

**General information**

Wellbore name	6406/3-6
Type	EXPLORATION
Purpose	APPRAISAL
Status	P&A
Press release	link to press release
Factmaps in new window	link to map
Main area	NORWEGIAN SEA
Field	TYRIHANS
Discovery	6407/1-2 Tyrihans Sør
Well name	6406/3-6
Seismic location	inline 484 & x-line 927: ST9503R99
Production licence	091
Drilling operator	Statoil ASA (old)
Drill permit	1040-L
Drilling facility	STENA DON
Drilling days	56
Entered date	21.09.2002
Completed date	15.11.2002
Release date	15.11.2004
Publication date	01.12.2004
Purpose - planned	APPRAISAL
Reentry	NO
Content	OIL/GAS
Discovery wellbore	NO
1st level with HC, age	MIDDLE JURASSIC
1st level with HC, formation	GARN FM
2nd level with HC, age	MIDDLE JURASSIC
2nd level with HC, formation	ILE FM
Kelly bushing elevation [m]	24.0
Water depth [m]	273.0
Total depth (MD) [m RKB]	4175.0
Final vertical depth (TVD) [m RKB]	4174.0
Maximum inclination [°]	3.7
Bottom hole temperature [°C]	151
Oldest penetrated age	EARLY JURASSIC
Oldest penetrated formation	TILJE FM
Geodetic datum	ED50
NS degrees	64° 47' 43.56" N



EW degrees	6° 57' 55.17" E
NS UTM [m]	7187388.89
EW UTM [m]	403326.40
UTM zone	32
NPDID wellbore	4589

Wellbore history

General

Well 6406/3-6 is located on the Halten Terrace on the western part of the Tyrihans Sør structure. The overall goal for the well was to appraise the Tyrihans Sør Discovery. The main objectives were to sample formation fluid from Tyrihans Sør in order to determine the hydrocarbon phase and to identify any possible erosion in the western part of the Discovery.

Operations

Appraisal well 6406/3-6 was spudded with the semi-submersible installation Stena Don on 21 October 2001. The rig drilled to a TD of 4175 m in the Jurassic Tilje Formation. The well was drilled in a water depth of 273 m, with RKB at 24 m. The well was drilled with seawater and hi-vis sweeps down to 1780 m and with Versavert oil based mud through the 12 1/4" and 8 1/2" sections from 1780 m to 3654.5 m, 4.5 m into the Garn Formation. The subsequent 6" section to TD was drilled with KCl / glycol / low sulphate water-based mud (Glydril).

The well penetrated mainly mudstones above the Jurassic Fangst Group with siltstone intervals in the Nise and Kvitnos Formations. No shows were reported above the Fangst Group. A thick Garn Formation was found, with no trace of erosion. Hydrocarbons were found in the Garn Formation with oil-water contact at 3683 m TVD MSL, and in the upper part of the Ile Formation with oil-water contact at 3825 m TVD MSL. Good shows were recorded in the Garn and Ile Formations down to 3840 m. Due to problems with real-time data mainly memory data were available from MWD in the 8-1/2" section. Both LWD real time runs failed in the 6" section. However, wire line logging covered most of the 6" section. Recovery of sidewall cores was excellent. VSP with P+S mode sonic was gathered in the Garn Formation, and several runs were performed with MDT, collecting samples from Garn, Ile and Tilje (water) Formations. A number of pressure data points gave good correlation for gas and fluid contacts. No conventional cores were cut. The well was completed on 15 November 2002, permanently plugged and abandoned as an oil and gas appraisal.

Testing

No drill stem test was performed

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
1790.00	4175.00

Cuttings available for sampling?	YES
----------------------------------	-----

**Palynological slides at the Norwegian Offshore Directorate**

Sample depth	Depth unit	Sample type	Laboratory
3562.0	[m]	DC	STATOI
3565.0	[m]	DC	STATOI
3568.0	[m]	DC	STATOI
3571.0	[m]	DC	STATOI
3574.0	[m]	DC	STATOI
3577.0	[m]	DC	STATOI
3580.0	[m]	DC	STATOI
3583.0	[m]	DC	STATOI
3586.0	[m]	DC	STATOI
3589.0	[m]	DC	STATOI
3592.0	[m]	DC	STATOI
3595.0	[m]	DC	STATOI
3598.0	[m]	DC	STATOI
3601.0	[m]	DC	STATOI
3604.0	[m]	DC	STATOI
3610.0	[m]	DC	STATOI
3613.0	[m]	DC	STATOI
3616.0	[m]	DC	STATOI
3619.0	[m]	DC	STATOI
3622.0	[m]	DC	STATOI
3625.0	[m]	DC	STATOI
3628.0	[m]	DC	STATOI
3631.0	[m]	DC	STATOI
3634.0	[m]	DC	STATOI
3637.0	[m]	DC	STATOI
3640.0	[m]	DC	STATOI
3643.0	[m]	DC	STATOI
3646.0	[m]	DC	STATOI
3649.0	[m]	DC	STATOI
3652.0	[m]	DC	STATOI
3658.0	[m]	DC	STATOI
3661.0	[m]	DC	STATOI
3664.0	[m]	DC	STATOI
3667.0	[m]	DC	STATOI
3670.0	[m]	DC	STATOI
3676.0	[m]	DC	STATOI



3679.0	[m]	DC	STATOI
3682.0	[m]	DC	STATOI
3685.0	[m]	DC	STATOI
3688.0	[m]	DC	STATOI
3697.0	[m]	DC	STATOI
3700.0	[m]	DC	STATOI
3703.0	[m]	DC	STATOI
3706.0	[m]	DC	STATOI
3709.0	[m]	DC	STATOI
3715.0	[m]	DC	STATOI
3718.0	[m]	DC	STATOI
3721.0	[m]	DC	STATOI
3724.0	[m]	DC	STATOI
3727.0	[m]	DC	STATOI
3730.0	[m]	DC	STATOI
3733.0	[m]	DC	STATOI
3736.0	[m]	DC	STATOI
3739.0	[m]	DC	STATOI
3742.0	[m]	DC	STATOI
3745.0	[m]	DC	STATOI
3748.0	[m]	DC	STATOI
3751.0	[m]	DC	STATOI
3754.0	[m]	DC	STATOI
3757.0	[m]	DC	STATOI
3760.0	[m]	DC	STATOI
3763.0	[m]	DC	STATOI
3766.0	[m]	DC	STATOI
3769.0	[m]	DC	STATOI
3772.0	[m]	DC	STATOI
3775.0	[m]	DC	STATOI
3781.0	[m]	DC	STATOI
3784.0	[m]	DC	STATOI
3787.0	[m]	DC	STATOI
3790.0	[m]	DC	STATOI
3796.0	[m]	DC	STATOI
3802.0	[m]	DC	STATOI
3808.0	[m]	DC	STATOI
3814.0	[m]	DC	STATOI
3820.0	[m]	DC	STATOI
3826.0	[m]	DC	STATOI



3832.0	[m]	DC	STATOI
3838.0	[m]	DC	STATOI
3844.0	[m]	DC	STATOI
3850.0	[m]	DC	STATOI
3856.0	[m]	DC	STATOI
3862.0	[m]	DC	STATOI
3867.0	[m]	DC	STATOI
3873.0	[m]	DC	STATOI
3876.0	[m]	DC	STATOI
3882.0	[m]	DC	STATOI
3888.0	[m]	DC	STATOI
3891.0	[m]	DC	STATOI
3897.0	[m]	DC	STATOI
3903.0	[m]	DC	STATOI
3909.0	[m]	DC	STATOI
3915.0	[m]	DC	STATOI
3921.0	[m]	DC	STATOI
3927.0	[m]	DC	STATOI
3933.0	[m]	DC	STATOI
3940.0	[m]	DC	STATOI
3945.0	[m]	DC	STATOI
3951.0	[m]	DC	STATOI
3957.0	[m]	DC	STATOI
3963.0	[m]	DC	STATOI
3969.0	[m]	DC	STATOI
3975.0	[m]	DC	STATOI
3981.0	[m]	DC	STATOI
3987.0	[m]	DC	STATOI
3993.0	[m]	DC	STATOI
3999.0	[m]	DC	STATOI
4005.0	[m]	DC	STATOI
4011.0	[m]	DC	STATOI
4013.0	[m]	DC	STATOI
4023.0	[m]	DC	STATOI
4029.0	[m]	DC	STATOI
4035.0	[m]	DC	STATOI
4041.0	[m]	DC	STATOI
4047.0	[m]	DC	STATOI
4053.0	[m]	DC	STATOI
4059.0	[m]	DC	STATOI



4065.0	[m]	DC	STATOI
4071.0	[m]	DC	STATOI
4077.0	[m]	DC	STATOI
4083.0	[m]	DC	STATOI
4089.0	[m]	DC	STATOI
4095.0	[m]	DC	STATOI
4101.0	[m]	DC	STATOI
4107.0	[m]	DC	STATOI
4119.0	[m]	DC	STATOI
4125.0	[m]	DC	STATOI
4131.0	[m]	DC	STATOI
4137.0	[m]	DC	STATOI
4143.0	[m]	DC	STATOI
4149.0	[m]	DC	STATOI
4155.0	[m]	DC	STATOI
4161.0	[m]	DC	STATOI
4167.0	[m]	DC	STATOI
4173.0	[m]	DC	STATOI
4175.0	[m]	DC	STATOI

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
297	NORDLAND GP
297	NAUST FM
1421	KAI FM
1865	HORDALAND GP
1865	BRYGGE FM
2235	ROGALAND GP
2235	TARE FM
2304	TANG FM
2371	SHETLAND GP
2371	SPRINGAR FM
2490	NISE FM
2806	KVITNOS FM
3095	CROMER KNOLL GP
3095	LYSING FM
3124	LANGE FM
3548	LYR FM



3577	VIKING GP
3577	SPEKK FM
3594	MELKE FM
3650	FANGST GP
3650	GARN FM
3767	NOT FM
3805	ILE FM
3889	BÅT GP
3889	ROR FM
4041	TILJE FM

Composite logs

Document name	Document format	Document size [MB]
4589	pdf	0.38

Documents - reported by the production licence (period for duty of secrecy expired)

Document name	Document format	Document size [MB]
4589_6406_3_6_COMPLETION_LOG	.pdf	3.28
4589_6406_3_6_COMPLETION_REPORT	.pdf	14.80

Logs

Log type	Log top depth [m]	Log bottom depth [m]
HRLA DSI IPLT	3380	3864
HRLA IPLT	3760	4175
MDT GR	3656	3752
MDT GR	3656	3752
MDT GR	3668	3668
MDT GR	3675	3719
MDT GR	3685	3685
MDT GR	3692	3707
MDT GR	3694	3694
MDT GR	3694	3694
MDT GR	3807	3833





MDT GR	3843	4157
MSCT	3655	3833
MWD LWD - EWR-P4 DGR SLD CNT	3867	4175
MWD LWD - MPR	359	3867
VSP - ASI GR	340	3775

Casing and leak-off tests

Casing type	Casing diam. [inch]	Casing depth [m]	Hole diam. [inch]	Hole depth [m]	LOT/FIT mud eqv. [g/cm3]	Formation test type
CONDUCTOR	30	357.0	36	459.0	0.00	LOT
SURF.COND.	13 3/8	1773.0	17 1/2	1780.0	1.83	LOT
INTERM.	9 5/8	2897.0	12 1/4	1903.0	1.85	LOT
INTERM.	7	3647.0	8 1/2	3654.0	1.49	LOT
OPEN HOLE		4175.0	6	4175.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
459	1.03			sea water	
1780	1.20			sea water	
2903	1.75			versavert	
3654	1.66			versavert	
4175	1.22			glydrill	

Pressure plots

The pore pressure data is sourced from well logs if no other source is specified. In some wells where pore pressure logs do not exist, information from Drill stem tests and kicks have been used. The data has been reported to the NPD, and further processed and quality controlled by IHS Markit.

Document name	Document format	Document size [MB]
4589 Formation pressure (Formasjonstrykk)	pdf	0.22

