General information

Wellbore name	2/5-10 A
Type	EXPLORATION
Purpose	WILDCAT
Status	P&A
Factmaps in new window	link to map
Main area	NORTH SEA
Well name	2/5-10
Seismic location	SH 8903-103 SP. 370/SH 82-411 SP. 484
Production licence	067
Drilling operator	Norsk Agip AS
Drill permit	769-L
Drilling facility	POLAR PIONEER
Drilling days	30
Entered date	27.08.1993
Completed date	25.09.1993
Release date	25.09.1995
Publication date	24.09.2003
Purpose - planned	WILDCAT
Reentry	NO
Content	OIL SHOWS
Discovery wellbore	NO
Kelly bushing elevation [m]	23.0
Water depth [m]	65.0
Total depth (MD) [m RKB]	4715.0
Final vertical depth (TVD) [m RKB]	4676.0
Maximum inclination [°]	34.1
Bottom hole temperature [°C]	162
Oldest penetrated age	TRIASSIC
Oldest penetrated formation	SKAGERRAK FM
Geodetic datum	ED50
NS degrees	56° 41' 21.66'' N
EW degrees	3° 29' 27.32'' E
NS UTM [m]	6283054.46
EW UTM [m]	530071.86
UTM zone	31
NPDID wellbore	2194

Wellbore history

General

Exploration well 2/5-10 is located in the Central Graben on the Steinbit Terrace. The well was drilled with Late Jurassic sandstone of Oxfordian age, in a combination trap with structural and dip closing elements, as the primary target. Secondary targets were the Middle Jurassic Bryne Formation in the same combination trapping configuration, while the Late Cretaceous Chalk and the Lower Cretaceous Cromer Knoll Group were stratigraphic trap targets. After reaching TD evaluation of the cores and electric logs concluded that a fault had been intercepted within the main Jurassic target, justifying a sidetrack in search of a better pay zone. Well 2/5-10 was therefore plugged back in and well 2/5-10 A sidetracked.

Operations and results

Well 2/5-10 was spudded with the semi-submersible installation "Polar Pioneer" on 23 May 1993 and drilled to TD at 4701 m in rocks of the Triassic Smith Bank Formation. The well was drilled with sea water and hi-vis sweeps down to 865 m, with KCl/Polymer mud from 865 m to 4235 m, and with HPHT/Polymer mud from 4235 m to TD. Shallow gas was encountered after drilling the 8 1/2" pilot hole, prior to opening up the hole to 26" and running 20" casing. In order to ensure a good 20" casing cement job without compromising rig safety it was decided to plug back the gas bearing zone and set 20" casing at 509m, 291m shallower than originally planned 800m. To avoid gas migration the cement slurries for the 20" and 13 3/8" were redesigned with gas tight cement (microblock added).

Top reservoir was encountered at 4582 m, 174 m deeper than prognosis due to complex geology and higher than expected shale interval velocities in the Late Jurassic. The main part of the Late Jurassic sandstone target was removed by faulting, and Triassic strata were encountered 5 m below top reservoir through a fault plane. The Late Jurassic sandstone was highly affected by the faulting, and the reservoir quality was poor. The secondary target Middle Jurassic Bryne Formation was not present. The Smith Bank Formation was encountered 5 m below top reservoir through a fault plane. A small hydrocarbon accumulation was found in the main target Late Jurassic Oxfordian age sandstone. Weak shows were encountered also in the Chalk and in the Vestland Group.

Two conventional cores were cut from 4575 m in the Late Jurassic sandstone and down to 4591 m in the Smith Bank Formation. Two samples collected at 4594.3 m and 4583.1 m in the Vestland Group during the MDT run contained weak hydrocarbon shows, a discontinuous film of oil in sample #1 and gas traces in sample #2. Because of a failure of the MDT tool's equalization valve, a leakage between the two chambers was considered likely and therefore the location of these hydrocarbon shows is doubtful. However they should more likely be attributed to the top part of the Late Jurassic SST as confirmed by the sample #3 collected in the following RFT run which contained at 4594.3 m (same depth as sample #1) formation water. Only mud filtrate was finally recovered in the sample #4 taken at 4614 m. Well bore 2/5-10 was subsequently plugged back and permanently abandoned on 26 August 1993 as a well with shows.

Sidestep 2/5-10 A was kicked off from 4306 m in 2/5-10 on 27 August 1993 and was drilled to a total depth of 4715 m in the Triassic Smith Bank Formation. The well was drilled with HPHT/polymer mud from kick-off to TD. The expected reservoir was encountered at 4616 m with a thickness of 57 m and with poor to medium reservoir characteristics. The shows encountered were poor, and no hydrocarbons could be extracted using downhole testing tools. Three conventional cores were cut in the Late Jurassic sandstone from 4612 m to 4640.1 m. Four RFT samples collected at 4619 m,

4624.1 m, 4630 m and 4657 m contained formation water and mud filtrate with only traces of oil. Sidetrack 2/5-10 A was permanently plugged and abandoned on 25 September 1993 as a well with shows.

Testing

No drill stem test was performed.

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
4295.00	4715.00

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	4612.0	4620.8	[m]
2	4621.5	4631.4	[m]
3	4631.4	4640.2	[m]

Total core sample length [m]	27.5
Cores available for sampling?	YES

Core photos


4612-4617m


4612-4620m


4621-4626m


4626-4631m


4631-4631m


4631-4636m

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
88	NORDLAND GP
1733	HORDALAND GP
3052	ROGALAND GP
3052	BALDER FM
3062	SELE FM
3072	LISTA FM
3181	VÅLE FM
3214	SHETLAND GP
3214	EKOFISK FM
3342	TOR FM
3735	HOD FM
4295	CROMER KNOLL GP
4298	TYNE GP
4298	FARSUND FM
4616	VESTLAND GP
4673	NO GROUP DEFINED
4673	SKAGERRAK FM

Composite logs

Document name	Document format	Document size [MB]
2194	pdf	0.09

Geochemical information

Document name	Document format	Document size [MB]
2194_1	pdf	1.95
2194_2	pdf	1.44
2194_3	pdf	0.93

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

Document name	Document format	Document size [MB]
2194_2_5_10_A_COMPLETION_LOG	pdf	1.05
2194_2_5_10_A_COMPLETION_REPORT	pdf	50.05

Logs

Log type	Log top depth [m]	Log bottom depth [m]
AIT BHC MSFL GR AMS	4219	4715
CBL VDL GR	2100	4219
CST GR	4230	4704
LDL CNL NGS FMS AMS	4219	4711
MDT-PO GR	4617	4688
MWD - DIR	4292	4318
MWD - GR DIR	4318	4631
MWD - GR RAR RPD DIR	4640	4715
VSP	3000	4715

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
INTERM.	9 5/8	4217.0	12 1/4	4217.0	0.00	LOT
OPEN HOLE		4715.0	8 3/8	4715.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
4215	2.06	39.0		WATER BASED	
4301	2.02	33.0		WATER BASED	
4312	2.02	36.0		WATER BASED	
4318	2.04	36.0		WATER BASED	
4394	2.02	35.0		WATER BASED	
4430	2.02	37.0		WATER BASED	
4460	2.02	37.0		WATER BASED	
4500	2.02	39.0		WATER BASED	
4598	2.02	40.0		WATER BASED	
4612	2.02	39.0		WATER BASED	

4631	2.04	38.0		WATER BASED	
4640	2.02	36.0		WATER BASED	
4679	2.06	35.0		WATER BASED	
4715	2.06	35.0		WATER 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]
2194_Formation_pressure_(Formasjonstrykk)	pdf	0.22