General information

Wellbore name	2/7-31
Type	EXPLORATION
Purpose	WILDCAT
Status	P&A
Factmaps in new window	link to map
Main area	NORTH SEA
Discovery	2/7-31
Well name	2/7-31
Seismic location	BPN 9102-163 2& SP 982
Production licence	018
Drilling operator	Phillips Petroleum Company Norway
Drill permit	943-L
Drilling facility	MÆRSK GALLANT
Drilling days	148
Entered date	13.01.1999
Completed date	09.06.1999
Release date	09.06.2001
Publication date	29.05.2002
Purpose - planned	WILDCAT
Reentry	NO
Content	OIL
Discovery wellbore	YES
1st level with HC, age	EARLY CRETACEOUS
1st level with HC, formation	TUXEN FM
2nd level with HC, age	LATE JURASSIC
2nd level with HC, formation	ULA FM
3rd level with HC, age	EARLY PERMIAN
3rd level with HC, formation	ROTLIEGEND GP
Kelly bushing elevation [m]	47.5
Water depth [m]	72.8
Total depth (MD) [m RKB]	4968.2
Final vertical depth (TVD) [m RKB]	4965.6
Maximum inclination [°]	6.9
Bottom hole temperature [°C]	176
Oldest penetrated age	EARLY PERMIAN
Oldest penetrated formation	ROTLIEGEND GP
Geodetic datum	ED50
NS degrees	56° 20' 12.4'' N

EW degrees	3° 5' 15.4'' E
NS UTM [m]	6243705.05
EW UTM [m]	505416.77
UTM zone	31
NPDID wellbore	3573

Wellbore history

General

The objectives of drilling the 2/7-31 Ebba Prospect well were to test the hydrocarbon potential of the Permian Rotliegend and Jurassic Lower Ula sandstones in a fault closed structural trap. The prospect was located 10 km west of the Embla field and 1 km west of the Phillips 2/7-19 well, which tested hydrocarbons in the Jurassic Lower Ula Formation. Further, the well should establish proven economic reserves and obtain open hole wire line logs, cores and production tests in both formations.

Operations and results

Well 2/7-31 was spudded with the jack-up rig "Mærsk Galant" on 13 January 1999 and drilling was completed on 5 May 1999 at 4968 m in the Permian Rotliegend Group. It was drilled with spud mud down to 593 m and with oil based Versaport mud from 593 to TD.
Hydrocarbons were encountered first in the Lower Cretaceous Tuxen Formation (Top 4372.1 m), then in the sandstones of the Jurassic Lower Ula (Top 4483.6 m) and Bryne (Top 4634.2 m) Formations, and finally in the sandstone of the Permian Rotliegend Group (Top 4750m). All zones were evaluated either by MWD/LWD log or open and cased hole wire line data. Wire line formation pressure tests were taken throughout the Rotliegend section and oil samples were recovered from two FMT tests at 4793 m and 4812 m. Planned coring of the Jurassic sandstones was cancelled due to operational difficulties in the HPHT environment encountered in this well. Coring in the Rotliegend faced a similar fate but the setting of a liner stabilized the well and one core was taken from the interval 4795.7 - 4798.2 m and three in the interval 4811.3 - 4850.9 m. The well was suspended as an oil discovery.

Testing

A DST was performed over the Ula Sandstone interval 4565.9 - 4623.8 m. The well flowed at an average stabilized rate of 283 Sm3 oil and 120000 Sm3 gas on a 16/64" choke.

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
466.00	4968.00

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	15734.0	15741.6	[ft]
2	15785.0	15877.6	[ft]
3	15877.6	15905.6	[ft]
4	15908.0	15915.3	[ft]

Total core sample length [m]	41.3
Cores available for sampling?	YES

Core photos


15734-15791ft


15791-15806ft


15806-15821ft


15821-15836ft


15836-15851ft


15851-15866ft


15866-15880ft


15880-15895ft


15895-15911ft


15911-15915ft

Palynological slides at the Norwegian Offshore Directorate

Sample depth	Depth unit	Sample type	Laboratory
14560.0	[m]	DC	PETROS
14920.0	[m]	DC	PETROS
15330.0	[m]	DC	PETROSTA

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	DST1	0.00	0.00		23.05.1999 - 23:00	YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
121	NORDLAND GP
1541	HORDALAND GP
3000	ROGALAND GP
3000	BALDER FM
3018	SELE FM
3072	LISTA FM
3115	VÅLE FM
3146	SHETLAND GP
3146	EKOFISK FM
3203	TOR FM
3580	HOD FM
4074	BLODØKS FM
4087	HIDRA FM
4204	CROMER KNOLL GP
4204	RØDBY FM
4284	SOLA FM
4372	TUXEN FM
4379	ÅSGARD FM
4437	TYNE GP
4437	MANDAL FM
4439	FARSUND FM
4469	VESTLAND GP
4469	ULA FM
4634	BRYNE FM
4668	ZECHSTEIN GP
4750	ROTLIEGEND GP

Composite logs

Document name	Document format	Document size [MB]
3573	pdf	0.80

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

Document name	Document format	Document size [MB]
3573_2_7_31_COMPLETION_REPORT	.pdf	319.61

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	4623	4565	6.3

Test number	Final shut-in pressure [MPa]	Final flow pressure [MPa]	Bottom hole pressure [MPa]	Downhole temperature [°C]
1.0				163

Test number	Oil [Sm3/day]	Gas [Sm3/day]	Oil density [g/cm3]	Gas grav. rel.air	GOR [m3/m3]
1.0	282	120360		0.702	426

Logs

Log type	Log top depth [m]	Log bottom depth [m]
CBIL HDIP GR	4763	4849
FMT	3157	4198
FMT	4783	4937
HDIL MAC ZDL GR	1943	4230
HDIL XMAC CN GR	4763	4965
HDIL XMAC GR	4763	4849
ISF LSS GR	157	770
MRIL	4774	4854
MWD CDR ADN DIR	4258	4968
SBT	1993	4229
SWC	4778	4954
VSP	152	4846
ZDL CN GR	4763	4967
ZDL CN XMAC GR	4763	4849

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	222.5	36	225.0	0.00	LOT
SURF.COND.	20	584.3	26	586.0	0.00	LOT
INTERM.	13 3/8	1946.8	17 1/2	1950.0	1.67	LOT
INTERM.	9 7/8	4253.8	12 1/4	4255.0	1.95	LOT
LINER	7 3/4	4968.0	8 1/2	4968.0	2.15	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
134	1.03	12.0		BENTONITE	
227	1.26	15.0		BENTONITE	
253	1.14	6.0		BENTONITE	
584	1.13	8.0		BENTONITE	
649	1.43	29.0		VERSAPORT	
1006	1.43	23.0		VERSAPORT	
1574	1.43	21.0		VERSAPORT	
1798	1.56	25.0		VERSAPORT	
1947	1.67	22.0		VERSAPORT	
1951	1.56	24.0		VERSAPORT	
2052	1.67	24.0		VERSAPORT	
2350	1.67	25.0		VERSAPORT	
2934	1.70	24.0		VERSAPORT	
3186	1.67	20.0		VERSAPORT	
3207	1.67	22.0		VERSAPORT	
3537	1.67	22.0		VERSAPORT	
3827	1.67	24.0		VERSAPORT	
3895	1.67	25.0		VERSAPORT	
3900	1.67	25.0		VERSAPORT	
3995	2.16	90.0		VERSAPORT	
4020	2.16	91.0		VERSAPORT	
4045	1.67	28.0		VERSAPORT	
4165	1.71	29.0		VERSAPORT	
4167	2.12	46.0		VERSAPORT	
4225	1.80	34.0		VERSAPORT	

4233	1.80	38.0		VERSAPORT	
4243	1.82	32.0		VERSAPORT	
4245	1.80	33.0		VERSAPORT	
4251	1.80	27.0		VERSAPORT	
4259	1.80	32.0		VERSAPORT	
4369	2.16	82.0		VERSAPORT	
4372	2.00	38.0		VERSAPORT	
4382	2.12	46.0		VERSAPORT	
4407	2.12	42.0		VERSAPORT	
4449	2.12	44.0		VERSAPORT	
4477	2.12	43.0		VERSAPORT	
4510	2.12	47.0		VERSAPORT	
4539	2.14	45.0		VERSAPORT	
4542	2.16	49.0		VERSAPORT	
4546	2.16	49.0		VERSAPORT	
4599	2.16	48.0		VERSAPORT	
4671	2.16	50.0		VERSAPORT	
4686	2.16	49.0		VERSAPORT	
4705	2.06	49.0		VERSAPORT	
4722	2.14	51.0		VERSAPORT	
4755	2.16	50.0		VERSAPORT	
4756	2.16	52.0		VERSAPORT	
4759	2.16	57.0		VERSAPORT	
4764	2.16	51.0		VERSAPORT	
4775	2.06	43.0		VERSAPORT	
4781	2.06	42.0		VERSAPORT	
4795	2.10	47.0		VERSAPORT	
4798	2.06	41.0		VERSAPORT	
4811	2.06	45.0		VERSAPORT	
4839	2.06	48.0		VERSAPORT	
4848	2.06	48.0		VERSAPORT	
4851	2.06	49.0		VERSAPORT	
4925	2.06	52.0		VERSAPORT	
4968	1.70			BRINE	
4968	2.16	81.0		VERSAPORT	