General information

Wellbore name	35/11-8 S
Type	EXPLORATION
Purpose	WILDCAT
Status	P&A
Factmaps in new window	link to map
Main area	NORTH SEA
Field	FRAM
Discovery	35/11-8 S
Well name	35/11-8
Seismic location	MN 9201- INLINE 4287 & CROSSLINE 1277
Production licence	090
Drilling operator	Norsk Hydro Produksjon AS
Drill permit	841-L
Drilling facility	TREASURE SAGA
Drilling days	70
Entered date	03.03.1996
Completed date	11.05.1996
Release date	11.05.1998
Publication date	15.06.2005
Purpose - planned	WILDCAT
Reentry	NO
Content	OIL/GAS
Discovery wellbore	YES
1st level with HC, age	LATE JURASSIC
1st level with HC, formation	INTRA HEATHER FM SS
Kelly bushing elevation [m]	26.0
Water depth [m]	361.0
Total depth (MD) [m RKB]	3624.0
Final vertical depth (TVD) [m RKB]	3355.0
Maximum inclination [°]	33
Bottom hole temperature [°C]	128
Oldest penetrated age	EARLY JURASSIC
Oldest penetrated formation	DRAKE FM
Geodetic datum	ED50
NS degrees	61° 5' 25.53'' N
EW degrees	3° 32' 14.85'' E
NS UTM [m]	6773139.14

EW UTM [m]	528987.44
UTM zone	31
NPDID wellbore	2772

Wellbore history

General

Well 35/11-8 S is located ca 15 km due north of the Troll Field. It was designed to test the hydrocarbon potential in the H-structure located in a down-faulted position west of the F/C complex where oil and gas was discovered in the wells 35/11-4 and -7. The main targets were the Brent Group and the Sognefjord Formation equivalent. Possible secondary targets were seen in Intra Draupne sandstone and a mound feature in the Paleocene sequence.

Operations and results

Wildcat well 35/11-8 S was spudded with the semi-submersible installation Treasure Saga on 3 March 1996 and drilled to TD at 3624 m (3355 m TVD RKB) m in the Early Jurassic Drake Formation. The well was drilled vertically in the top hole, starting to build angle below the 30" casing shoe at 447 m. From 950 m to 2250 m the deviation was kept at 31 ± 2°, from which point the inclination was gradually reduced towards a more vertical path. After the testing phase, operations were interrupted for some three days by an industrial strike. Operations went without significant technical problems. The well was drilled with spud mud down to 1233 m and with KCl/polymer mud from 1233 m to TD.

The Paleocene mound feature proved to consists of 66 m of water bearing sand with weak shows in the uppermost part.

The prognosed lead related to the high amplitude Intra Draupne reflector corresponded to the Late Jurassic source rock. A thin sandstone at the base of the Sognefjord Formation was water filled with weak shows. Oil and gas was discovered in a 115 m thick Late Jurassic turbiditic sandstone unit at 2860 m. The sequence could not be correlated with the Sognefjord Formation in the neighbouring wells and is classified as an Intra Heather Sandstone unit. From 2860 to 2881 m 20.7 m net pay gas reservoir showed a gas saturation of 89 % and the average porosity was calculated to 21.9 %. A 40.1 m net pay oil zone was calculated for the interval between 2881m and 2938 m. Average porosity for this interval is 22.1 % and the oil saturation is 80.0 %. MDT pressure measurements gave a gas-oil contact at 2881 m (2600 m TVD MSL) and an oil-water contact at 2938 m (2654 m TVD MSL). Low saturation of residual hydrocarbons were observed in intervals below the oil-water contact. The Brent Group was encountered at 3376.5 m and was water bearing. A trace oil show was however recorded at 3467 m in the Etive Formation. The MDT pressure measurements failed to define a water gradient due to poor reservoir quality. Four cores were taken in the Intra Heather Sandstone unit, covering the gas zone, the oil zone, and parts of the water zone. An MDT water sample was taken at 2818 m in the Sognefjord Formation. MDT water samples were taken also in the Brent Group.

The well was permanently abandoned on 11 May 1996 as an oil and gas discovery.

Testing

Three drill stem tests were conducted in the Intra Heather Sandstone unit. DST 1 tested the interval 2924 m to 2931 m, DST 1B tested the intervals 2924 m to 2931 m and 2910 m to 2920 m, and DST 2 tested the interval 2885 m to 2892 m. All three tests produced 0.85 g/cm3 (35 deg API) oil with GOR in the range 95 to 113 Sm3/Sm3.

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
1240.00	3625.00

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	2866.0	2883.7	[m]
2	2884.0	2911.5	[m]
3	2911.5	2936.2	[m]
4	2938.0	2964.0	[m]

Total core sample length [m]	95.9
Cores available for sampling?	YES

Core photos


2866-2871m


2871-2876m


2876-2881m


2881-2883m


2884-2889m


2889-2894m


2894-2899m


2899-2904m


2904-2909m


2909-2911m


2911-2916m


2916-2921m


2921-2926m


2926-2931m


2931-2936m











2936-2936m 2938-2943m 2943-2948m 2948-2953m 2953-2958m


2958-2963m


2963-2964m

Palynological slides at the Norwegian Offshore Directorate

Sample depth	Depth unit	Sample type	Laboratory
1240.0	[m]	DC	RRI
1260.0	[m]	DC	RRI
1280.0	[m]	DC	RRI
1300.0	[m]	DC	RRI
1320.0	[m]	DC	RRI
1340.0	[m]	DC	RRI
1360.0	[m]	DC	RRI
1380.0	[m]	DC	RRI
1400.0	[m]	DC	RRI
1420.0	[m]	DC	RRI
1440.0	[m]	DC	RRI
1460.0	[m]	DC	RRI
1480.0	[m]	DC	RRI
1500.0	[m]	DC	RRI
1520.0	[m]	DC	RRI
1540.0	[m]	DC	RRI
1560.0	[m]	DC	RRI
1580.0	[m]	DC	RRI
1600.0	[m]	DC	RRI
1620.0	[m]	DC	RRI
1640.0	[m]	DC	RRI
1650.0	[m]	DC	RRI
1660.0	[m]	DC	RRI
1670.0	[m]	DC	RRI
1680.0	[m]	DC	RRI
1690.0	[m]	DC	RRI
1700.0	[m]	DC	RRI

1710.0	[m]	DC	RRI
1720.0	[m]	DC	RRI
1730.0	[m]	DC	RRI
1740.0	[m]	DC	RRI
1750.0	[m]	DC	RRI
1760.0	[m]	DC	RRI
1770.0	[m]	DC	RRI
1785.0	[m]	SWC	RRI
1792.0	[m]	SWC	RRI
1800.0	[m]	DC	RRI
1810.0	[m]	DC	RRI
1820.0	[m]	DC	RRI
1826.0	[m]	SWC	RRI
1840.0	[m]	DC	RRI
1850.0	[m]	DC	RRI
1860.0	[m]	DC	RRI
1880.0	[m]	DC	RRI
1888.0	[m]	SWC	RRI
1905.0	[m]	SWC	RRI
1920.0	[m]	DC	RRI
1930.0	[m]	DC	RRI
1940.0	[m]	DC	RRI
1950.0	[m]	DC	RRI
1960.0	[m]	DC	RRI
1970.0	[m]	DC	RRI
1980.0	[m]	DC	RRI
1990.0	[m]	DC	RRI
2000.0	[m]	DC	RRI
2010.0	[m]	DC	RRI
2020.0	[m]	DC	RRI
2030.0	[m]	DC	RRI
2040.0	[m]	DC	RRI
2050.0	[m]	SWC	RRI
2060.0	[m]	DC	RRI
2070.0	[m]	DC	RRI
2080.0	[m]	DC	RRI
2089.0	[m]	SWC	RRI
2101.0	[m]	DC	RRI
2110.0	[m]	DC	RRI
2120.0	[m]	DC	RRI

2130.0	[m]	DC	RRI
2150.0	[m]	DC	RRI
2190.0	[m]	DC	RRI
2210.0	[m]	DC	RRI
2230.0	[m]	DC	RRI
2250.0	[m]	DC	RRI
2270.0	[m]	DC	RRI
2290.0	[m]	DC	RRI
2310.0	[m]	DC	RRI
2330.0	[m]	DC	RRI
2350.0	[m]	DC	RRI
2370.0	[m]	DC	RRI
2390.0	[m]	DC	RRI
2410.0	[m]	DC	RRI
2430.0	[m]	DC	RRI
2450.0	[m]	DC	RRI
2470.0	[m]	DC	RRI
2510.0	[m]	DC	RRI
2530.0	[m]	DC	RRI
2550.0	[m]	DC	RRI
2570.0	[m]	DC	RRI
2580.0	[m]	DC	RRI
2590.0	[m]	DC	RRI
2600.0	[m]	DC	RRI
2610.0	[m]	DC	RRI
2620.0	[m]	DC	RRI
2630.0	[m]	DC	RRI
2640.0	[m]	DC	RRI
2650.0	[m]	DC	RRI
2660.0	[m]	SWC	RRI
2670.0	[m]	SWC	RRI
2680.0	[m]	DC	RRI
2690.0	[m]	DC	RRI
2700.0	[m]	DC	RRI
2710.0	[m]	DC	RRI
2720.0	[m]	DC	RRI
2730.0	[m]	DC	RRI
2740.0	[m]	DC	RRI
2754.0	[m]	SWC	RRI
2760.0	[m]	DC	RRI

2770.0	[m]	DC	RRI
2780.0	[m]	DC	RRI
2787.0	[m]	SWC	RRI
2800.0	[m]	DC	RRI
2810.0	[m]	DC	RRI
2820.0	[m]	DC	RRI
2830.0	[m]	DC	RRI
2840.0	[m]	DC	RRI
2852.0	[m]	DC	RRI
2862.0	[m]	DC	RRI
2872.0	[m]	DC	RRI
2878.0	[m]	C	RRI
2880.0	[m]	C	RRI
2894.0	[m]	C	RRI
2899.0	[m]	C	RRI
2904.0	[m]	DC	RRI
2907.0	[m]	C	RRI
2918.0	[m]	C	RRI
2930.0	[m]	C	RRI
2933.0	[m]	C	RRI
2935.0	[m]	C	RRI
2950.0	[m]	C	RRI
2962.0	[m]	C	RRI
2970.0	[m]	DC	RRI
2980.0	[m]	DC	RRI
2990.0	[m]	SWC	RRI
2997.0	[m]	SWC	RRI
3010.0	[m]	DC	RRI
3020.0	[m]	DC	RRI
3030.0	[m]	DC	RRI
3038.0	[m]	SWC	SWC
3050.0	[m]	DC	RRI
3060.0	[m]	DC	RRI
3070.0	[m]	DC	RRI
3080.0	[m]	DC	RRI
3090.0	[m]	DC	RRI
3100.0	[m]	DC	RRI
3110.0	[m]	DC	RRI
3120.0	[m]	DC	RRI
3130.0	[m]	DC	RRI

3135.0	[m]	SWC	RRI
3140.0	[m]	DC	RRI
3150.0	[m]	DC	RRI
3160.0	[m]	DC	RRI
3170.0	[m]	DC	RRI
3180.0	[m]	DC	RRI
3190.0	[m]	DC	RRI
3200.0	[m]	DC	RRI
3210.0	[m]	DC	RRI
3222.0	[m]	DC	RRI
3250.0	[m]	DC	RRI
3260.0	[m]	DC	RRI
3270.0	[m]	DC	RRI
3280.0	[m]	DC	RRI
3290.0	[m]	DC	RRI
3300.0	[m]	DC	RRI
3310.0	[m]	DC	RRI
3320.0	[m]	DC	RRI
3330.0	[m]	DC	RRI
3340.0	[m]	DC	RRI
3350.0	[m]	DC	RRI
3360.0	[m]	DC	RRI
3370.0	[m]	DC	RRI
3380.0	[m]	DC	RRI
3390.0	[m]	DC	RRI
3400.0	[m]	DC	RRI
3410.0	[m]	DC	RRI
3420.0	[m]	DC	RRI
3430.0	[m]	DC	RRI
3440.0	[m]	DC	RRI
3450.0	[m]	DC	RRI
3460.0	[m]	DC	RRI
3470.0	[m]	DC	RRI
3480.0	[m]	DC	RRI
3503.0	[m]	SWC	RRI
3510.0	[m]	DC	RRI
3520.0	[m]	DC	RRI
3535.0	[m]	DC	RRI
3545.0	[m]	SWC	RRI
3555.0	[m]	DC	RRI

3565.0	[m]	DC	RRI
3575.0	[m]	DC	RRI
3595.0	[m]	DC	RRI
3605.0	[m]	DC	RRI

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	TEST 1B	2931.00	2885.00		21.04.1996 - 00:00	YES
DST	TEST2	2892.00	2885.00		27.04.1996 - 13:47	YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
387	NORDLAND GP
722	UTSIRA FM
785	HORDALAND GP
1618	ROGALAND GP
1618	BALDER FM
1681	SELE FM
1730	LISTA FM
1797	HEIMDAL FM
1877	LISTA FM
1975	VÅLE FM
2021	TY FM
2041	VÅLE FM
2063	TY FM
2087	VÅLE FM
2124	SHETLAND GP
2124	JORSALFARE FM
2292	KYRRE FM
2598	SVARTE FM
2678	CROMER KNOLL GP
2678	RØDBY FM
2686	VIKING GP
2686	DRAUPNE FM

2789	HEATHER FM
2807	SOGNEFJORD FM
2825	HEATHER FM
2860	INTRA HEATHER FM SS
3377	BRENT GP
3377	TARBERT FM
3387	NESS FM
3459	ETIVE FM
3480	RANNOCH FM
3505	OSEBERG FM
3576	DUNLIN GP
3576	DRAKE FM

Composite logs

Document name	Document format	Document size [MB]
2772_35_11_8_S	pdf	0.58

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

Document name	Document format	Document size [MB]
2772_35_11_8_S_COMPLETION_REPORT_AND_COMPLETION_LOG	pdf	18.64

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	2924	2931	19.1
2.0	2910	2920	19.1
3.0	2886	2901	12.7

Test number	Final shut-in pressure [MPa]	Final flow pressure [MPa]	Bottom hole pressure [MPa]	Downhole temperature [°C]
1.0	26.000	21.000	27.000	104
2.0	26.000	24.000	27.000	105
3.0	26.000	25.000	27.000	103

Test number	Oil [Sm3/day]	Gas [Sm3/day]	Oil density [g/cm3]	Gas grav. rel.air	GOR [m3/m3]
1.0	700	79000	0.850	0.720	112
2.0	860	82000	0.850	0.690	95
3.0	520	58000	0.850	0.706	112

Logs

Log type	Log top depth [m]	Log bottom depth [m]
CBL VBDL USIT GR CCL AMS	1650	3227
CST GR	1785	3135
CST GR	2588	3462
DLL MSFL LSS LDL CNL GR AMS SP	1195	3629
FMS NGT	1703	3110
MDT GR	1872	2975
MDT GR	2896	2930
MDT GR	3380	3483
MDT GR	3381	3490
MWD	387	3624
VSP GR	1420	3600

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	447.0	36	450.0	0.00	LOT
SURF.COND.	13 3/8	1220.0	17 1/2	1233.0	0.00	LOT
INTERM.	9 5/8	3232.0	12 1/4	3242.0	0.00	LOT
OPEN HOLE		3624.0	8 1/2	3624.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
449	1.03			WATER BASED	
1233	1.30	16.0		WATER BASED	

1787	1.30	24.0		WATER BASED	
2224	1.30	28.0		WATER BASED	
2650	1.12			WATER BASED	
2907	1.12	14.0		WATER BASED	
3085	1.12	16.0		WATER BASED	
3242	1.30	23.0		WATER BASED	
3263	1.31	22.0		WATER BASED	
3624	1.31	22.0		WATER BASED	

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]
2772_Formation_pressure_(Formasjonstrykk)	pdf	0.24