



General information

Wellbore name	6407/6-4
Type	EXPLORATION
Purpose	APPRAISAL
Status	P&A
Factmaps in new window	link to map
Main area	NORWEGIAN SEA
Field	MIKKEL
Discovery	6407/6-3 Mikkel
Well name	6407/6-4
Seismic location	8402 - 114 SP. 1420
Production licence	092
Drilling operator	Mobil Exploration Norway INC
Drill permit	654-L
Drilling facility	ROSS RIG (2)
Drilling days	41
Entered date	31.10.1990
Completed date	13.12.1990
Release date	13.12.1992
Publication date	09.03.2009
Purpose - planned	APPRAISAL
Reentry	NO
Content	OIL SHOWS
Discovery wellbore	NO
Kelly bushing elevation [m]	23.5
Water depth [m]	219.5
Total depth (MD) [m RKB]	3126.0
Final vertical depth (TVD) [m RKB]	3125.0
Maximum inclination [°]	3.7
Bottom hole temperature [°C]	110
Oldest penetrated age	EARLY JURASSIC
Oldest penetrated formation	ÅRE FM
Geodetic datum	ED50
NS degrees	64° 37' 36.77" N
EW degrees	7° 40' 51" E
NS UTM [m]	7167706.66
EW UTM [m]	436926.45
UTM zone	32
NPDID wellbore	1604



Wellbore history

General

Well 6407/6-4 drilled the Mikkel Structure in the Bremstein Fault Complex, which separates the Trøndelag Platform in the east from the Halten Terrace in the west. The structure is an anticline aligned north-south. The well was planned to reach a total depth of 3150 m. There were no anomalous amplitudes at the planned well location, but there was an indication of shallow gas at 401 to 505 m. The purpose of drilling was to test the possibility of a significant oil leg in the southern part of the Mikkel Structure and to test the communication between the Garn- and Ile Formations in the southern part of the structure.

Operations and results

Appraisal well 6407/6-4 was spudded 31 October 1990 by the semi-submersible installation Ross Rig and drilled to TD at 3126 m in Early Jurassic sediments of the Åre Formation. The well was started with a 9 7/8" pilot hole down to 1088 m due to the possibility of shallow gas. No shallow gas was encountered. The well was then opened up and drilled with sea water and viscous pills down to 1085 m, and with KCl/polymer mud from 1085 m to TD. No significant technical problems were encountered in the operations.

The Garn Formation was penetrated at 2651 m (26 m deeper than prognosis) and was 101 m thick. The reservoir quality of this sandstone was good. The only oil shows recorded during the drilling were in the Garn Formation at 2658 - 2686 m. These were of a poor quality consisting of very dull yellow direct fluorescence, weak light yellow streaming cut fluorescence with a milky cut colour. The shows were patchy with no oil bleeding or hydrocarbon odour being noted.

Two cores were cut in the well, the first in the Garn Formation of the Fangst Group and the second in the Åre Formation of the Båt Group, both with 100% recovery. The RFT tool was run in the Båt and Fangst Groups. A comparison of pore pressure in the Ile and Tilje Formations show they have slightly higher pore pressure than the Garn Formation. This imply the formations may not be in communication. An RFT fluid sample was obtained from 2661 m in the Garn Formation. It recovered only water.

The well was permanently abandoned on 13 December 1990 as a dry well with shows.

Testing

No drill stem test was performed.

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
1090.00	3126.00

Cuttings available for sampling?	YES
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**Cores at the Norwegian Offshore Directorate**

Core sample number	Core sample - top depth	Core sample - bottom depth	Core sample depth - uom
1	2658.0	2686.0	[m]
2	3082.0	3095.1	[m]

Total core sample length [m]	41.1
Cores available for sampling?	YES

Core photos

2658-2663m



2663-2668m



2668-2673m



2673-2678m



2678-2683m



2683-2686m



3082-3087m



3087-3092m



3092-3095m

Palynological slides at the Norwegian Offshore Directorate

Sample depth	Depth unit	Sample type	Laboratory
1117.0	[m]	SWC	RRI
1200.0	[m]	DC	RRI
1210.0	[m]	DC	RRI
1291.0	[m]	SWC	RRI
1341.0	[m]	SWC	WESTL
1360.0	[m]	DC	RRI
1370.0	[m]	DC	RRI
1378.0	[m]	SWC	RRI
1420.0	[m]	DC	RRI
1425.0	[m]	SWC	RRI
1430.0	[m]	DC	RRI



1437.0 [m]	SWC	RRI
1448.0 [m]	SWC	RRI
1452.0 [m]	SWC	RRI
1480.0 [m]	DC	RRI
1490.0 [m]	DC	RRI
1500.0 [m]	DC	RRI
1513.0 [m]	SWC	RRI
1520.0 [m]	DC	RRI
1528.0 [m]	SWC	RRI
1540.0 [m]	DC	RRI
1550.0 [m]	DC	RRI
1560.0 [m]	DC	RRI
1570.0 [m]	DC	RRI
1584.0 [m]	SWC	RRI
1590.0 [m]	DC	RRI
1600.0 [m]	DC	RRI
1611.0 [m]	SWC	RRI
1620.0 [m]	DC	RRI
1630.0 [m]	DC	RRI
1650.0 [m]	DC	RRI
1660.0 [m]	DC	RRI
1800.0 [m]	DC	RRI
1820.0 [m]	DC	RRI
1830.0 [m]	DC	RRI
1880.0 [m]	DC	RRI
1890.0 [m]	DC	RRI
1910.0 [m]	DC	RRI
1912.0 [m]	SWC	RRI
1916.0 [m]	SWC	RRI
2020.0 [m]	DC	RRI
2080.0 [m]	DC	RRI
2100.0 [m]	DC	RRI
2110.0 [m]	DC	RRI
2130.0 [m]	DC	RRI
2140.0 [m]	DC	RRI
2150.0 [m]	DC	RRI
2190.0 [m]	DC	RRI
2200.0 [m]	DC	RRI
2210.0 [m]	DC	RRI
2221.0 [m]	SWC	RRI



2230.0	[m]	DC	RRI
2236.0	[m]	SWC	RRI
2252.0	[m]	SWC	RRI
2260.0	[m]	DC	RRI
2270.0	[m]	DC	RRI
2280.0	[m]	DC	RRI
2290.0	[m]	DC	RRI
2300.0	[m]	DC	RRI
2310.0	[m]	DC	RRI
2320.0	[m]	DC	RRI
2329.0	[m]	SWC	RRI
2331.0	[m]	SWC	RRI
2344.0	[m]	SWC	RRI
2350.0	[m]	DC	RRI
2360.0	[m]	DC	RRI
2370.0	[m]	DC	RRI
2473.0	[m]	SWC	RRI
2522.0	[m]	SWC	RRI
2535.0	[m]	SWC	RRI
2536.0	[m]	SWC	RRI
2541.0	[m]	DC	RRI
2544.0	[m]	DC	RRI
2547.0	[m]	SWC	RRI
2553.0	[m]	DC	RRI
2556.0	[m]	DC	RRI
2559.0	[m]	SWC	RRI
2562.0	[m]	SWC	RRI
2565.0	[m]	DC	RRI
2568.0	[m]	DC	RRI
2572.0	[m]	SWC	RRI
2575.0	[m]	SWC	RRI
2579.0	[m]	SWC	RRI
2583.0	[m]	DC	RRI
2585.0	[m]	SWC	RRI
2589.0	[m]	DC	RRI
2592.0	[m]	SWC	RRI
2595.0	[m]	RRI	RRI
2598.0	[m]	DC	RRI
2601.0	[m]	SWC	RRI
2604.0	[m]	DC	RRI



2607.0	[m]	SWC	RRI
2610.0	[m]	DC	RRI
2613.0	[m]	DC	RRI
2616.0	[m]	SWC	RRI
2619.0	[m]	DC	RRI
2622.0	[m]	DC	RRI
2625.0	[m]	DC	RRI
2631.0	[m]	SWC	RRI
2634.0	[m]	DC	RRI
2637.0	[m]	DC	RRI
2640.0	[m]	DC	RRI
2643.0	[m]	SWC	RRI
2650.0	[m]	SWC	RRI
2652.0	[m]	DC	RRI
2658.0	[m]	C	RRI
2663.0	[m]	C	RRI
2677.0	[m]	C	RRI
2691.0	[m]	DC	RRI
2712.0	[m]	DC	RRI
2729.0	[m]	SWC	RRI
2751.0	[m]	DC	RRI
2769.0	[m]	DC	RRI
2781.0	[m]	DC	RRI
2790.0	[m]	DC	RRI
2800.0	[m]	SWC	RRI
2805.0	[m]	SWC	RRI
2820.0	[m]	DC	RRI
2829.0	[m]	DC	RRI
2841.0	[m]	DC	RRI
2850.0	[m]	SWC	RRI
2856.0	[m]	SWC	RRI
2871.0	[m]	DC	RRI
2880.0	[m]	DC	RRI
2889.0	[m]	DC	RRI
2901.0	[m]	DC	RRI
2905.0	[m]	SWC	RRI
2915.0	[m]	SWC	RRI
2925.0	[m]	DC	RRI
2933.0	[m]	SWC	RRI
2942.0	[m]	SWC	RRI



2949.0	[m]	DC	RRI
2961.0	[m]	DC	RRI
2972.0	[m]	SWC	RRI
2982.0	[m]	SWC	RRI
2993.0	[m]	SWC	RRI
2997.0	[m]	SWC	RRI
3009.0	[m]	DC	RRI
3021.0	[m]	DC	RRI
3030.0	[m]	DC	RRI
3038.0	[m]	SWC	RRI
3047.0	[m]	SWC	RRI
3056.0	[m]	SWC	RRI
3069.0	[m]	DC	RRI
3082.0	[m]	C	RRI
3099.0	[m]	DC	RRI
3105.0	[m]	SWC	RRI
3114.0	[m]	DC	RRI
3126.0	[m]	DC	RRI

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
243	NORDLAND GP
243	NAUST FM
1156	KAI FM
1436	HORDALAND GP
1436	BRYGGE FM
1876	ROGALAND GP
1876	TARE FM
1948	TANG FM
2037	SHETLAND GP
2037	SPRINGAR FM
2060	NISE FM
2329	KVITNOS FM
2433	CROMER KNOLL GP
2433	LANGE FM
2536	VIKING GP
2536	SPEKK FM
2630	MELKE FM



2651	FANGST GP
2653	GARN FM
2752	NOT FM
2791	ILE FM
2881	BÅT GP
2881	ROR FM
2933	TILJE FM
3027	ÅRE FM

Geochemical information

Document name	Document format	Document size [MB]
1604_1	pdf	0.13
1604_2	pdf	7.68
1604_3	pdf	0.44
1604_4	pdf	0.62

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

Document name	Document format	Document size [MB]
1604_01 WDSS General Information	pdf	0.18
1604_02 WDSS completion log	pdf	0.19

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

Document name	Document format	Document size [MB]
1604_6407_6_4 COMPLETION REPORT AND LOG	pdf	28.72

Logs

Log type	Log top depth [m]	Log bottom depth [m]
CBL	168	2496
CST	1090	2490
CST	2511	3105





DIL LSS GR	1079	3130
LDL CAL GR AMS	1079	3130
MWD	243	3082
RFT	2661	2965
SHDT	2496	3129
VSP	400	3120

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	353.0	36	357.0	0.00	LOT
INTERM.	20	1079.0	26	1085.0	1.73	LOT
INTERM.	13 3/8	2492.0	17 1/2	2500.0	1.91	LOT
INTERM.	9 5/8	3126.0	12 1/4	3126.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
279	1.02	15.0	20.0	WATER BASED	05.11.1990
352	1.02	15.0	20.0	WATER BASED	06.11.1990
356	1.02	15.0	20.0	WATER BASED	05.11.1990
507	1.01	15.0	20.0	WATER BASED	01.11.1990
596	1.02	67.0	13.0	WATER BASED	07.11.1990
870	1.02	67.0	13.0	WATER BASED	08.11.1990
1078	1.02	67.0	13.0	WATER BASED	09.11.1990
1082	1.02	15.0	20.0	WATER BASED	02.11.1990
1085	1.06	14.0	100.0	WATER BASED	12.11.1990
1088	1.02	15.0	20.0	WATER BASED	05.11.1990
1426	1.37	24.0	20.0	WATER BASED	13.11.1990
1770	1.55	28.0	30.0	WATER BASED	15.11.1990
2042	1.60	24.0	32.0	WATER BASED	15.11.1990
2082	1.62	17.0	15.0	WATER BASED	19.11.1990
2352	1.62	17.0	20.0	WATER BASED	19.11.1990
2439	1.62	21.0	17.0	WATER BASED	22.11.1990
2500	1.62	18.0	16.0	WATER BASED	22.11.1990
2500	1.62	18.0	16.0	WATER BASED	27.11.1990
2514	1.62	18.0	16.0	WATER BASED	27.11.1990



2658	1.20	18.0	16.0	WATER BASED	28.11.1990
2686	1.20	18.0	16.0	WATER BASED	29.11.1990
2769	1.20	18.0	16.0	WATER BASED	30.11.1990
2965	1.20	18.0	16.0	WATER BASED	03.12.1990
3082	1.20	18.0	16.0	WATER BASED	03.12.1990
3095	1.20	18.0	16.0	WATER BASED	04.12.1990
3126	1.20	18.0	16.0	WATER BASED	05.12.1990
3126	1.20	18.0	16.0	WATER BASED	14.12.1990
3126	1.20	18.0	16.0	WATER BASED	11.12.1990
3126	1.20	18.0	16.0	WATER BASED	12.12.1990
3126	1.20	18.0	16.0	WATER BASED	14.12.1990

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]
1604 Formation pressure (Formasjonstrykk)	pdf	0.27

