General information

Wellbore name	6407/7-6
Type	EXPLORATION
Purpose	WILDCAT
Status	P&A
Press release	link to press release
Factmaps in new window	link to map
Main area	NORWEGIAN SEA
Field	NJORD
Discovery	6407/7-6
Well name	6407/7-6
Seismic location	
Production licence	107
Drilling operator	Norsk Hydro Produksjon AS
Drill permit	985-L
Drilling facility	SCARABEO 6
Drilling days	60
Entered date	18.10.2000
Completed date	16.12.2000
Release date	16.12.2002
Publication date	18.12.2002
Purpose - planned	WILDCAT
Reentry	NO
Content	GAS/CONDENSATE
Discovery wellbore	YES
1st level with HC, age	EARLY JURASSIC
1st level with HC, formation	TILJE FM
Kelly bushing elevation [m]	26.0
Water depth [m]	336.0
Total depth (MD) [m RKB]	3975.0
Final vertical depth (TVD) [m RKB]	3971.0
Maximum inclination [°]	9.58
Bottom hole temperature [°C]	148
Oldest penetrated age	EARLY JURASSIC
Oldest penetrated formation	ÅRE FM
Geodetic datum	ED50
NS degrees	64° 17' 40.66'' N
EW degrees	7° 6' 16.31'' E
NS UTM [m]	7131389.98

EW UTM [m]	408271.69
UTM zone	32
NPDID wellbore	4172

Wellbore history

General

Well 6407/7-6 is located within Njord Unit on the western flank of the Njord Field. The northwest flank structure consists of five fault blocks defined by faults trending south-southwest and north-northeast, with throw towards west. The objective for the well 6407/7-6 was to test the hydrocarbon potential of the "B-segment" on the northwest flank of the Njord field. The primary target was to test the hydrocarbon potential of the Tilje formation of the Båt Group, while the hydrocarbon potential of the Ile Formation of the Fangst Group was a secondary target. There existed also a possibility of hydrocarbons in the Upper Jurassic Melke formation of the Viking Group, and in the Lower Cretaceous Lange Formation of the Cromer Knoll Group.

Operations and results

Wildcat well 6407/7-6 was spudded with the semi-submersible installation "Scarabeo 6" on 18 October 2000. First spud failed due to boulders and high angle in the hole. After a second spud on October 19 the well was first drilled to TD at 3930 m in the Early Jurassic Åre Formation. The TD was later extended to 3975 m to get space for test equipment. The extended TD was not logged. Shallow gas was not encountered. The well was drilled with water based bentonite mud down 1231 m and with oil based mud (Versavert) from 1231 m to TD. The main result of the well was the discovery of gas-condensate in the Tilje Formation as proven by a DST and by MDT fluid samples. The well penetrated 127 m Late Jurassic, 111 m Ile Formation, and 197 m Tilje Formation. The sands encountered in the Lange Formation, the Viking Group, and the Ile Formation were water bearing, but hydrocarbon shows were observed in the approximate 20 m net Lange sandstone and increasing amounts of background gas was measured while drilling in the upper part of the Ile Formation. The Tilje Formation was saturated with a heavy gas-condensate from 3693 m down to a Gas/Water Contact at 3777 m, determined from the resistivity log. Six cores were cut in the Tilje Formation with a recovery of 98% giving a total of 129m. Horizontal Klinkenberg corrected permeability in the range of 0.02 - 12.2 mD was measured in the cores. The core porosity seldom exceeded 20%. Pressure measurements from both the Ile and the Tilje Formations indicate an approximate overpressure of 160-170 bar on the B-segment compared to the Njord East flank. MDT fluid sampling was attempted in the Tilje, Lange and the Ile formations. No samples could be taken in Lange and Ile formations due to tight formations. In the Tilje Formation five samples were retrieved from 3748 m. The short clean-up time prior to sampling caused the samples to be highly contaminated with base oil from the drilling mud (30 % & 60 % base oil). The well was plugged and abandoned as an oil discovery on 16 December 2000.

Testing

The well was production tested with a perforation interval between 3686-3770 m in the Tilje Formation. With 24 hours production the flow rate was measured to 155 000 Sm3/D gas and 220 Sm3/D oil. The GOR was 705 Sm3/Sm3.

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
1240.00	3930.00

Cuttings available for sampling?	YES

Cores at the Norwegian Offshore Directorate

Core sample number	Core sample - top depth	Core sample - bottom depth	Core sample depth - uom
1	3701.0	3707.6	[m]
2	3743.0	3769.0	[m]
3	3770.5	3785.7	[m]
4	3786.0	3808.7	[m]
5	3809.0	3837.3	[m]
6	3837.4	3864.9	[m]

Total core sample length [m]	126.2
Cores available for sampling?	YES

Core photos


3701-3706m


3706-3746m


3746-3751m


3751-3756m


3756-3761m


3761-3766m


3766-3771m


3771-3776m


3776-3781m


3781-3785m


3786-3791m


3791-3796m


3796-3801m


3801-3806m


3806-3811m


3811-3816m


3816-3821m


3821-3826m


3826-3831m


3831-3836m


3836-3840m


3840-3845m


3845-3850m


3850-3855m


3855-3860m


3860-3865m

Oil samples at the Norwegian Offshore Directorate

Test type	Bottle number	Top depth MD [m]	Bottom depth MD [m]	Fluid type	Test time	Samples available
DST	DST 1	3726.00	0.00		01.12.2000 - 00:00	YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
362	NORDLAND GP
362	NAUST FM
1169	HORDALAND GP
1169	BRYGGE FM
1840	ROGALAND GP
1840	TARE FM

1922	TANG FM
2105	SHETLAND GP
2105	SPRINGAR FM
2142	NISE FM
2352	KVITNOS FM
2747	CROMER KNOLL GP
2747	LANGE FM
3338	VIKING GP
3338	SPEKK FM
3351	MELKE FM
3407	FANGST GP
3407	NOT FM
3448	ILE FM
3558	BÅT GP
3558	ROR FM
3684	TILJE FM
3882	ÅRE FM

Composite logs

Document name	Document format	Document size [MB]
4172	pdf	0.46

Geochemical information

Document name	Document format	Document size [MB]
4172_1	pdf	1.88
4172_2	pdf	1.67

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

Document name	Document format	Document size [MB]
4172_6407_7_6_COMPLETION_LOG	.PDF	1.52
4172_6407_7_6_COMPLETION_REPORT	.PDF	9.52
4172_6407_7_6_COMPLETION_REPORT_ENCL_1	.PDF	3.38

4172_6407_7_6_COMPLETION_REPORT_ENCL 2	.PDF	3.77
4172_6407_7_6_COMPLETION_REPORT_ENCL 3	.PDF	0.67
4172_6407_7_6_COMPLETION_REPORT_ENCL 4	.PDF	0.56

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	3686	3770	16.0

Test number	Final shut-in pressure [MPa]	Final flow pressure [MPa]	Bottom hole pressure [MPa]	Downhole temperature [°C]
1.0		52.450		136

Test number	Oil [Sm3/day]	Gas [Sm3/day]	Oil density [g/cm3]	Gas grav. rel.air	GOR [m3/m3]
1.0	220	155000	0.815		705

Logs

Log type	Log top depth [m]	Log bottom depth [m]
AIT IPLT /LDS APS HNGS	3093	3930
CMR ESC VSP	2900	3913
CMR+	3440	3882
CST	3125	3900
MDT	3880	3925
MSCT	0	0
MWD - CDR GR RES PWD DIR	365	3100
MWD - RAB CDR GR RES DEN PWD	3100	3930
UBI DSI	2900	3925

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	446.5	36	449.0	0.00	LOT
SURF.COND.	20	1224.0	26	1229.0	1.80	LOT
INTERM.	9 5/8	3094.0	12 1/4	3100.0	1.76	LOT
OPEN HOLE		3975.0	8 1/2	3975.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
386	1.05			WATER BASED	
392	0.00			WATER BASED	
900	0.00			OIL BASED	
1232	1.60	72.0		OIL BASED	
2541	1.60	38.0		OIL BASED	
2900	1.61	50.0		OIL BASED	
3083	1.60	44.0		OIL BASED	
3100	1.60	45.0		OIL BASED	
3205	1.60	44.0		OIL BASED	
3377	1.61	42.0		OIL BASED	
3558	1.60	33.0		OIL BASED	
3700	1.60	33.0		OIL BASED	
3709	1.62	33.0		OIL BASED	
3720	1.60	34.0		OIL BASED	
3743	1.61	34.0		OIL BASED	
3771	1.61	33.0		OIL BASED	
3786	1.61	37.0		OIL BASED	
3809	1.61	36.0		OIL BASED	
3852	1.61	36.0		OIL BASED	
3864	1.61	34.0		OIL BASED	
3975	1.61	46.0		OIL BASED	

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]
4172_Formation_pressure_(Formasjonstrykk)	pdf	0.29