

**General information**

Wellbore name	34/6-3 S
Type	EXPLORATION
Purpose	APPRAISAL
Status	P&A
Press release	link to press release
Factmaps in new window	link to map
Main area	NORTH SEA
Discovery	34/6-2 S (Garantiana)
Well name	34/6-3
Seismic location	MC3D-B34-6R06 PSDM
Production licence	554
Drilling operator	Total E&P Norge AS
Drill permit	1521-L
Drilling facility	LEIV EIRIKSSON
Drilling days	118
Entered date	30.05.2014
Completed date	24.09.2014
Plugged date	24.09.2014
Release date	24.09.2016
Publication date	25.09.2016
Purpose - planned	APPRAISAL
Reentry	NO
Content	OIL
Discovery wellbore	NO
1st level with HC, age	EARLY JURASSIC
1st level with HC, formation	COOK FM
Kelly bushing elevation [m]	25.0
Water depth [m]	380.5
Total depth (MD) [m RKB]	4462.0
Final vertical depth (TVD) [m RKB]	3816.0
Maximum inclination [°]	66.6
Bottom hole temperature [°C]	142
Oldest penetrated age	EARLY JURASSIC
Oldest penetrated formation	STATFJORD GP
Geodetic datum	ED50
NS degrees	61° 34' 29.55" N
EW degrees	2° 43' 48.69" E
NS UTM [m]	6827015.07



EW UTM [m]	485670.96
UTM zone	31
NPDID wellbore	7468

Wellbore history

General

Wellbore 34/6-3 S was drilled to appraise the 34/6-2 S Garantiana discovery in the Visund area in the North Sea. The Primary objective was to prove hydrocarbon presence, determine fluid nature and evaluate reservoir characteristics in the Early Jurassic Cook Formation. The secondary objective was to prove petroleum in the Statfjord Group higher up on the structure than the 34/6-2 S well.

Operations and results

Garantiana appraisal well 34/6-3 S was spudded with the semi-submersible installation Leiv Eiriksson on 30 May 2014 and drilled to 4462 m (3816 m TVD) in the Early Jurassic Statfjord Group. The well was drilled vertical down to ca 2500 m and deviated with a sail angle of ca 48 ° from there to TD. While RIH with cement stinger for plugging back the Statfjord reservoir prior to testing the Cook reservoir, severe losses leading to formation supercharging was observed. It resulted in ballooning effect. Several bleed off sequences was required to assess and regain normal situation. The well was drilled with seawater and hi-vis sweeps down to 1500 m, with Sildril Sodium Silicate WBM from 1500 m to 2058 m, with EMS-4600 NABM OBM from 2058 m to 3704 m, and with WARP-NABM mud from 3704 m to TD.

Top Cook Formation was penetrated at 3850 m (3493 m TVD) and was oil filled all through (oil-down-to) to top Burton Formation at 4000 m (3593 m TVD). The NTG of the Cook formation was proven to be 86 %, with average effective porosity of 22 % and water saturation of 17.5 %. Formation pressure data and the PVT analysis of the acquired DST samples indicate that the formation fluid in the Cook reservoir of 34/6-3S is the same as the fluid encountered in the 34/6-2S exploration well. The Statfjord Group proved to be water bearing with a NTG of 45.7%, effective average porosity of 12.4% and water saturation of 98.4%. Oil shows were described only within the Cook Formation.

A total of 77 metres of core was cut and 75.5 metres recovered (98.0% recovery) in two cores from the interval 3918 to 3995 m in the Cook Formation. No wire line fluid sample was taken.

The wellbore was plugged back for sidetracking and abandoned on 24 September 2014. It is classified as an oil appraisal well.

Testing

A well test was performed within the Cook reservoir from 3911 to 3998 m (3533 to 3591 m TVD). The test produced 945 Sm³ oil and 16731 Sm³ gas through a 24/64" choke in the second main flow. The separator GOR was 42 Sm³/Sm³, the stock tank oil density was 0.8784 g/cm³ and the gas gravity was 0.927. The flowing bottom hole temperature was 132.2 °C.

Cuttings at the Norwegian Offshore Directorate



Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
1500.00	4460.00

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	3918.0	3959.9	[m]
2	3959.9	3993.5	[m]

Total core sample length [m]	75.5
Cores available for sampling?	YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
406	NORDLAND GP
406	UNDIFFERENTIATED
1159	UTSIRA FM
1246	HORDALAND GP
1246	UNDIFFERENTIATED
1849	ROGALAND GP
1849	BALDER FM
1876	SELE FM
1886	LISTA FM
2008	VÅLE FM
2022	SHETLAND GP
2022	JORSALFARE FM
2249	KYRRE FM
3377	TRYGGVASON FM
3643	SVARTE FM
3759	BRENT GP
3759	RANNOCH FM
3793	DUNLIN GP
3793	DRAKE FM
3851	COOK FM
4001	BURTON FM



4013	AMUNDSEN FM
4360	STATEFJORD GP
4360	NANSEN FM
4407	EIRIKSSON FM

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	3911	3998	9.5

Test number	Final shut-in pressure [MPa]	Final flow pressure [MPa]	Bottom hole pressure [MPa]	Downhole temperature [°C]
1.0				132

Test number	Oil [Sm3/day]	Gas [Sm3/day]	Oil density [g/cm3]	Gas grav. rel.air	GOR [m3/m3]
1.0	950	16731	0.820	0.927	42

Logs

Log type	Log top depth [m]	Log bottom depth [m]
APS TLD HNGS AITC	3630	3729
CMR GR	3697	3701
GR RES SON DI	2070	2086
LWD - DI GR RES APWD	472	1500
LWD - GR DI APWD RES GR SON	3995	4662
LWD - GR DI APWD RES NEU DEN FTW	3753	4116
LWD - GR DI APWD RES NEU DEN JPG	1	1000
LWD - GR RES SON DI APWD	0	0
LWD - GR RES SON DI APWD	1500	3704
LWD - GR RES SON DI APWD	2053	2105
LWD - RES DI GR APWD SON	3704	3918
OBMI PPC MSIP PPC GR	3200	4153
USIT CBL VDL GR	3090	3692
USIT CBL VDL GR	3580	4163

**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	472.0	36	472.5	0.00	
SURF.COND.	20	1494.0	26	1500.0	1.40	FIT
INTERM.	13 3/8	2049.0	17 1/2	2058.0	1.63	LOT
INTERM.	9 7/8	3697.0	12 1/4	3704.0	1.66	FIT
LINER	7	4249.0	8 1/2	4462.0	0.00	

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
421	1.03			Sea water	
473	1.35			Spud mud	
734	1.03			Sea water	
2061	1.62	32.0		NABM	
2112	1.65	51.0		NABM	
3709	1.84	47.0		NABM	
4251	1.82	41.0		NABM	
4462	1.84	48.0		NABM	