General information

Wellbore name	34/10-13
Type	EXPLORATION
Purpose	APPRAISAL
Status	P&A
Factmaps in new window	link to map
Main area	NORTH SEA
Field	GULLFAKS
Discovery	34/10-1 Gullfaks
Well name	34/10-13
Seismic location	3D - 185 SP: 385.
Production licence	050
Drilling operator	Den norske stats oljeselskap a.s
Drill permit	300-L
Drilling facility	DEEPSEA SAGA
Drilling days	135
Entered date	24.08.1981
Completed date	05.01.1982
Release date	05.01.1984
Publication date	02.12.2014
Purpose - planned	APPRAISAL
Reentry	NO
Content	OIL
Discovery wellbore	NO
1st level with HC, age	EARLY JURASSIC
1st level with HC, formation	STATFJORD GP
2nd level with HC, age	LATE JURASSIC
2nd level with HC, formation	HEGRE GP
Kelly bushing elevation [m]	25.0
Water depth [m]	214.0
Total depth (MD) [m RKB]	3392.0
Final vertical depth (TVD) [m RKB]	3391.0
Maximum inclination [°]	3.8
Bottom hole temperature [°C]	108
Oldest penetrated age	LATE TRIASSIC
Oldest penetrated formation	HEGRE GP
Geodetic datum	ED50
NS degrees	61° 12' 1.93'' N
EW degrees	2° 18' 3'' E

NS UTM [m]	6785486.52
EW UTM [m]	462422.23
UTM zone	31
NPDID wellbore	431

Wellbore history

General

Well 34/10-13 was drilled on a horst block in the eastern part of the Gullfaks Fault Block. The primary objective of the well was to test the sandstone of Early Jurassic age (Statfjord formation). The Secondary objective was Carnian sandstone.

Operations and results

Appraisal well 34/10-13 was spudded with the semi-submersible installation Deepsea Saga on 24 August 1981 and drilled to TD at 3392 m, 76 m into the Carnian sandstone. At 1725 m, the well started to flow. The influx was circulated out with 1.69 s.g. mud. A total of 21.5 days were lost due to a strike after the drilling of the 6" section had been initiated. The well was drilled with spud mud down to 300 m, with seawater gel from 300 m to 893 m, and with gel/lignosulphonate mud from 893 m to TD. The RFT tool stuck at 2882 m during sampling. The tool was left in the hole and the well was plugged back and tested.

First oil shows, typically cut and/or fluorescence on claystone and limestone cuttings, was recorded at 1350 m in the Hordaland Group. The shows were described more or less continuous down to top Statfjord reservoir at 1924 m. When drilling mudstones, limestone and marl in the Lista Formation from 1656 to 1701 m there was oil in the mud. Oil was found from top Statfjord Group at 1924 m and down to at least 2114 m in the Hegre Group where oil was tested on DST. No oil/water contact could be established in the Statfjord sandstone and pressure measurements in the Hegre Group were inconclusive. Shows were recorded on sandstones down to 2450 m. From petrophysical analyses the Statfjord Group had 70 m net pay with 27% average porosity and 24% average water saturation. The Hegre Group reservoir had 16.5 m net pay with average 27.8% porosity and 56% average water saturation. The Carnian sand was encountered at 3316 m. It was waterbearing without shows.

Sixteen cores were cut in the well. Fifteen cores were cut in succession from 1931 m to 2087 m in the Amundsen Formation and Statfjord Group and recovered a total of 150.8 m core (87% total recovery). The last core was cut from 3373.5 m to 3391.5 m in the Carnian sandstone with 92% recovery. RFT fluid samples were taken at 1936.5 m (oil and gas), 1940 m (oil and gas) and 2111 m (oil and gas).

The well was permanently abandoned on 5 January 1982 as an oil appraisal well on the Gullfaks Field.

Testing

Two drill stem tests were performed.

DST 1 tested the interval 2107 m to 2114 m in the Hegre Group. The test produced 440 Sm3 oil/day through a 32/64” choke. The GOR was 82.1 Sm3/Sm3 and the oil gravity was 31 °API. The temperature measured at gauge depth was 84 °C.

DST2 tested the interval 2003 to 2009 m in the Statfjord Group. The test produced 835 Sm3 oil/day through a 32/64” choke. The GOR was 92.5 Sm3/Sm3 and the oil gravity was 40.1 °API. Solution gas had a gravity of 0.82 (air = 1). The temperature measured at gauge depth was 79.8 °C.

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
300.00	3378.00

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
1	1931.1	1931.3	[m]
2	1931.3	1941.8	[m]
4	1944.0	1959.8	[m]
5	1961.0	1961.9	[m]
6	1963.0	1973.7	[m]
7	1974.0	1987.3	[m]
8	1988.0	1997.2	[m]
9	2003.0	2011.2	[m]
10	2011.5	2017.5	[m]
11	2018.5	2034.1	[m]
12	2035.0	2044.7	[m]
13	2047.2	2062.9	[m]
14	2065.5	2075.4	[m]
15	2077.0	2085.0	[m]
16	3373.5	3390.1	[m]

Total core sample length [m]	150.0
Cores available for sampling?	YES

Core photos


1931-1931m


1931-1936m


1936-1941m


1944-1949m


1949-1954m


1954-1959m


1961-1962m


1963-1968m


1968-1973m


1974-1978m


1979-1984m


1984-1987m


1988-1993m


1993-1997m


2003-2008m


2008-2011m


2011-2016m


2016-2017m


2018-2023m


2023-2029m


2029-2034m


3379-3385m


2035-2040m


3385-3390m


2040-2044m


2047-2052m


2052-2058m


2058-2063m


2065-2070m


2070-2075m


2077-2082m


2082-2085m


3378-3374m

Palynological slides at the Norwegian Offshore Directorate

Sample depth	Depth unit	Sample type	Laboratory
1110.0	[m]	DC	GEOCH
1140.0	[m]	DC	GEOCH
1170.0	[m]	DC	GEOCH

1200.0	[m]	DC	GEOCH
1230.0	[m]	DC	GEOCH
1260.0	[m]	DC	GEOCH
1290.0	[m]	DC	GEOCH
1320.0	[m]	DC	GEOCH
1350.0	[m]	DC	GEOCH
1380.0	[m]	DC	GEOCH
1410.0	[m]	DC	GEOCH
1430.0	[m]	DC	GEOCH
1460.0	[m]	DC	GEOCH
1490.0	[m]	DC	GEOCH
1518.0	[m]	DC	GEOCH
1545.0	[m]	DC	GEOCH
1572.0	[m]	DC	GEOCH
1599.0	[m]	DC	GEOCH
1626.0	[m]	DC	GEOCH
1653.0	[m]	DC	GEOCH
1680.0	[m]	DC	GEOCH
1707.0	[m]	DC	GEOCH
1725.0	[m]	DC	GEOCH
1743.0	[m]	DC	GEOCH

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	TEST2	2003.00	2009.00		23.12.1981 - 21:15	YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
239	NORDLAND GP
942	UTSIRA FM
956	HORDALAND GP
1539	ROGALAND GP
1539	BALDER FM
1596	LISTA FM

1707	SHETLAND GP
1905	DUNLIN GP
1905	AMUNDSEN FM
1924	STATFJORD GP
2052	HEGRE GP

Geochemical information

Document name	Document format	Document size [MB]
431_GCH_1	pdf	1.00
431_GCH_2	pdf	0.34

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

Document name	Document format	Document size [MB]
431_01_WDSS_General_Information	pdf	0.20
431_02_WDSS_completion_log	pdf	0.24

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

Document name	Document format	Document size [MB]
431_34_10_13_Completion_log	pdf	1.91
431_34_10_13_Completion_Report	pdf	24.61
431_34_10_13_Conventional_Core_Data	pdf	1.97
431_34_10_13_Paleontological_Stratigraphical_Final_Report	pdf	4.85
431_34_10_13_Petrofysisk_Evaluering	pdf	12.21
431_34_10_13_PVT_study	pdf	0.11
431_34_10_13_Reservoir_Fluid_Study	pdf	0.35
431_34_10_13_Sedimentological_Description	pdf	5.19
431_34_10_13_Well_Test_Report	pdf	10.91

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	2107	2114	12.7

2.0	2003	2009	12.7

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

Test number	Oil [Sm3/day]	Gas [Sm3/day]	Oil density [g/cm3]	Gas grav. rel.air	GOR [m3/m3]
1.0	467	38000	0.876	0.686	80
2.0	860	82000	0.825	0.645	95

Logs

Log type	Log top depth [m]	Log bottom depth [m]
CBL VDL GR	694	2682
CYBERDIP	1717	3394
DIR	1720	3394
DLL MSFL GR	1717	2160
FDC CNL GR CAL	299	3394
GEODIP	1920	2055
HDT	1717	2687
ISF SON GR SP MSFL	299	3393
LSS GR	1898	2155
TDT GR	1920	2371
VDL	1914	2100
WAVEFORM	1914	2100

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	299.0	36	300.0	0.00	LOT
SURF.COND.	20	869.0	26	893.0	1.47	LOT
INTERM.	13 3/8	1536.0	17 1/2	1542.0	1.80	LOT
INTERM.	9 5/8	1720.0	12 1/4	1725.0	1.95	LOT
LINER	7	2680.0	8 1/2	2700.0	1.96	LOT

OPEN HOLE		3391.5	6	3392.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
300	1.06	70.0		waterbased	
875	1.11	48.0		waterbased	
1380	1.25	49.0		waterbased	
1630	1.60	50.0		waterbased	
1900	1.85	56.0		waterbased	
2425	1.86	53.0		waterbased	
3392	1.65	55.0		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]
431_Formation_pressure_(Formasjonstrykk)	pdf	0.22