

**General information**

Wellbore name	35/11-2
Type	EXPLORATION
Purpose	WILDCAT
Status	P&A
Factmaps in new window	link to map
Main area	NORTH SEA
Field	VEGA
Discovery	35/11-2 Vega Sør
Well name	35/11-2
Seismic location	NM84 - 208 SP. 520
Production licence	090
Drilling operator	Mobil Exploration Norway INC
Drill permit	553-L
Drilling facility	TREASURE SCOUT
Drilling days	138
Entered date	20.07.1987
Completed date	04.12.1987
Release date	04.12.1989
Publication date	25.04.2005
Purpose - planned	WILDCAT
Reentry	NO
Content	GAS/CONDENSATE
Discovery wellbore	YES
1st level with HC, age	MIDDLE JURASSIC
1st level with HC, formation	BRENT GP
Kelly bushing elevation [m]	23.0
Water depth [m]	372.0
Total depth (MD) [m RKB]	4025.0
Final vertical depth (TVD) [m RKB]	4024.0
Maximum inclination [°]	3.2
Bottom hole temperature [°C]	153
Oldest penetrated age	EARLY JURASSIC
Oldest penetrated formation	STATFJORD GP
Geodetic datum	ED50
NS degrees	61° 10' 26.42" N
EW degrees	3° 27' 31.36" E
NS UTM [m]	6782416.83
EW UTM [m]	524675.04



UTM zone	31
NPDID wellbore	893

Wellbore history

General

Block 35/11 is situated at the boundary between the Horda Platform and the Viking Graben just north of the Troll Field and south of block 35/8 where two gas/condensate discoveries had been made. The work obligation for Block 35/11 included three exploration wells to be drilled to 4000 metres or to Triassic sediments, one of which must test an Early Cretaceous stratigraphic play. The first of these wells, 35/11-1, was drilled in 1984 to a depth of 3361 m in rocks of Triassic age. The primary objective of that well was to assess the hydrocarbon potential of the Middle to Upper Jurassic sands in the "A" structure. No hydrocarbons were present in any of the objectives although good quality Brent sands were encountered. The second well to be drilled on the block was 35/11-2. It was designed primarily to test an Early Cretaceous stratigraphic play, interpreted seismically as a fan development with a 130 km³ closure, and reservoir thickness of 270 m. A secondary objective was the "B" structure at Brent level.

Operations and results

Wildcat well 35/11-2 was spudded with the semi-submersible rig Treasure Scout on 20 July 1987 and drilled to TD at 4025 m in Early Jurassic rocks. The hole was drilled to setting depth for 20" casing without a riser. MWD was used, but the resistivity unit was destroyed after few meters. Conventional logs did not get past 760 m, and while attempting this; there was an intrusion of formation fluid into the hole. There was no sign of shallow gas, and heavier mud was used. The hole was opened to 26" without logging below 760 m. The reason for the problems around 760 m was probably washed-out zones. When preparing the setting of 20" casing, fluid was again flowing into the hole, and the mud weight was increased. Further drilling went without significant problems. The well was drilled with spud mud down to 1026 m, with seawater and lignosulphonate from 1026 m to 2195 m, and with a seawater/low solids polymer from 2195 m to TD.

The well penetrated the Early Cretaceous at 2682 m (prognosed at 2713 m) and intersected a 225 m thick, predominantly argillaceous/marly sequence. No reservoir rocks were penetrated. At 3011 m Intra Heather Formation sandstone was encountered, and at 3370 m the Brent Group was penetrated (prognosed at 3298 m). The Brent section was 231 m thick with reservoir quality sandstones in the Tarbert, Ness, Etive, and Oseberg Formations. It contained a 175 m gross hydrocarbon column, but the net/gross ratio is low. The logs and RFT pressure data showed a gas/water contact around 3545 m (3522 m SS) in the Oseberg Formation. Oil shows were observed in the Late Jurassic Intra Heather sandstone and throughout the Middle Jurassic Brent Group sandstones. Patchy shows persisted through the Dunlin Group and the Statfjord Formation to total depth. Organic geochemical analyses showed good source rock potential in the Draupne and the Heather Formations, the first of these being the best and more oil prone. The penetrated source intervals were immature to marginally mature, and certainly less mature than the sampled petroleum. Analysis of the DST oils indicated a common source, and the oils increased in maturity with depth.

Eight cores were cut in the Late and Middle Jurassic reservoirs (total 129 m). Core recovery was 124.9 m (97%). Four RFT fluid samples were taken. Sample RFT 1 taken at 3040.99 m in the Intra Heather Formation sandstone filled very slowly and recovered gas and mud filtrate with a light oil film. Sample RFT 2 at 3077 m in the Tarbert Formation recovered gas and mud filtrate. Sample RFT 3 at 3481.05 m in the Etive Formation recovered gas and condensate. Sample RFT 4 at 3524.98 m in the Oseberg



Formation recovered gas and condensate.

The well was plugged and abandoned on 4 December 1987 as a gas and condensate discovery.

Testing

Five drill stem tests, including one in the water leg, were undertaken. The Intra Heather sandstone was tight, with a low net/gross, and was not tested.

DST 1, the water test in the lower Oseberg Formation, produced 315 m3 water/day through a 28/64? choke in the main flow. The reservoir temperature was 136 °C.

DST 2B in the upper Oseberg Formation produced at maximum 280 Sm3 condensate and 369000 gas /day through a 48/64? choke. The GOR was 1319 Sm3/Sm3. The reservoir temperature was 133.3 °C.

DST 3 in the Etive Formation produced at maximum 510 Sm3 condensate and 531000 gas /day through a 40/64? choke. The GOR was 1041Sm3/Sm3. The reservoir temperature was 133.3 °C.

DST 4 in the Ness Formation produced at maximum 425 Sm3 condensate and 402400 Sm3 gas /day through a 44/64? choke. The GOR was 946 Sm3/Sm3. The reservoir temperature was 135 °C.

DST 5 in the Tarbert Formation produced 415 Sm3 condensate and 177400 Sm3 gas /day through a 32/64? choke in the main flow. The GOR was 427 Sm3/Sm3. The reservoir temperature was 130 °C. This test indicated that there is a thin Tarbert Formation on the top without connection to the rest of the reservoir because the GOR is less than half of the GOR in the other tests.

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
1030.00	4025.00

Cuttings available for sampling?	NO
----------------------------------	----

Cores at the Norwegian Offshore Directorate

Core sample number	Core sample - top depth	Core sample - bottom depth	Core sample depth - uom
2	3042.0	3045.2	[m]
3	3369.0	3391.6	[m]
4	3392.9	3413.7	[m]
5	3414.0	3428.9	[m]
6	3452.0	3462.5	[m]
7	3463.0	3489.3	[m]
8	3490.0	3516.3	[m]



Total core sample length [m]	124.4
Cores available for sampling?	YES

Palynological slides at the Norwegian Offshore Directorate

Sample depth	Depth unit	Sample type	Laboratory
1040.0	[m]	DC	RRI
1240.0	[m]	DC	RRI
1440.0	[m]	DC	RRI
1490.0	[m]	DC	RRI
1640.0	[m]	DC	RRI
1840.0	[m]	DC	RRI
2015.0	[m]	DC	RRI
2175.0	[m]	DC	RRI
2332.0	[m]	DC	RRI
2335.0	[m]	DC	RRI
2495.0	[m]	DC	RRI
2605.0	[m]	DC	RRI
2694.0	[m]	DC	RRI
2720.5	[m]	SWC	RRI
2745.0	[m]	DC	RRI
2760.0	[m]	DC	RRI
2772.0	[m]	DC	RRI
2808.0	[m]	DC	RRI
2835.0	[m]	DC	RRI
2841.0	[m]	DC	RRI
2865.0	[m]	DC	RRI
2940.0	[m]	DC	RRI
2950.0	[m]	DC	RRI
2970.0	[m]	DC	RRI
2991.0	[m]	DC	RRI
3012.0	[m]	DC	RRI
3033.0	[m]	DC	RRI
3042.3	[m]	C	RRI
3042.9	[m]	C	RRI
3044.2	[m]	C	RRI
3044.8	[m]	C	RRI
3045.0	[m]	DC	RRI
3045.2	[m]	C	RRI



3135.0 [m]	DC	RRI
3174.0 [m]	DC	RRI
3246.0 [m]	DC	RRI
3300.0 [m]	DC	RRI
3354.0 [m]	DC	RRI
3371.4 [m]	C	GEOSTRAT
3375.0 [m]	C	RRI
3376.6 [m]	C	GEOSTRAT
3382.3 [m]	C	GEOSTR
3383.0 [m]	C	RRI
3393.5 [m]	C	GEOSTRAT
3397.0 [m]	C	RRI
3400.2 [m]	C	GEOSTRAT
3411.0 [m]	C	RRI
3411.6 [m]	C	GEOSTR
3412.0 [m]	C	RRI
3421.7 [m]	C	RRI
3422.0 [m]	C	RRI
3456.8 [m]	C	GEOSTRAT
3462.1 [m]	C	GEOSTR
3462.3 [m]	C	RRI
3468.7 [m]	C	GEOSTRAT
3474.0 [m]	C	RRI
3478.9 [m]	C	GEOSTR
3480.2 [m]	C	RRI
3492.9 [m]	C	GEOSTRAT
3505.3 [m]	C	GEOSTR
3511.0 [m]	C	RRI
3515.8 [m]	C	GEOSTRAT
3525.0 [m]	C	RRI
3612.0 [m]	DC	RRI
3630.0 [m]	DC	RRI
3648.0 [m]	DC	RRI
3672.0 [m]	DC	RRI
3690.0 [m]	DC	RRI
3762.0 [m]	DC	RRI
3777.0 [m]	C	RRI
3822.0 [m]	DC	RRI
3846.0 [m]	DC	RRI
3870.0 [m]	DC	RRI



3900.0 [m]	DC	RRI
3942.0 [m]	DC	RRI
3960.0 [m]	DC	RRI
3978.0 [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	DST2	3524.00	3542.00		03.11.1987 - 00:00	YES
DST		3524.00	3542.00		09.11.1987 - 00:00	YES
DST	DST2B	0.00	0.00		09.11.1987 - 00:00	YES
DST	DST3	3477.00	3486.50		12.11.1987 - 00:00	YES
DST	DST4	3370.00	3378.00		14.11.1987 - 00:00	YES
DST	DST4	0.00	0.00		14.11.1987 - 02:00	YES
DST	DST4	3427.00	3432.00		14.11.1987 - 00:00	YES
DST		3374.00	3378.00		19.11.1987 - 00:00	YES
DST	DST 5	3378.00	3374.00		19.11.1987 - 00:00	YES
DST	DST5A	3374.00	3378.00			YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
395	NORDLAND GP
741	UTSIRA FM
824	UNDIFFERENTIATED
1081	HORDALAND GP
1663	ROGALAND GP
1663	BALDER FM
1721	SELE FM



1753	LISTA FM
1926	VÅLE FM
1950	SHETLAND GP
1950	JORSALFARE FM
2087	KYRRE FM
2675	TRYGGVASON FM
2682	CROMER KNOLL GP
2682	RØDBY FM
2710	SOLA FM
2721	ÅSGARD FM
2927	VIKING GP
2927	DRAUPNE FM
3011	INTRA HEATHER FM SS
3042	HEATHER FM
3370	BRENT GP
3370	TARBERT FM
3380	NESS FM
3475	ETIVE FM
3487	RANNOCH FM
3524	OSEBERG FM
3601	DUNLIN GP
3601	DRAKE FM
3615	COOK FM
3712	AMUNDSEN FM
3730	JOHANSEN FM
3775	AMUNDSEN FM
3798	STATFJORD GP

Composite logs

Document name	Document format	Document size [MB]
893	pdf	0.73

Geochemical information

Document name	Document format	Document size [MB]
893_1	pdf	1.37





893_2	pdf	4.51
893_3	pdf	1.09

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

Document name	Document format	Document size [MB]
893_01_WDSS_General_Information	pdf	0.48
893_02_WDSS_completion_log	pdf	0.33

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

Document name	Document format	Document size [MB]
893_35_11_2_COMPLETION_REPORT_AND_LOG	pdf	46.01

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	3551	3559	10.7
2.0	3524	3542	18.3
3.0	3477	3487	15.9
4.0	3427	3432	17.4
5.0	3374	3378	12.7

Test number	Final shut-in pressure [MPa]	Final flow pressure [MPa]	Bottom hole pressure [MPa]	Downhole temperature [°C]
1.0		36.000	50.000	136
2.0	45.000		49.000	133
3.0		42.000	49.000	133
4.0		31.000	48.000	135
5.0		29.000	48.000	130

Test number	Oil [Sm3/day]	Gas [Sm3/day]	Oil density [g/cm3]	Gas grav. rel.air	GOR [m3/m3]
1.0					5





2.0	280	36900	0.811	0.719	1319
3.0	510	531000	0.820	0.739	1041
4.0	425	402400	0.822	0.740	946
5.0	415	177400	0.828	0.780	427

Logs

Log type	Log top depth [m]	Log bottom depth [m]
CBL VDL GR	857	2184
CBL VDL GR	2163	3348
CBL VDL GR	3356	3972
CET GR	3262	3596
CST	0	0
DIL BHC GR	547	759
DIL BHC GR	1002	2188
DIL LSS GR	390	759
DIL LSS GR	2185	3372
DIL SDT GR	3350	4028
DLL MSFL GR	2185	3372
DLL MSFL GR	3350	4026
LDL CNL GR	725	2188
LDL CNL GR	2185	3373
LDL CNL NGS	3350	4030
MWD - GR RES DIR	372	4025
MWD - GR RLL	3378	3517
NGS	3350	4030
RFT	2945	3042
RFT	2995	3373
RFT	3377	3963
SHDT	2185	3373
SHDT	3350	4029
VELOCITY	1430	4030

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	546.8	36	1026.0	0.00	LOT
SURF.COND.	20	1004.0	26	1026.0	1.39	LOT



INTERM.	13 3/8	2184.6	17 1/2	2195.0	1.62	LOT
INTERM.	9 3/5	3348.8	12 1/4	3377.0	1.85	LOT
LINER	7	4025.0	8 1/2	4025.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
1	1.03			WATER BASED	23.07.1987
461	1.02			WATER BASED	22.07.1987
550	1.03			WATER BASED	23.07.1987
550	1.06			WATER BASED	27.07.1987
556	1.06			WATER BASED	27.07.1987
649	1.00	6.0		03WATER BASED	28.07.1987
1026	1.06			OIL BASED	29.07.1987
1026	1.06			WATER BASED	03.08.1987
1026	1.30			WATER BASED	03.08.1987
1026	1.32			WATER BASED	03.08.1987
1180	1.26	10.0	14.4	WATER BASED	10.08.1987
1335	1.26	16.0	27.8	WATER BASED	10.08.1987
1335	1.26	16.0	27.8	WATER BASED	11.08.1987
1350	1.30	11.0	28.3	WATER BASED	13.08.1987
1350	1.26	16.0	23.0	WATER BASED	11.08.1987
1350	1.26	14.0	15.4	WATER BASED	11.08.1987
1350	1.26	12.0	31.1	WATER BASED	12.08.1987
1350	1.30	13.0	29.7	WATER BASED	18.08.1987
1350	1.30	13.0	26.8	WATER BASED	18.08.1987
1350	1.30	18.0	23.5	WATER BASED	19.08.1987
1350	1.30	12.0	34.5	WATER BASED	14.08.1987
1350	1.30	13.0	29.2	WATER BASED	18.08.1987
2195	1.20	26.0	8.6	WATER BASED	20.08.1987
2310	1.20	18.0	8.6	WATER BASED	21.08.1987
2343	1.20	23.0	7.7	WATER BASED	24.08.1987
2442	1.20	25.0	8.1	WATER BASED	24.08.1987
2544	1.20	26.0	8.6	WATER BASED	24.08.1987
2559	1.22	32.0	9.1	WATER BASED	25.08.1987
2631	1.24	25.0	10.5	WATER BASED	26.08.1987
2685	1.20	27.0	9.6	WATER BASED	27.08.1987
2738	1.20	27.0	9.6	WATER BASED	28.08.1987



2788	1.20	31.0	11.0	WATER BASED	31.08.1987
2886	1.20	28.0	12.5	WATER BASED	31.08.1987
2934	1.20	24.0	12.5	WATER BASED	31.08.1987
2950	1.22	25.0	12.0	WATER BASED	03.09.1987
2950	1.22	25.0	11.0	WATER BASED	03.09.1987
2950	1.22	33.0	12.5	WATER BASED	04.09.1987
2950	1.22	25.0	12.0	WATER BASED	07.09.1987
2950	1.22	23.0	11.0	WATER BASED	07.09.1987
2950	1.22	23.0	12.0	WATER BASED	07.09.1987
3377	1.43	28.0	11.0	WATER BASED	09.09.1987
3377	1.51	25.0	8.6	WATER BASED	09.09.1987
3377	1.54	30.0	11.0	WATER BASED	10.09.1987
3377	1.57	29.0	10.0	WATER BASED	11.09.1987
3377	1.57	29.0	12.0	WATER BASED	14.09.1987
3377	1.57	28.0	10.5	WATER BASED	14.09.1987
3377	1.57	29.0	9.1	WATER BASED	16.09.1987
3377	1.62	43.0	1.1	WATER BASED	18.09.1987
3377	1.57	33.0	14.4	WATER BASED	14.09.1987
3377	1.58	23.0	6.7	WATER BASED	07.10.1987
3377	1.58	15.0	6.2	WATER BASED	08.10.1987
3377	1.58	16.0	4.8	WATER BASED	09.10.1987
3379	1.62	33.0	8.6	WATER BASED	21.09.1987
3398	1.62	27.0	7.2	WATER BASED	21.09.1987
3417	1.62	28.0	6.7	WATER BASED	21.09.1987
3438	1.62	22.0	6.7	WATER BASED	21.09.1987
3461	1.62	31.0	8.1	WATER BASED	22.09.1987
3488	1.62	30.0	8.1	WATER BASED	23.09.1987
3504	1.62	30.0	7.7	WATER BASED	24.09.1987
3521	1.62	25.0	7.7	WATER BASED	25.09.1987
3580	1.62	25.0	9.1	WATER BASED	28.09.1987
3682	1.62	25.0	9.6	WATER BASED	28.09.1987
3719	1.62	22.0	7.7	WATER BASED	28.09.1987
3774	1.62	24.0	9.6	WATER BASED	29.09.1987
3787	1.62	18.0	8.1	WATER BASED	01.10.1987
3835	1.62	22.0	9.6	WATER BASED	30.09.1987
3961	1.62	20.0	6.2	WATER BASED	05.10.1987
3962	1.58	25.0	7.7	WATER BASED	06.10.1987
4025	1.62	15.0	4.8	WATER BASED	05.10.1987
4025	1.62	15.4	4.8	WATER BASED	05.10.1987
4025	1.58	20.0	6.7	WATER BASED	05.10.1987

**Thin sections at the Norwegian Offshore Directorate**

Depth	Unit
3043.36	[m]

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]
893 Formation pressure (Formasjonstrykk)	pdf	0.23

