General information

Wellbore name	6/3-2
Type	EXPLORATION
Purpose	WILDCAT
Status	P&A
Factmaps in new window	link to map
Main area	NORTH SEA
Well name	6/3-2
Seismic location	511 - 108 SP. 80
Production licence	086
Drilling operator	Den norske stats oljeselskap a.s
Drill permit	492-L
Drilling facility	ROSS ISLE
Drilling days	110
Entered date	21.11.1985
Completed date	10.03.1986
Release date	10.03.1988
Publication date	11.02.2005
Purpose - planned	WILDCAT
Reentry	NO
Content	SHOWS
Discovery wellbore	NO
Kelly bushing elevation [m]	22.0
Water depth [m]	89.0
Total depth (MD) [m RKB]	4091.0
Final vertical depth (TVD) [m RKB]	4085.0
Maximum inclination [°]	9.2
Bottom hole temperature [°C]	154
Oldest penetrated age	EARLY PERMIAN
Oldest penetrated formation	ROTLIEGEND GP
Geodetic datum	ED50
NS degrees	57° 54' 25.99'' N
EW degrees	1° 59' 14.19'' E
NS UTM [m]	6418975.76
EW UTM [m]	439982.26
UTM zone	31
NPDID wellbore	862

Wellbore history

General

Well 6/3-2 was drilled on the gamma structure on an early Permian formed fault block, 1.4 km from the Norwegian/UK median line. The primary objective was to test Jurassic/Triassic sandstones at different levels for possible hydrocarbon accumulations. Secondary objectives were to test Cretaceous porous/fractured limestone/chalk and Rotliegend sandstone. The prognosed TD was 4325 m. The location was chosen due to the proximity to mature source rocks and oil/gas discoveries in British waters. Seismic anomalies indicated shallow gas. Due to this the original planned well location was abandoned and a new location was chosen 500 m to the east.

Operations and results

Wildcat well 6/3-2 was spudded with the semi-submersible installation ROSS Isle 21 November 1985 and drilled to TD at 4091 m in the Early Permian Rotliegend Formation. Some hole problems were experienced in the top of the 12 1/4" hole section. 9 5/8" casing was set close to the Zechstein formation before drilling the 8 1/2" hole into the salt. At 3772 m, an over-pressured zone of dolomite/slate was encountered. It was anticipated that one had found a "floating lens" enclosed in the evaporites. The well started flowing and pressure was increased to 2.05 g/cc in order to stabilise the well. Because of this a 7" liner had to be set in the middle of the salt. A 6" hole was drilled to base of the Zechstein Formation and a 5" liner was set in order to be able to reduce mud weight through the Rotliegend sandstone. The well was drilled with seawater/hi-vis pills/pre-hydrated bentonite through the top sections to 622 m, with gypsum/polymer mud from 622 m to top of the salt at 3400 m, and with Safemul oil based mud from 3400 m to TD. No indication of shallow gas was encountered at this location.

Top Cretaceous came in at 2511 m. There were some shows in the Cretaceous limestone/chalk. However, logs, cores and cuttings showed that the reservoir properties were poor, with no fracturing, and permeabilities were less than 0.02 mD. There is a possibility that the shows are due to hydrocarbons that have migrated from the underlying Jurassic sandstone. Top Jurassic sandstone was encountered at 3017 m and extended down to 3165 m. Conglomerates are developed in a thin bed on top of the Triassic. Fair shows were recorded in the Hugin Formation, but logs showed no moveable hydrocarbons, so the shows were interpreted as residual hydrocarbons. The Rotliegend sandstone came in at 4045 m. Base was not seen. Core, cuttings and logs all proved a water-saturated formation without trace of hydrocarbons. Three cores were cut in the Cretaceous chalk between 2794 m and 2859 m, seven cores were cut in the Jurassic sandstone and into the Triassic Skagerrak Formation from 3042 m to 3197.5 m, and one core was cut at TD in the Rotliegend sandstone between 4098 m and 4091 m. FMT fluid samples were taken at 3017 m and 2652 m. Both samples contained mud filtrate and no liquid or gaseous hydrocarbons.

The well was permanently abandoned 10 March 1986 at as dry

Testing

A salt-water depletion test was performed to deplete the over-pressured shale/dolomite layer in the Zechstein to be able to continue drilling to prognosed TD. The secondary objective was to determine the formation pressure in this abnormal pressure zone.

The test interval was the open-hole section from 3722 to 3776 m with the production packer just above the 7" liner shoe at 3712. The lithology from 3722 to 3761 was mainly halite. From 3761 to 3772 m the lithology was anhydrite/halite/shale with minor amounts of dolomite. The interval from 3772 to 3776 m consisted of mainly shale interbedded with salt and porous clastic dolomite. Cumulative 21.6 Sm3 salt water was produced during the main flow period and the water flow rate decreased gradually from 234 Sm3/day to 0 Sm3/day. Initial Pressure at reference depth 3710 m, from Horner plot was 75670 KPa. Maximum-recorded temp during main flow was 145.6 deg C.

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
230.00	4088.00

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	2794.0	2803.5	[m]
2	2803.5	2831.6	[m]
3	2831.6	2859.2	[m]
4	3042.0	3047.0	[m]
5	3049.0	3075.1	[m]
6	3077.0	3100.1	[m]
7	3100.0	3127.5	[m]
8	3127.5	3155.5	[m]
9	3155.5	3174.1	[m]
10	3174.1	3197.5	[m]
11	4088.0	4089.9	[m]

Total core sample length [m]	218.6
Cores available for sampling?	YES

Core photos


2794-2799m


2799-2803m


2803-2808m


2808-2813m


2813-2818m


2818-2823m


2823-2828m


2828-2831m


2831-2836m


2836-2841m


2841-2846m


2846-2851m


2851-2856m


2856-2859m


3042-3047m


3049-3054m


3043-3059m


3059-3064m


3064-3069m


3069-3074m


3074-3075m


3077-3082m


3082-3087m


3087-3092m


3092-3097m


3097-3100m


3100-3105m


3105-3110m


3110-3115m


3115-3120m


3120-3125m


3125-3127m


3127-3132m


3132-3137m


3137-3142m


3142-3147m


3147-3152m


3152-3155m


3155-3160m


3160-3165m


3165-3110m


3170-3174m


3174-3179m


3179-3184m


3184-3189m


3189-3194m


3194-3197m


4088-4089m

Palynological slides at the Norwegian Offshore Directorate

Sample depth	Depth unit	Sample type	Laboratory
3147.0	[m]	C	GEOLAB
3161.0	[m]	DC	STATOIL
3162.3	[m]	C	GEOLAB
3164.3	[m]	C	GEOLAB
3166.0	[m]	C	GEOLAB
3169.7	[m]	C	GEOLAB
3170.0	[m]	DC	STATOIL
3173.2	[m]	C	GEOLAB
3174.1	[m]	C	GEOLAB
3181.5	[m]	C	GEOLAB
3185.0	[m]	DC	STATOIL
3194.0	[m]	C	GEOLAB
3197.0	[m]	DC	STATOIL
4027.0	[m]	SWC	STATOI
4035.0	[m]	SWC	STATOI

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
111	NORDLAND GP
1160	HORDALAND GP
2283	ROGALAND GP
2283	BALDER FM
2300	SELE FM
2405	LISTA FM
2489	VÅLE FM
2511	SHETLAND GP
2511	TOR FM
2605	HOD FM
2987	CROMER KNOLL GP
2987	SOLA FM
3000	ÅSGARD FM
3008	VIKING GP
3008	DRAUPNE FM
3017	VESTLAND GP
3017	NO FORMAL NAME
3165	NO GROUP DEFINED
3165	SKAGERRAK FM
3293	ZECHSTEIN GP
3293	UNDIFFERENTIATED
4043	KUPFERSCHIEFER FM
4045	ROTLIEGEND GP

Composite logs

Document name	Document format	Document size [MB]
862	pdf	0.68

Geochemical information

Document name	Document format	Document size [MB]
862_1	pdf	5.55

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

Document name	Document format	Document size [MB]
862_01_WDSS_General_Information	pdf	0.27
862_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]
862_6_3_2_COMPLETION_REPORT_AND_LOG	pdf	27.88

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	3776	3772	31.8

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

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

Logs

Log type	Log top depth [m]	Log bottom depth [m]
ACBL VDL GR	100	1298
ACBL VDL GR	105	600
ACBL VDL GR	650	3722
ACBL VDL GR	3567	4035
CDL CNL GR CAL	222	4091
DIFL BHC AC GR SP CAL	104	4091

DIPLOG	1298	3381
DLL MLL GR	2461	3324
FMT	2493	2965
FMT	3011	3263
MWD	220	3737
SPECTRALOG	2950	3377
VELOCITY	500	4067

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	222.0	36	222.0	0.00	LOT
SURF.COND.	20	600.0	26	622.0	1.52	LOT
INTERM.	13 3/8	1300.0	17 1/2	1316.0	1.53	LOT
INTERM.	9 5/8	3375.0	12 1/4	3387.0	0.00	LOT
LINER	7	3722.0	8 1/2	3772.0	2.14	LOT
LINER	5	4091.0	6	4091.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
622	1.10	42.0	17.5	WATERBASED	25.11.1985
760	1.13	46.0	9.0	WATER BASED	02.12.1985
850	1.17	44.0	8.5	WATER BASED	02.12.1985
1316	1.20	14.0	18.0	WATER BASED	02.12.1985
1316	1.20	60.0	22.0	GYP/POL	15.12.1985
1319	0.00				15.12.1985
2028	1.20	18.0		GYP/POL	11.12.1985
2394	1.20	56.0		GYP/POL	11.12.1985
2394	0.00				15.12.1985
2794	1.28	60.0	20.0	GYP/POL	16.12.1985
2794	1.28	62.0	20.0	GYP/POL	18.12.1985
2857	1.28	62.0	19.0	GYP/POL	19.12.1985
2984	1.40	62.0		GYP/POL	23.12.1985
3028	0.00				06.01.1986
3320	1.63	62.0		OIL BASED	19.01.1986
3400	1.50	58.0		OIL BASED	13.01.1986

3772	1.97	70.0		OIL BASED	19.01.1986
3772	1.97	66.0		OIL BASED	19.01.1986
3772	1.99	83.0		OIL BASED	23.01.1986
3772	2.00	82.0		OIL BASED	23.01.1986
3776	2.05	59.0		OIL BASED	11.02.1986
4040	1.80	35.0		OILBASED	25.02.1986

Thin sections at the Norwegian Offshore Directorate

Depth	Unit
4089.00	[m]
4089.90	[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]
862_Formation_pressure_(Formasjonstrykk)	pdf	0.21