

General information

Wellbore name	31/4-2
Type	EXPLORATION
Purpose	WILDCAT
Status	P&A
Factmaps in new window	link to map
Main area	NORTH SEA
Well name	31/4-2
Seismic location	
Production licence	055
Drilling operator	Norsk Hydro Produksjon AS
Drill permit	226-L
Drilling facility	NORSKALD
Drilling days	51
Entered date	26.09.1979
Completed date	15.11.1979
Release date	15.11.1981
Publication date	29.03.2014
Purpose - planned	WILDCAT
Reentry	NO
Content	OIL
Discovery wellbore	NO
Kelly bushing elevation [m]	25.0
Water depth [m]	142.0
Total depth (MD) [m RKB]	2900.0
Bottom hole temperature [°C]	82
Oldest penetrated age	TRIASSIC
Oldest penetrated formation	HEGRE GP
Geodetic datum	ED50
NS degrees	60° 36' 14.6" N
EW degrees	3° 0' 26.7" E
NS UTM [m]	6718845.00
EW UTM [m]	500406.14
UTM zone	31
NPDID wellbore	401

Wellbore history

General

Well 31/4-2 is a replacement for junk well 31/4-1. The well is located on the Brage Horst between the Oseberg and Troll Fields in the Northern North Sea. The primary objective was Middle Jurassic sandstones of the Brent Formation. A "flat-spot" was seen on the seismic sections and tentatively interpreted to represent a gas fluid contact in these sandstones. A secondary objective was sandstones in the Early Jurassic Staffjord Formation. Sandstone intervals of upper Early Jurassic age (Dunlin Formation) and of Triassic age (Hegre Group), were also expected to be penetrated, but were not considered to be prospective. The well was planned to be drilled to a depth of 2930 m RKB (+/- 90 m), ca 100 m into the Triassic.

Operations and results

Wildcat well 31/4-2 was spudded with the semi-submersible installation Norskald on 26 September 1979 and drilled to TD at 2900 m in the Triassic Lunde Formation. There were some problems with keeping position and anchor movements in rough weather, but otherwise operations went forth without significant problems. The well was drilled with Seawater and pre-hydrated bentonite down to 990 m, with Seawater/Drispac/pre-hydrated bentonite from 990 m to 1712 m, and with seawater/prehydrated bentonite/ligcon/Unical mud from 1712 m to TD.

Good oil shows were recorded on sidewall cores from thin sandstone stringers at 2061 to 2069 m in the upper part of the Shetland Group. The well penetrated top Draupne Formation at 2146 m and top Heather Formation at 2171 m. The Heather Formation contained a 49 m thick very fine to silty water-bearing sandstone interval from 2190 to 2239 m. The well penetrated two hydrocarbon bearing sandstone intervals at 2325 to 2329 m and 2344.5 to 2354 m within a 29 m thick Middle Jurassic Brent Group. Both reservoirs consist of very fine to fine, occasional coarse grained sandstones. The upper reservoir has a net pay of 4m and an average calculated porosity and water saturation of 25.6 % and 39.2 %, respectively. Log interpretations suggest an OWC at 2328 m. The lower interval, which is separated from the interval above by a 15.5m thick claystone sequence, is hydrocarbon bearing down to 2349.5 m. At this level a tight limestone interval occurs, below which (2351.5 m) the sandstone is water-wet. The lower sandstone interval has a net pay of 5 m average calculated porosity and water saturation of 27.8 % and 57.5 %, respectively. Below this a 54 m thick "Intra-Dunlin Sand", Staffjord Group sands and Triassic sands were penetrated. These were all found to be water-bearing.

Three cores were cut: core 1 from 2204.7 to 2222.7 m in the Heather Formation, core 2 from 2490 to 2495.1 m in the "Intra-Dunlin Sand", and core 3 from 2686 to 2693 m in the Staffjord Formation. The RFT was run for pressure recordings in the Cretaceous, Jurassic and Triassic intervals, and for formation fluid sampling in the hydrocarbon bearing Middle Jurassic sandstones. The pressures recorded showed a normal or close to normal pressure development through the whole well. The segregated samples were taken at 2326.5 m (gas-condensate) and at 2346 m (gas and thick oil).

The well was permanently abandoned on 15 November 1979. It is a technical discovery, but it is classified as 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]
1000.00	2900.00

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	2205.7	2222.7	[m]
2	2490.3	2495.1	[m]
3	2688.9	2693.0	[m]

Total core sample length [m]	26.0
Cores available for sampling?	YES

Core photos



2205-2208m



2208-2211m



2211-2213m



2213-2216m



2216-2219m



2219-2221m



2221-2222m



2490-2493m



2493-2494m



2688-2691m



2691-2693m

Palynological slides at the Norwegian Offshore Directorate

Sample depth	Depth unit	Sample type	Laboratory
1410.0	[m]	DC	GEOCH
1440.0	[m]	DC	GEOCH
1470.0	[m]	DC	GEOCH
1500.0	[m]	DC	GEOCH
1530.0	[m]	DC	GEOCH
1560.0	[m]	DC	GEOCH
1590.0	[m]	DC	GEOCH
1620.0	[m]	DC	GEOCH
1650.0	[m]	DC	GEOCH
1680.0	[m]	DC	GEOCH
1710.0	[m]	DC	GEOCH
1740.0	[m]	DC	GEOCH
1770.0	[m]	DC	GEOCH
1800.0	[m]	DC	GEOCH
1830.0	[m]	DC	GEOCH
1860.0	[m]	DC	GEOCH
1890.0	[m]	DC	GEOCH
1920.0	[m]	DC	GEOCH
1950.0	[m]	DC	GEOCH
1980.0	[m]	DC	GEOCH
2010.0	[m]	DC	GEOCH
2040.0	[m]	DC	GEOCH
2050.0	[m]	DC	GEOCH
2060.0	[m]	DC	GEOCH
2090.0	[m]	DC	GEOCH
2120.0	[m]	DC	OD
2140.0	[m]	DC	OD
2140.0	[m]	SWC	
2148.0	[m]	SWC	
2150.0	[m]	DC	OD
2160.0	[m]	DC	OD
2170.0	[m]	DC	OD
2170.0	[m]	SWC	
2180.0	[m]	DC	OD
2190.0	[m]	DC	OD
2200.0	[m]	DC	
2200.0	[m]	DC	
2205.7	[m]	C	

2216.0 [m]	C	
2220.0 [m]	DC	
2221.6 [m]	C	
2240.0 [m]	SWC	
2242.0 [m]	DC	
2262.0 [m]	DC	
2265.0 [m]	SWC	
2280.0 [m]	DC	
2300.0 [m]	DC	
2315.0 [m]	SWC	
2320.0 [m]	DC	
2322.0 [m]	SWC	
2332.0 [m]	SWC	
2340.0 [m]	DC	
2357.0 [m]	SWC	
2360.0 [m]	DC	
2385.0 [m]	SWC	
2435.0 [m]	SWC	
2477.0 [m]	SWC	
2550.0 [m]	SWC	
2598.0 [m]	SWC	
2630.0 [m]	SWC	
2657.0 [m]	SWC	
2685.0 [m]	SWC	
2688.9 [m]	C	
2690.5 [m]	C	
2691.5 [m]	C	
2745.0 [m]	SWC	
2779.0 [m]	SWC	
2795.0 [m]	SWC	
2825.0 [m]	SWC	
2880.0 [m]	SWC	

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
167	NORDLAND GP
707	UTSIRA FM
994	HORDALAND GP

1793	ROGALAND GP
1793	BALDER FM
1858	SELE FM
1893	LISTA FM
2043	SHETLAND GP
2115	CROMER KNOLL GP
2146	VIKING GP
2146	DRAUPNE FM
2171	HEATHER FM
2190	FENSFJORD FM
2325	BRENT GP
2354	DUNLIN GP
2354	DRAKE FM
2479	COOK FM
2533	AMUNDSEN FM
2632	STATFJORD GP
2786	HEGRE GP

Geochemical information

Document name	Document format	Document size [MB]
401_1	pdf	0.40
401_2	pdf	0.25
401_3	pdf	2.52
401_4	pdf	1.49
401_5	pdf	4.36
401_6	pdf	1.05

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

Document name	Document format	Document size [MB]
401_01_WDSS_General_Information	pdf	0.11
401_02_WDSS_completion_log	pdf	0.18

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

Document name	Document format	Document size [MB]
401_31_4_2_COMPLETION_REPORT_AND_LOG	pdf	12.59

Logs

Log type	Log top depth [m]	Log bottom depth [m]
CPI	2155	2887
CST	2035	2598
CST	2050	2884
CST	2230	2630
CST	2300	2598
CST	2633	2897
DLL MSFL	2190	2550
FDC CNL	971	2895
HDT	1698	2897
HRT	180	1671
ISF SON	971	2896
RFT	1850	2858
RFT	2047	2171
RFT	2297	2523
VELOCITY	549	2890

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	254.0	36	255.0	0.00	LOT
SURF.COND.	20	972.0	26	990.0	1.79	LOT
INTERM.	13 3/8	1697.0	17 1/2	1712.0	1.90	LOT
OPEN HOLE		2900.0	12 1/4	2900.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
995	1.29	58.0		waterbased	
1500	1.40	70.0		waterbased	

1735	1.56	50.0		waterbased	
1970	1.56	80.0		waterbased	
2040	1.50	50.0		waterbased	
2645	1.30	44.0		waterbased	

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]
401 Formation pressure (Formasjonstrykk)	pdf	0.21

