General information

Wellbore name	2/8-9
Type	EXPLORATION
Purpose	APPRAISAL
Status	P&A
Factmaps in new window	link to map
Main area	NORTH SEA
Field	VALHALL
Discovery	2/8-6 Valhall
Well name	2/8-9
Seismic location	
Production licence	006
Drilling operator	Amoco Norway Oil Company
Drill permit	155-L
Drilling facility	SEDCO 135 G
Drilling days	80
Entered date	09.04.1976
Completed date	27.06.1976
Release date	27.06.1978
Publication date	16.10.2012
Purpose - planned	APPRAISAL
Reentry	NO
Content	OIL
Discovery wellbore	NO
1st level with HC, age	LATE CRETACEOUS
1st level with HC, formation	TOR FM
2nd level with HC, age	LATE CRETACEOUS
2nd level with HC, formation	HOD FM
Kelly bushing elevation [m]	33.0
Water depth [m]	69.0
Total depth (MD) [m RKB]	2703.0
Bottom hole temperature [°C]	86
Oldest penetrated age	EARLY CRETACEOUS
Oldest penetrated formation	RØDBY FM
Geodetic datum	ED50
NS degrees	56° 17' 49.3'' N
EW degrees	3° 23' 4'' E
NS UTM [m]	6239343.54
EW UTM [m]	523793.84
UTM zone	31
NPDID wellbore	279

Wellbore history

General

Well 2/8-9 was drilled as an appraisal to help establish the commerciality of the southern North Sea Valhall Field, which had earlier been discovered by 2/8-6 and confirmed by 2/8-8. The primary objective of 2/8-9 was an evaluation of the Chalk reservoirs of Maastrichtian (Tor Formation) and pre-Maastrichtian (Hod Formation) age. The existence of hydrocarbons in the Early-Middle Miocene section creates a low velocity "bright spot" on the seismic, blanketing the crest of the Valhall structure and causing "dimming" or total loss of the top chalk section. The Valhall crest is therefore an area where the estimated thickness of the Tor section and the fault patterns are questionable. Only one previous well, 2/8-4, had been drilled in the vicinity some 2.5 km to the west. Well 2/8-4 was essentially a dry hole with only 1 m of Tor and tight but oil bearing Hod Formation.

Operations and results

Appraisal well 2/8-9 was spudded with the semi-submersible installation Sedco 135 G on 9 April 1976 and drilled to TD at 2703 m in the Early Cretaceous Rødby Formation. The well was drilled in a total of 30 days, without any major drilling problems. It was drilled with sea water and viscous mud down to 183 m, with seawater and gel from 183 m to 392 m, and with Drispac/lime/seawater mud from 392 m to TD.

Well 2/8-9 penetrated a normal of Quarternary -Tertiary section from surface to top of the Late Cretaceous. The Danian was found to have been removed by erosion. The well found the Chalk hydrocarbon bearing at 2524 m correlating 53.3 m high and 76.8 m low to wells 2/8-4 and 2/8-8, respectively. The Tor Formation was 5.5 m thick with high reservoir quality; porosity of up to 48% and a water saturation close to zero. The Hod Formation was 128 m thick. The average porosity and water saturations of the Upper Hod were 30% and 60%, respectively. An oil-water contact was encountered in the Lower Hod at 2605 m. Oil shows (fluorescence and cut) were recorded above the chalk reservoir in shales, claystones and siltstones at 1555 to 1963 m; in limestone at 2048 to 2064 m; and in siltstone 2094.5 to 2105.

Four conventional cores were cut from 2531 to 2573.5 m with 85 - 100% recovery. No wire line fluid samples were taken.

The well was permanently abandoned on 27 June as an oil appraisal well.

Testing

Two drill stem tests were performed

Test 1 tested the interval 2550.6 m to 2557 m in the Hod Formation after stimulation by hydraulic fracturing and sand injection. The well flowed solids that plugged up the test string. A second attempt, Test 1A, was made but with no success. The test from this interval was terminated.

Test 2 tested the interval 2524 to 2529.2 m, the entire Tor Formation. Prior to stimulation the well cleaned up sufficiently to be put through the separator. Stable flow was not obtained due to solids production. The average fluid production during 11 hrs and on variable choke was 353 Sm3 oil and 82100 Sm3 gas /day. Average GOR was 233 Sm3/Sm3. The oil gravity was 36 deg API. After simulation similar to Test 1 no flow was obtained due to solids problems.

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
441.96	2700.53

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	8302.0	8327.6	[ft]
2	8332.0	8347.0	[ft]
3	8347.0	8377.0	[ft]
4	8382.0	8439.0	[ft]

Total core sample length [m]	38.9
Cores available for sampling?	YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
102	NORDLAND GP
2493	ROGALAND GP
2493	BALDER FM
2497	SELE FM
2505	LISTA FM
2524	SHETLAND GP
2524	TOR FM
2529	HOD FM
2637	BLODØKS FM
2640	HIDRA FM
2658	CROMER KNOLL GP
2658	RØDBY FM

Documents - older Norwegian Offshore Directorate WDSS reports and other related documents

Document name	Document format	Document size [MB]
279_01_WDSS_General_Information	pdf	0.28

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

Document name	Document format	Document size [MB]
279_2_8_9_Completion_log	pdf	1.76
279_2_8_9_Completion_report	pdf	24.70
279_2_8_9_Completion_report_Attachemnts	pdf	20.76
279_2_8_9_Completion_report_Drilling_summary	pdf	28.13

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	2552	2558	0.0
2.0	2525	2529	0.0

Test number	Final shut-in pressure [MPa]	Final flow pressure [MPa]	Bottom hole pressure [MPa]	Downhole temperature [°C]
1.0				
2.0	45.200	20.400		

Test number	Oil [Sm3/day]	Gas [Sm3/day]	Oil density [g/cm3]	Gas grav. rel.air	GOR [m3/m3]
1.0					
2.0	353	81693	0.840		231

Logs

Log type	Log top depth [m]	Log bottom depth [m]
CBL GR	95	2479
CBL GR	2352	2538
CBL VDL GR	2340	2647
CBL VDL GR	2507	2698
CNL FDC GR CAL	2507	2701

DLL MSFL SP GR CAL	2507	2700
GR	2450	2582
ISF SON GR	440	2512
ISF SON SP GR	2507	2699
TDK-K	2475	2539
TEMP	2300	2701

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	183.0	36	183.0	0.00	LOT
SURF.COND.	20	435.0	26	442.0	0.00	LOT
INTERM.	13 3/8	1285.0	17 1/2	1290.0	0.00	LOT
INTERM.	9 5/8	2510.0	12 1/2	2518.0	0.00	LOT
LINER	7	2701.0	8 1/2	2704.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
261	1.09	46.0		waterbased	
441	1.05			waterbased	
1157	1.28	45.0		waterbased	
1289	1.29			waterbased	
2324	1.80			waterbased	
2703	1.89			waterbased	