

**General information**

Wellbore name	6406/3-8
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	MARIA
Discovery	6406/3-8 Maria
Well name	6406/3-8
Seismic location	ST0614Inline 1346 & St0614 Xline 2122
Production licence	475 BS
Drilling operator	Wintershall Norge ASA
Drill permit	1303-L
Drilling facility	SONGA DELTA
Drilling days	87
Entered date	16.05.2010
Completed date	10.08.2010
Release date	10.08.2012
Publication date	23.08.2012
Purpose - planned	WILDCAT
Reentry	NO
Content	OIL
Discovery wellbore	YES
1st level with HC, age	MIDDLE JURASSIC
1st level with HC, formation	GARN FM
Kelly bushing elevation [m]	29.0
Water depth [m]	303.0
Total depth (MD) [m RKB]	4216.0
Final vertical depth (TVD) [m RKB]	4138.0
Maximum inclination [°]	21.6
Oldest penetrated age	EARLY JURASSIC
Oldest penetrated formation	TILJE FM
Geodetic datum	ED50
NS degrees	64° 56' 9.31" N
EW degrees	6° 56' 33.43" E
NS UTM [m]	7203074.63
EW UTM [m]	402756.88



UTM zone	32
NPDID wellbore	6350

Wellbore history

**General**

Well 6406/3-8 was drilled on the Maria prospect located in the Haltenbanken area, offshore Mid Norway. The prospect area is surrounded by producing fields and discoveries; Kristin (W), Smørbukk Sør (NW), Smørbukk (NW), Heidrun (N), Midgard (E), Tyrihans (SE) and Trestakk (SW). The primary objective was to confirm petroleum in the Middle Jurassic Garn Formation, with the deeper Ile and Tilje formations as secondary objectives. Also the Cretaceous Lysing Formation was seen at potentially hydrocarbon bearing.

Operations and results

Wildcat well 6406/3-8 was drilled with the semi-submersible installation Songa Delta. The well was spudded on three different locations with a 9 7/8" pilot hole assembly, due to shallow gas zones at 569 m, 620 m, and 670 m. The third pilot hole was drilled to revised 20" setting depth, at 545 m. Technical problems with lost circulation in the 14 3/4"x 17 1/2" hole led to a sidetrack at 1727 m (6406/3-8 T2) from the 16" liner shoe around the problem section, and back to the planned trajectory towards the end of the 12 1/4" section. This gave significant deviation from the vertical trajectory. The well was drilled to 4216 m (4138 m TVD) in the Early Jurassic Tilje Formation. The well was drilled with sea water down to 541 m and with Carbo-Sea oil based mud from 541 m to TD.

The Lysing Formation was found tight and water bearing. Clear hydrocarbon shows and increased gas values were observed when penetrating the Middle Jurassic Garn Formation at 3841 m (3771 m TVD). Based on log and pressure data an OWC was established at 3907 m (3837 m TVD) giving an oil column of 66 m TVD in the well. No gas cap was observed. Two parallel oil gradients of 0.66 g/cc with a separation of 0.4 Bar was established in the Garn Formation and a clear water gradient of 0.982 g/cc in the lower part of Garn Formation was encountered. The Garn Formation sandstones had an average porosity of 14.5 % with porosity cut off of 10 % and Vclay cut-off of 50 %. The secondary targets, Ile and Tilje Formations, were water bearing.

Two cores were cut from 3846 to 3929.6 m in the Garn Formation with 100% core recovery. The sandstones had an average porosity of 14.5 % when using a 10% cut off. The second core was water wet in the bottom after coring through the OWC. The upper 5 m of the Garn Formation was missed in the process of picking the coring point, and a sidewall coring run was performed to compensate for this. Oil and water samples were collected from the Garn Fm, both with conventional RCI probe and with the RCI straddle packer as part of the mini DST program. The fluid samples were taken at 3842.01 m (oil), 3843.5 m (oil), 3852 m (oil), 3873.5 m (oil), 3877.53 m (oil), 3896.12 m (oil), 3900 m (oil), and 3920 m (water). The samples were variably contaminated by the OBM in the C13 to C20 alkane range. The oil gravity was measured to 36.4 deg API with a GOR of 170 Sm³/Sm³.

The well was permanently abandoned on 10 August 2010 as an 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]
550.00	2280.00



Cuttings available for sampling?	YES
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Cores at the Norwegian Offshore Directorate

Core sample number	Core sample - top depth	Core sample - bottom depth	Core sample depth - uom
1	3846.0	3873.9	[m]
2	3874.0	3929.6	[m]

Total core sample length [m]	83.5
Cores available for sampling?	YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
332	NORDLAND GP
332	NAUST FM
1485	KAI FM
1850	HORDALAND GP
1850	BRYGGE FM
2299	ROGALAND GP
2299	TARE FM
2358	TANG FM
2424	SHETLAND GP
2424	SPRINGAR FM
2586	NISE FM
2777	KVITNOS FM
3244	CROMER KNOLL GP
3244	LYSING FM
3303	LANGE FM
3783	VIKING GP
3783	SPEKK FM
3795	MELKE FM
3841	FANGST GP
3841	GARN FM
3940	NOT FM
3976	ILE FM
4041	BÅT GP



4041	ROR FM
4166	TILJE FM

Geochemical information

Document name	Document format	Document size [MB]
6350_01_6406_3_8_gch_transfer_1	txt	0.00
6350_02_6406_3_8_gch_results_1	txt	0.26

Logs

Log type	Log top depth [m]	Log bottom depth [m]
MMWD LWD - GR RES DIR SON	1698	2280
MWD LWD - GR RES DIR	332	1698
MWD LWD - GR RES DIR	1654	2312
MWD LWD - NB GR RES DIR CAL DEN	2312	4216
MWD LWD - NEU SONIC	2312	4216
QUAD COMBO	3759	4186
RCI	3842	4182
RCI MINI-DST-VIT-SAMPLE	3843	3890
SWC	3840	3847
VSP	1700	4210

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	397.0	36	398.0	0.00	LOT
SURF.COND.	20	541.0	26	544.0	0.00	LOT
PILOT HOLE		545.0	9 5/8	545.0	0.00	LOT
LINER	16	1692.0	20	1698.0	0.00	LOT
INTERM.	13 3/8	2280.0	17 1/2	2327.0	0.00	LOT
INTERM.	9 5/8	3803.0	12 1/4	3805.0	0.00	LOT
OPEN HOLE		4216.0	8 1/2	4216.0	0.00	LOT

Drilling mud





Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
368	1.06			SPUD MUD	
544	1.07			SPUD MUD	
672	1.21	14.0		AQUACOL KCL/POLYMER/GLY COL	
1277	1.26	16.0		AQUACOL KCL/POLYMER/GLY COL	
1654	1.60	34.0		CARBO TECH	
1694	1.27	18.0		AQUACOL KCL/POLYMER/GLY COL	
1700	1.31	17.0		AQUACOL KCL/POLYMER/GLY COL	
1808	1.60	45.0		CARBO TECH	
1918	1.67	48.0		CARBO TECH	
1964	1.33	19.0		AQUACOL KCL/POLYMER/GLY COL	
2054	1.63	47.0		CARBO TECH	
2135	1.33	20.0		AQUACOL KCL/POLYMER/GLY COL	
2180	1.63	55.0		CARBO TECH	
2280	1.67	49.0		CARBO TECH	
2327	1.63	52.0		CARBO TECH	
2828	1.72	52.0		CARBO TECH	
3647	1.22	5.7		CARBO TECH	
3805	1.72	50.0		CARBO TECH	
3846	1.20	17.0		CARBO TECH	
3928	1.23	20.0		CARBO TECH	
3997	1.20	21.0		CARBO TECH	
4216	1.21	22.0		CARBO TECH	

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]
6350 Formation pressure (Formasjonstrykk)	pdf	0.27

