



General information

Wellbore name	2/4-2
Type	EXPLORATION
Purpose	WILDCAT
Status	P&A
Factmaps in new window	link to map
Main area	NORTH SEA
Field	EKOFISK
Discovery	2/4-2 Ekofisk
Well name	2/4-2
Seismic location	LINE PG-0312 SP: 698.
Production licence	018
Drilling operator	Phillips Petroleum Company Norway
Drill permit	34-L
Drilling facility	OCEAN VIKING
Drilling days	98
Entered date	18.09.1969
Completed date	24.12.1969
Release date	24.12.1971
Publication date	18.01.2007
Purpose - planned	WILDCAT
Reentry	NO
Content	OIL
Discovery wellbore	YES
1st level with HC, age	PALEOCENE
1st level with HC, formation	EKOFISK FM
2nd level with HC, age	LATE CRETACEOUS
2nd level with HC, formation	TOR FM
Kelly bushing elevation [m]	27.0
Water depth [m]	70.0
Total depth (MD) [m RKB]	3305.0
Maximum inclination [°]	6.75
Bottom hole temperature [°C]	133
Oldest penetrated age	LATE CRETACEOUS
Oldest penetrated formation	TOR FM
Geodetic datum	ED50
NS degrees	56° 32' 8.65" N
EW degrees	3° 11' 54.57" E
NS UTM [m]	6265865.23



EW UTM [m]	512208.29
UTM zone	31
NPDID wellbore	172

Wellbore history

General

Wildcat well 2/4-2 (originally termed 2/4-1AX by the License) was drilled by Phillips as a replacement for well 2/4-1, which was junked at 1662 m in Miocene sediments due to an oil kick and severe circulation problems. The objective was to test the hydrocarbon potential of the Tertiary and top Cretaceous.

Operations and results

Wildcat well 2/4-2 was spudded with the semi-submersible installation Ocean Viking on 18 September 1969 and drilled to TD at 3305 m in the Late Cretaceous Tor Formation. No significant problems occurred in the operations. The well was drilled with seawater and hi-vis pills down to 619 m, and with lignosulphonate mud from 619 m to TD.

The well discovered oil in Danian and Late Cretaceous chalk (Ekofisk and Tor Formations). The oil was found in two reservoirs separated by a hard, grey and tight lime mudstone in the base of the Ekofisk Formation. The upper, Ekofisk Formation reservoir was encountered at 3033 m and continued down to the tight lime mudstone at 3183 m. The lower, Tor Formation reservoir extended from 3203 m to 3257 m. Comparison between DST oil from the Ekofisk Formation in well 2/4-2 and the Miocene "kick-oil" encountered in well 2/4-1 showed that the 2/4-1 Miocene oil is a heavier oil with a higher asphaltene content and lower paraffin content than the 2/4-2 oil.

Eight conventional cores were cut with a total of 48.5 m recovered. Core 1 was cut in Early Miocene from 1664 to 1679.4 m, while cores 2 - 8 were cut in the Ekofisk and Tor Formations in the interval 3051 m to 3280 m. No wire line fluid samples were taken

The well was suspended on 24 December 1969 as the Ekofisk Discovery well, the first economic petroleum discovery on the Norwegian Continental Shelf.

Testing

One successful drill stem tests (DST 4) was conducted in open hole in the interval 3159 to 3195.5 m at the base of the Ekofisk Formation. It flowed 5.9 MMCFD (167069 Sm³) gas and 1071 BPD (170 Sm³) oil on a 34/64" choke. The GOR was reported as 5500 cu.ft./STB (980 Sm³/Sm³). The oil had an API gravity of 37.2 deg. The reservoir temperature was reported to be 265 deg F (129.4 deg C).

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
838.20	3304.03

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
2	10010.0	10017.0	[ft]
3	10496.0	10510.0	[ft]
4	10515.0	10528.0	[ft]
5	10565.0	10573.0	[ft]
6	10605.0	10621.5	[ft]
7	10653.0	10657.0	[ft]
8	10713.0	10755.0	[ft]

Total core sample length [m]	31.9
Cores available for sampling?	YES

Palynological slides at the Norwegian Offshore Directorate

Sample depth	Depth unit	Sample type	Laboratory
5980.0	[ft]	DC	
6220.0	[ft]	DC	
6250.0	[ft]	DC	
6280.0	[ft]	DC	
6300.0	[ft]	DC	
6330.0	[ft]	DC	
6410.0	[ft]	DC	
6440.0	[ft]	DC	
6480.0	[ft]	DC	
6580.0	[ft]	DC	
6630.0	[ft]	DC	
6690.0	[ft]	DC	
6750.0	[ft]	DC	
6810.0	[ft]	DC	
6870.0	[ft]	DC	
6900.0	[ft]	DC	
6930.0	[ft]	DC	
6960.0	[ft]	DC	
7020.0	[ft]	DC	
7100.0	[ft]	DC	
7160.0	[ft]	DC	
7210.0	[ft]	DC	



7260.0 [ft]	DC	
7330.0 [ft]	DC	
7420.0 [ft]	DC	
7480.0 [ft]	DC	
7540.0 [ft]	DC	
7600.0 [ft]	DC	
7690.0 [ft]	DC	
7750.0 [ft]	DC	
7820.0 [ft]	DC	
7880.0 [ft]	DC	
7940.0 [ft]	DC	
8000.0 [ft]	DC	
8090.0 [ft]	DC	
8150.0 [ft]	DC	
8210.0 [ft]	DC	
8270.0 [ft]	DC	
8330.0 [ft]	DC	
8390.0 [ft]	DC	
8450.0 [ft]	DC	
8510.0 [ft]	DC	
8570.0 [ft]	DC	
8620.0 [ft]	DC	
8680.0 [ft]	DC	
8750.0 [ft]	DC	
8810.0 [ft]	DC	
8840.0 [ft]	DC	
8900.0 [ft]	DC	
8960.0 [ft]	DC	
9020.0 [ft]	DC	
9080.0 [ft]	DC	
9120.0 [ft]	DC	
9180.0 [ft]	DC	
9240.0 [ft]	DC	
9330.0 [ft]	DC	
9390.0 [ft]	DC	
9450.0 [ft]	DC	
9500.0 [ft]	DC	
9560.0 [ft]	DC	
9650.0 [ft]	DC	
9710.0 [ft]	DC	



9770.0	[ft]	DC	
9840.0	[ft]	DC	
9890.0	[ft]	DC	
9940.0	[ft]	DC	
9980.0	[ft]	DC	
10020.0	[ft]	DC	
10060.0	[ft]	DC	
10100.0	[ft]	DC	
10140.0	[ft]	DC	
10180.0	[ft]	DC	
10221.0	[ft]	C	
10230.0	[ft]	DC	
10240.0	[ft]	DC	
10260.0	[ft]	DC	
10350.0	[ft]	DC	
10365.0	[ft]	DC	
10410.0	[ft]	DC	
10430.0	[ft]	DC	
10470.0	[ft]	DC	
10485.0	[ft]	DC	
10505.0	[ft]	DC	
10520.0	[ft]	DC	
10550.0	[ft]	DC	
10600.0	[ft]	DC	
10620.0	[ft]	DC	
10640.0	[ft]	DC	
10675.0	[ft]	C	
10720.0	[ft]	DC	
10800.0	[ft]	DC	
10840.0	[ft]	DC	
10860.0	[ft]	DC	
10876.0	[ft]	C	
10926.0	[ft]	C	
11000.0	[ft]	DC	
11045.0	[ft]	DC	
11100.0	[ft]	DC	
11150.0	[ft]	DC	
11200.0	[ft]	DC	
11240.0	[ft]	DC	
11250.0	[ft]	DC	

**Lithostratigraphy**

Top depth [mMD RKB]	Lithostrat. unit
98	NORDLAND GP
1682	HORDALAND GP
2904	ROGALAND GP
2904	BALDER FM
2911	SELE FM
2970	LISTA FM
3017	VÅLE FM
3050	SHETLAND GP
3050	EKOFISK FM
3203	TOR FM

Composite logs

Document name	Document format	Document size [MB]
172	pdf	0.29

Geochemical information

Document name	Document format	Document size [MB]
172_1	pdf	0.34
172_2	pdf	1.28

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

Document name	Document format	Document size [MB]
172_01_WDSS_General_Information	pdf	0.19

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





Document name	Document format	Document size [MB]
172_01_2_4_2_Completion_Report_and_Completion_log_2	pdf	11.04
172_02_2_4_2_Well_Recompletion_Report	pdf	3.43
172_2_4_2_Additional_Core_Description_Sheets	pdf	11.08
172_2_4_2_Completion_report	pdf	6.02
172_2_4_2_Drilling_Fluid_Summary	pdf	3.29
172_2_4_2_Drilling_Mud_Reports	pdf	0.17
172_2_4_2_Individual_Well_Completion_Report	pdf	43.44
172_2_4_2_Individual_well_Record	pdf	30.92
172_2_4_2_Lithological_and_Sedimentological_Eval	pdf	2.55
172_2_4_2_Petrography_of_Selected_Samples	pdf	25.72
172_2_4_2_Quantitative_Log_Analysis_1	pdf	8.81
172_2_4_2_Quantitative_Log_Analysis_2	pdf	5.15
172_2_4_2_The_Micropalaeontology_and_Stratigraphy	pdf	4.25
172_2_4_2_Well_Log_Study	pdf	7.28

Documents - Norwegian Offshore Directorate papers

Document name	Document format	Document size [MB]
172_01_NPD_Paper_No.25_Lithology_Well_2_4_2	pdf	18.62
172_02_NPD_Paper_No.25_Lithologic_Correlation_chart_Well_2_4_2	pdf	1.95
172_03_NPD_Paper_No.25_Paleocene_Maastrichtian_Correlation_chart_Well_2_4_2	pdf	1.18

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	3160	3196	25.4
2.0	3160	3196	0.0
3.0	3160	3196	0.0
4.0	3148	3160	25.4





Test number	Final shut-in pressure [MPa]	Final flow pressure [MPa]	Bottom hole pressure [MPa]	Downhole temperature [°C]
1.0				
2.0				
3.0				
4.0				

Test number	Oil [Sm3/day]	Gas [Sm3/day]	Oil density [g/cm3]	Gas grav. rel.air	GOR [m3/m3]
1.0	1089				
2.0					
3.0					
4.0	170	167067	0.839		

Logs

Log type	Log top depth [m]	Log bottom depth [m]
AC GR CAL	580	3302
CBL	2295	3154
DIP	2365	3155
FDC	2865	3304
IEL	580	3305
LL	2865	3304
MLL	2865	3304
NEU POR	2865	3304
TEMP	40	3305

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	132.0	36	133.0	0.00	LOT
SURF.COND.	20	581.0	26	581.0	0.00	LOT
INTERM.	13 3/8	1607.0	17 1/2	1607.0	0.00	LOT
INTERM.	9 5/8	2366.0	12 1/4	2366.0	0.00	LOT
LINER	7	3159.0	8 1/2	3159.0	0.00	LOT
LINER	5	3305.0	6	3305.0	0.00	LOT

**Drilling mud**

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
619	1.15	85.0		spud-mud	
655	1.55	45.0		spud-mud	
1150	1.64	50.0		spud-mud	
1616	1.67	50.0		water-based	
2377	1.71	50.0		water-based	
3039	1.61	45.0		water-based	
3265	1.66	45.0		water-based	
3305	1.67	47.0		water-based	

Thin sections at the Norwegian Offshore Directorate

Depth	Unit
10679.00	[ft]
10685.00	[ft]
10759.00	[ft]