

**General information**

Wellbore name	6407/9-10
Type	EXPLORATION
Purpose	APPRAISAL
Status	RE-CLASS TO DEV
Factmaps in new window	link to map
Main area	NORWEGIAN SEA
Field	DRAUGEN
Discovery	6407/9-1 Draugen
Well name	6407/9-10
Seismic location	on line 1560 and inline 2922
Production licence	093
Drilling operator	A/S Norske Shell
Drill permit	1051-L
Drilling facility	STENA DON
Drilling days	13
Entered date	11.06.2003
Completed date	23.06.2003
Release date	23.06.2005
Publication date	23.06.2005
Purpose - planned	APPRAISAL
Reclassified to wellbore	6407/9-F-1 H
Reentry	NO
Content	OIL
Discovery wellbore	NO
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]	24.0
Water depth [m]	250.0
Total depth (MD) [m RKB]	1800.0
Final vertical depth (TVD) [m RKB]	1800.0
Maximum inclination [°]	0.8
Oldest penetrated age	MIDDLE JURASSIC
Oldest penetrated formation	NOT FM
Geodetic datum	ED50
NS degrees	64° 22' 32" N
EW degrees	7° 46' 9.2" E



NS UTM [m]	7139616.70
EW UTM [m]	440609.12
UTM zone	32
NPDID wellbore	4710

Wellbore history

General

Well 6407/9-10 is located on the Draugen Field. The primary objective of the well was to appraise the Garn Formation in the "Garn Central North" area, with respect to saturation (oil, water) and to prove up reserves. The secondary objective was to obtain the residual water saturation in the Rogn Formation. Results would be used in deciding the size and scope of the Draugen infill-drilling program, and to provide necessary insight into the performance of the water flood in the Rogn Formation.

Operations and results

Appraisal well 6407/9-10 was spudded with the semi-submersible installation Stena Don on 11 June 2003 and drilled to TD at 1800 m in the Middle Jurassic Not Formation. The well was drilled without significant technical problems and within time schedule. The well was drilled with seawater down to 348 m, with KCl/polymer mud from 348 m to 1013 m, and with silicate (SilDril) mud from 1013 m to TD.

Correlation of the wire line logs from this well with the data from the nearby wells 6407/9-1 and 6407/9-A-2, showed that the Rogn Formation is of equally good reservoir quality at the 6407/9-10 location. The Garn formation, however, compared with well 6407/9-A-2 and 6407/9-4, had poorer reservoir quality than expected. High quality rock and fluids data were obtained with 3 successful wire line logging runs. The results showed that the Garn formation was 13.5 m deeper than prognosis, which is below the original oil water contact. The net original oil column in the Rogn formation was found to be 5 metres thicker than prognosis. The top three meters were unswept while the remaining section of the Rogn was swept with an average remaining hydrocarbon saturation of 19% at present. The MDT tests showed that the Rogn formation was at 158 bar, which is 7 bar lower than the original reservoir pressure. This is still at least 100 bar above the bubble point pressure. In the Garn 4 there is a 1 bar draw-down when compared to the original Garn pressure while Garn 3 is at original pressure. Fluid samples were taken in the Garn Formation (1706 m and 1669 m) and in the centre of the Rogn Formation (1650 m). None of these samples contained hydrocarbons and were all shown to be original formation water rather than injected seawater. The only rock samples collected were ditch cuttings from the 8 1/2" hole section. No core or sidewall core samples were taken.

The well was permanently abandoned on 23 June 2003 as an oil appraisal well.

Testing

No drill stem test was performed.

Lithostratigraphy



Top depth [mMD RKB]	Lithostrat. unit
294	NORDLAND GP
294	NAUST FM
797	KAI FM
878	HORDALAND GP
878	BRYGGE FM
1385	ROGALAND GP
1385	TARE FM
1445	TANG FM
1555	SHETLAND GP
1579	CROMER KNOLL GP
1608	VIKING GP
1608	SPEKK FM
1635	ROGN FM
1665	FANGST GP
1665	GARN FM
1766	NOT FM

Composite logs

Document name	Document format	Document size [MB]
4710_6407_9_10	pdf	0.26

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

Document name	Document format	Document size [MB]
4710_6407_9_10_COMPLETION_LOG	.pdf	0.39
4710_6407_9_10_COMPLETION_REPORT	.PDF	8.58

Logs

Log type	Log top depth [m]	Log bottom depth [m]
CMR GR	0	0
MDT GR	1636	1739
MWD LWD - GR RES V675R	273	1800





PEX DSI EMS ACTS	1000	1800
------------------	------	------

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	358.0	36	359.0	0.00	LOT
CONDUCTOR	20	363.0	26	363.0	0.00	LOT
SURF.COND.	9 5/8	1008.0	12 1/4	1020.0	0.00	LOT
OPEN HOLE		1800.0	8 1/2	1800.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
274	1.03			DUMMY	
360	1.03			DUMMY	
916	1.03			DUMMY	
1020	1.25	18.0		SPUD MUD	

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]
4710 Formation pressure (Formasjonstrykk)	PDF	0.22

