General information

Wellbore name	6507/7-2
Type	EXPLORATION
Purpose	WILDCAT
Status	P&A
Factmaps in new window	link to map
Main area	NORWEGIAN SEA
Field	HEIDRUN
Discovery	6507/7-2 Heidrun
Well name	6507/7-2
Seismic location	BP 83 - 307 SP. 910
Production licence	095
Drilling operator	Conoco Norway Inc.
Drill permit	454-L
Drilling facility	NORTRYM
Drilling days	106
Entered date	25.02.1985
Completed date	10.06.1985
Release date	10.06.1987
Publication date	18.12.2008
Purpose - planned	WILDCAT
Reentry	NO
Content	OIL/GAS
Discovery wellbore	YES
1st level with HC, age	MIDDLE JURASSIC
1st level with HC, formation	FANGST GP
2nd level with HC, age	EARLY JURASSIC
2nd level with HC, formation	BÅT GP
Kelly bushing elevation [m]	25.0
Water depth [m]	351.0
Total depth (MD) [m RKB]	3262.0
Final vertical depth (TVD) [m RKB]	3260.0
Maximum inclination [°]	7.8
Bottom hole temperature [°C]	113
Oldest penetrated age	LATE TRIASSIC
Oldest penetrated formation	ÅRE FM
Geodetic datum	ED50
NS degrees	65° 20' 12.37'' N
EW degrees	7° 18' 34.52'' E

NS UTM [m]	7247224.93
EW UTM [m]	421294.24
UTM zone	32
NPDID wellbore	464

Wellbore history

General

The well 6507/7-2 was drilled in the northern part of the Haltenbanken area, some 190 km west of the Norwegian coast. It was drilled to evaluate the "B" prospect in the intensely faulted zone that lies at the intersection of the Nordland Ridge in the northeast and the Halten Terrace in the south. The prospect was in a southward plunging horst block formed by a Late Jurassic tensional fault system. The main reservoir interval was anticipated to be the Lower Jurassic sandstone of the Aldra (Tilje) Formation.

Operations and results

Wildcat well 6507/7-2 was spudded with the semi-submersible installation Nortrym on 25 February 1985 and drilled to TD at 3262 m in Late Triassic sediments of the Åre Formation. No significant problems occurred during drilling operations, which went very much according to schedule. The seven-test program was however delayed approximately two weeks due to a premature firing of the Baker Tubing-Conveyed Perforating Guns while running in for DST 4. This necessitated the running of a protective string of 7" casing to cover the perforations (1062.5m to 1072.5m) and enable the testing program to be completed. Additional time was lost due to pulling and repairing the BOP stack after running the protective casing string. The well was drilled with sea water down to 1030 m and with gypsum mud from 1030 m to TD.

Shetland Group sediments were resting directly on the Fangst Group, confirming heavy erosion at the crest of the structure as prognosed. The oldest dating of the Shetland Group was Santonian age, in sediments ca 5 m above top Fangst Group, while the youngest Fangst Group sediments were dated Toarcian-?Aalenian. At 2198 meters gas levels rose, indicating the top of the Jurassic sediments. Associated with the gas show was a rare dull-gold fluorescence on cuttings; however, no cut or staining was evident. The MWD gave little indication of sand through the Fangst Group and very little sand was seen in samples. The Ror Formation claystones separated the Fangst Group from the underlying Tilje formation.

The Fangst and Båt groups were found hydrocarbon-bearing. Using gradients established from electric logs, RFT data, and fluid analysis the gas/oil contact was estimated to be at 2317.5 m. The oil/water contact was not as clear-cut. From logs it was placed at 2455, while the RFT data indicated an OWC between 2476 and 2482 m.

Fourteen cores were cut in the Tilje Formation from 2283.5m to 2448.5m with an 84% recovery. The coring point was picked on the basis of prognosed depths, two earlier drilling breaks in claystones having been circulated out. Good oil shows were observed. There was good fluorescence to 2317m though little or no visible staining and cut was apparent. Visible oil with a good cut was apparent to 2439 meters, but the quality of show declined from this depth, with no fluorescence recorded below 2470 meters. Analysis of cores and logs indicated very good sandstone porosities and permeabilities throughout the interval. The low gas values through the reservoir were thought to reflect an overbalance of 3.5 - 4.5ppg which combined with increasing permeability caused flushing of the formation ahead of the bit.

Four segregated RFT samples were taken at 2220.5 m (gas + water, mud and small amount of light coloured oil/condensate), 2303 m (gas + water, mud and small amount of

light coloured oil/condensate), 2331.5 m (2.5 litres 29.8 deg API gravity oil with some gas) and 2382.7 m (9 litres of 22 deg API gravity oil with some water and gas).

The well was permanently abandoned on 10 June 1985 as an oil and gas discovery.

Testing

Seven drill stem tests were undertaken. DST 1 was performed in the water zone within the Tilje Formation from 2521 to 2529 m. Four further tests were performed in the Tilje Formation with DST 2 (2417 - 2439 m), 3 (2356.5 - 2376 m) and 4A (2330 - 2340 m) flowing oil and DST 5 (2290 - 2310 m) gas/condensate. DST 6 (2232 - 2245 m) in the Ror Formation produced gas/condensate, and DST 7 in the Fangst Group, 2203 to 2222 m, produced predominantly gas. At stabilized conditions using various chokes sizes the cumulative peak production of oil was 2095 Sm3/day. Oil gravity ranged from 0.922 g/cm3 (22 deg API) to 0.876 g/cm3 (30 deg API). Cumulative peak gas production was 21100000 Sm3/day. Average gas gravity with respect to air was 0.65. Condensate produced in conjunction with the gas tests totalled 185 standard cubic meters per day (1166 BCPD) with an average gravity of 0.75 g/cm3(57 API). The average temperatures measured at the gauge carriers were: 83.4 (DST 1), 82.8 (DST 2), 80.9 (DST 3), 80.8 (DST 4A), 77.2 (DST 5), 72.4 (DST 6), and 75.5 (DST 7).

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
480.00	3262.20

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	2283.5	2295.7	[m]
2	2300.5	2310.7	[m]
3	2316.0	2318.5	[m]
4	2320.0	2325.1	[m]
5	2327.0	2342.0	[m]
6	2345.0	2362.0	[m]
7	2363.5	2378.1	[m]
8	2379.0	2392.0	[m]
9	2394.0	2408.6	[m]
10	2410.0	2420.1	[m]
11	2422.0	2427.2	[m]
12	2431.0	2435.0	[m]
13	2436.0	2443.5	[m]
14	2444.0	2448.2	[m]

Total core sample length [m]	135.2
Cores available for sampling?	YES

Palynological slides at the Norwegian Offshore Directorate

Sample depth	Depth unit	Sample type	Laboratory
2000.0	[m]	DC	OD
2021.0	[m]	DC	OD
2042.0	[m]	DC	OD
2060.0	[m]	DC	OD
2081.0	[m]	DC	OD
2099.0	[m]	DC	OD
2108.0	[m]	DC	OD
2120.0	[m]	DC	OD
2129.0	[m]	DC	OD
2141.0	[m]	DC	OD
2150.0	[m]	DC	OD
2162.0	[m]	DC	OD
2171.0	[m]	DC	OD
2180.0	[m]	DC	OD
2192.0	[m]	DC	OD
2199.0	[m]	DC	OD
2210.0	[m]	DC	OD
2219.0	[m]	DC	OD
2231.0	[m]	DC	OD
2243.0	[m]	DC	OD
2249.0	[m]	DC	OD
2261.0	[m]	DC	OD
2273.0	[m]	DC	OD
2282.0	[m]	DC	OD
2294.0	[m]	DC	OD
2318.0	[m]	DC	OD
2330.0	[m]	DC	OD
2345.0	[m]	DC	OD
2363.0	[m]	DC	OD
2381.0	[m]	DC	OD
2405.0	[m]	DC	OD
2426.0	[m]	DC	OD
2435.0	[m]	DC	OD

2444.0	[m]	DC	OD
2450.0	[m]	DC	OD
2462.0	[m]	DC	OD
2474.0	[m]	DC	OD
2486.0	[m]	DC	OD
2495.0	[m]	DC	OD
2528.0	[m]	DC	OD
2555.0	[m]	DC	OD
2585.0	[m]	DC	OD
2615.0	[m]	DC	OD
2645.0	[m]	DC	OD
2675.0	[m]	DC	OD
2705.0	[m]	DC	OD
2735.0	[m]	DC	OD
2765.0	[m]	DC	OD
2795.0	[m]	DC	OD
2825.0	[m]	DC	OD
2855.0	[m]	DC	OD
2885.0	[m]	DC	OD
2915.0	[m]	DC	OD
2945.0	[m]	DC	OD
2975.0	[m]	DC	OD
2999.0	[m]	DC	OD

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
DST		2417.00	2439.00		29.04.1985 - 00:00	YES
DST	DST2	2365.00	2376.00		30.04.1985 - 00:00	YES
DST	DST4A	2330.00	2340.00		24.05.1985 - 00:00	YES
DST	DST5	2290.00	2310.00		29.05.1985 - 00:00	YES
DST	DST6	2232.00	2245.00		01.06.1985 - 00:00	YES
DST	DST7	2203.00	2222.00		05.06.1985 - 00:00	YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
376	NORDLAND GP
376	NAUST FM
1454	KAI FM
1863	HORDALAND GP
1863	BRYGGE FM
1944	ROGALAND GP
1944	TARE FM
1977	TANG FM
2042	SHETLAND GP
2203	FANGST GP
2217	BÅT GP
2217	ROR FM
2285	TILJE FM
2482	ÅRE FM

Geochemical information

Document name	Document format	Document size [MB]
464_1	pdf	0.72
464_2	pdf	0.17
464_3	pdf	0.36

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

Document name	Document format	Document size [MB]
464_01_WDSS_General_Information	pdf	0.31
464_02_WDSS_completion_log	pdf	0.23

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

Document name	Document format	Document size [MB]
464_01_6507_7_2_COMPLETION_REPORT	pdf	20.53

464_02_6507_7_2_COMPLETION_LOG	pdf	2.39

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	2521	2529	6.1
2.0	2417	2439	25.4
2.1	2417	2439	9.5
2.2	2417	2439	9.5
2.3	2417	2439	25.4
3.0	2357	2376	25.4
4.0	2330	2340	22.2
5.0	2290	2310	19.1
6.0	2232	2245	19.1
7.0	2203	2222	20.2

Test number	Final shut-in pressure [MPa]	Final flow pressure [MPa]	Bottom hole pressure [MPa]	Downhole temperature [°C]
1.0		1.000	26.000	
2.0				
2.1		5.000		
2.2		5.000		
2.3	6.000	3.000	25.000	
3.0		40.000		
4.0		4.000	25.000	
5.0		12.000		
6.0		5.000		
7.0		9.000		

Test number	Oil [Sm3/day]	Gas [Sm3/day]	Oil density [g/cm3]	Gas grav. rel.air	GOR [m3/m3]
1.0					
2.0	704	34000	0.922	0.617	48
2.1	208	12000	0.910		57
2.2	208	12000	0.910		57
2.3	704	34000	0.920		49
3.0	489	32000	0.982	0.668	65
4.0	902	68000	0.876	0.660	75

5.0	73	724000	0.754	0.650	9965
6.0	17	45000	0.755	0.650	2632
7.0	96	900000	0.755		9360

Logs

Log type	Log top depth [m]	Log bottom depth [m]
CBL VDL GR CCL	1900	2597
CST	1940	2097
CST	2115	2591
CST	2610	3249
DLL MSFL GR SP	2100	2602
ISF BHC MSFL GR SP	474	1028
ISF LSS MSFL GR SP	1026	2109
ISF LSS MSFL GR SP	2100	2605
ISF LSS MSFL GR SP	2602	3250
LDT CNL GR	2016	2110
LDT CNL GR	2602	3250
LDT CNL NGS	2100	2606
MWD - GYRO MULTISHOT	474	3262
RFT	2205	2574
SHDT GR	1026	2110
SHDT GR	2100	2606
SHDT GR	2602	3250
TEMP	500	2025
TEMP	998	2551
VSP	474	3250

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	474.0	36	476.0	0.00	LOT
SURF.COND.	20	1025.8	26	1030.0	1.52	LOT
INTERM.	13 3/8	2100.0	17 1/2	2110.0	1.76	LOT
INTERM.	9 5/8	2599.7	12 1/4	2610.0	1.81	LOT
INTERM.	9 5/8	2600.2	12 1/4	2610.0	1.81	LOT
OPEN HOLE		3262.0	8 1/2	3262.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
383	0.00			WATER BASED	25.02.1985
426	1.02	180.0		WATER BASED	27.02.1985
476	1.06	180.0		WATER BASED	27.02.1985
476	1.02	180.0		WATER BASED	01.03.1985
476	1.02	180.0		WATER BASED	01.03.1985
836	1.12	5.0	77.0	WATER BASED	03.03.1985
1030	1.12	6.0	148.0	WATER BASED	03.03.1985
1030	1.02	7.0	115.0	WATER BASED	03.03.1985
1030	1.26	9.0	124.5	WATER BASED	04.03.1985
1030	1.02	7.0	115.0	WATER BASED	03.03.1985
1030	1.26	9.0	124.5	WATER BASED	04.03.1985
1070	1.08	23.0	76.6	WATER BASED	10.03.1985
1486	1.35	21.0	57.5	WATER BASED	10.03.1985
1646	1.39	11.0	86.2	WATER BASED	11.03.1985
1862	1.43	11.0	91.0	WATER BASED	12.03.1985
2052	1.45	14.0	115.0	WATER BASED	13.03.1985
2110	1.48	14.0	124.0	WATER BASED	14.03.1985
2110	1.47	14.0	110.0	WATER BASED	17.03.1985
2110	1.47	14.0	110.0	WATER BASED	17.03.1985
2179	1.54	14.0	119.7	WATER BASED	19.03.1985
2228	1.56	14.0	81.3	WATER BASED	20.03.1985
2284	1.58	16.0	95.7	WATER BASED	21.03.1985
2313	1.58	16.0	95.7	WATER BASED	24.03.1985
2327	1.58	16.0	95.7	WATER BASED	24.03.1985
2403	1.58	16.0	95.8	WATER BASED	27.03.1985
2436	1.58	16.0	65.6	WATER BASED	29.03.1985
2582	1.58	16.0	105.3	WATER BASED	01.04.1985
2605	1.58	18.0	81.4	WATER BASED	01.04.1985
2610	1.58	22.0	71.8	WATER BASED	09.04.1985
2610	1.58	23.0	81.4	WATER BASED	09.04.1985
2610	1.58	20.0	67.0	WATER BASED	09.04.1985
2610	1.58	23.0	86.2	WATER BASED	09.04.1985
2610	1.58	23.0	81.4	WATER BASED	09.04.1985
2610	1.58	20.0	67.0	WATER BASED	09.04.1985
2610	1.58	23.0	86.2	WATER BASED	09.04.1985

2627	1.50	13.0	67.0	WATER BASED	09.04.1985
2645	1.48	15.0	62.2	WATER BASED	09.04.1985
2680	1.44	15.0	62.3	WATER BASED	10.04.1985
2728	1.42	16.0	71.8	WATER BASED	11.04.1985
2810	1.39	15.0	71.8	WATER BASED	12.04.1985
2917	1.39	17.0	62.2	WATER BASED	15.04.1985
2989	1.39	15.0	67.0	WATER BASED	15.04.1985
3135	1.39	16.0	67.0	WATER BASED	15.04.1985
3262	1.39	16.0	76.6	WATER BASED	16.04.1985
3262	1.39	16.0	76.6	WATER BASED	17.04.1985
3262	1.39	20.0	95.6	WATER BASED	18.04.1985
3262	1.39	20.0	95.6	WATER BASED	18.04.1985
3262	1.39	16.0	76.6	WATER BASED	17.04.1985

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]
464_Formation_pressure_(Formasjonstrykk)	pdf	0.28