General information

Wellbore name	1/9-7
Type	EXPLORATION
Purpose	WILDCAT
Status	P&A
Press release	link to press release
Factmaps in new window	link to map
Main area	NORTH SEA
Field	TOMMELITEN A
Discovery	1/9-1 Tommeliten Alpha
Well name	1/9-7
Seismic location	ST92063D- Line 928 & Trace 936
Production licence	044
Drilling operator	Phillips Petroleum Company Norway
Drill permit	1048-L
Drilling facility	MÆRSK GIANT
Drilling days	134
Entered date	22.03.2003
Completed date	02.08.2003
Release date	02.08.2005
Publication date	10.10.2012
Purpose - planned	WILDCAT
Reentry	NO
Content	GAS/CONDENSATE
Discovery wellbore	NO
1st level with HC, age	PALEOCENE
1st level with HC, formation	EKOFISK FM
2nd level with HC, age	LATE CRETACEOUS
2nd level with HC, formation	TOR FM
Kelly bushing elevation [m]	45.0
Water depth [m]	76.0
Total depth (MD) [m RKB]	4986.0
Final vertical depth (TVD) [m RKB]	4966.0
Maximum inclination [°]	16.1
Bottom hole temperature [°C]	180
Oldest penetrated age	TRIASSIC
Oldest penetrated formation	SMITH BANK FM
Geodetic datum	ED50
NS degrees	56° 24' 31.23'' N

EW degrees	2° 52' 55'' E
NS UTM [m]	6251710.63
EW UTM [m]	492714.66
UTM zone	31
NPDID wellbore	4652

Wellbore history

General

Well 1/9-7 was drilled on the Tommeliten Alpha structure on the south-western side of the Feda Graben of the North Sea, ca 1.5 km from the UK border. The main objective of well 1/9-7 was to explore the hydrocarbon potential of the Tommeliten Alpha prospect in the Jurassic level. Secondary objective was to appraise the Tommeliten Alpha Chalk discovery made by well 1/9-1 in 1976.

Operations and results

Wildcat well 1/9-7 was spudded with the jack-up installation Mærsk Giant on 22 March 2003. The well was drilled to the TD of the 17 1/2" section at 3040 m by 21 April. Problems with losses at the 20" shoe at 1039 m were remediated by spotting cement at the shoe. The well was inadvertently sidetracked as 1/9-7 T2 while drilling out the cement on 27 April. Unable to re-enter the original borehole after drilling to 1215 m, the 1/9- 7 T2 sidetrack was cemented back to the 20" shoe. The well was then deliberately and successfully sidetracked from 1039 m as 1/9-7 T3 on 4 May 2003. The 17 1/2" hole was re-drilled to a TD of 3058 m and 14" casing set. From there the well was drilled without further significant problems to TD at 4986 m (4965 m TVD) in the Triassic Smith Bank Formation. The well was drilled with seawater/bentonite/CMC down to 1047 m, with Versavert OBM in from 1047 to 3058 m (Versavert was used also in the primary well track and the failed sidetrack), and with Versatherm HTHP mud, a mineral oil based mud, from 3058 m to TD.

Chalk of the Ekofisk Formation was encountered at 3093 m and top Tor Formation was encountered at 3159 m. Reservoir quality sands were not encountered at any level below the Base Cretaceous Unconformity, although an interval containing very fine sand and silt equivalent to the Oxfordian J50 Sand Unit in the UK well 30/19a-5, 8 km to the WNW, was encountered. The only significant hydrocarbons encountered were in the Ekofisk and Tor Formations in the upper portion of the Chalk Group where oil shows were observed. MDT sampling in Ekofisk proved a gas/condensate. Logs indicated hydrocarbon saturation down to ca 3195 m but no definite hydrocarbon contact was found.

Petrophysical analyses indicated some hydrocarbon saturation in a thin Miocene Sand Unit at 1675 m (1/9-7 depth) and a thin Andrew Formation sand in the Paleocene from 2989 m to 2992.5 m (1/9-7 T3 depth). None of these had oil shows. Shales in the Mandal Formation at 4315 - 4350 m had definite shows (hydrocarbon odour). However, the oil-based drilling fluids made shows identification difficult below 1047 m.

Two cores were cut with 100% recovery from 3104 to 3153 m in the Ekofisk Formation. During MDT operations across the Chalk Group, 5 down hole samples were retrieved from 3112 m in the Ekofisk Formation with an MDT dual-packer tool. Upon examination at surface, it was concluded that the samples contained what appeared to be single-phase retrograde gas condensate. From PVT studies it was concluded that the samples are 12-16 wt% contaminated with base-oil drilling mud, geochemical analyses by GC show that apart from the contamination in the range C12 - C20 the 1/9-7 MDT oil is very similar to the oil sampled from 1/9-1 side of the Tommeliten Alpha discovery.

The well was permanently abandoned on 2 August 2003. The well is classified as dry in the main Jurassic exploration target and is also a positive appraisal of the 1/9-1 Tommeliten Alpha Ekofisk/Tor Formation discovery.

Testing

No drill stem test was performed.

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
320.00	3020.00

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	3104.4	3107.0	[m]
2	3107.0	3135.4	[m]

Total core sample length [m]	31.0
Cores available for sampling?	YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
121	NORDLAND GP
1537	HORDALAND GP
2920	ROGALAND GP
2920	BALDER FM
2931	SELE FM
2987	LISTA FM
2989	ANDREW FM
2992	LISTA FM
3065	VÅLE FM
3093	SHETLAND GP
3093	EKOFISK FM
3159	TOR FM
3364	HOD FM
3705	HIDRA FM
3789	CROMER KNOLL GP
3789	RØDBY FM
3867	SOLA FM
3948	TUXEN FM
4001	ÅSGARD FM
4313	TYNE GP

4313	MANDAL FM
4400	FARSUND FM
4504	HAUGESUND FM
4911	SMITH BANK FM

Geochemical information

Document name	Document format	Document size [MB]
4652_GCH_1	pdf	0.56
4652_GCH_2	pdf	1.78

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

Document name	Document format	Document size [MB]
4652_1_9_7_COMPLETION_DRILLING_REPORT	.PDF	103.62
4652_1_9_7_COMPLETION_GEOLOGICAL_REPORT	.PDF	5.71
4652_1_9_7_COMPLETION_LOG	.PDF	1.16
4652_1_9_7_T3_COMPLETION_LOG	.PDF	0.92

Logs

Log type	Log top depth [m]	Log bottom depth [m]
AIT DSI IPLT HNGS	1039	3040
AIT DSI IPLT HNGS	3049	3566
AIT DSI IPLT HNGS	4613	4963
AIT GPIT DSI IPLT HNGS	3845	4609
CMR	3090	3400
DSI GR	300	1039
DSI IPLT HNGS	2900	3049
DSI IPLT HNGS	2909	3845
DSI IPLT HNGS	4312	4613
GR	120	3049
LWD MWD - DIR	307	310
MDT	3098	3300
MDT CMR GR	0	0
MWD LWD - DGR EWR P4 PWD	310	1210

MWD LWD - DGR EWR P4 PWD	1042	3040
MWD LWD - DGR EWR P4 PWD	1045	1210
MWD LWD - DGR EWR P4 PWD	1045	4605
MWD LWD - DIR	1210	1042
MWD LWD - SS PWD EWR P4 GR	4986	4992
UBI OBMI	3080	3350
VSP CSAT GR	2100	4610

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	308.0	36	310.0	0.00	LOT
SURF.COND.	20	1039.0	26	1047.0	1.82	LOT
INTERM.	14	3050.0	17 1/2	3058.0	2.00	LOT
INTERM.	9 7/8	3838.0	12 1/4	3845.0	2.16	LOT
LINER	7 5/8	4604.0	8 1/2	4605.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
251	1.26	9.0		BENTONITE	
310	1.20			BENTONITE	
495	1.70	28.0		VERSATHERM OBM +	
695	1.70	27.0		VERSATHERM OBM +	
695	1.15	11.0		BENTONITE	
1047	1.15	10.0		BENTONITE	
1210	1.56	8.0		BENTONITE	
1215	1.74	45.0		VERSAVERT OBM	
2495	1.79	44.0		VERSAVERT OBM	
2858	1.70	37.0		VERSATHERM OBM +	
3040	1.81	46.0		VERSAVERT OBM	
3040	1.81	45.0		VERSAVERT OBM	
3058	1.73	41.0		VERSAVERT OBM	
3105	1.67	32.0		VERSATHERM OBM	
3561	1.66	37.0		VERSATHERM OBM	

3845	1.67	33.0		VERSATHERM OBM	
4250	2.00	54.0		VERSATHERM OBM +	
4509	1.96	58.0		VERSATHERM OBM +	
4727	2.04	74.0		VERSATHERM OBM +	
4960	2.04	91.0		VERSATHERM OBM +	
4986	2.04	85.0		VERSATHERM OBM +	

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]
4652_Formation_pressure_(Formasjonstrykk)	pdf	0.21