General information

Wellbore name	33/9-17
Type	EXPLORATION
Purpose	WILDCAT
Status	P&A
Factmaps in new window	link to map
Main area	NORTH SEA
Well name	33/9-17
Seismic location	E 86 R-93-3D INLINE 497 & CROSSLINE 436
Production licence	172
Drilling operator	Mobil Exploration Norway INC
Drill permit	786-L
Drilling facility	TREASURE SAGA
Drilling days	33
Entered date	02.04.1994
Completed date	04.05.1994
Release date	04.05.1996
Publication date	18.05.2004
Purpose - planned	WILDCAT
Reentry	NO
Content	OIL SHOWS
Discovery wellbore	NO
Kelly bushing elevation [m]	26.0
Water depth [m]	228.0
Total depth (MD) [m RKB]	3233.0
Final vertical depth (TVD) [m RKB]	3230.0
Maximum inclination [°]	5.6
Bottom hole temperature [°C]	120
Oldest penetrated age	MIDDLE JURASSIC
Oldest penetrated formation	NESS FM
Geodetic datum	ED50
NS degrees	61° 27' 18.58'' N
EW degrees	1° 50' 45.79'' E
NS UTM [m]	6814193.73
EW UTM [m]	438481.99
UTM zone	31
NPDID wellbore	2114

Wellbore history

General

Well 33/9-17 is located immediately north of the Statfjord field, northwest of the Statfjord Nord field with the Murchison field to the west.

The primary objective of the well was to evaluate the hydrocarbon potential of intra-Draupne sandstone informally named the Munin sandstone unit. It was designed to find commercial hydrocarbons in a structural/stratigraphic play above 3080 meters sub-sea, the interpreted oil/water contact. The secondary objective was to evaluate the Middle Jurassic sandstones of the Brent Group.

Operations and results

Well 33/9-17 was spudded on 2 April 1994 with the semi-submersible rig Treasure Saga and reached a total driller's depth of 3233 m RKB in the Middle Jurassic Brent Group. The well was drilled with seawater and swept with high viscosity mud down to the 12 1/4" section, while KCl/polymer/Glycol mud was used when drilling the 12 1/4" section and to TD.

The Munin sandstone unit (3050 - 3131m) was mostly water bearing with localized hydrocarbon shows. Average water saturation within the reservoir is 89.2%. The unit consisted of 47.3 meters of net reservoir out of a gross interval of 81 meters (N/G = 58.4%). The net reservoir was of excellent quality. Average Munin porosity was 22.6% and permeability was generally over l Darcy. The Brent Group (3187 -3233m) has 22.9 meters of good quality reservoir rock from a gross sandstone thickness of 37 meters, but is water bearing. Average porosity for the reservoir rock is 19.7%.

None of the analysed potential source rocks of this well are within the oil window and only limited early generation of hydrocarbons has taken place. The Viking Group claystones do, however, seem to have generated some hydrocarbons. These hydrocarbon products appear to be fairly sulphur-rich.

The best source rocks found in well 33/9-17 are represented by the claystones in the upper and lower sections of the Draupne Formation and in the Munin sandstone unit. These are very rich source rocks and are oil prone. The lower section of the Draupne Formation appears to contain an almost lacustrine assemblage of kerogen.

The Brent Group contains TOC-rich claystones, but they appear to be more gas prone although they could have some oil potential. The Tertiary and Cretaceous sections have at best a fair potential for gas generation although the base of the Cromer Knoll Group grades to the Draupne Formation and could be said to have some potential for oil generation.

Three cores were cut through the Mime Formation of the Cromer Knoll Group and the Draupne Formation of the Viking Group. The last core penetrated some 13 m of the Munin sandstone unit. The Munin sandstone cores had good porosity. An RFT sample taken at 3087 m (logger’s depth) in the Munin sandstone unit contained water. RFT formation pressures were obtained in Draupne (Munin sandstone unit), Tarbert Formation and Ness Formation. Traces of oil shows were observed in sandy laminations within claystones of the Draupne Group immediately overlying the Munin sandstones. In the Middle Jurassic Brent Group, no oil shows were observed in sandstones of the Tarbert and Ness Formations and no cores were cut here.

Well 33/9-17 discovered only traces of hydrocarbons within the Munin sandstone unit. These hydrocarbons were not detected during drilling (MWD) but are evident within the whole core (core depths 3045m and 3055m, measured depths 3050.5mand 3060.5m).

Petrophysical analysis confirmed the existence of low oil saturations within the Munin sandstone unit.

The well was plugged and abandoned as a dry hole with oil shows in the Munin sandstone unit on 4 May 1994.

Testing

No drill stem test was performed.

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
590.00	3232.00

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	3029.0	3034.5	[m]
2	3034.5	3041.7	[m]
3	3042.5	3059.1	[m]

Total core sample length [m]	29.3
Cores available for sampling?	YES

Core photos


3029-3034m


3034-3035m


3035-3039m


3039-3041m


3042-3047m


3047-3052m


3052-3057m


3057-3059m

Palynological slides at the Norwegian Offshore Directorate

Sample depth	Depth unit	Sample type	Laboratory
590.0	[m]	DC	
610.0	[m]	DC	
630.0	[m]	DC	
650.0	[m]	DC	
670.0	[m]	DC	
690.0	[m]	DC	
710.0	[m]	DC	
730.0	[m]	DC	
750.0	[m]	DC	
770.0	[m]	DC	
790.0	[m]	DC	
810.0	[m]	DC	
830.0	[m]	DC	
850.0	[m]	DC	
870.0	[m]	DC	
890.0	[m]	DC	
910.0	[m]	DC	
930.0	[m]	DC	
950.0	[m]	DC	
970.0	[m]	DC	
990.0	[m]	DC	
1010.0	[m]	DC	
1020.0	[m]	DC	
1030.0	[m]	DC	
1040.0	[m]	DC	
1050.0	[m]	DC	
1060.0	[m]	DC	
1070.0	[m]	DC	
1080.0	[m]	DC	
1090.0	[m]	DC	
1100.0	[m]	DC	
1110.0	[m]	DC	
1120.0	[m]	DC	
1130.0	[m]	DC	
1150.0	[m]	DC	

1170.0	[m]	DC	
1190.0	[m]	DC	
1210.0	[m]	DC	
1230.0	[m]	DC	
1250.0	[m]	DC	
1270.0	[m]	DC	
1290.0	[m]	DC	
1310.0	[m]	DC	
1330.0	[m]	DC	
1350.0	[m]	DC	
1370.0	[m]	DC	
1390.0	[m]	DC	
1410.0	[m]	DC	
1430.0	[m]	DC	
1450.0	[m]	DC	
1470.0	[m]	DC	
1490.0	[m]	DC	
1510.0	[m]	DC	
1530.0	[m]	DC	
1550.0	[m]	DC	
1570.0	[m]	DC	
1590.0	[m]	DC	
1590.0	[m]	DC	
1600.0	[m]	DC	
1610.0	[m]	DC	
1620.0	[m]	DC	
1630.0	[m]	DC	
1640.0	[m]	DC	
1650.0	[m]	DC	
1660.0	[m]	DC	
1670.0	[m]	DC	
1680.0	[m]	DC	
1690.0	[m]	DC	
1710.0	[m]	DC	
1730.0	[m]	DC	
1750.0	[m]	DC	
1770.0	[m]	DC	
1790.0	[m]	DC	
1810.0	[m]	DC	
1826.0	[m]	SWC	

1840.0	[m]	DC	
1852.5	[m]	SWC	
1866.0	[m]	SWC	
1880.0	[m]	DC	
1890.0	[m]	DC	
1900.0	[m]	DC	
1904.5	[m]	SWC	
1910.0	[m]	DC	
1920.0	[m]	DC	
1930.0	[m]	DC	
1940.0	[m]	DC	
1960.0	[m]	DC	
1985.0	[m]	SWC	
2000.0	[m]	DC	
2020.0	[m]	DC	
2040.0	[m]	DC	
2060.0	[m]	DC	
2083.0	[m]	SWC	
2090.0	[m]	DC	
2100.0	[m]	DC	
2110.0	[m]	DC	
2120.0	[m]	DC	
2140.0	[m]	DC	
2160.0	[m]	DC	
2180.0	[m]	DC	
2200.0	[m]	DC	
2220.0	[m]	DC	
2240.0	[m]	DC	
2260.0	[m]	DC	
2280.0	[m]	DC	
2300.0	[m]	DC	
2320.0	[m]	DC	
2340.0	[m]	DC	
2360.0	[m]	DC	
2380.0	[m]	DC	
2400.0	[m]	DC	
2420.0	[m]	DC	
2440.0	[m]	DC	
2460.0	[m]	DC	
2480.0	[m]	DC	

2500.0	[m]	DC	
2520.0	[m]	DC	
2540.0	[m]	DC	
2546.0	[m]	SWC	
2560.0	[m]	DC	
2580.0	[m]	DC	
2580.0	[m]	DC	
2600.0	[m]	DC	
2620.0	[m]	DC	
2640.0	[m]	DC	
2660.0	[m]	DC	
2680.0	[m]	DC	
2700.0	[m]	DC	
2720.0	[m]	DC	
2740.0	[m]	DC	
2760.0	[m]	DC	
2780.0	[m]	DC	
2800.0	[m]	DC	
2818.0	[m]	DC	
2836.0	[m]	DC	
2854.0	[m]	DC	
2872.0	[m]	DC	
2890.0	[m]	DC	
2908.0	[m]	DC	
2926.0	[m]	DC	
2944.0	[m]	DC	
2962.0	[m]	DC	
2971.5	[m]	SWC	
2980.0	[m]	DC	
2989.0	[m]	DC	
2995.0	[m]	DC	
2998.0	[m]	DC	
3002.5	[m]	SWC	
3005.0	[m]	SWC	
3010.0	[m]	DC	
3013.0	[m]	DC	
3016.0	[m]	DC	
3022.0	[m]	DC	
3022.0	[m]	SWC	
3025.0	[m]	DC	

3026.0	[m]	SWC	
3027.5	[m]	SWC	
3030.0	[m]	C	
3034.0	[m]	C	
3035.0	[m]	C	
3037.0	[m]	C	
3039.0	[m]	C	
3041.0	[m]	C	
3043.8	[m]	C	
3045.8	[m]	C	
3048.0	[m]	SWC	
3053.8	[m]	C	
3057.8	[m]	C	
3059.0	[m]	C	
3061.0	[m]	DC	
3064.0	[m]	DC	
3070.0	[m]	DC	
3076.0	[m]	SWC	
3082.0	[m]	DC	
3090.0	[m]	SWC	
3094.0	[m]	DC	
3097.0	[m]	DC	
3101.0	[m]	SWC	
3109.0	[m]	DC	
3115.0	[m]	DC	
3121.0	[m]	DC	
3127.0	[m]	DC	
3130.0	[m]	DC	
3135.0	[m]	SWC	
3142.0	[m]	DC	
3148.0	[m]	DC	
3151.0	[m]	DC	
3154.0	[m]	DC	
3157.0	[m]	DC	
3160.0	[m]	DC	
3166.0	[m]	DC	
3172.0	[m]	DC	
3178.0	[m]	DC	
3181.0	[m]	DC	
3184.0	[m]	DC	

3187.0	[m]	DC	
3190.0	[m]	DC	
3193.0	[m]	DC	
3199.0	[m]	DC	
3202.0	[m]	DC	
3208.0	[m]	DC	
3213.5	[m]	SWC	
3220.0	[m]	DC	
3226.0	[m]	DC	
3229.0	[m]	DC	
3233.0	[m]	DC	

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
254	NORDLAND GP
947	UTSIRA FM
1105	HORDALAND GP
1668	ROGALAND GP
1668	BALDER FM
1763	LISTA FM
1903	VÅLE FM
1916	SHETLAND GP
1916	JORSALFARE FM
2165	KYRRE FM
2858	TRYGGVASON FM
2930	CROMER KNOLL GP
2930	RØDBY FM
3017	SOLA FM
3022	ÅSGARD FM
3038	VIKING GP
3038	DRAUPNE FM
3050	INTRA DRAUPNE FM SS
3131	DRAUPNE FM
3158	HEATHER FM
3187	BRENT GP
3187	TARBERT FM
3202	NESS FM

Composite logs

Document name	Document format	Document size [MB]
2114_33_9_17	pdf	0.59

Geochemical information

Document name	Document format	Document size [MB]
2114_1	pdf	4.56

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

Document name	Document format	Document size [MB]
2114_33_9_17_COMPLETION_REPORT_AND_LOG	pdf	286.83

Logs

Log type	Log top depth [m]	Log bottom depth [m]
AS - CBL VDL	1120	1784
CST GR	1826	3213
DIL SDL LDL CNL AMS GR	572	1795
FMS LDL CNL NGS TCCB AMS	1784	3240
MWD - RGD	255	3233
PI DLL MSFL AS GR	1784	3240
RFT HP GR TCCB AMS	3052	3217
VSP GR	520	3230

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	304.0	36	305.0	0.00	LOT
SURF.COND.	13 3/8	572.0	17 1/2	578.0	0.00	LOT

INTERM.	9 5/8	1782.0	12 1/4	1792.0	0.00	LOT
OPEN HOLE		3233.0	8 1/2	3233.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
257	1.00			WATER BASED	04.05.1994
270	1.50			WATER BASED	02.05.1994
270	1.00			WATER BASED	03.05.1994
270	1.00			WATER BASED	04.05.1994
303	1.00			WATER BASED	05.04.1994
303	1.00			WATER BASED	05.04.1994
422	1.00			WATER BASED	05.04.1994
578	1.00			WATER BASED	08.04.1994
578	1.00			WATER BASED	08.04.1994
578	1.00			WATER BASED	08.04.1994
929	1.26	14.0	12.0	WATER BASED	11.04.1994
1277	1.40	14.0	12.0	WATER BASED	11.04.1994
1645	1.57	30.0	9.2	WATER BASED	02.05.1994
1777	1.47	20.0	25.0	WATER BASED	11.04.1994
1790	1.47	20.0	25.0	WATER BASED	12.04.1994
1790	1.60	19.0	19.0	WATER BASED	13.04.1994
1871	1.60	19.0	19.0	WATER BASED	18.04.1994
2105	1.60	19.0	19.0	WATER BASED	18.04.1994
2105	1.60	26.0	10.4	WATER BASED	18.04.1994
2129	1.56	26.0	10.4	WATER BASED	18.04.1994
2236	1.56	32.0	11.3	WATER BASED	18.04.1994
2428	1.56	32.0	11.3	WATER BASED	18.04.1994
2527	1.56	32.0	11.3	WATER BASED	19.04.1994
2711	1.56	32.0	11.3	WATER BASED	20.04.1994
2814	1.56	32.0	11.3	WATER BASED	21.04.1994
2970	1.56	32.0	11.3	WATER BASED	22.04.1994
3029	1.56	32.0	11.3	WATER BASED	25.04.1994
3036	1.56	32.0	11.3	WATER BASED	25.04.1994
3060	1.56	32.0	11.3	WATER BASED	25.04.1994
3177	1.56	32.0	11.3	WATER BASED	28.04.1994
3233	1.56	32.0	11.3	WATER BASED	28.04.1994
3233	1.56	32.0	11.3	WATER BASED	28.04.1994

3233	1.56	32.0	11.3	WATER BASED	29.04.1994

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]
2114_Formation_pressure_(Formasjonstrykk)	pdf	0.21