General information

Wellbore name	6407/6-7 S
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	HALTEN ØST
Discovery	6407/6-7 S (Harepus)
Well name	6407/6-7
Seismic location	ST04m8-inline 2154 and crossline 2680
Production licence	312
Drilling operator	StatoilHydro Petroleum AS
Drill permit	1243-L
Drilling facility	OCEAN VANGUARD
Drilling days	46
Entered date	12.04.2009
Completed date	27.05.2009
Release date	27.05.2011
Publication date	27.05.2011
Purpose - planned	WILDCAT
Reentry	NO
Content	GAS
Discovery wellbore	YES
1st level with HC, age	LATE JURASSIC
1st level with HC, formation	ROGN FM
2nd level with HC, age	MIDDLE JURASSIC
2nd level with HC, formation	GARN FM
Kelly bushing elevation [m]	22.0
Water depth [m]	247.0
Total depth (MD) [m RKB]	3227.0
Final vertical depth (TVD) [m RKB]	3184.0
Maximum inclination [°]	15.8
Bottom hole temperature [°C]	127
Oldest penetrated age	EARLY JURASSIC
Oldest penetrated formation	ÅRE FM
Geodetic datum	ED50
NS degrees	64° 33' 53'' N

EW degrees	7° 40' 26.7'' E
NS UTM [m]	7160787.20
EW UTM [m]	436458.94
UTM zone	32
NPDID wellbore	6100

Wellbore history

General

The 6407/6-7 S Harepus well was drilled on the eastern limits of the Halten Terrace, adjacent to the Trøndelag Platform offshore Mid Norway. The main objective was to prove hydrocarbon bearing sands in the Middle Jurassic Garn and Ile Formations (Fangst Group). Secondary objectives were to test the hydrocarbon potential of the Ror, Tilje and Åre Formations.

Operations and results

Well 6407/6-U-2 (pilot hole) was spudded and drilled to a total depth of 437 m. A drill break and a drop in gamma measurements indicated a sand layer from 436 - 437 m. Shallow gas was observed at seabed surface by ROV sonar during the connection at 437 m. The well was killed with 1.60 SG kill mud and plugged back to surface with three cement plugs.

Wildcat well 6407/6-7 S was spudded with the semi-submersible installation Ocean Vanguard on 12 April 2009 and drilled to TD at 3227 m (3184 m TVD) in the Early Jurassic Åre Formation. The well was designed as a vertical well down to ca 1710 m in the 12 1/4" hole section and directionally drilled from the 12 1/4" section to hit the geological target at a 15 deg angle, holding this inclination to TD. No shallow gas was observed while drilling the 36" and 17 1/2" hole sections. The well was drilled with Seawater and hi-vis sweeps down to 422 m, with 1.15 SG WB spud mud from 422 m to 1149 m, with Performadril HPWBM mud from 1149 m to 2701 m, and with Performadril mud from 2701 m to TD.

The well penetrated rocks of Quaternary, Tertiary, Cretaceous, and Jurassic age. TD of the well was in the Åre Formation. Base Cretaceous/Top Spekk Formation was encountered at 2685 m with Late Jurassic Rogn Formation sandstone coming in at 2747 m (2716.2 m TVD) and a second Spekk Formation interval at 2765.7 m (2734.3 m TVD). Eroded Middle Jurassic Garn formation was encountered at 2777.3 m (2745.6 m TVD, 40 m deeper than predicted. Gas with condensate was proved in the Rogn and Garn Formations with a gas down to (GDT) proven in the Garn formation. The Garn formation pressure was 28 bar depleted and the pressure plots could not be used to determine gas-water-contact (GWC). From pressure points and logs gas is seen down to 2813.4 m (2780.6 m TVD) and water up to 2827.2 m (2794.0 m TVD). No hydrocarbons were seen in the Early Jurassic Båt Group.

No oil shows were seen in the well apart from some weak cloudy bluish white cut fluorescence, and in parts, a greenish yellow residual in core chips from the reservoir section.

One core was cut from 2756.5 to 2778.8 m in the Rogn and Garn Formations. Good quality gas samples were collected with the MDT single probe equipment in the Rogn Formation at 2764 m, 2764.7 m, and 2770.8 m and in the Garn Formation at 2784.1 m. No water samples were collected due to hole conditions.

The well was permanently abandoned on 27 May 2009 as a gas discovery.

Testing

No drill stem test was performed.

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
430.00	3222.00

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	2756.5	2778.8	[m]

Total core sample length [m]	22.3
Cores available for sampling?	YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
269	NORDLAND GP
269	NAUST FM
1114	KAI FM
1290	HORDALAND GP
1290	BRYGGE FM
1850	ROGALAND GP
1850	TARE FM
1945	TANG FM
2052	SHETLAND GP
2052	SPRINGAR FM
2295	NISE FM
2367	KVITNOS FM
2458	CROMER KNOLL GP
2458	LANGE FM
2685	VIKING GP
2685	SPEKK FM
2747	ROGN FM
2766	SPEKK FM
2777	FANGST GP
2777	GARN FM
2811	NOT FM
2827	ILE FM
2893	BÅT GP
2893	ROR FM

2911	TOFTE FM
2990	ROR FM
3046	TILJE FM
3179	ÅRE FM

Logs

Log type	Log top depth [m]	Log bottom depth [m]
FMI MSIP	2700	3220
MDT PRETEST	2751	3139
MDT PS PA MINI-DST	0	0
MDT PS SAMPLING	2764	2784
MWD - PP ARCVRES6 GR RES PWD DIR	1149	3227
MWD - PP ARCVRES9 GR RES PW	321	1149
MWD - PP DIR	269	321
PEX HRLA ECS CMR	2700	3227
VSP	328	3220

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	317.0	36	317.0	0.00	LOT
SURF.COND.	20	418.0	26	422.0	1.27	LOT
PILOT HOLE		437.0	9 7/8	437.0	0.00	LOT
INTERM.	13 3/8	1144.0	17 1/2	1149.0	1.76	LOT
INTERM.	9 5/8	2700.0	12 1/4	2701.0	1.86	LOT
OPEN HOLE		3227.0	8 1/2	3227.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
547	1.15	10.0		Spud Mud	
649	1.17	9.0		Spud Mud	
850	1.17	9.0		Spud Mud	
965	1.14	9.0		Spud Mud	
1149	1.24	8.0		HPWBM	

1310	1.45	27.0		HPWBM	
1884	1.52	38.0		HPWBM	
2052	1.51	37.0		HPWBM	
2192	1.51	34.0		HPWBM	
2626	1.51	43.0		HPWBM	
2698	1.27	19.0		HPWBM	
2756	1.26	24.0		HPWBM	
3215	1.25	25.0		HPWBM	
3227	1.25	25.0		HPWBM	

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]
6100_Formation_pressure_(Formasjonstrykk)	pdf	0.27