbs	1.6	-	17.6
RPM	75	-	148
Torque kft-lbs.	0.29	-	16.11
Pump Pressure, psi	568	-	3275
Flow In, gpm	776	-	1295

Mud System

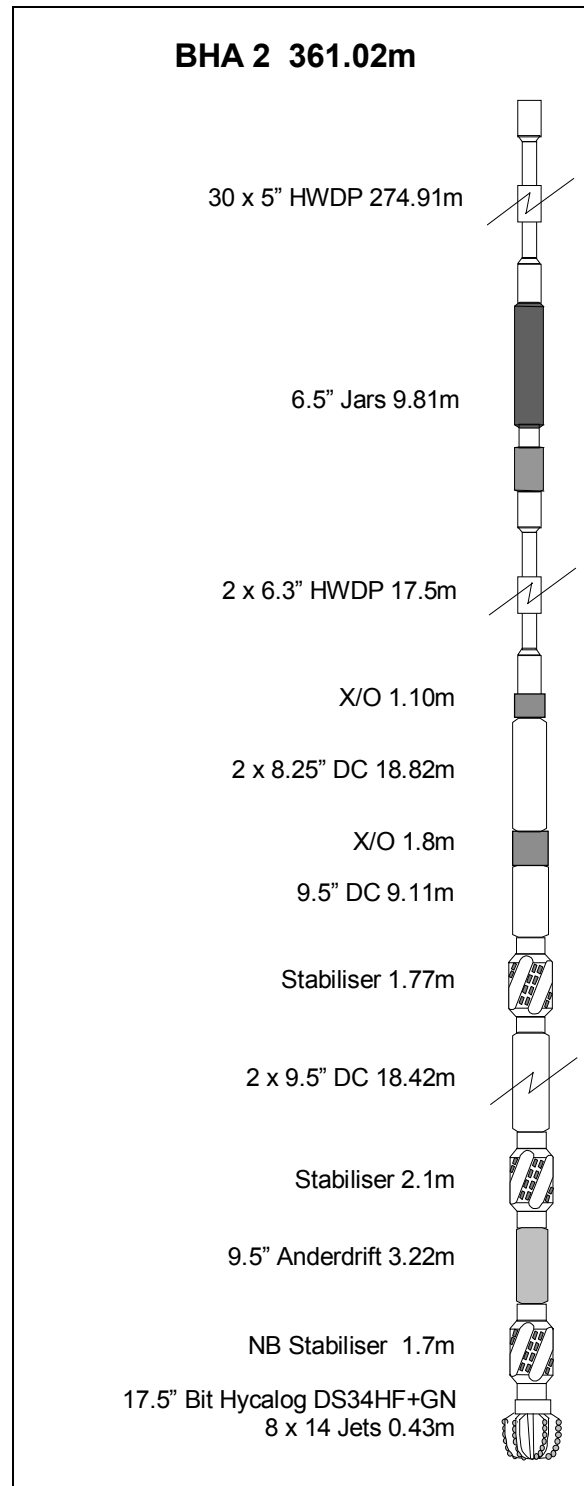
Seawater & hi-viscosity	8.6 ppg
Gel Sweeps	

Lithology

Returns to seabed.

Drilling Summary

NB 2, a fixed cutter bit was made up to a packed drilling assembly and run in, tagging cement at 117m. After drilling out of the cement and the 20" casing shoe at 122.0m, new formation was drilled from 122.5m with 50bbls prehydrated gel (PHG) sweeps pumped every 15 metres drilled. Section TD was reached at 863m. A 100bbls hi-vis gel pill was swept around, followed by 300bbls of seawater. A 800bbl high-vis gel pill was then spotted. The hole was then wiped back to the 30" casing shoe at 122.0m. On the way back in no fill was recorded. Another 300bbls of seawater was pumped to clean the hole. The open hole was then displaced to weighted (12ppg) gel mud. The survey tool was dropped and the bit pulled out of the hole. There were no hole problems encountered on the trip out.



12.25" Phase: 31 July – 3 August 2002**Bit Run 3 Summary**

Bit Number	NB 3
Bit Size	12.25"
Bit Type	Reed - Hycalog DSX195DGNW
S/N	103092
Jets	5 x 14
Depth In	863m
Depth Out	1579m
Metres Drilled	716
Drilling Hours	28.1
TBR, krevs	263.9
Circulating Hours	33.3
Average ROP, m/hr	25.5
API Condition	5-8-LT-N-X-1-RO-PR

Drilling Parameters

WOB, klbs	0.2	-	30.5
RPM	61	-	205
Torque kft-lbs.	2.05	-	15.57
Pump Pressure, psi	1495	-	3696
Flow In, gpm	719	-	989

Mud System

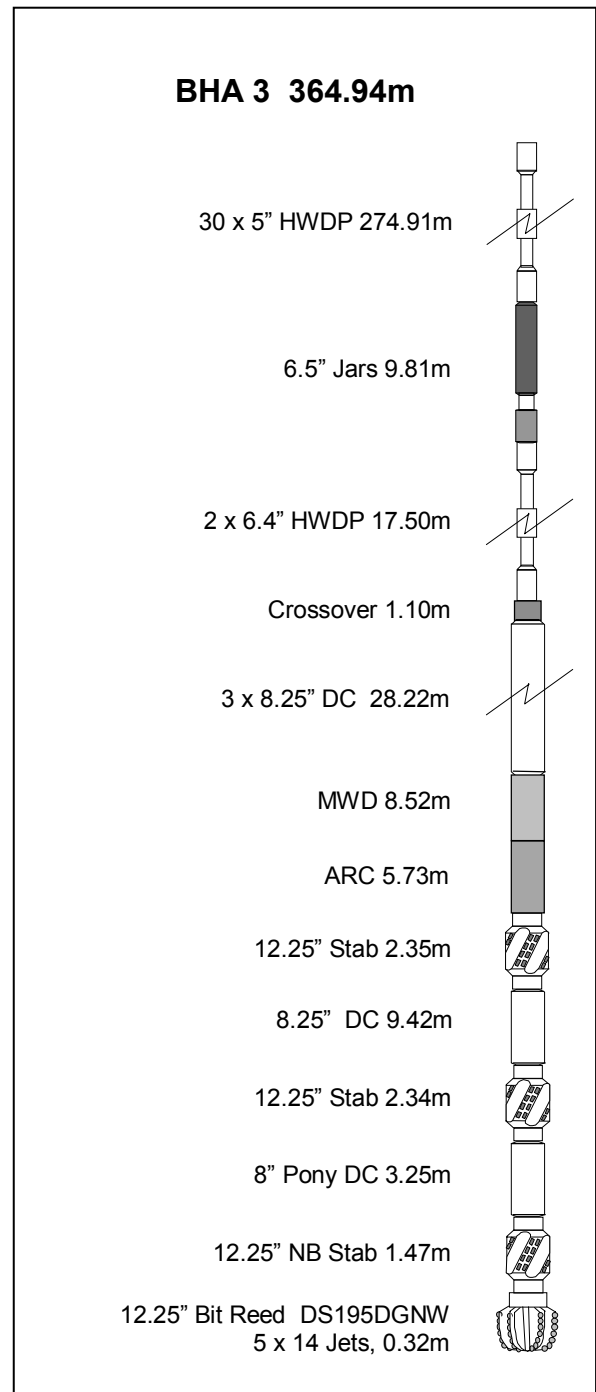
KCI / PHPA / Glycol	8.9	-	9.8 ppg
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Lithology

Argillaceous Calcilutite, Argillaceous Calcisiltite, Calcilutite, Claystone, Siltstone, Sandstone, Coal, Carbonaceous Siltstone & Conglomeratic Sandstone.

Drilling Summary

After running BOPs and marine riser, NB 3 was made up to a locked conventional drilling assembly with MWD tool and run in, tagging cement at 820m. The hole was displaced to 8.9ppg KCI/PHPA/Glycol mud whilst drilling cement, shoe track, the casing shoe at 849.1m and three metres of new formation to 866m were drilled out. After circulating bottoms up, the bit was pulled back into the casing shoe and a Pressure Integrity Test (PIT) was performed. A surface pressure of 838psi exerted on the formation with 8.9ppg mud yielded an Equivalent Mud Weight (EMW) of 14.73ppg. Drilling resumed from 866m to 913m. Drilling was halted briefly to change out a backed out saver sub on the TDS. Drilling resumed from 913m and the mud weight was gradually increased to 9.5ppg, and then naturally increased to 9.8ppg by the end of the bit run. A maximum gas of 1.12% was seen at 1405m. The hole was drilled down to 1579m where it was decided to pull out of hole due to slow rates of penetration. Two tight spots were seen



on the trip out both giving 20klbs of overpull at 1282m and 1098m. No other hole problems were noted on the trip out.

Bit Run 4 Summary

Bit Number	NB 4
Bit Size	12.25"
Bit Type	Reed EHP51HKPRDH
S/N	NL5038
Jets	3 x 18
Depth In	1579m
Depth Out	1905m
Metres Drilled	326
Drilling Hours	34.4
TBR, krevs	199.2
Circulating Hours	41.4
Average ROP, m/hr	9.5
API Condition	3-4-WT-A-E-2-NO-TD

Drilling Parameters

WOB, klbs	21.2	-	55.2
RPM	54	-	130
Torque kft-lbs.	2.49	-	7.7
Pump Pressure, psi	2753	-	3317
Flow In, gpm	806	-	876

Mud System

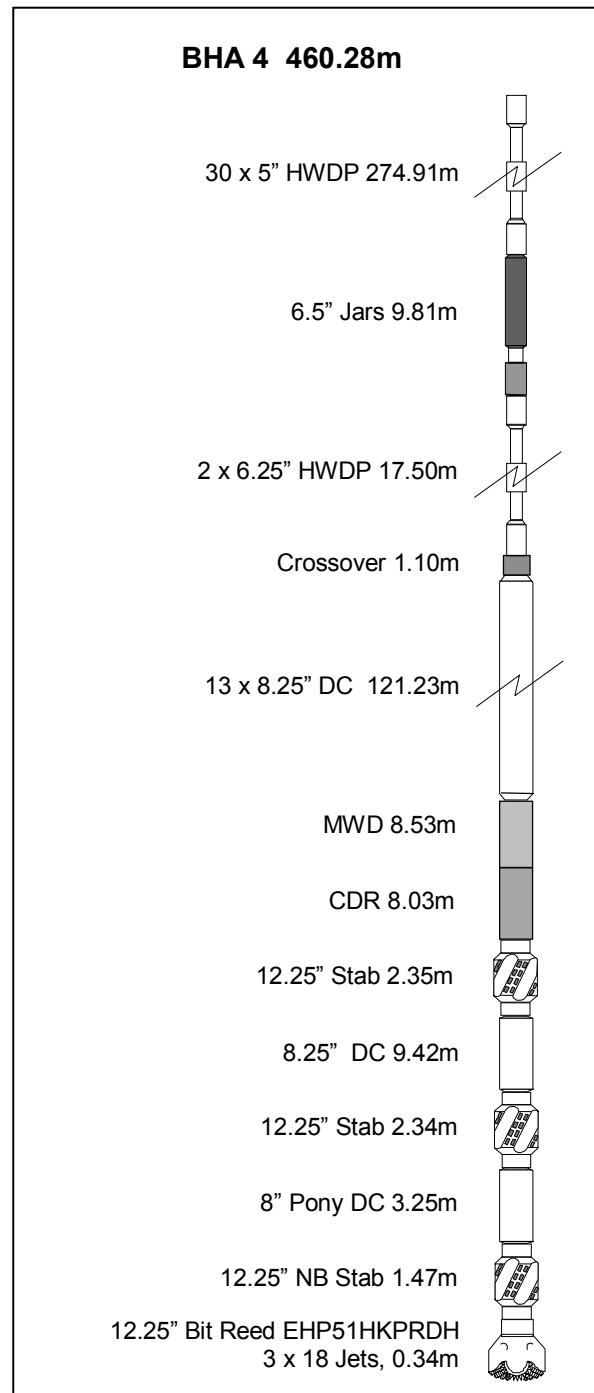
KCI / PHPA /Glycol 9.8 sg

Lithology

Sandstone, Coal, Siltstone, Claystone and Conglomeratic Sandstone.

Drilling Summary

NB4, a tricone insert bit, was made up on a rotary drilling assembly with in-string MWD & CDR tools and run in the hole. Fill was tagged at 1572m and the bit was washed and reamed down to bottom at 1579m. New 12.25" hole was drilled from 1579m to TD at 1905m where a 100bbl Hi-Vis pill was pumped and bottoms up circulated, before conducting a flow check (static) and pulling out of hole for a wiper trip. After 3 stands had been pulled tight hole was encountered with 60K overpull. The drillstring was made up to the top drive and circulation broken to condition the hole. The string was then pumped and rotated out of the hole to the 13.375" shoe and run back to bottom to complete the wiper trip. 6m of fill was encountered on the trip back to bottom. Bottoms up was circulated twice, large chunks of coal were seen at the shakers, this is suspected as the cause of the hole fill. After a flowcheck the bit was pulled out of hole to run wireline logs.



2.2 Casing and Cementing Summaries

30" Casing

Hole Size 36"
Depth 123.5m

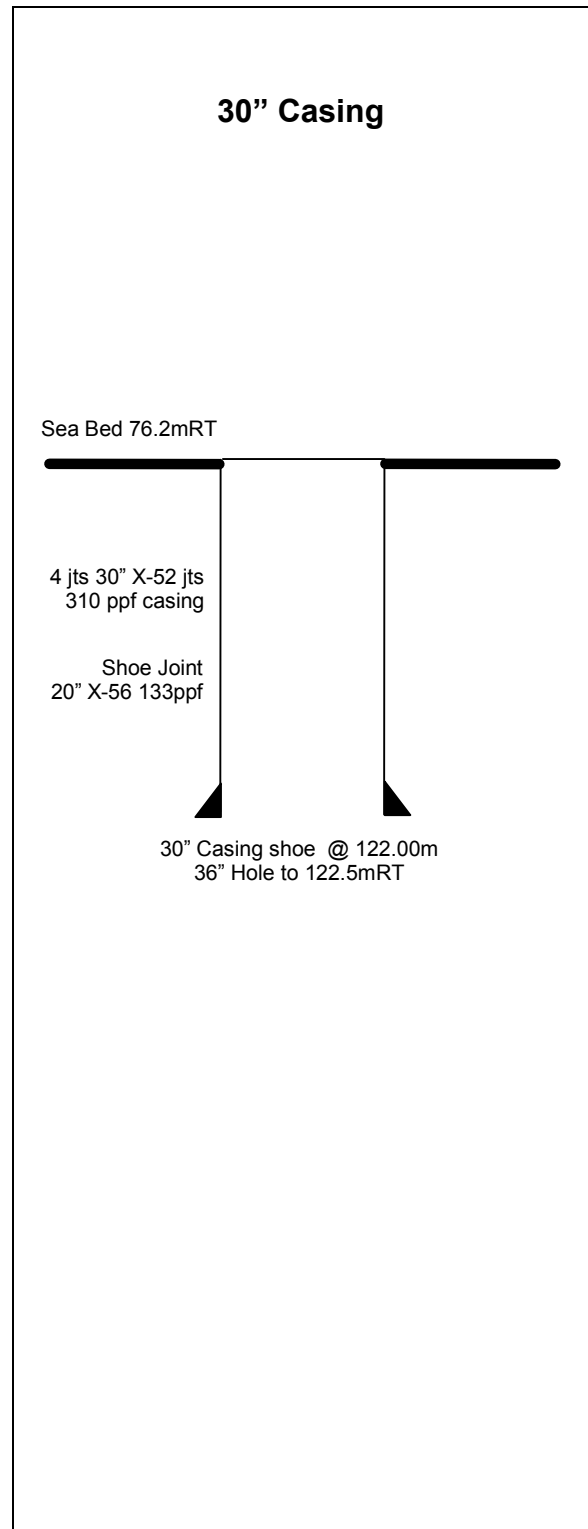
Casing
OD 30/20"
ID 27.5/18.6"
Weight 310 lb/ft X52

Shoe Depth 122.0m

Cement Single Stage, Tail
Type ABC Class G
sacks 1228 sx
Yield 2.56 cu-ft/sx
Slurry Density 15.9 ppg
Volume 125 bbls
Additives 1% CaCl₂

Summary

The 30" conductor casing was run and the top joint made up to the PGB. The casing string was filled with seawater while lowering to sealevel and landed out with heavyweight drillpipe. At seabed, the ROV aided in stabbing the shoe joint into the hole after the rig was moved to proper alignment. The shoe was landed at 122m with the PGB set 1.0m above the mud line. The bullseye on the PGB indicated a deviation from level of 0.25 degree port-aft. After testing the cement lines to 2000 psi, the cement tail slurry of 256 bbls at 15.9 ppg weight was mixed and pumped. The floats were checked and because they had not held, pressure was maintained down the landing string with the cement unit for 3.5 hours to allow the cement to harden in place. The ROV monitored good returns throughout the cementing job. The full casing weight was slacked off and the running tool backed out. The running tool was then pulled out of hole.

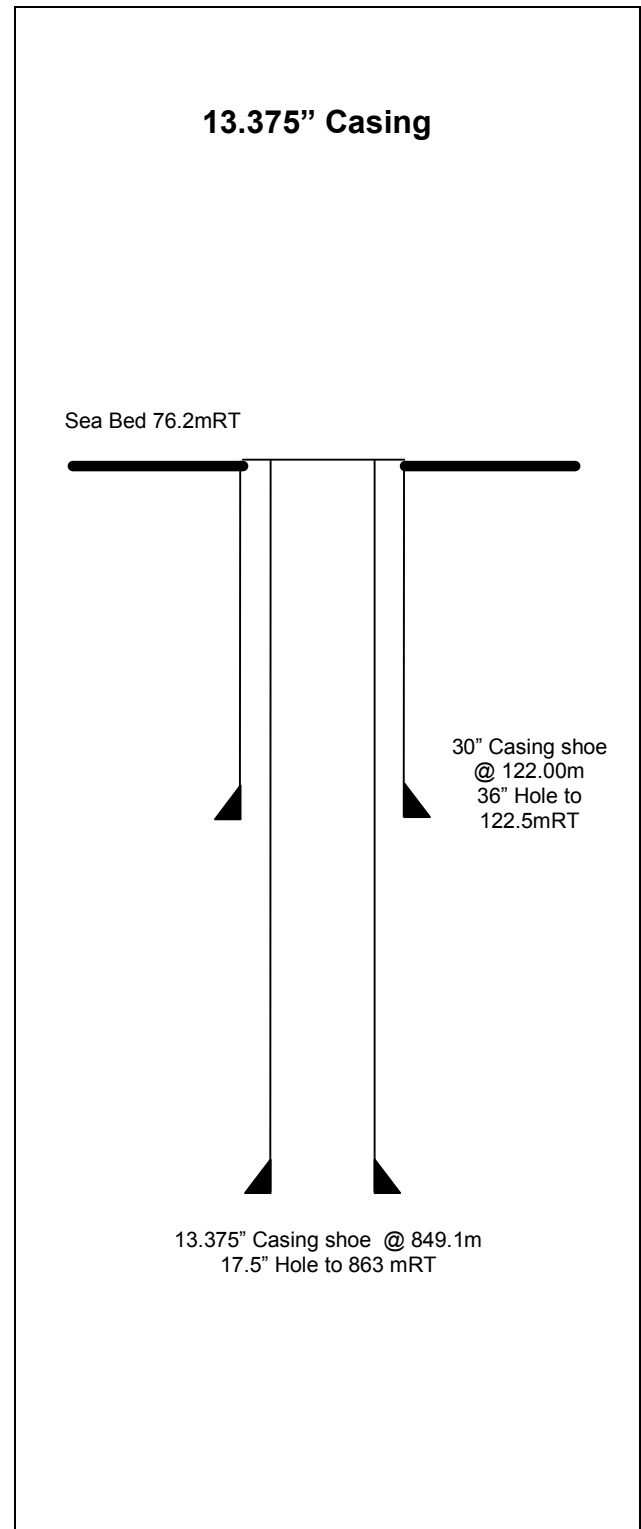


13.375" Casing

Hole Size	17.5"
Depth	863m
Casing	
OD	13.375"
ID	12.347"
Weight	68 lb/ft K-55 BTC
Shoe Depth	849.1m
Cement	Lead Slurry
Type	ABC class"G"
Sacks	1335 sx
Slurry Density	12.5 ppg
Yield	2.21 cu-ft/sx
Additives	Econolite/NF-5
Cement	Tail Slurry
Type	class"G"
Sacks	726sx
Slurry Density	15.8 ppg
Yield	1.16 cu-ft/sx
Mix Water	5.15 gal/sx

Summary

Sixty-four joints of 13.375" casing including the shoe and housing joint were run and landed, setting the shoe at 849.1m. The casing was circulated with 500 bbls seawater prior to cementing. The cement lines were pressure-tested to 2500psi for 3 minutes. The lead slurry of 523 bbls at 12.5 ppg, followed by 150 bbls of 15.8 ppg tail slurry. The dart was released and the cement was displaced with 5bbls of drillwater to shear the plug followed by 5bbls of drillwater. The cement was displaced with the rig pumps, pumping 363 bbls of seawater. The plug did not bump. Pressure was held for two minutes after pumping, then bled off after the floats were checked to be holding.



Section 3

Geology and Shows

GEOLOGY AND SHOWS

Formation Evaluation for Beardie - 1 commenced from below the 13.375" casing shoe at 849.1m MDRT to the well's Total Depth of 1905m MDRT. Sampling rates were dependent on rate of penetration. Washed and lightly washed (Palynology) cuttings samples were collected at the following intervals:

From (m)	To (m)	Sampling Interval (m)
863	890	27
890	920	30
920	1430	5
1430	1500	10
1500	1905	5

During the course of the well, all gas equipment was checked and calibrated before drilling.

The lithological units observed during the drilling of Beardie – 1 are described below. For more detailed descriptions, see Appendix-1, Formation Evaluation Log.

36" HOLE SECTION

Seabed to 123.5m: Returns to Seabed

17.5" HOLE SECTION

123.5m to 863m: Returns to Seabed

12.25" HOLE SECTION

863m to 1065m: ARGILLACEOUS CALCILUTITE

ARGILLACEOUS CALCILUTITE: White to very light grey, light grey, medium light grey to medium dark grey, light olive grey to olive grey, brown grey. Soft to moderately hard, occasionally friable, subblocky to blocky, occasionally amorphous with abundant argillaceous matrix, trace glauconite, trace pyrite, trace carbonaceous material, trace recrystallised calcite, trace crystalline calcite, trace echinoid spines and trace Foraminifera. Grading to CALCAREOUS CLAYSTONE in places.

There were no oil shows in this interval.

1065m to 1195m: ARGILLACEOUS CALCILUTITE, ARGILLACEOUS CALCISILTITE, SANDSTONE with minor CALCILUTITE and CLAYSTONE

ARGILLACEOUS CALCILUTITE: White, very light to light grey, medium to medium dark grey, olive grey to brownish grey. Soft to firm, amorphous to subblocky with abundant argillaceous matrix, rare glauconite pellets, trace carbonaceous material, trace recrystallised calcite, trace glauconite, trace disseminated and nodular pyrite, trace Foraminifera. Grading to CALCAREOUS CLAYSTONE in places.

CALCILUTITE: White to very light grey. Soft to firm, amorphous to subblocky with trace glauconite.

ARGILLACEOUS CALCISILTITE: White to light grey, medium grey to medium dark grey. Soft to moderately hard, amorphous to subblocky with common glauconite, trace carbonaceous material and trace crystalline calcite.

SANDSTONE: White to light grey. Translucent, occasionally clear quartz grains, loose, occasionally moderately hard to hard aggregates. Fine to coarse, predominantly medium to coarse, trace very coarse grains, subangular to rounded, predominantly subrounded, subelongate to spherical, poorly to moderately well sorted. Trace pyrite cement, trace calcareous cement and trace carbonaceous material. Fair to good inferred porosity, poor visual porosity.

CLAYSTONE: White, very light grey, light olive grey, pale yellowish brown. Soft, amorphous to subblocky, common siderite staining, minor green and dark green moderately coarse grained glauconite, rare fine quartz grains and trace disseminated pyrite.

There were no oil shows in this interval.

1195m to 1405m: Interbedded SANDSTONE, COAL and minor SILTSTONE

SANDSTONE: White to light grey, medium light grey. Clear to translucent quartz grains, predominantly loose, common fine grained hard aggregates, fine to very coarse grained, predominantly moderately coarse, occasionally granular, rare pebbles, subrounded to rounded, occasionally subangular, subelongate to spherical, trace fractured grains, poor to moderately well sorted with trace to abundant slightly calcareous argillaceous matrix. Rare disseminated and nodular pyrite, rare to trace pyrite cement, trace to common mica, trace glauconite pellets, trace carbonaceous material, trace coal and trace Foraminifera. Poor to fair visual porosity, poor to good inferred porosity.

COAL: Medium brown, dusky brown, brownish black, olive black, greyish black to black. Subvitreous to vitreous, brittle to moderately hard, occasionally hard, blocky, angular to sub-conchoidal, conchoidal in places with trace disseminated pyrite. Grades to CARBONACEOUS SILTSTONE in places.

SILTSTONE: Medium light grey to light grey, light olive grey. Soft, amorphous to subblocky with common very fine quartz grains, trace pyrite and trace glauconite.

There were no oil shows in this interval.

1405m to 1555m SANDSTONE with interbedded COAL, SILTSTONE and minor CARBONACEOUS SILTSTONE

SANDSTONE: Clear to translucent and occasionally grey and orange stained quartz grains, fine to coarse grained, predominantly medium to coarse, rare pebbles, loose, angular to subrounded, occasionally rounded, subelongate to subspherical, rare to trace fractured grains, moderately well sorted containing trace white argillaceous matrix, rare to trace pyrite cement and trace glauconite. Poor to good inferred porosity.

COAL: Greyish black to black, brownish black to olive black. Firm to moderately hard, vitreous, blocky, sub-conchoidal to conchoidal fracture. Grading to a CARBONACEOUS SILTSTONE in places.

SILTSTONE: Moderate yellowish brown to light pale brown, greyish orange pink, pale yellowish orange, greyish brown, mottled texture in places. Soft to firm, occasionally moderately hard, subblocky to subfissile with carbonaceous microlaminations, common carbonaceous material, trace nodular and disseminated pyrite and trace mica. Grading to a CARBONACEOUS SILTSTONE.

CARBONACEOUS SILTSTONE: Brownish grey to dark yellowish brown, moderate yellowish brown. Soft, subfissile, subblocky to blocky, with carbonaceous microlaminations and trace disseminated pyrite. Grading to SILTSTONE in places.

There were no oil shows in this interval.

1555m to 1625m: SANDSTONE and CONGLOMERATIC SANDSTONE with Interbedded COAL and SILTSTONE

SANDSTONE: Clear to translucent quartz grains, loose, common very hard aggregates, fine to very coarse grained, subrounded to subangular, common to abundant fractured grains, subspherical, poorly sorted with common hard dolomite cement, trace pyrite, trace glauconite. Poor visual porosity. Dolomite fluorescence: light yellowish green.

CONGLOMERATIC SANDSTONE: Clear to translucent quartz grains, loose, fine to very coarse with occasional granules, predominantly medium to coarse, subangular occasionally subrounded, common fractured grains, subelongate to subspherical, poorly sorted. Contains common hard, dolomite cement, which is medium grey to dark grey, greyish orange in colour, trace pyrite cement, trace nodular pyrite and trace glauconite pellets. Poor visual porosity. Dolomite fluorescence: Bright greenish yellow.

COAL: Greyish black to black, brownish black to olive black. Firm to moderately hard, vitreous, blocky, sub-conchoidal to conchoidal fracture. Grading to a CARBONACEOUS SILTSTONE in places.

SILTSTONE: Moderate yellowish brown to light pale brown, greyish orange pink, pale yellowish orange, greyish brown, mottled texture in places. Soft to firm, occasionally moderately hard, subblocky to sub-fissile with carbonaceous microlaminations, common carbonaceous material, trace nodular and disseminated pyrite and trace mica. Grading to a CARBONACEOUS SILTSTONE.

There were no oil shows in this interval.

1625m to 1780m: Interbedded SANDSTONE, SILTSTONE and COAL

SANDSTONE: Clear to translucent quartz grains, loose, trace hard aggregates, fine to very coarse, angular to subrounded, subelongate to subspherical, poor to moderate sorting with rare pyrite cement, trace argillaceous matrix, trace mica flakes, trace pyrite nodules and trace glauconite. Poor to fair inferred porosity, poor visible porosity.

COAL: Dusky brown to black, greyish black. Subvitreous to vitreous, firm to moderately hard, blocky, angular to sub-conchoidal with trace disseminated pyrite.

SILTSTONE: Dusky brown to dusky yellowish brown, light brownish grey, medium light grey to light grey, light olive grey, yellowish grey, occasional moderate yellowish brown, occasional medium grey. Soft to moderately hard, amorphous to subblocky, occasionally subfissile, with trace to minor carbonaceous laminations, trace to minor carbonaceous specks and trace disseminated pyrite. Grading to CARBONACEOUS SILTSTONE and CLAYSTONE in places.

CLAYSTONE: Pale yellowish brown to dusky yellowish brown, occasional light brown. Soft, amorphous to subblocky. Grading to a SILTSTONE in places.

There were no oil shows in this interval.

1780m to 1905m: SANDSTONE and CLAYSTONE with minor interbedded SILTSTONE and COAL

SANDSTONE: Clear to translucent quartz grains, rare medium light grey to medium grey opaque grains. Loose, with trace hard aggregates, fine to coarse grained, predominantly medium to coarse, angular to subrounded, subelongate to subspherical, minor to abundant fractured grains, moderately sorted containing trace dolomite cement, trace to rare pyrite cement, trace pyrite nodules, trace glauconite and trace mica flakes. Fair to good inferred porosity, poor visible porosity.

CLAYSTONE: Pale yellowish brown, light olive grey, very light grey to medium grey, occasionally brownish grey, occasionally greyish brown to dusky brown. Soft to firm, amorphous to subblocky with trace pyrite, and trace carbonaceous specks. Grades to SILTSTONE in places.

SILTSTONE: Light brownish grey, medium light grey to light grey, light olive grey, yellowish grey, light brown to moderate brown. Soft to firm, subfissile to fissile, subblocky, with trace disseminated pyrite, trace carbonaceous specks and trace of carbonaceous microlaminations.

COAL: Black to brownish black, olive black, dusky yellowish brown. Subvitreous to vitreous, firm to moderately hard, subblocky to blocky, sub-conchoidal fracture with trace to common disseminated pyrite.

There were no oil shows in this interval.

Drilling Rate Summary for All Lithology Intervals on Beardie-1			
Depth Interval (m)	RATE OF PENETRATION (m/hr)		
	Minimum	Maximum	Average
863 - 1065	8.6	64.3	27.9
1065 - 1195	11.5	139.5	29.9
1195 - 1405	1.7	160.0	53.7
1405 - 1555	10.3	168.2	56.1
1555 - 1625	0.8	56.3	18.3
1625 - 1780	4.7	63.3	25.2
1780 - 1905	2.1	55.9	15.2

Summary of Gas Readings Recorded for All Lithology Intervals on Beardie-1													
Interval (m)		Total Gas (%)				Chromatograph Analysis (percent %)							
		Range		Max Gas	Av. Total								
From	To	From	To	at (m)	Gas		C1	C2	C3	iC4	NC4	IC5	nC5
0	863	Returns to Seabed				Min Max	-	-	-	-	-	-	-
863	1065	0.0	0.03	997-998,1006 1012-1018	0.02	Min Max	0.0027 0.280	-	-	-	-	-	-
1065	1195	0.01	0.26	1192	0.05	Min Max	0.0054 0.2031	- 0.0182	- 0.007	-	-	-	-
1195	1405	0.04	0.92	1236	0.24	Min Max	0.0190 0.6559	- 0.0610	- 0.0250	- 0.009	- 0.0057	- 0.0095	- 0.003
1405	1555	0.10	1.14	1413	0.22	Min Max	0.0180 0.1534	- 0.0390	0.0019 0.0265	- 0.0111	- 0.0253	- 0.0250	- 0.0223
1555	1625	0.03	0.22	1625	0.08	Min Max	0.0095 0.0907	- 0.0235	- 0.0144	- -	- 0.0014	- 0.0010	- 0.0015
1625	1780	0.04	4.57	1676	0.35	Min Max	0.0180 3.4004	0.0060 0.4665	0.0049 0.1110	- 0.0181	- 0.0295	- 0.0081	- 0.0089
1780	1905	0.01	0.23	1792-1793	0.06	Min Max	0.0125 0.2551	- 0.0279	- 0.0101	- 0.0006	- 0.0022	- -	- -

**3.2 SAMPLES DISTRIBUTION LIST
ESSO AUSTRALIA PTY LTD
Beardie –1**



CONTAINER: SC 283

SAMPLE TYPE	No. of Sets	COMPOSITION			PACKING DETAILS
		Sample	Depth Interval (m)		
		Box No.	From	To	
Set A (200g) : Lightly Washed & Air Dried Palynology	1	1	863	1150	Packed into 4 large boxes.
		2	1150	1400	
		3	1400	1700	
		4	1700	1905	
Sets B, C, D, E (100g) : Washed & Dried	4	1	863	1000	Small boxes 1-8 are packed in large Box 1
		2	1000	1110	
		3	1110	1200	
		4	1200	1300	
		5	1300	1400	
		6	1400	1540	
		7	1540	1630	
		8	1630	1725	
		9	1725	1825	Small boxes 9-10 are taped Together making large Box 2.
		10	1825	1905	
Set F: Charts & Worksheets	1	-	-	-	1 Large Box.
Set G: Mud Samples (890m,1200m, 1579m,1675m,1905m)	1	1	863	1905	Packed in 1 large Box.
Sidewall Core Samples	1	1			1 large box handcarried to Melbourne by WSG

3.2 SAMPLES DISTRIBUTION LIST
ESSO AUSTRALIA PTY LTD
Beardie –1



ALL BOXES TO BE SENT TO KESTREL WAREHOUSE FOR ONWARD DISTRIBUTION:

DISTRIBUTION	Destination & Address	Attention of:
Lightly Washed & Dried (Palynology) Set A: ESSO	ESSO c/o Kestral Information Management 596-600 Somerville Rd SUNSHINE, VIC 3020	Diana Giodano Core/Archive Supervisor
Washed & Dried Set B: ESSO	ESSO c/o Kestral Information Management 596-600 Somerville Rd SUNSHINE, VIC 3020	Diana Giodano Core/Archive Supervisor
Washed & Dried Set C: BHPP	BHPP c/o Kestral Information Management 596-600 Somerville Rd SUNSHINE, VIC 3020	Diana Giodano Core/Archive Supervisor
Washed & Dried Set D: VIC DNRE	DNRE Core Sample Library South Rd. (off Sneydes Rd) WERRIBEE, Victoria, 3030	Note: To be forwarded to VIC DNRE after 2 days notification
Washed & Dried Set E: AGSO	AGSO Data Repository Cnr Jerrabomberra Ave and Hindmarsh Drive SYMONSTON, ACT, 2609	Eddie Resiak
Charts & Worksheets	ESSO c/o Kestral Information Management 596-600 Somerville Rd Sunshine, VIC 3020	Ops Geologist Andrew Hodgson, ESSO, Melbourne

Section 4

Pressure Evaluation

4.1 PORE PRESSURE EVALUATION

An average sea water density of 8.6 ppg was assumed as the normal saline pressure gradient for all calculations for Beardie-1. Using real-time data, such as the hydrocarbon gas trend, lithology, flowline temperature, character of drilled cuttings, constant drilling fluid parameters, corrected drilling exponent (DxC) data, as well as wireline logging data when available, pore pressure estimates were made during the drilling of Beardie-1. For more details, please refer to Appendix 3, "Pressure Summary Plot".

36" Hole Section

The 36" hole was drilled from seabed at 76.2mMDRT to 122.5m with NB#1 Security S3SJ4, 26" and a 36" hole opener. The section was short, with returns dumped to the seabed. With an average penetration rate of about 46m/hr and low weight-on-bit 3-8 klbs, the plotted DxC data curve showed no decent trend for a possible pressure evaluation. The wide DxC scatter suggested strong jetting of the formation. The variations in the penetration rates, 6.7 – 70.6m/hr and the DxC, 0.52 - 0.99 units over this shallow interval were also due to the varying drillability of the lithologies consisting of very soft, possibly unconsolidated sediments and cemented calcarenite. The pore pressure was estimated to be normal at 8.6ppg EMW from the seabed down to 122.5mMDRT.

17½" Hole Section

This section was drilled from 122.5m to 863m with a PDC bit, NB#2 Hycalog, DS34HF+GN 17.5" with 8x14 jets. As in the 36" section, pore pressure estimates were based on the DxC curve, penetration rate and the behaviour of available drilling parameters (torque and pump pressure), since drilling was done riserless and returns were directed to the seabed. The DxC ranged between 0.27 – 1.24 over the section, the use of a PDC bit hinders the value of using Dxc as a method of pressure evaluation. No signs of abnormal pressure were noted over the section. The hole was kept clean by circulating guar gum sweeps every joint drilled and prehydrated gel spotted at each connection. There was no abnormal torque, drag or hole problems throughout the section. The pore pressure was estimated to be normal at 8.6 ppg EMW from 122.5 down to 863m.

12 ¼" Hole Section

The 12¼" hole section was drilled initially with NB#3 Reed Hycalog DSX195DGNUW PDC bit, with 5x15 jets from 863m to 1579m. Prior to drilling, the hole was displaced and conditioned to a KCl/PHPA/Glycol mud system weighing 8.9 ppg. Pore pressure estimation, due to the use of the PDC bit, relied on the relationship of mud weight, gas and cavings, and the temperature log and drilling parameters rather than corrected drilling exponent data.

From 863m to 1190m the bit drilled argillaceous calcilutites and occasional calcisiltites and calcareous claystones at 8 - 64m/hr, averaging 23.5 m/hr. Normal pressure at 8.6 ppg EMW in this section was indicated by the low background gas, (0 – 0.14%), no connection gas, rare to trace amounts of splintery cavings and the temperature gradient 0.09 °C/m (22.8 – 51.7°C). There was no drag seen at connections while drilling and the torque was low at 6.7 kft-lb average. With 8.9-9.5 ppg mud in the hole, a slightly overbalanced condition was in place.

From 1190m to 1579m the lithologies changed to the target sandstones with occasional coal beds. Penetration in this section ranged from 0.8 - 168 m/hr, averaging 27.4 m/hr. The mudweight ranged between 9.5 ppg and 9.8ppg. The ditch gas was maintained at 0.04 – 1.14% units background with no distinct peaks and no connection gases recorded. The flowline temperature slightly decreased its gradient to 0.03 °C/m with a range of 49.3 – 63.1°C. The pore pressure at this section remained normal at 8.6 ppg EMW. No pressure cavings were seen in the section, however large blocky coal cavings were seen after drilling through coal beds. This is thought to be related to the stability of the coal beds and not as a result of a pore pressure increase.

New bit #4, a Reed EHP51HKPRDH tricone bit with 3 x 18 jets was used to drill the hole from 1579m to total depth of 1905m.

From 1579m to 1880m the lithologies were mainly sandstones, siltstones and minor shales and coals. From 1880m to TD at 1905m claystone was the dominant lithology. The rate of penetration ranged from 2.1 – 63.3 m/hr and averaged 9.5m/hr. The background gas stayed in the range 0.02 – 0.2% with peaks of up to 4.67%, liberated from the coalbeds and occasionally from the sandstones. Connection gas was absent. The flowline temperature ranging 52.6°C – 61.5°C had a gradient of 0.03°C/m, the same as that of the overlying sediments. The cuttings and the cavings increased in volume and size. The cavings were mostly of coal dominated by the blocky stress-relief type, with very rare splintery and concave-shaped cavings. The pore pressure at this section was estimated to have remained normal at 8.6 ppg EMW. No notable drag and fill at the bottom was observed while drilling and after connections. However, seven metres of fill was recorded on the trip in with bit #4 and six metres of fill recorded after the wiper trip to the shoe at TD. On both occasions the hole fill is thought to have been caused by coal, large coal cavings were seen at the shakers upon bottoms up. This was thought to be unrelated to any pore pressure increase but rather to the general instability of the coal formations. The hole was tight on the wiper trip and the bit was backreamed to 1579m, no other hole problems were seen on rest the wiper trip or on the trip out to run e-logs. The pore pressure gradient at TD was thought to have remained normal at 8.6 ppg EMW.

4.2 FRACTURE PRESSURE EVALUATION

Fracture pressure estimation for Beardie-1 was made using the Baker Hughes INTEQ zero tensile strength method. For a full explanation of this method, refer to INTEQ Manual MS-156 "The Theory and Evaluation of Formation Pressures".

With no returns to surface it was not possible to estimate the fracture pressure through the 36 and 17.5" hole sections. A Pressure Integrity Tests (PIT) was performed at the 13.375" casing shoe, with the result shown below:

Casing Depth	Casing Size		Hole Size		Test Mud Density	FIT EMW	Test type
mMDRT	in	mm	in	mm	(ppg)	(ppg)	
849.1	13.375	340	12.25	311	8.9	14.73	PIT

The 13.375" casing was run and set at 849.1m. The 12.25" assembly was made-up and RIH. After drilling cement, casing shoe and new hole to 866m, the hole was displaced to a KCL/PHPA/Glycol water-based mud system weighted at 8.9 ppg. A Pressure Integrity Test was then performed recording a 14.73ppg EMW formation strength. Drilling resumed with occasional surface losses, but no downhole losses. The system was weighted up to 9.5ppg before the Lakes Entrance formation was penetrated. At 1150m, Baracarb limestone Loss Circulation Material was then gradually added to the drilling fluid to minimise seepage loss to the Latrobe sands. Further additions of KCL and Baracarb then increased the mud weight to 9.8 ppg without significant fluid loss to the formation. The maximum effective circulating density exerted by the rig pumps was calculated at 10.0ppg. This value was way below the 14.73 ppg EMW strength of the casing shoe.

Tables

Table 1: Bit Run Summary

Tables

OPERATOR				WELL NAME			LOCATION				CONTRACTOR							RIG									
ESSO AUSTRALIA PTY LTD							BEARDIE-1				VIC/L2				DIAMOND OFFSHORE GENERAL COMPANY							MODU OCEAN BOUNTY					
<div><div><div>BAKER HUGHES</div><div>INTEQ</div></div><div><div>Esso</div></div></div>				PUMP 1 - OILWELL A1700 PT 6" LINER (36, 17.5 & 12.25) PUMP 2 - OILWELL A1700 PT 6" LINER (36, 17.5 & 12.25) PUMP 3 - OILWELL A1700 PT 6" LINER (36, 17.5 & 12.25)			BIT DULL CHARACTERISTICS										REASONS PULLED										
							BC - Broken Cone		CI - Cone Interference		JD - Junk Damage		PB - Pinched Bit		SS - Self-Sharpening		BHA - Bottomhole Assembly		LOG - Run Logs		FM - Formation Change		TD - Total / Csg depth				
							BT - Broken Teeth		CR - Cored		LC - Lost Cone		PN - Plugged Nozzle		TR - Tracking		DMF - Downhole Motor failure		RIG - Rig repair		HP - Hole Problems		TQ - Torque				
							BU - Balled Up		CT - Chipped Teeth		LN - Lost Nozzle		RG - Rounded Gauge		WO - Washed-Out Bit		DSF - Drill String failure		CM - Condition Mud		HR - Hours		TW - Twist-Off				
CC - Cracked Cone		FC - Flat Crested Wear		LT - Lost Teeth		RO - Ring Out		WT - Worm Teeth		DST - Drill Stem Test		CP - Core Point		PP - Pump Pressure		WC - Weather Conditions											
CD - Cone Dragged		HC - Heat Checking		OC - Off-Center Wear		SD - Shirttail Damage		NO - No Dull Characs.		DTF - Downhole Tool Failure		DP - Drill Plug		PR - Penetration rate		WO - Washout - Drill String											
BIT RUN	BIT No.	MAKE	TYPE	TFA sq.in.	JETS	SERIAL No.	DEPTH IN m	METRES ON BIT	HRS ON BOTTOM	AV ROP m/hr	IADC HRS	WOB klbs	RPM S/M	TBR krevs	SPP psi	GPM	TQ	GRADE								MW ppg	REMARKS
																		I	O	D	L	B	G	O	R		
36"/26" HOLE SECTION 76.2 - 123.5mMDRT																											
1	NB1	Security	S3SJ4	1.875	4x20, (5x13)	SER 668369	76.2	47.3	1.0	47.3	2.0	3.3-8.7	74 / -	6.2	160-952	508-1083	0.9-5.6	2	2	NO	A	E	I	NO	TD	8.6	With 36" Hole Opener
17.5" HOLE SECTION 123.5 - 863mMDRT																											
2	NB2	Hycalog	DS34HF+GN	1.203	8 x 14	244002	122.5	739.5	14.8	50.0	21.0	1.6-17.6	117 / -	108.4	568-3275	776-1295	0.29-16.11	1	1	NO	A	X	I	NO	TD	8.6	
12.25" HOLE SECTION 863 - 1579mMDRT																											
3	NB3	Reed/Hycalog	DSX195DGNUW	0.752	5 x 14	103092	863	716	28.1	25.5	36.75	0.2-30.5	167 / -	263.9	1495-3696	719-989	2.05-15.57	5	8	LT	N	X	1	RO	PR	8.9-9.8	MWD
4	NB4	Reed	EHP51HKPRDH	0.746	3 x 18	NL5038	1579	326	34.4	9.5	39.5	21.2-55.2	102 / -	199.2	2753-3317	806-876	2.49-7.70	3	4	WT	A	E	2	NO	TD	9.8	MWD

Table 2: Bit Hydraulics Summary

Tables

<div><div><div><div></div><div>BAKER HUGHES</div></div><div>INTEQ</div></div></div> <div>Table 2: BIT HYDRAULICS SUMMARY</div> <div><div>Esso</div></div>																							
OPERATOR							WELL NAME					LOCATION			CONTRACTOR					RIG			
ESSO AUSTRALIA PTY LTD							BEARDIE-1					VIC/L2			Diamond Offshore General Co.					MODU OCEAN BOUNTY			
Drillstring Abbreviations												Hydraulics Models											
N Normal MWD T Turbine Core P Positive Displacement Motor												Power Law Model used for drilling with Mud Bingham Model used for coring and drilling with sea water											
Bit No.	Depth In (m)	Hole Size in	Calc'd Hole Size in	JETS x 1/32"	Drill String Type	Mud Density ppg	Mud Type	PV / YP	Flow Rate gpm	ECD ppg	Annular Velocities				Jet Vel m/sec	HHP hp	HSI hp/sq in	Impact Force lbf	Bit Pressure Loss psi	% Bit Loss	Theoretical Pressure Loss psi	Actual Pressure Loss psi	
											DP Riser m/min	DP OH m/min	DC OH m/min	DC critical m/min									
36"/26" HOLE SECTION												76.2 - 123.5mMDRT											
NB1	76.2	36/26	36	4x20, (5x13)	N	8.6	SW / Gel sweeps	1 / 1	1083	8.6	-	-	6.7	25.2	56.5	166.7	0.3	893.9	264	50.5	523	952	
17.5 " HOLE SECTION												123.5 - 863mMDRT											
NB2	122.5	17.5	17.5	8 x 14	N	8.6	SW / Gel sweeps	1 / 1	1295	8.6	-	34.5	44.8	25.48	105.3	693.1	2.9	1993.2	918	33.3	2755	3275	
12.25 " HOLE SECTION												863 - 1905mMDRT											
NB3	863	12.25	12.25	5 x 14	MWD	9.8	KCl/PHPA/Glycol	18 / 26	989	10.0	20.3	59.3	90.1	140.95	128.7	900.4	7.8	2119.3	1562	42.3	3695	3696	
NB4	1579	12.25	12.25	3 x 18	MWD	9.8	KCl/PHPA/Glycol	20 / 32	833	10.0	17.1	50.0	75.9	160.5	109.3	547.0	4.7	1516.0	1127	33.8	3335	3317	

Table 3: Survey Data Summary

Tables

Esso Australia Pty Ltd
Beardie-1

July - August 2002

Latitude:	38° 15' 16.214" S	Field Strength, HCNT:	1202.85
Longitude:	147° 48' 24.643" E	Grid Convergence:	-0.50°
Section Azimuth:	0.00	Total Azimuth Corr:	13.45°
Dip:	-68.85°	North Reference:	Grid North
Declination:	12.95°	Computation Method:	Minimum Curvature

Directional Survey Listing

MEASURED DEPTH (m)	INCLINATION ANGLE (deg)	AZIMUTH ANGLE (deg)	VERTICAL DEPTH (m)	LATITUDE +N/S- (m)	DEPARTURE +E/W- (m)	VERTICAL SECTION (m)	DOGLEG (deg/10 m)	Survey Type
0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	TIP
75.80	0.00	0.00	75.80	0.00	0.00	0	0.00	GYR
103.70	0.15	148.92	103.70	-0.03	0.02	-0.03	0.05	GYR
130.50	0.12	223.02	130.50	-0.08	0.02	-0.08	0.06	GYR
157.50	0.05	236.77	157.50	-0.11	-0.01	-0.11	0.03	GYR
184.20	0.05	297.06	184.20	-0.11	-0.03	-0.11	0.02	GYR
212.20	0.07	153.34	212.20	-0.12	-0.03	-0.12	0.04	GYR
240.40	0.04	159.19	240.40	-0.14	-0.02	-0.14	0.01	GYR
268.60	0.09	144.59	268.60	-0.17	-0.01	-0.17	0.02	GYR
296.30	0.07	298.19	296.30	-0.18	-0.01	-0.18	0.06	GYR
324.10	0.10	212.83	324.10	-0.19	-0.04	-0.19	0.04	GYR
351.70	0.24	245.32	351.70	-0.24	-0.10	-0.24	0.06	GYR
380.50	0.37	241.18	380.50	-0.31	-0.24	-0.31	0.05	GYR
409.60	0.36	254.31	409.60	-0.38	-0.41	-0.38	0.03	GYR
438.60	0.38	243.71	438.60	-0.45	-0.58	-0.45	0.02	GYR
467.20	0.30	227.88	467.20	-0.54	-0.72	-0.54	0.04	GYR
496.30	0.40	206.80	496.30	-0.68	-0.83	-0.68	0.06	GYR
525.20	0.41	205.20	525.20	-0.86	-0.92	-0.86	0.01	GYR
553.90	0.44	205.99	553.90	-1.05	-1.01	-1.05	0.01	GYR
583.20	0.45	201.04	583.19	-1.26	-1.10	-1.26	0.01	GYR
612.10	0.42	202.70	612.09	-1.47	-1.18	-1.47	0.01	GYR
641.10	0.48	206.49	641.09	-1.67	-1.28	-1.67	0.02	GYR
669.80	0.46	203.26	669.79	-1.89	-1.37	-1.89	0.01	GYR
698.80	0.48	202.05	698.79	-2.11	-1.47	-2.11	0.01	GYR
727.90	0.50	195.89	727.89	-2.34	-1.55	-2.34	0.02	GYR
757.00	0.52	180.34	756.99	-2.60	-1.58	-2.6	0.05	GYR
786.20	0.52	176.91	786.19	-2.86	-1.58	-2.86	0.01	GYR
814.70	0.58	177.65	814.69	-3.13	-1.56	-3.13	0.02	GYR
843.60	0.55	168.87	843.58	-3.42	-1.53	-3.42	0.03	GYR
852.70	0.56	173.86	852.68	-3.50	-1.52	-3.5	0.05	GYR
907.95	0.55	184.35	907.93	-4.04	-1.51	-4.04	0.02	MWD
1025.73	0.60	210.10 1	1025.71	-5.13	-1.86	-5.13	0.02	MWD
1083.00	0.46	228.69	1082.97	-5.54	-2.18	-5.54	0.04	MWD
1169.99	0.47	231.26	1169.96	-6	-2.72	-6	0	MWD
1257.42	0.51	245.44	1257.39	-6.38	-3.36	-6.38	0.01	MWD
1344.31	0.67	230.55	1344.27	-6.87	-4.1	-6.87	0.03	MWD
1431.33	0.79	216.92	1431.29	-7.67	-4.85	-7.67	0.02	MWD
1517.17	1.19	222.49	1517.11	-8.8	-5.81	-8.8	0.05	MWD
1551.21	1.09	226.63	1551.15	-9.28	-6.29	-9.28	0.04	MWD
1639.11	0.83	214.91	1639.03	-10.38	-7.26	-10.38	0.04	MWD

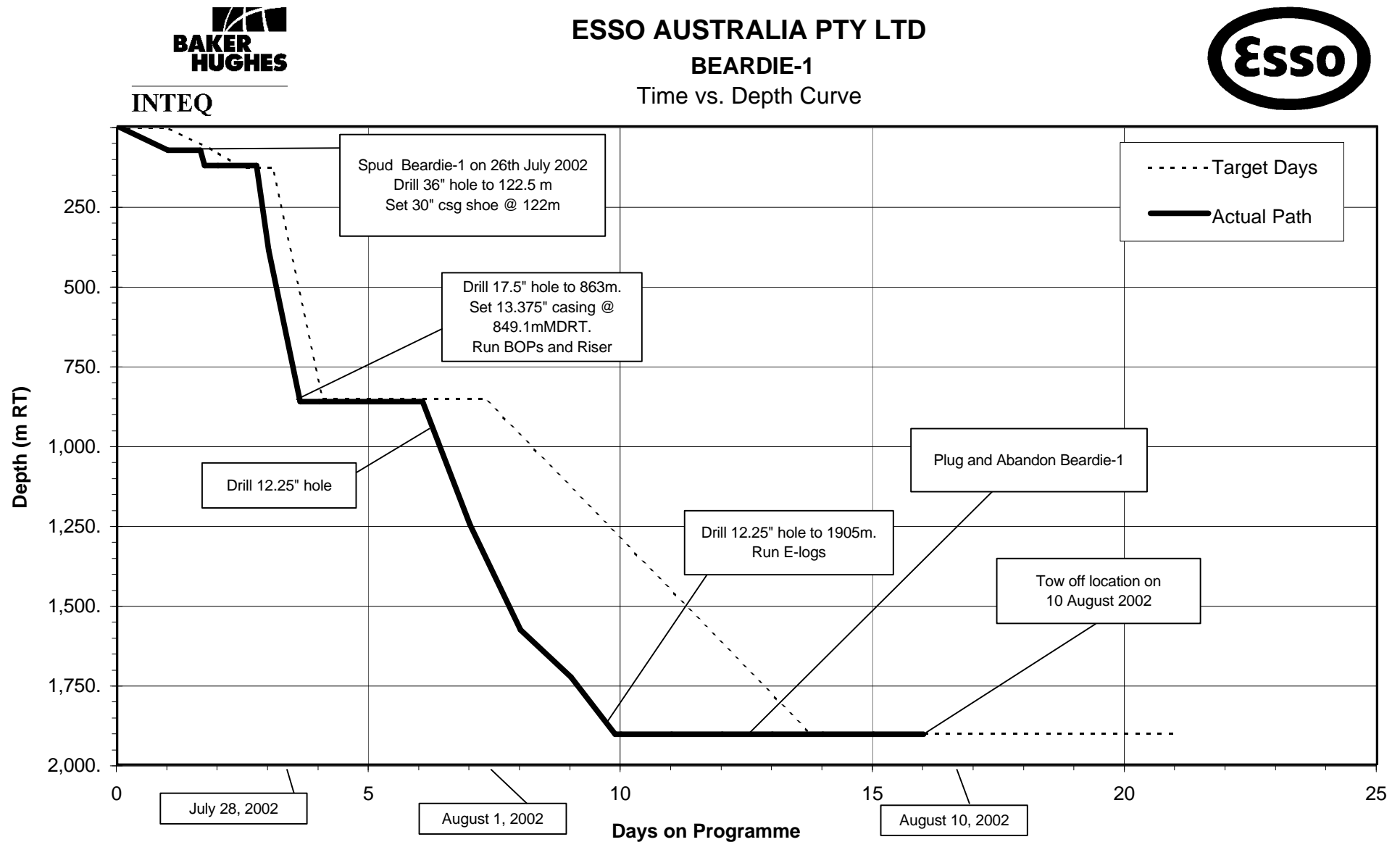
Table 3: Survey Data Summary

Tables

MEASURED DEPTH (m)	INCLINATION ANGLE (deg)	AZIMUTH ANGLE (deg)	VERTICAL DEPTH (m)	LATITUDE +N/S- (m)	DEPARTURE +E/W- (m)	VERTICAL SECTION (m)	DOGLEG (deg/10 m)	Survey Type
1725.47	0.90	209.82	1725.38	-11.48	-7.95	-11.48	0.01	MWD
1754.65	0.83	200.48	1754.56	-11.88	-8.14	-11.88	0.05	MWD
1834.52	0.89	216.64	1834.42	-12.92	-8.71	-12.92	0.03	MWD
1869.06	0.98	215.87	1868.96	-13.37	-9.05	-13.37	0.03	MWD

Table 4: Time vs Depth Curve

Tables



Appendices

Formation Evaluation Log

1: 500

Drilling Data Plot

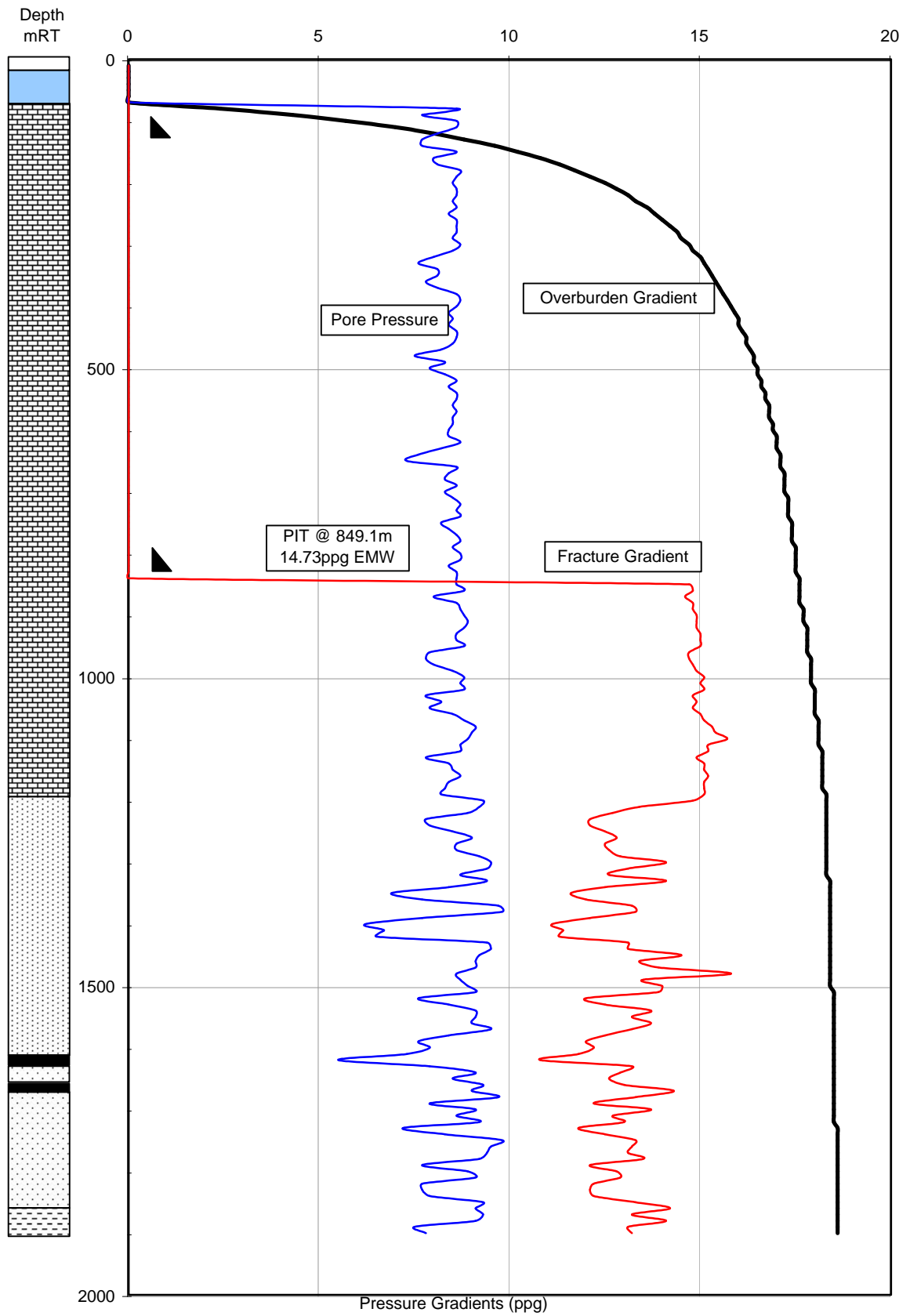
1: 1000

Pressure Data Plot

1: 1000

Pressure Summary Plot

Pressure Summary Plot Beardie - 1



Gas Ratio Analysis Plot

1: 500