General information

Wellbore name	6406/3-9
Type	EXPLORATION
Purpose	WILDCAT
Status	P&A
Press release	link to press release
Factmaps in new window	link to map
Main area	NORWEGIAN SEA
Discovery	6406/3-9
Well name	6406/3-9
Seismic location	CE08M1;inline 3661 & crossline 5492
Production licence	431
Drilling operator	Maersk Oil Norway AS
Drill permit	1355-L
Drilling facility	TRANSOCEAN WINNER
Drilling days	139
Entered date	09.11.2011
Completed date	26.03.2012
Release date	15.03.2013
Publication date	15.03.2013
Purpose - planned	WILDCAT
Reentry	NO
Content	OIL
Discovery wellbore	YES
1st level with HC, age	LATE CRETACEOUS
1st level with HC, formation	LYSING FM
2nd level with HC, age	LATE CRETACEOUS
2nd level with HC, formation	LANGE FM
Kelly bushing elevation [m]	26.0
Water depth [m]	315.0
Total depth (MD) [m RKB]	4183.0
Final vertical depth (TVD) [m RKB]	4183.0
Maximum inclination [°]	1.2
Bottom hole temperature [°C]	145
Oldest penetrated age	CRETACEOUS
Oldest penetrated formation	LANGE FM
Geodetic datum	ED50
NS degrees	64° 58' 4.55'' N
EW degrees	6° 41' 12.73'' E

NS UTM [m]	7207058.17
EW UTM [m]	390803.20
UTM zone	32
NPDID wellbore	6594

Wellbore history

General

Well 6406/3-9 was drilled on the Halten Terrace east of the Kristin field and to the north of the Tyrihans field. The objective was to evaluate the presence of movable hydrocarbons in the Lange sandstones unit (primary target) and Lysing sandstone unit (secondary target); down dip from the 6506/11-2 and 6506/11-4 S wells.

Operations and results

Wildcat well 6406/3-9 was spudded with the semi-submersible installation Transocean Winner on 9 November 2011 and drilled to TD at 4183 m in Albian age shale of the Lange Formation. The well was not drilled within the AFE time and cost estimate. This was primarily due to poor weather conditions (third worst weather recorded ever since 1958), which caused prolonged periods of downtime. Despite this and many other operational problems data acquisition was successful and gave data of good quality. The well was drilled with Seawater and hi-vis sweeps down to 1406 m, with Performadril Water based mud from 1406 m to 2286 m, and with XP-07 oil based mud from 2286 m to TD.

Both the primary Lange sandstone target at 4079 m and the secondary Lysing sands at 3395 m were non-commercial oil discoveries. The primary target Lange sands were encountered 19 m deeper than prognosed (TVD) and were 56 m thick with a net sand value of 2.4 m. The permeability encountered was less than anticipated due to diagenesis. The secondary Lysing sands were 37 m deeper than prognosed (TVD) with net sands approximately 2 m. The only shows reported from the well were from the target Lysing and Lange reservoir sections.

Three cores were cut from 4086 m to 4138 m in the Lange sandstones with 97% recovery. Success case wire line logging programs were run across both targets including a dual packer mini DST across the most promising zone (4102-4103 m) in the Lange sandstones. The result indicated sub-commercial permeabilities. Two good MDT pressure measurements were achieved in the Lysing Formation, giving a gradient of 0.059 bar/m. Fluid samples acquired at 3457.5 m confirm this to be an accurate oil gradient. MDT pressure samples in the Lange sandstones did not give a realistic gradient. However, fluid samples taken at 4102.1 m - although highly contaminated by mud filtrate - confirmed the presence of oil.

The well was permanently abandoned on 26 March 2012 as a minor oil discovery.

Testing

No drill stem test was performed.

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
1410.00	4183.00

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	4086.0	4115.6	[m]
2	4116.0	4128.1	[m]
3	4129.0	4137.8	[m]

Total core sample length [m]	50.5
Cores available for sampling?	YES

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
MDT		4102.15	0.00	OIL	02.03.2012 - 00:00	YES
MDT		0.00	3457.50	OIL	22.01.2012 - 00:00	YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
341	NORDLAND GP
341	NAUST FM
1436	KAI FM
1936	HORDALAND GP
1936	BRYGGE FM
2324	ROGALAND GP
2324	TARE FM
2387	TANG FM
2447	SHETLAND GP

2447	SPRINGAR FM
2641	NISE FM
2805	KVITNOS FM
3395	CROMER KNOLL GP
3395	LYSING FM
3500	LANGE FM
4079	NO FORMAL NAME
4135	LANGE FM

Logs

Log type	Log top depth [m]	Log bottom depth [m]
AIT PEX ECS HNGS	3729	4184
AIT PEX HNGS	340	3738
MDT	4083	4107
MDT DP	4102	4102
MDT PR SA	3424	3457
MSCT GR	3396	3485
MWD - GR RES DIR	340	2286
MWD - GR RES DIR ADN SON	2286	4183
OBMI1 PPC MSIP PPC	2278	3729
OBMI2 PPC MSIP PPC GR	3729	4185
VSP	480	4176

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	471.0	36	473.0	0.00	LOT
SURF.COND.	20	1397.0	26	1406.0	0.00	LOT
INTERM.	13 3/8	2281.0	17 1/2	2286.0	1.65	LOT
INTERM.	9 7/8	3731.0	12 1/4	3738.0	1.84	LOT
OPEN HOLE		4183.0	8 1/2	4183.0	1.97	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
433	1.03			SPUD MUD	
1335	1.05			Hi-Vis	
1405	1.39			Peformadril	
1406	1.39			Peformadril	
1406	1.39			Sea Water	
1406	1.50			WATER BASED MUD	
1406	1.50			WATER BASED MUD	
1406	1.25			WATER BASED MUD	
1999	1.52			Peformadril	
2286	1.62			Peformadril	
3247	1.74			OIL (ENVIRON)	
3250	1.79			XP-07	
3640	1.75			XP-07	
3743	1.77			XP-07	
4116	1.79			XP-07	
4134	1.79			XP-07	
4183	1.79			XP-07	

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.

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