Santos

A.B.N. 80 007 550 923

CASINO-3

FINAL WELL REPORT

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1.0 WELL DATA SUMMARY

(All depths are measured depths from rotary table (MDRT) unless otherwise specified.)

Well name	: Casino 3
Basin	: Otway
Permit	: VIC/P44
Operator	: Santos Limited
Drilling Rig	: Ocean Epoch
Well Classification	: Vertical Appraisal Well
Surface Location	
Latitude	: 38° 46' 34.558" S
Longitude	: 142° 44' 05.437" E
Depth Reference	: L.A.T. (lowest astronomical tide)
Water Depth	: 66.65 m
Rotary Table	: 22.4 m
Rotary Table to Seabed	: 89.05 m
Casing Data	: (1) 762/500 mm (30"/20") Casing Shoe at 121.3 m
	: (2) 340 mm (13 $^{3}/_{8}$") Casing Shoe at 635.83 m
	: (3) 244 mm (9 $^{5}/_{8}$") Casing Shoe at 2113.25 m
Hole Size	: (1) 914 mm (36") Hole from 89.05 to 121.3 m
	: (2) 444 mm (17½") Hole from 121.3 to 645.0 m
	: (3) 311 mm (12¼") Hole from 645.0 to 2135.0 m
Mud Type	: (1) Seawater/Hi-Vis Gel Sweeps
	: (2), (3) Aqua-Drill
Offset Wells	: Casino 1, Casino 2
Proposed Total Depth	: 2137.0 m
Actual Total Depth	: 2135.0 m
Total Vertical Depth	: 2112.52 m TVDSSLAT
Date arrived on Location	: 13 October 2003
Date departed Location	: 13 November 2003
Date Spudded	: 20:00 hours, 14 October 2003
Date TD Reached	: 08:00 hours, 30 October 2003
Well Status	: Plugged & Suspended

2.0 GENERAL INFORMATION

2.1 Executive Summary

Casino-3 was drilled as a vertical appraisal well in the Casino gas field. Casino 1 and Casino 2 have previously established the presence of gas in the Waare Sandstone. The gas field is located offshore in VIC/P44, approx 29 km southwest of Port Campbell, 24 km WSW of the Minerva gas field and 22 km north of the La Bella gas field. The objectives of Casino 3 were to drill down-dip on the Casino structure, establish a GWC, investigate pressure regimes in the younger Waare sand and to establish the reservoir characteristics in the older Waare sand.

Casino-3 was officially spudded at 20:00 hours on the 14th of October 2003. The well was begun with a 26" (660 mm) bit and 36" (914 mm) hole opener, tagging the seafloor at 89.05 m RT and drilling to 121.3 m. A combination 30" (762 mm) and 20" (500 mm) conductor casing was run on a PGB and cemented with the shoe at 121.3 m.

A 17½" (445 mm) bit tagged TOC was at 117.0 m and drilled from 121.3 m to the TD of the 17½" section at 645.0 m. This section was cased off with a $13^{3}/_{8}$" casing string with the shoe set at 635.83 m.

The subsea stack and riser were lowered and tested. The flowline and diverter were rigged up and function tested and the LMRP was tested as per specifications.

The 12¼" (311 mm) phase was begun, tagging the TOC at 619.0 m. The cement was drilled out and 3.0 m of new hole was made to 648.0 m. The hole was displaced to 1.03 SG Aqua-Drill mud prior to performing a Leak Off Test, which reached an EMW of 15.0 ppg.

12¼" (311 mm) hole was drilled ahead from 648.0 m down to 1226.0 m with a Tri-cone bit rather than a PDC bit, due to previously seen pyrite in this interval. This bit was then pulled out to change over to a PDC bit and a BHA with MWD tools, in order to drill to the core point. This PDC bit drilled from 1226.0 m to the coring point of 2004.0 m. The trip out of hole prior to coring was not very smooth, with a few tight spots encountered. A maximum overpull of 70 klbs was recorded at 1613 m.

A 12¼" (311 mm) Security CD-93 Core head and BHA was made up and run in hole. The coring BHA required working through tight spots and washing to 1675 m where the hole was circulated and the mud weight raised from 9.3 to 9.6 ppg. The core head was then run to bottom and a 27 m core was cut from 2004 m to 2031 m, out of which 24.7 m was recovered (91.5%). The previous drilling bit and BHA was then rerun and the hole was drilled to TD at 2135 m.

A total of 5 wireline logging runs were made at the completion of drilling and prior to casing and testing the well.

The well was cased with $9^{5}/_{8}$" casing set at 2113.25 m. The last joints of casing had to be washed down due to tight hole. A CBL wireline log was run prior to displacing the well to brine and setting a permanent packer in place at 1973.9 m. TCP guns were lowered and the casing was perforated from 2004 m to 2013 m in the top Waare Formation. A satisfactory gas flare was produced and monitored before shutting in, killing the well and setting cement plugs.

Geoservices provided a full mudlogging service from spud to TD during this well. This service included Reserval gas monitoring in addition to the regular FCP/FGP FID equipment.

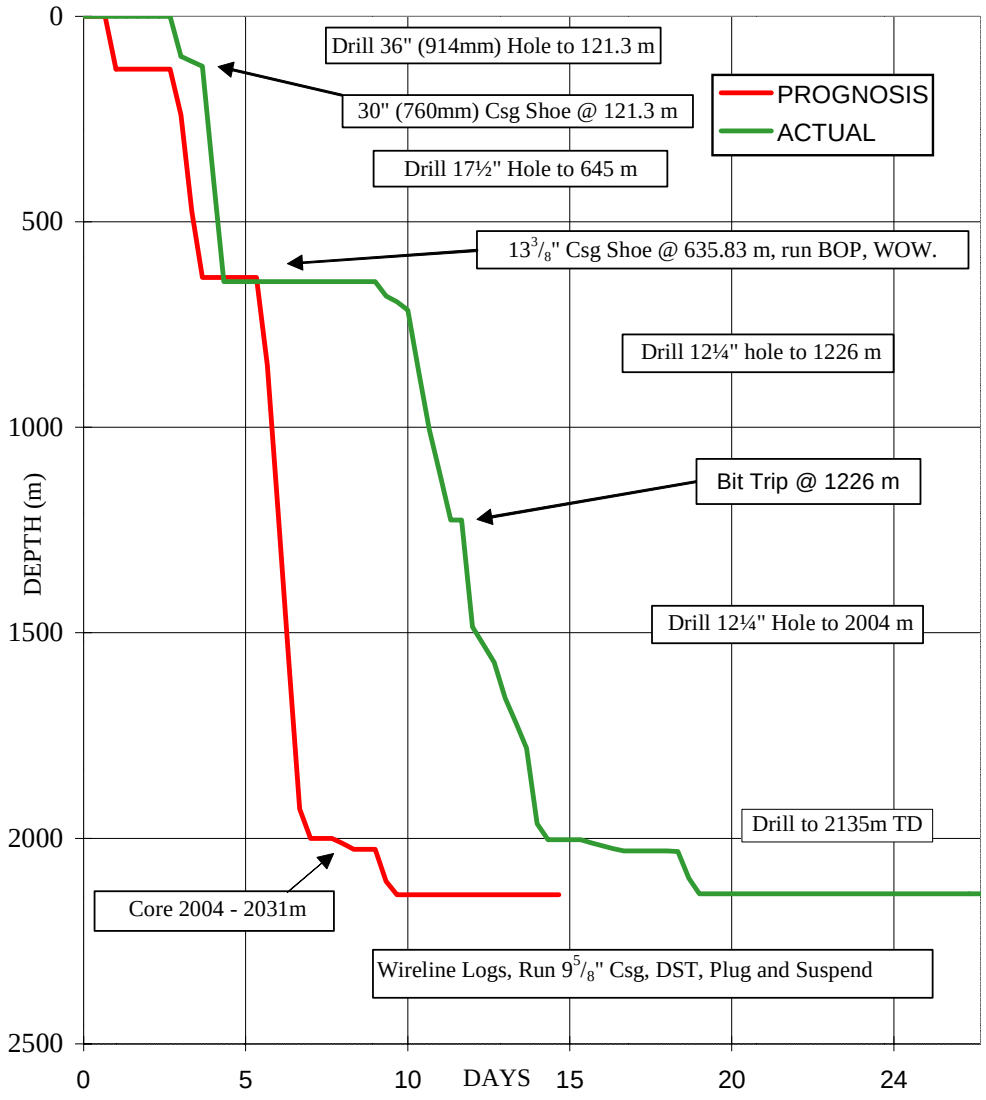
2.2 Geoservices Personnel

ALS Engineers	: Fernandes, Gavin
	: Dóczy, Gedeon
	: Willson, Stanley
	: Misquitta, Patrick
Mudloggers	: Adderley, David
	: Babu, J.V.

2.3 Contractor Information

Drilling	: Diamond Offshore
Rig name	: Ocean Epoch
Rig type	: Semi-Submersible
Mud logging	: Geoservices Overseas S.A.
Mud engineering	: Baker Hughes INTEQ
MWD	: Sperry Sun Halliburton
Wireline logging	: Schlumberger Oilfield Australia
Cementing	: Halliburton
Well head completion	: DrilQuip
ROV	: Total Marine Technology
Casing	: Premium
Work boats	: Lady Dawn, Pacific Challenger
Helicopters	: Bristows
Catering	: Eurest

2.4 Days versus Depth Progress Chart



2.5 Sample Collection Summary

5 sets of Washed and Dried Samples and 2 sets of Samplex trays were collected on this well.

From 645 m to 1200 m the collection interval was 5 m and from 1200 m to 2135 m TD the collection interval was 3 m.

Uncollected samples are listed below :

675 – 680 m
680 – 685 m
690 – 695 m
750 – 755 m
775 – 780 m
865 – 870 m
910 – 915 m
920 – 925 m
935 – 940 m
1050 – 1055 m
1065 – 1070 m
1203 - 1206 m
1212 - 1215 m
1254 - 1257 m
1269 - 1272 m
1287 - 1290 m
1302 - 1305 m
1317 - 1320 m
1326 – 1329 m
1341 – 1344 m
1356 – 1359 m
1359 – 1362 m
1392 – 1395 m
1404 – 1407 m
1413 – 1416 m
1419 – 1422 m
1440 – 1443 m
1449 – 1452 m
1461 – 1464 m
1479 – 1482 m
1482 – 1485 m
1485 – 1488 m
1503 – 1506 m
1593 – 1596 m
1602 – 1605 m
1623 – 1626 m
1647 – 1650 m
1662 – 1665 m
1677 – 1680 m
1692 – 1695 m
1704 – 1707 m
1707 – 1710 m
1710 – 1713 m
1725 – 1728 m
1731 – 1734 m
1740 – 1743 m
1743 – 1746 m
1758 – 1761 m
1764 – 1767 m
1776 – 1779 m
1779 – 1782 m
1782 - 1785 m
1785 – 1788 m
1815 – 1818 m
1818 – 1821 m
1821 – 1824 m
1839 – 1842 m
1848 – 1851 m
1851 – 1854 m
1863 – 1866 m
1866 – 1969 m
1878 – 1881 m
1881 – 1884 m
1884 – 1887 m
1899 – 1902 m
1902 – 1905 m
1905 – 1908 m
1908 – 1911 m
1911 – 1914 m
1932 – 1935 m
1944 – 1947 m
1950 – 1953 m
2007 – 2010 m
2013 – 2016 m
2019 – 2022 m

Sample distribution was as follows:

Recipient		Washed and Dried 100 g	Washed and Dried 200 g	Samplex Trays
Santos	:	2		1
A.W.E.	:	1		1
Geoscience Australia	:		1	
D.P.I.	:		1	

The Samplex trays and washed and dried cuttings samples were dispatched to the Santos Core Library, Gillman.

3.0 GEOLOGICAL INFORMATION

3.1 Lithology and Show Summary

From Spud to 645.0 m RT returns were to the seafloor. Returns were taken from 645.0 m onwards to total depth of 2135.0 m.

645-675 m
Narrawaturk Marl

Drilling Parameters:
WOB: 6-25 klbs MF : 760-900 gpm
RPM: 160-170 SPP: 1420-1850 psi
TRQ: 4-7 klb*ft

Lithology	Lithology description	ROP m/hr			Depth	Total	C1	C2	C3	iC4	nC4	C5
		ave.	max.	min.	m	Gas %	%	%	%	%	%	%
MARL	Pale brown grey, occasional medium brown, commonly argillaceous, rare fossil fragments, corals, echinoid spines, occasional fine to medium quartz grains, occasional lithics, very soft to dispersive, amorphous.	54	258	15	645-675	0.002-0.004	0.0003 0.0009					

675-782 m
Mepunga Formation

Drilling Parameters:
WOB: 12-25 klbs MF : 755-855 gpm
RPM: 155-160 SPP: 1150-1750 psi
TRQ: 3.2-9.2 klb*ft

Lithology	Lithology description	ROP m/hr			Depth	Total	C1	C2	C3	iC4	nC4	C5
		ave.	max.	min.	m	Gas %	%	%	%	%	%	%
SANDSTONE	Light to medium brown, occasional light orange yellow, generally coarse to very coarse, occasional fine to medium, mod sorted, sub-angular to sub-round, wk silicious cement, rare argillaceous matrix, occasional to common ferrous staining, loose, occasional friable aggregates, fair to good visible and inferred porosity, no fluorescence.	75	294	15	675-782	0.002-0.01	0.0004 0.009					
CLAYSTONE	Light to medium grey, occasional light grey brown, calcareous in part, trace fossil fragments, trace pyrite, very soft to dispersive, amorphous.											

782-976 m
Wangerrip Group, Dilwyn Formation

Drilling Parameters:
WOB: 1-15 klbs MF : 560-775 gpm
RPM: 150-160 SPP: 1050-180 psi
TRQ: 3.1-6.5 klb*ft

Lithology	Lithology description	ROP m/hr			Depth	Total	C1	C2	C3	iC4	nC4	C5
		ave.	max.	min.	m	Gas %	%	%	%	%	%	%
SANDSTONE	Clear to translucent, pale yellow brown, medium to coarse, locally very coarse, mod to well sorted, sub-angular to sub-round, weak silicious cement, rare weak calcareous cement, no visible matrix, common disseminated and nod pyrite, occasional lithics and carbonaceous specks, loose grains, occasional friable aggregates, fair to occasional good visible and inferred porosity, no fluorescence.	70	144	10	782-976	0.0-0.008	0.0-0.005					
CLAYSTONE	Medium to dark brown grey, occasional medium brown, silty in part, occasional to commonly disseminated and nodular pyrite, occasional carbonaceous inclusions, soft to firm, occasionally moderately hard, fissile to blocky, amorphous.											

976-1037m
Wangerrip Group, Pember Mudstone

Drilling Parameters:
WOB: 17-30 klbs MF : 790-850 gpm
RPM: 160-180 SPP: 1750-2200 psi
TRQ: 5-8.2 klb*ft

Lithology	Lithology description	ROP m/hr			Depth	Total	C1	C2	C3	iC4	nC4	C5
		ave.	max.	min.	m	Gas %	%	%	%	%	%	%
SANDSTONE	Clear to translucent, pale yellow brown in part, occasional frosted, very coarse to coarse, moderately sorted, sub-angular to sub-round, weak silicious cement, trace argillaceous matrix, locally nodular pyrite, loose, fair visible and inferred porosity, no fluorescence.	12	55	10	976-1037	.004-0.046	0.0035 - 0.035					
CLAYSTONE	Pale to medium brown, rare brown grey, occasional to commonly micro micaceous, commonly micro carbonaceous specks, very soft to dispersive, amorphous to occasional fissile.											

1037-1084 m
Wangerrip Group, Pebble Point Formation

Drilling Parameters:
WOB: 8-18 klbs MF : 855 gpm
RPM: 180 SPP: 2040 psi
TRQ: 3.6-5.5 klb*ft

Lithology	Lithology description	ROP m/hr			Depth	Total	C1	C2	C3	iC4	nC4	C5
		ave.	max.	min.	m	Gas %	%	%	%	%	%	%
SANDSTONE	Clear to translucent, occasional pale yellow brown, course to very coarse, moderately sorted, sub-angular to sub-round, weak silicious cement, common pyrite nodules, trace glauconite, loose, fair to good visible and inferred porosity, no fluorescence.	90	267	26	1037-1084	0.01-0.056	0..009 - 0.047	0-0.002				
CLAYSTONE	Medium brown, occasional brown grey, micro micaceous in part, firm, occasionally grading to argillaceous SILTSTONE, very soft to occasional dispersive, fissile to in part, amorphous.											

1084-1180 m
Wangerrip Group, Pebble Point Equivalent

WOB: 5-8 klbs
RPM: 140 MF : 800 gpm
TRQ: 3.4-5.7 klb*ft SPP: 1900 psi

Lithology	Lithology description	ROP m/hr			Depth	Total	C1	C2	C3	iC4	nC4	C5
		ave.	max.	min.	m	Gas %	%	%	%	%	%	%
SANDSTONE	Clear to translucent, occasional pale brown, medium to very coarse, moderately to moderately well sorted, sub-angular to sub-round, trace weak calcareous and silicious cement, occasional argillaceous matrix, commonly nodular pyrite, occasional glauconite grains, loose, fair to good visible and inferred porosity, no fluorescence.	48	117	20	1084-1180	0.024-0.156	0.021-0.1352	0-0.0017				
SILTSTONE	Grey, grey brown, argillaceous, dispersive, occasionally grading to CLAYSTONE, occasionally micro micaceous, trace carbonaceous material, firm to very soft, fissile to sub - fissile.											
CLAYSTONE	Pale grey brown, occasional pale brown, dispersive to very soft, trace very fine arenaceous in part grading to SILTSTONE, trace disseminated pyrite, amorphous to fissile.											

1180-1234 m
Wangerrip Group, Massacre Shale

Drilling Parameters:
WOB: 4-20 klbs MF : 800 gpm
RPM: 165 SPP: 2030 psi
TRQ: 3.3-6.8 klb*ft

Lithology	Lithology description	ROP m/hr			Depth	Total	C1	C2	C3	iC4	nC4	C5
		ave.	max.	min.	m	Gas %	%	%	%	%	%	%
SANDSTONE	Translucent to pale brown, opaque in part, medium to occasional coarse, trace fine, moderately well sorted, sub-angular to sub-round, trace weak calcareous cement, occasional argillaceous matrix, trace micro carbonaceous specks, trace nodular pyrite, locally friable aggregates, fair visible and inferred porosity, no fluorescence.	28	82	15	1180-1234	0.014-0.098	0.0104 - 0.070	0.0006 - 0.0097				
SILTSTONE	Pale grey brown, pale brown to occasional off white, argillaceous, calcareous in part, occasional grading to CLAYSTONE, micro micaceous in part, trace carbonaceous material and specks, abundant nodular pyrite, soft to firm, sub - fissile.											
CLAYSTONE	Light brown, occasional light brown grey, dispersive to very soft, trace carbonaceous specks, trace nodular pyrite, amorphous to fissile.											

1234-1249 m
Timboon Sandstone

Drilling Parameters:
WOB: 5-14 klbs MF : 860 gpm
RPM: 150-175 SPP: 3100-3300 psi
TRQ: 4.7-7.4 klb*ft

Lithology	Lithology description	ROP m/hr			Depth	Total	C1	C2	C3	iC4	nC4	C5
		ave.	max.	min.	m	Gas %	%	%	%	%	%	%
SANDSTONE	Clear to translucent, pale brown, medium to fine, occasional coarse grains, moderately well sorted, sub-angular to angular, occasional weak dolomitic cement, commonly silty matrix, disseminated pyrite in part, occasional glauconite, loose to friable aggregates, poor visible and inferred porosity, no fluorescence.	30	56	7	1234-1249	0.012-0.038	0.012-0.036	.005-0.008				
SILTSTONE	Pale grey brown, pale brown to occasional off white, argillaceous, calcareous in part, occasional grading to CLAYSTONE, micro micaceous in part, trace carbonaceous material and specks, abundant nodular pyrite, soft to firm, sub - fissile.											

1249-1328 m
Sherbrook Group, Skull Creek Mudstone

Drilling Parameters:
WOB: 4-15 klbs MF : 860 gpm
RPM: 19 SPP: 3160 psi
TRQ: 4.3-6.6 klb*ft

Lithology	Lithology description	ROP m/hr			Depth	Total	C1	C2	C3	iC4	nC4	C5
		ave.	max.	min.	m	Gas %	%	%	%	%	%	%
SILTSTONE	Light brown grey, argillaceous, occasional grading to CLAYSTONE, calcareous in part, trace micro micaceous, occasional carbonaceous specks, occasional nodular and disseminated pyrite, soft to firm sub - fissile to occasionally fissile.	25	70	15	1249-1328	0.02-0.064	0.0144 - 0.0576	0.0-0.0002				
SANDSTONE	Clear to translucent, very pale brown, occasional pale grey, fine to medium, occasionally very fine to coarse, moderately to moderately well sorted, sub-angular to sub-round, strong calcareous cement, occasional to commonly silty matrix, commonly nodular pyrite, glauconite grains in part, loose, friable to hard, poor visible and inferred porosity, no fluorescence.											

1328-1509 m
Paaratte Formation

Drilling Parameters:
WOB: 10-25 klbs MF : 850-870 gpm
RPM: 120-70 SPP: 3300-3400 psi
TRQ: 4.7-9.2 klb*ft

Lithology	Lithology description	ROP m/hr			Depth	Total	C1	C2	C3	iC4	nC4	C5
		ave.	max.	min.	m	Gas %	%	%	%	%	%	%
SILTSTONE	Pale to occasional medium brown, occasional pale brown grey, argillaceous to arenaceous, occasional to commonly glauconite grains, rare pyrite nodules, micro carbonaceous specks, very soft to firm, occasionally moderately hard, dispersive, amorphous in part, sub - blocky.	36	152	13	1328-1509	0.028-0.298	0.0214 - 0.2802	0.0001 - 0.0033	0.0001 - 0.0008	0.0001 - 0.0007	0-0.0001	
SANDSTONE	Off white to milky, occasional clear to translucent, medium to coarse, occasional fine, poor to occasionally moderately sorted, sub-angular to predominately sub-round, weak to moderately silicious cement, occasional off white kaolinite matrix, occasional glauconite grains, occasional pyrite nodules, generally loose, moderately hard in part, poor to occasional fair inferred and visible porosity, no fluorescence.											
LIMESTONE	Tan to off white, occasional very pale yellow, micritic, arenaceous, occasional argillaceous, micro crystalline, moderately hard to hard.											

1509-1530 m
Nullawarre Sandstone

Drilling Parameters:
WOB: 15-20 klbs MF : 850 gpm
RPM: 160-220 SPP: 3450-3540 psi
TRQ: 5.4-9.2 klb*ft

Lithology	Lithology description	ROP m/hr			Depth	Total	C1	C2	C3	iC4	nC4	C5
		ave.	max.	min.	m	Gas %	%	%	%	%	%	%
SILTSTONE	Very pale brown to very pale brown grey, very argillaceous, g/t CLAYSTONE in part, occasional to rare glauconite grains, occasional micro carbonaceous specks, rare pyrite nodules, very soft to predominately dispersive, sub - blocky, amorphous.	25	64	17	1509-1530	0.238-0.418	0.2273 - 0.3922	0.0013 - 0.0043	0.0003 - 0.0009	0.0002 - 0.0007	0.0-0.0001	0.0-0.0005
SANDSTONE	Off white, pale brown, pale green in part, very fine to fine, occasional medium, moderate to strong calcareous cement, occasional off white kaolinite matrix, occasional to common glauconite grains, friable to moderately hard, loose in part, poor to very poor visible and inferred porosity, no fluorescence.											

1530-1941 m
Belfast Mudstone

Drilling Parameters:
WOB: 8-20 klbs MF : 850-870 gpm
RPM: 160-220 SPP: 3450-3800 psi
TRQ: 4.8-10.6 klb*ft

Lithology	Lithology description	ROP m/hr			Depth	Total	C1	C2	C3	iC4	nC4	C5
		ave.	max.	min.	m	Gas %	%	%	%	%	%	%
SILTSTONE	Light to medium grey, pale grey brown, argillaceous to arenaceous, occasional micro micaceous, trace local pyrite and carbonaceous specks, occasional glauconite, firm to occasional moderately hard, sub-blocky to sub fissile.	36	62	13	1530-1941	0.202-0.602	0.1592 - 0.9907	0.0011 - 0.0099	0.0002 - 0.0023	0.0001 - 0.0008	0.0001 - 0.0005	0.0-0.0003
SANDSTONE	Off white to occasional milky, translucent to clear, very pale grey, pale brown in part, very fine to fine, occasional medium, moderately to moderately well sorted, sub-round, occasional round to sub-angular, weak to moderately calcareous cement, occasional off white to pale brown argillaceous matrix, occasional glauconite grains, trace pyrite, loose, friable to moderately hard, poor visible and inferred porosity, no fluorescence.											

1941-1999 m
Flaxmans Formation

Drilling Parameters:
WOB: 10-20 klbs MF : 850-870 gpm
RPM: 150-185 SPP: 3730to3940 psi
TRQ: 7.3-12.0 klb*ft

Lithology	Lithology description	ROP m/hr			Depth	Total	C1	C2	C3	iC4	nC4	C5
		ave.	max.	min.	m	Gas %	%	%	%	%	%	%
SANDSTONE	Off white to milky, occasionally pale yellow, clear to translucent, very fine to coarse in part, poorly sorted, angular to sub-round, moderately silicious cement, occasional moderately calcareous cement, occasional to common kaolinite matrix, locally commonly glauconite grains, moderately hard to hard, very poor to fair visible and inferred porosity, no fluorescence.	34	62	15	1941-1999	0.426-9.81	0.4048 - 9.1347	0.0054 - 0.1615	0.0014 - 0.0408	0.0004 - 0.0051	0.0002 - 0.0054	0.0001 - 0.0014
SILTSTONE	Very pale to pale brown, medium brown, brown grey, pale green, commonly very arenaceous, grading to very fine SANDSTONE in part, occasionally argillaceous, locally common glauconite grains, moderately hard to hard, blocky to sub-blocky.											

1999-2135 m (T.D.)
Waarre Formation

Drilling Parameters:
WOB: 10-20 klbs MF : 755-820 gpm
RPM: 150-190 SPP: 2490-3990 psi
TRQ: 3.7-11.0 klb*ft

Lithology	Lithology description	ROP m/hr			Depth	Total	C1	C2	C3	iC4	nC4	C5
		ave.	max.	min.	m	Gas %	%	%	%	%	%	%
SANDSTONE (C) (Younger Sand)	Off white to milky, occasional clear to translucent, occasional pale yellow, course to very coarse, occasional fine to medium, poor sorted, angular to sub-round, moderately silicious cement, occasional kaolinite matrix, occasional pyrite nodules, loose, moderately hard to hard, fair to good visible and inferred porosity, no fluorescence.	9	25	2	1999-2135	0.07-8.1	0.0120 - 6.4278	0.0011 - 0.1290	0.0004 - 0.0329	0.0002 - 0.0043	0.0002 - 0.0046	0.0-0.0012
SILTSTONE	Pale to medium grey brown, medium to occasional dark grey, locally very arenaceous grading to SANDSTONE in part, locally commonly micro carbonaceous specks, rare locally glauconite grains, very soft to moderately hard, dispersive in part, blocky to sub-blocky, occasionally amorphous.											
SANDSTONE (A) (Older Sand)	Off white, clear to translucent, occasionally very pale grey, very fine to fine, occasionally medium, moderately well to occasional well sorted, sub-angular to sub-round, moderately calcareous and silicious cement, common to abundant off white kaolinite matrix, trace carbonaceous specks and pyrite nodules, locally common rock flour, moderately hard to hard, occasionally friable, loose in part, poor to very poor visible and inferred porosity, no fluorescence.											

3.2 Gas Ratio Interpretation - Introduction

Gas composition and total gas in mud were measured using the Reserval (A combined total gas detector and chromatograph supplied with gas from a GZG degasser). This degasser pumps mud continuously to an enclosed chamber with a constant mud volume, and, as a backup gas detection system, a Geoservices FID Chromatograph Panel (FCP) and FID Gas Panel (FGP) were in place. Both use the same principle of measuring ions released when organic material, actively released from the mud, is burnt. The mud is degassed at the flow line by a degasser which is essentially an agitator inside a chamber through which the mud passes. The gas is then drawn back to the unit where it is analysed for hydrocarbons. H_2S and CO_2 are measured by independent sensors.

Although both systems use the FID (flame ionization detector) principle, the chromatograph first separates the hydrocarbon gases by passing the sample through a column where heavier gases take longer to pass through than lighter ones. After the hydrocarbon gases are separated, they are burned at the detector in the presence of hydrogen (which maintains combustion). Each burnt hydrocarbon molecule releases ions proportional to the number of carbon atoms in the molecule. These free ions (C+) will reduce the resistivity of the air in a filament allowing a voltage to pass from the cathode to the anode. This created voltage is proportional to the gas burned. Note: as the FGP (total gas) burns all the gases simultaneously, values are recorded in methane equivalent.)

The composition of the gas in mud from the formation is significant in determining the geochemical origin and value of a show. There are several methods which can be used to determine whether the hydrocarbon gas in mud comes from a potential gas or oil zone. Amongst these methods are the Triangle Diagram (also known as the gas composition diagram), Pixler Diagram (also know as the gas ratios method) and the Wetness/Balance/Character plots.

3.3 Explanation of Gas Composition Diagrams

The composition of entrained reservoir gas in mud is significant in determining the origin and value of a show. The Gas Composition Diagram is used to graphically represent the hydrocarbon distribution in the gas and to determine whether it corresponds to a gas or oil reservoir.

The triangular diagram is obtained by tracing lines on three scales at 120° to each other, corresponding respectively to the ratios of ethane, propane and normal butane to the total gas. The scales are arranged in such a way that if the apex of the triangle is upward, the diagram represents the analysis of gas from a gas zone, while if the apex points downwards, the diagram represents the analysis of gas from an oil zone. A large triangle diagram represents dry gas or low GOR oil, while small triangles represent wet gases or high GOR oils.

The homothetic centre of the triangle should fall inside the area delineated by the dotted line, which encircles compositions which are 'normal'. If the triangle area is outside this area the gas indicates that the reservoir is not exploitable and that the heavier hydrocarbons composition is 'abnormal' (hydrocarbons chemically altered or dysmigrated or gases with special compositions which are not associated with oil) and may indicate a dead show.

The Gas Ratio Analysis Diagram is a plot of the ratio of C1 to the other gas elements. The magnitude of the methane to ethane ratio determines if the reservoir contains gas or oil or if it is non-productive. The following conclusions are possible:

Ratio C1/C2:	< 2	non-productive zone
	2 - 15	oil present
	15 - 65	gas present
	> 65	non-productive zone

The slope of the line of the ratio plot of C1/C2, C1/C3, C1/C4 and C1/C5 indicates whether the reservoir will produce hydrocarbons or hydrocarbons and water. Positive line slopes indicate production; negative line slopes indicate water bearing formations. When using the slope of the gas ratios plot as an indicator of a possibly productive zone the following points should be borne in mind:

1. Productive dry gas zones may show only C1, but abnormally high shows of C1 are usually indicative of salt water zones.

2. If the ratio C1/C2 is low in the oil section and the ratio C1/C4 is high in the gas section, the zone is probably non- productive.

3. If any ratio (C1/C5 excepted in an oil based mud) is lower than the preceding ratio then the zone is probably non- productive.

4. The ratios may not be definitive for zones of low permeability.

5. Steep gas ratio plots may be indicative of tight zones.

3.4 Explanation of Wetness/Balance/Character Curves

Another method for evaluating gas zones uses three ratios: hydrocarbon Wetness (W_h), hydrocarbon Balance (B_h) and hydrocarbon Character (C_h) plotted against depth where:

$$W_h = \frac{(C2 + C3 + C4 + C5)}{(C1+C2+C3+C4+C5)} \times 100\ (\%)$$

$$B_h = \frac{(C1 + C2)}{(C3 + C4 + C5)}$$

$$C_h = \frac{(C4 + C5)}{C3}$$

Wetness (W_h) is the primary zone indicator and provides a measure of the relative proportion of heavier gases in the overall gas show as follows:-

$W_h < 0.5$	Light non-associated gas with low productivity potential or only geo-pressured methane.
$0.5 < W_h < 17.5$	Potentially productive gas with gas density increasing with W_h.
$17.5 < W_h < 40.0$	Potentially productive oil with gravity decreasing as W_h increases.
$W_h > 40.0$	Heavy or residual oil with low productivity potential.

Balance (B_h) and Wetness (W_h) move closer together and eventually cross as reservoir hydrocarbons become denser in transition from gas to oil. The zone guidelines for B_h combine with those for W_h to improve reliability of show evaluation as follows:

$W_h < 0.5$ and $B_h > 100$	Very light, dry gas which is almost certainly non-productive.
$0.5 < W_h < 17.5$ and $W_h < B_h < 100$	Productive gas with gas increasing in wetness and density as the two curves converge.
$0.5 < W_h < 17.5$ and $B_h < W_h$	Productive gas condensate or a high gravity gas/oil ratio.
$17.5 < W_h < 40$ and $B_h < W_h$	Productive oil with oil gravity decreasing - density increasing as the curves diverge.
$17.5 < W_h < 40$ and $B_h > W_h$	Non-productive residual oil.

Character (C_h) serves to resolve ambiguities between oil or gas indications by defining the following:

$0.5 < W_h < 17.5$ and $B_h < W_h$ and $C_h < 0.5$ — Productive wet gas or condensate.

$0.5 < W_h < 17.5$ and $B_h < W_h$ and $C_h > 0.5$ — Productive high gravity and/or high GOR oil.

It is important to note that in the conclusion to each of the interpretive tools, the terms 'productive' and 'non-productive' are used in a geochemical sense. Ultimate production of a zone is dependent upon reservoir thickness and extent as well as other physical and economic factors which are not taken into account when analysing gas compositions. The methods discussed here are intended to assist the interpretive skills of the geologist or log analyst. We do not advocate their use blindly or in ignorance of the underlying geological and chemical principles of hydrocarbon occurrence.

Please refer to the Gas Ratio Log enclosure.

Abbreviation : GOR - Gas Oil Ratio

3.5 Gas Composition Discussion

From Spud to the TD of the 17½" phase at 645 m, returns were dumped to the seabed as a result of which no samples were collected nor was any gas monitored. Gas was first recorded in Casino 3 from 648 m, near the start of the 12¼" (311 mm) hole and gas was recorded continuously from here down to the TD of the well.

From 648 m down through the Mepunga formation, Dilwyn formation and Pember Mudstone, to the top of the Pebble point formation at 1037 m, the background gas was very low and ranged from 0.1 to 0.5 units, comprising of Methane alone without even traces of any of the heavier hydrocarbon gas components. There was no gas peak of note in this interval.

From the top of the Pebble point formation at 1037 m to 1125 m, the background gas showed a slow and gradual increase from 0.5 to 2 units, with a peak of 5.44 units at 1111 m, which appeared to be ROP related. This gas consisted predominantly of Methane with very minor traces of Ethane.

From 1125 m to 1225 m, i.e. through the Pebble point formation and the Massacre Shale, the background gas was 4 to 5 units, comprising predominantly of Methane with minor Ethane and traces of Propane. There was no real peak of note in this interval.

From 1225 m to 1360 m, i.e. through the Timboon Sandstone, Skull Creek Mudstone and top section of the Paaratte formation, the gas levels dropped a fraction and ranged from 0.5 to 1 unit. The gas comprised predominantly of Methane with minor Ethane and traces of Propane and Butane, without any gas peak worth mentioning.

From 1360 m to 1480 m, i.e. through Paaratte formation, the background gas increased slowly from 1 to 10 units, this appeared to be ROP related. This gas consisted predominantly of Methane with minor traces of Ethane to Butane. There was no real peak recorded in this interval, though a maximum gas of 20 units was recorded at 1460 m.

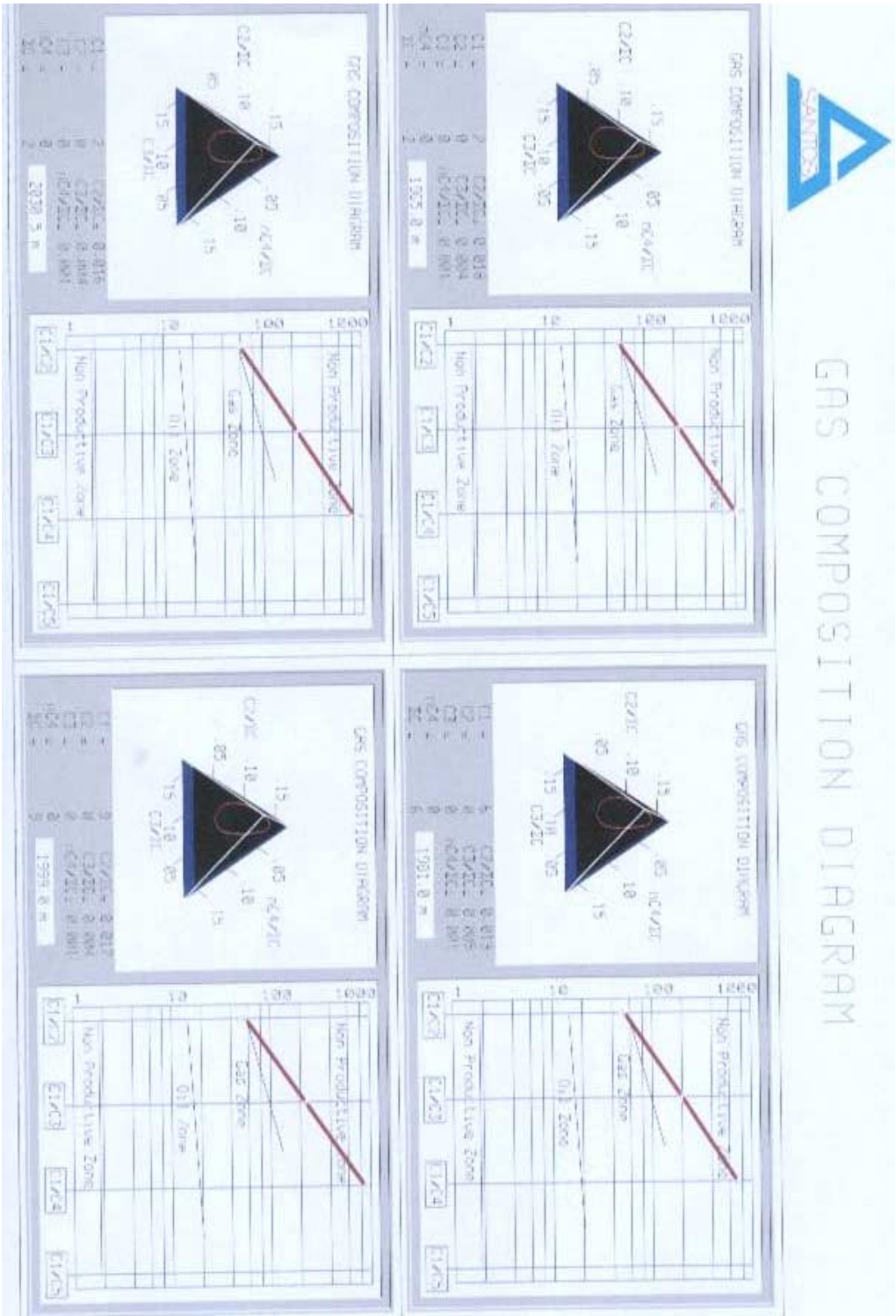
From 1480 m to 1960 m, i.e. from the lower section of the Paaratte formation, through the Nullawarre Sandstone and Belfast Mudstone, the background gas hung around 20 units, consisting predominantly of Methane with minor Ethane and Propane and the occasional trace of Butane. There was no real peak of note in this interval, with a maximum gas of 30.1 units recorded from a Sandstone at 1662 m.

From 1960 m to 1998 m, i.e. just above the Warre Sandstone, the gas levels increased in the interbedded Sandstone / Siltstone section. The background gas increased with depth from 20 to 80 units, with a maximum gas of 451 units recorded at 1998 m, which was a metre above the top of the Warre Sandstone. This gas composition was pretty much the same as that above and comprised predominantly of Methane with minor Ethane and Traces of Propane and Butane.

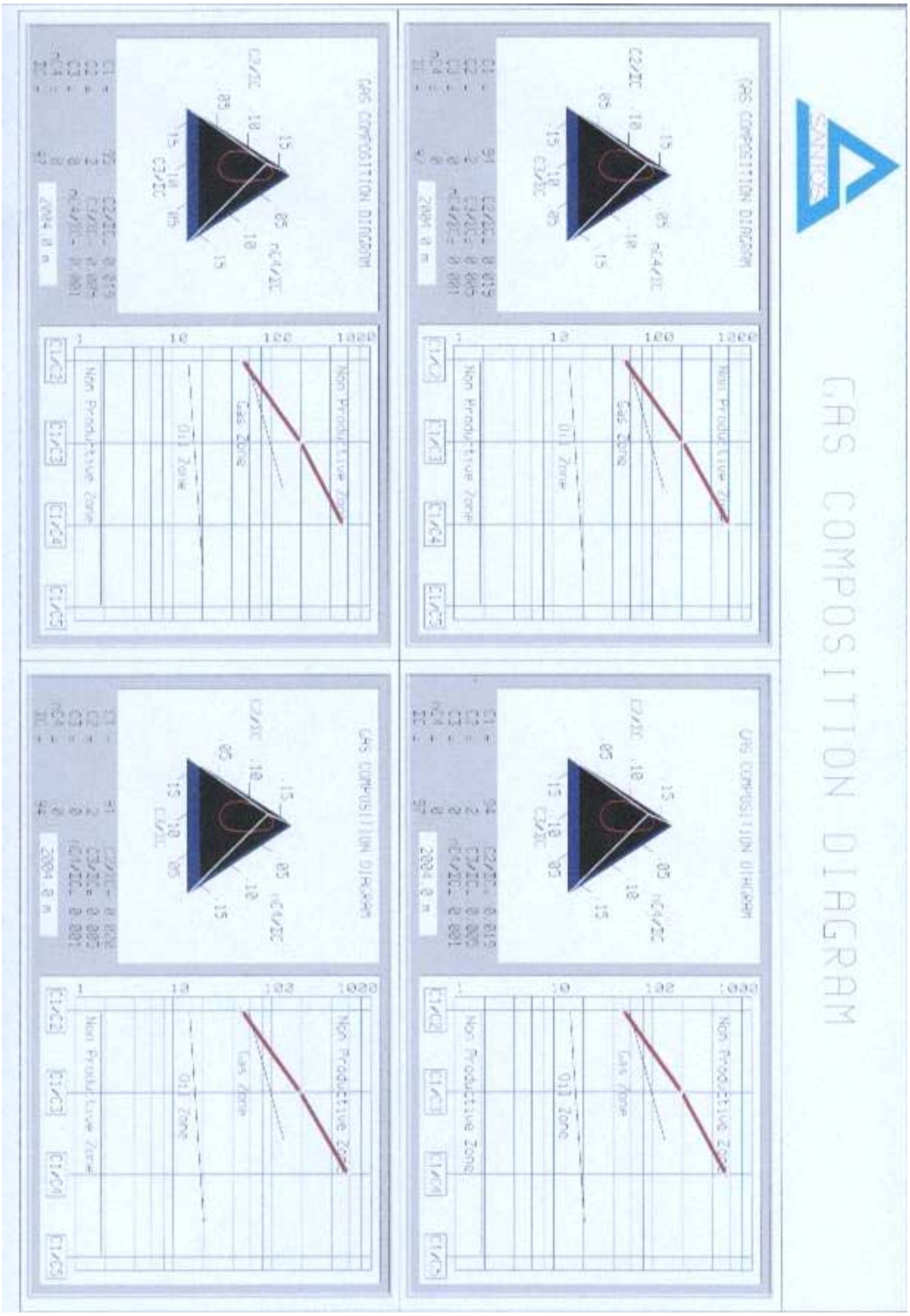
In the interval from 1999 m to 2035 m, which is the zone of interest in this well, a core was cut from 2004 to 2031 m. (young Warre Sandstone). The gas record in this cored interval isn't complete, due to the fact that the gas was not circulated out prior to pulling out with the core (which is normally the case). Gas, which was recorded from 2017 m consisted predominantly of Methane with minor Ethane and traces of Propane and Butane. The maximum gas recorded in this interval was 490.9 units at 1999 m. Gas composition in this section, as shown by the gas triangle diagrams on the following page, is dry for a zone of gas production.

Below 2035 m to 2135 m TD, the gas levels dropped appreciably, with a background of 10 to 12 units dropping to 5 to 7 units below 2100 m.

Gas Ratio Diagrams



Gas Ratio Diagrams



4.0 PRESSURE ANALYSIS

4.1 Pressure Summary

Formation pressures were monitored throughout this well by recording a range of indicators. These indicators vary from direct observations of background gas and cuttings form to drilling characteristics such as torque and tight hole, as well as quantitative methods like the D exponent.

Most indicators pointed to a normally pressured environment from surface to the top of the Waare Formation gas reservoir for Casino 3. No connection gases, serious hole problems or excess cavings were noted while drilling to core point at 2004.0 m. There were indications of tight hole while tripping and logging but this probably due to reactive / swelling clays or small ledges. More discussion on each indicator is presented in the table on the following page.

An estimated normal compaction trend for the D exponent showed an interval of undercompaction in the Belfast Mudstone, indicating increasing pore pressure. This was probably the case but a mud weight overbalance of 0.02 to 0.04 sg was enough to control any effects. Other zones where the D exponent plot shows high formation pressures were generally faster drilling sands or silts and can be discounted.

Below 2004 m in the Waare Formation sands, pore pressures were measured with wireline tools to be equivalent to 1.017 sg (19793 kPa at 2007 m with 22 m air gap).

4.2 Coefficients used for Casino-3

Sources	: Local (from LOT data) for Poisson, Gulf Coast (Soft) for Overburden.		
Poisson	: Ak = 0.26103	Bk = -2.24301	(source: local)
Overburden	: As = 0.01304	Bs = -0.17314	Cs = 1.43350
Normal Trend slope values		90 m to 1226 m:	a = 0.0000605
			b = -0.2303591
			offset = -0.008
		1227 m to 2003 m:	a = 0.0000605
			b = -0.0802740
			offset = -0.028
		2003 m to 2135 m:	a = 0.0000605
			b = 0.0197257
			offset = -0.048

4.3 Tabulated Summary of Pressure Detection Methods and Results

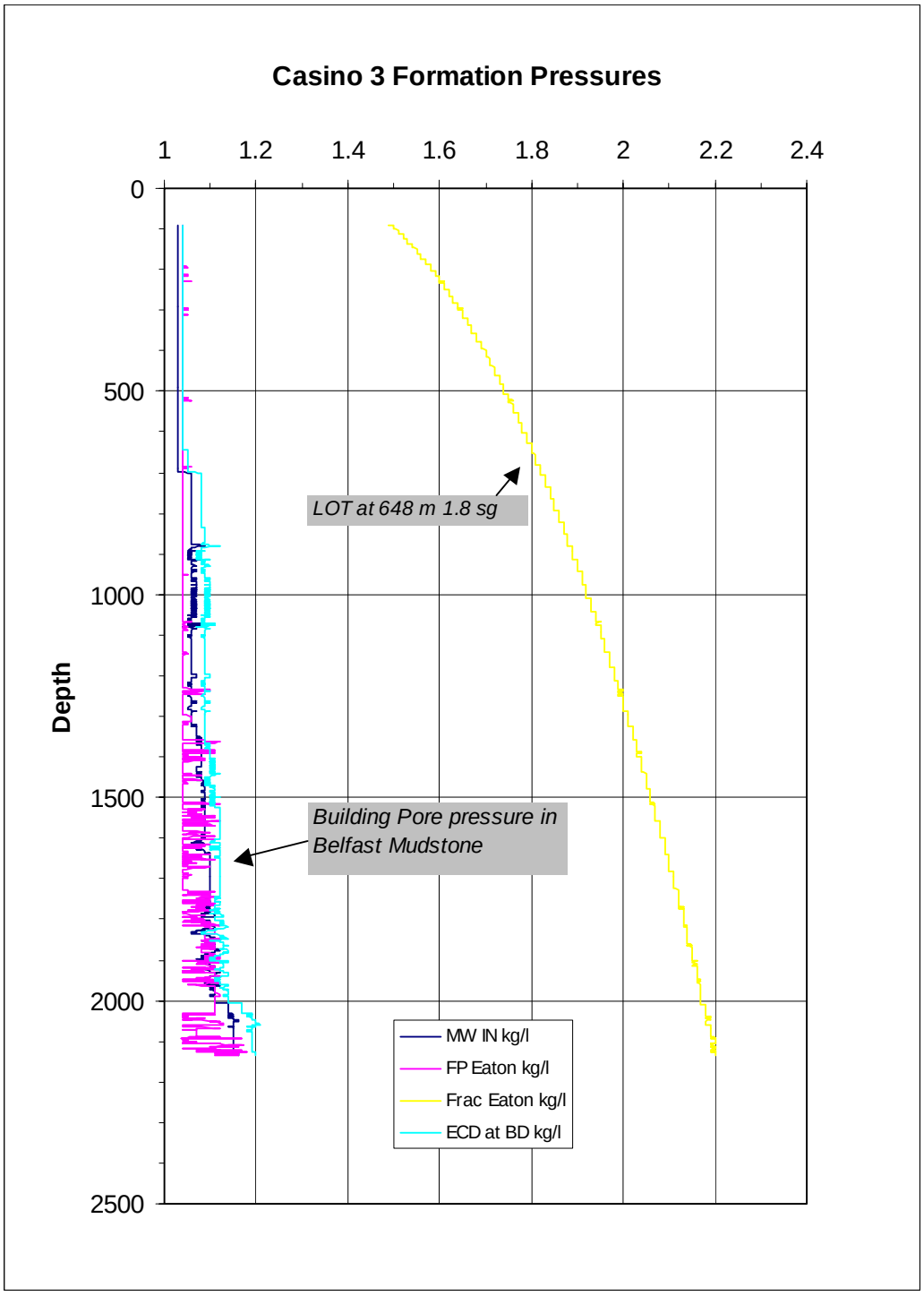
Depth interval:	Seabed to 2135.0 m	Normal pore pressure 8.66 ppg (Possible 9.0 ppg at top of Waare formation.)
Lithology	Seabed -645.0 m: Returns to seabed 645 - 705 m: Claystone interbedded w/ Sandstonestone 705 - 975 m: Massive Sandstone w/ minor Claystone 975 - 1085 m: Interbedded Claystone / Sandstone 1085 - 1180 m: Sandstone w/minor Claystone , tr Siltstone 1180 - 1250 m: Interbedded Claystone, Sandstone and Siltstone 1250 - 1940 m : Siltstone w/occ Sandstone 1940 – 2000 m : Interbedded Siltstone / Sandstone 2000 – 2135 m : Sandstone w/ interbedded Siltstone	

Observations	**Remarks**
Corrected Exponent: The D exponent plot is of limited validity due to non-shaly lithologies and usage of PDC and core bits. A compaction trend was nevertheless set and the formation pressure was calculated using the Eaton method. A fracture gradient was calculated using LOT data. The D exponent shows a leftward trend in the Belfast Mudstone indicating slightly elevated pore pressures in this formation.	A normal compaction trend was estimated. There was no suitable interval in this well. The Belfast Mudstone may have provided a satisfactory trend but it itself was probably slightly undercompacted.
Gas: Gas was first recorded at 648 m, with the average background ranging from 0.1 – 25 units The slow and gradual increase in gas levels prior to the gas zone were lithology related and not attributed to formation pressure. No connection gases were recorded in this interval.	The low gas values recorded over this interval can be attributed mostly to an organic poor lithology in combination with a normal pore pressure. An overbalance was maintained in this interval with a mud weight of 8.7 ppg f/ 645.0 m to 9.3 ppg to 2400.0 m and then to 9.7 ppg at 2135 m TD.
Flowline Temperature: The flowline temperature showed a gradual increase from 58°f to 77.4°F from the top to the bottom of this interval, there was no sudden increase in temperature to indicate any overpressure.	1.43°F /100 m was the temperature gradient of this interval as calculated from the flowline temperature.
Cuttings: No abnormal or splintery cavings were observed. The volume and size of cuttings observed at the shakers was normal.	Based on this information there is no evidence to suggest that there was any abnormal pressure in this interval.

Other Data: No major hole problems were encountered while drilling this section that could be attributed to abnormal pore pressure, the behaviour of the standpipe pressure and torque were normal at connections, ruling out any possibility of abnormal pressure.

Conclusions: The interval from 645 m to 1530 m was normally pressured. The Belfast Mudstone from 1530 m to 1941 m was a zone of increasing pore pressure. The Waare Formation was measured by wireline logging tools to be subnormally pressured (1.017 sg).

4.4 D-Exponent Plot



5.0 DRILLING INFORMATION

5.1 Mud Record

From Spud to 645.0 m Casino-3 was drilled with Seawater and high viscosity sweeps with returns to the seabed.

From 645.0 m to 2135.0 m an Aqua-drill gel based mud system was used.

Depth m	MW SG	FV sec/qt	PV cps	YP lb/100ft	Gels	WL	Solids %	Sand %	Chlorides mg/l	Cake /32"
648	1.03	71	23	29	9/8	10.0	3.0	-	35,800	1
810	1.05	70	28	37	8/10	7.0	3.0	0.5	35800	1
1005	1.06	54	21	29	7/15	7.0	3.5	0.25	35800	1
1226	1.06	58	18	22	7/14	6.5	3.0	1.0	35700	1
1436	1.07	60	19	27	7/14	6.0	1.0	0.65	35750	1
1610	1.10	61	19	28	8/16	6.0	2.0	0.5	35700	1
1781	1.12	72	25	30	7/16	6.5	3.0	0.5	40000	1
1955	1.12	69	24	33	7/16	6.0	3.5	0.5	40000	1
2004	1.12	70	24	32	8/16	5.5	3.0	0.5	40000	1
2020	1.14	71	25	32	8/18	4.5	7.0	0.55	35800	1
2031	1.15	71	24	37	8/12	4.4	7.0	0.5	36000	1
2039	1.16	73	24	36	7/11	4.0	7.0	0.75	35000	1
2074	1.15	70	24	35	7/11	4.0	7.0	0.6	34500	1
2117	1.16	75	26	39	8/11	4.0	7.0	0.6	34000	1
2135	1.16	65	24	40	8/12	4.0	7.0	0.6	33500	1

5.2 Bit Record

Bit #	Size (in)	Make	Type	Jets	TFA In^2	In (m)	Out (m)	Run (m)	Hrs	WOB	RPM	TORQ kftlbs	SPP	GPM	Grading
1	26 / 36HO	Smith	S987PX	3 x 24	1.33	89.05	121.3	32.25	9	5 - 15	60	2.5 – 3.3	1370 -1550	1200	3-5-WT-A-E-I-NO-TD
2	17½	Reed Hycalog	EM511GC	3 x 22 1 x 20	1.42	121.3	645	523.7	7.9	5 - 20	120	2.4 – 10.5	2400	1150	2-2-NO-A-E-I-NO-TD
3	12¼	Smith	MOZTL	4 x 16	0.79	645	1226	581	13.7	2 - 25	160- 170	3 0 – 6.7	1225 -2030	800	3-4-BT-M2-E-2-ER-BHA
4	12¼	Reed Hycalog	DSX195D	3 x 13 2 x 12	0.61	1226	2004	778	26.5	2 - 25	165- 210	3.3 – 10.4	3450 -3900	850	1-1-RR-A-X-I-IN-CP
5	12¼	Security	CD93 Core Head	10x14	1.5	2004	2031	27	2.8	2 - 15	50 -75	4.0 – 10	1370	253	1-1-NO-A-X-I-NO-TD
4RR	12¼	Reed Hycalog	DSX195D	3 x 13 2 x 12	0.61	2031	2135	104	15.41	15-24	150-190	6.0 -11	2480 -3980	755 - 823	2-2-WT-T-X-I-BU/CT-TD
6	8½	Reed Hycalog	HP 21G	OPEN		2077	2077	0		0	0	0			1-1-NO-A-0-0-NO-LOG

5.3 Hydraulic Listing Summary

Depth (m)	Mud Weight (ppg)	ECD (ppg)	Flow Rate (gpm)	Total Pressure Loss (psi)	Pressure Loss Across Bit (psi)	Mud Velocity Through bit (m/sec)	Bit Hydraulic Power (hp)	Mud Impact at Bit (lbf)	Total Hydraulic Power (hp)	Ratio (Bit Pwr/Total Pwr) (%)
97	8.6	8.6+	1202	1402	659	89	468	1566	995	47.0
121	8.6	8.6+	1202	1502	657	89	467	1556	1065	44.0
733	8.6	8.9	586	1252	445	73	154	626	433	35.5
1005	8.9	9.2	776	1860	810	97	371	1140	852	43.6
1226	8.8+	9.0	798	2067	832	99	392	1182	974	40.2
1690	9.1+	9.3	855	3218	1644	137	830	1814	1625	51.1
2004	9.3	9.5	855	4022	1643	137	830	1814	2031	41.0
2097	9.58	9.93	816	4302	1598	131	770	1746	2072	37.1
2135	9.58	9.92	823	4389	1626	132	790	1776	2133	37

5.4 Drilling Phase Summary

5.4.1 36½" (914 mm) Hole Section

Dates	: 14 to 15 October 2003
Measured depth	: 89.05 m to 121.3 m
TVDSSLAT	: 67.05 m to 99.3 m
Number of bits used	: 1 x 26" bit & 1 x 36" H/O
Mud type	: Seawater & gel sweeps

The well was spudded with a 26" (660 mm) Smith S987PX bit with 3 x 24 jets and a 36" (914 mm) hole opener, tagging the seafloor at 89.05 m RT. Casino-3 was spudded at 20:00 hrs on the 14th October 2003 and was drilled to 121.3 m. This section was drilled with seawater and Hi-Vis gel sweeps with returns to the seafloor. 32.25 m were drilled in 8.9 hrs for an average ROP of 3.6 m/hr and was the bit was graded as 3-5-WT-A-O-I-NO-TD

A combination 30" (762 mm) and 20" (500 mm) X-52 grade conductor casing was run on a PBG and cemented with the shoe at 121.3 m.

5.4.2 17½" (445 mm) Hole Section

Dates	: 16th October 2003
Measured depth	: 121.3 m to 645.0 m
TVDSSLAT	: 99.3 m to 623 m
Number of bits used	: 1
Mud type	: Seawater & gel sweeps

Bit #2, a 17½" (445 mm) Reed Hycalog EM5511GC with 3 x 22 and 1 x 20 nozzles was then made up and run in hole. The TOC was tagged at 117.0 m and drilled out, and new hole was drilled from 121.3 m to TD of the 17½" section at 645.0 m. This bit drilled 524.0 m in 7.9 on bottom hours for an average ROP of 66.3 m/hr and was graded as 2-2-NO-A-E-I-NO-TD.

After conditioning the hole, 42 joints of L-80 grade 340 mm ($13^{3}/_{8}$") casing was run and cemented, with the shoe set at 635.83 m.

5.4.3 12¼" (311 mm) Hole Section

Dates	: 22nd to 30th October 2003
Measured depth	: 645.0 m to 2135.0 m
TVDSSLAT	: 622.58 m to 2112.52 m
Number of bits used	: 2 (Including 1 core bit)
Mud type	: Aqua-drill

After waiting on weather the BOP stack and riser were run, and tested as per programme.

Bit #3, a 311 mm (12¼") Smith MOZTL tri-cone bit with 3 x 16 and 1 x 16 centre nozzle was made up with a BHA and run in the hole tagging the TOC at 619.0 m. After drilling out the cement and shoe and washing the rathole, 3.0 m of new formation was drilled to 648.0 m. The bit was pulled back inside the shoe and a LOT was conducted to 750 psi surface pressure, resulting in an EMW of 15.0 ppg. The 311 mm hole was drilled ahead from 648.0 to 1226.0 m. The bit was then pulled out, to be replaced by a PDC bit and a BHA incorporating MWD tools. This bit drilled 581 m in 13.7 on-bottom hours, for an average ROP of 42.4 m/hr. This bit was graded as 3-4-BT-M2-E-2-ER-BHA

Bit #4, a 311 mm (12¼") PDC bit, a Reed Hycalog DSX195D with 3 x 13, 2 x 12 nozzles was made up with a BHA incorporating Sperry Sun MWD tools and was run in the hole. Three deviation surveys were taken by Sperry in the earlier drilled section. This bit drilled from 1226.0 m to the core point at 2004.0 with no hole problems experienced. 778.0 m drilled in 26.5 on bottom hours gave an average ROP for this run of 29.4 m/hr. On pulling out of hole, tight spots were encountered at 1853.0, 1833.0, 1755.0, 1747.0, 1724.0, 1649.0, 1638.0, 1610.0 and 1604.0 m. The string was backreamed from 1596.0 m till inside the shoe. The hole was then circulated clean, which appeared to be the correct action as abundant cuttings were seen at the shakers for a short while. A flow check was performed, and after a delay caused by problems with the top drive, this bit was pulled to surface and the MWD was racked back for use after the next run (coring). Bit #4 was graded AS 1-1-RR-A-X-I-IN-CP

Bit #5, a 12¼" Security CD-93 Core bit was made up with the core barrel and BHA and run in hole. There were quite a few tight / sticky sections, which needed to be reamed through. The first tight spot was recorded at 674m and thereafter at 775m, 1075m, 1079m to 1243m, 1449m to 1511m. Reamed down from 1542m to 1643m. Circulated and worked the pipe from 1643m to 1675m while increasing the MW to 9.6 ppg. After circulating the hole clean with 9.6 ppg mud, an attempt was made to run in hole with no pumps and rpm, which was unsuccessful as the string got held up at 1680m. Reamed through the tight spot at 1680m and continued washing / reaming down to bottom. A 27 m core was then cut from 2004 to 2031m in 2.85 hrs for an average ROP of 9.47 m/hr. The coring BHA was then pulled out of hole and 24.7 m out of 27 m was recovered for a recovery of 91.5%.

Bit #4 was then made up again with the same previous drilling BHA (incorporating MWD tools) and run in hole. The MWD tools were tested at the shoe. Continued running in to 1900m, broke circulation and washed/ reamed down to 2031m, while Sperry Sun logged the previously cored interval. Resumed drilling and drilled down to the well TD of 2135m. The hole was then circulated clean prior to pulling out to surface. The bit drilled 104m in 15.4 hrs for an average ROP of 6.75 m/hr. The bit was graded as 2-2-WT-T-X-I-BU/CT-TD.

Wireline logs were then run as follows:

Run 1: GR-HALS-DSI
Run 2: MDT
Run 3: GMR-HGNS
Run 4: MSCT
Run 5: CST

After logging was completed, the program to test the hole was begun. The hole was cased with 167 joints of L-80 grade $9^5/_8$" casing with the last two joints requiring some washing through tight hole to get down. The cement job was then performed and the $9^5/_8$" shoe was set at 2113.25 m. 8 bbls of mud were lost while running casing and 12 bbls were lost during the cement job.

While waiting on cement, all surface equipment and the BOPs were tested. The old BHA was laid out and a casing scraper assembly was made up. This was run in on tubing and the cased hole was displaced to 9.3 ppg brine. The casing scraper assembly was pulled out and the tubing was racked into stands in the derrick, ready to be picked up for the test string. The flowhead assembly was then made up.

A wireline CBL log was run to assess the casing cement job. A permanent packer was next made up, run and set at 1973.9 m. The DST tool assembly was put together and tested and run in on tubing. This was landed out in the packer and set in the rams. Subsea equipment was then made up and tested and installed. After further pressure testing surface lines, the test string was completed. An 86 bbl underbalance diesel cushion was pumped into the string, displacing the heavier brine.

The well was perforated at 06:03 am on Nov 8 from 2004 m to 2013 m in the top Waare Formation. The annulus was monitored and filled from the trip tank every 30 minutes during the test. Flow and shut in times were as follows:

Initial flow for 10 min (06:03 to 06:13)
Shut in for 2 hrs
Clean up flow for 7.5 hrs (08:15 to 15:45)
Shut in for 6 hrs
Second flow for 19 hrs (21:45 to 16:45)

The flow rate for this well was calculated to be 44 million CFPD.

Injection results from gas samples taken from the separator while flowing the well were as follows:

Sample	Time	C1	C2	C3	iC4	nC4	iC5	nC5
1	12:30 Nov 8	944476	18034	4602	738	824	162	98
2	15:45 Nov 8	943180	18700	4814	838	872	182	110
3	01:40 Nov 9	914528	18552	4726	726	850	166	100
4	15:30 Nov 9	950118	18516	4758	908	876	182	122

H2S=NIL
CO2=NIL
(See Gas section for gas ratio analysis of these samples)

Samples 1 and 2 were caught during the clean up flow and samples 3 and 4 were caught during the second flow.

At the completion of testing the program to plug and abandon the hole was begun. A $9^5/_8$" EZSV packer was run in on 5" DP and set at 1962 m. 20 bbls of cement was squeezed below the packer and 10 bbls of cement was spotted above it. The string was then pulled up and circulated clean. While pulling out of hole, drill pipe was laid out leaving 10 stands in the derrick to use for cutting casing. The $9^5/_8$" casing was cut and retrieved from 185 m. Another EZSV packer was then run and set at 175 m and a second cement plug was pumped here.

Marine riser handling equipment was rigged up. The BOPs were unlatched and recovered as joints of riser were laid out. After unsuccessful attempts to cut the $13^3/_8$" casing, it was left and only the 30" casing was cut and retrieved from 90.3 m. The PGB and 18¾" wellhead were finally pulled up on the 30" casing. Anchor operations were then able to begin and the rig was released at 19:00 hrs on Nov 13th 2003.