General information

Wellbore name	34/3-3 S
Type	EXPLORATION
Purpose	WILDCAT
Status	P&A
Press release	link to press release
Factmaps in new window	link to map
Main area	NORTH SEA
Field	KNARR
Discovery	34/3-3 S
Well name	34/3-3
Seismic location	innline 5024 & crossline 2782
Production licence	373 S
Drilling operator	BG Norge AS
Drill permit	1351-L
Drilling facility	WEST ALPHA
Drilling days	71
Entered date	10.09.2011
Completed date	19.11.2011
Release date	19.11.2013
Publication date	19.11.2013
Purpose - planned	APPRAISAL
Reentry	NO
Content	OIL
Discovery wellbore	YES
1st level with HC, age	EARLY JURASSIC
1st level with HC, formation	COOK FM
Kelly bushing elevation [m]	18.0
Water depth [m]	400.0
Total depth (MD) [m RKB]	4063.0
Final vertical depth (TVD) [m RKB]	4012.0
Maximum inclination [°]	15
Bottom hole temperature [°C]	141
Oldest penetrated age	EARLY JURASSIC
Oldest penetrated formation	BURTON FM
Geodetic datum	ED50
NS degrees	61° 47' 42.49'' N
EW degrees	2° 43' 4.38'' E
NS UTM [m]	6851554.92

EW UTM [m]	485123.66
UTM zone	31
NPDID wellbore	6588

Wellbore history

General

Well 34/3-3 S was drilled on the Jordbær Vest west of the Knarr field (formerly called Jordbær) in the northern part of the North Sea. The objective was to prove hydrocarbons in the Early Jurassic Cook formation.

Operations and results

Wildcat well 34/3-3 S was spudded with the semi-submersible installation West Alpha on 10 September 2011 and drilled to TD at 4063 m (4012 m TVD) in the Early Jurassic Burton Formation. A 9 7/8" pilot hole was drilled to 983 m to check for shallow gas. No shallow gas was encountered. The well was drilled vertical down to 2220 m and deviated with up to 15 dg inclination from there to TD. No significant problem was reported. The well was drilled with sea water and hi-vis sweeps down to 984 m, with Glydril/KCl mud from 984 m to 2240 m, with Versatec oil based mud from 2240 m to 3780 m, and with Versatherm oil based mud from 3780 m to TD.

Cook Formation sandstones were penetrated at 3907.5 m (3859.8 m TVD), which was 42.8 m deeper than prognosed. Light oil was encountered in the upper Cook Formation down to 3932 m (3884 m TVD). A definite OWC was not resolved from the data. Convincing oil shows were recorded on cores from the reservoir down to 3938 m, otherwise no oil shows above the oil based mud were reported from the well.

A total of 80.42 m core was cut in the Cook Formation from 3910.85 m to 3992 m. The upper 9 m of core 1 was fragmented due to problems with the inner core liner. Core depth shifts were from 0.14 to 0.94 m relative to logger's depth. MDT fluid samples were taken at 3915.9 m (oil) and 3946.7 m (water). The temperature at sea bed was measured by ROV and at survey stations in the Jordbær area wells at different times during the year. These measurements gave an average of 6.5 deg C at sea bed.

The well was plugged back for sidetracking on 19 November 2011. It is classified as an oil discovery.

Testing

A successful DST was performed over the interval in 3912.5 to 3928.5 m in the Upper Cook Formation. The reservoir produced at a rate of 1220 Sm3 oil and 75700 Sm3 gas/day through a 32/64" fixed choke during the main flow. The first stage separator GOR was 62 Sm3/Sm3, oil density was 0.778 - 0.805 g/cm3, H2S = 5 - 10 ppm, CO2 = 4 - 9%, and gas gravity was 0.832 - 0.864 (air = 1). The maximum bottom hole temperature measured during the main flow was 137.8 deg C.

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
990.00	4063.00

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	3910.9	3938.4	[m]
2	3938.4	3965.8	[m]
3	3965.8	3991.3	[m]

Total core sample length [m]	80.4
Cores available for sampling?	YES

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
MDT		3928.50	3912.50	OIL		YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
418	NORDLAND GP
418	UNDIFFERENTIATED
1388	UTSIRA FM
1483	HORDALAND GP
1483	UNDIFFERENTIATED
1964	ROGALAND GP
1964	BALDER FM
1988	SELE FM
2005	LISTA FM
2090	SHETLAND GP
2090	JORSALFARE FM
2267	KYRRE FM
3433	TRYGGVASON FM
3739	CROMER KNOLL GP
3739	MIME FM

3748	DUNLIN GP
3748	DRAKE FM
3908	COOK FM
3996	BURTON FM

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	3912	3928	12.7

Test number	Final shut-in pressure [MPa]	Final flow pressure [MPa]	Bottom hole pressure [MPa]	Downhole temperature [°C]
1.0				137

Test number	Oil [Sm3/day]	Gas [Sm3/day]	Oil density [g/cm3]	Gas grav. rel.air	GOR [m3/m3]
1.0	1200	75700	0.778	0.832	62

Logs

Log type	Log top depth [m]	Log bottom depth [m]
GR DI	418	498
GR DI	498	984
GR RES DEN NEU DI APWD	3992	4063
GR RES DI APWD SON	418	983
GVR GR RES DI APWD	3781	3911
MDT	3907	3965
MSCT GR	3774	4047
PDGR GR RES DI APWD SON	984	2240
PDGR GR RES DI APWD SON DEN	2240	3781
PEX CMR ECS HNGS	3896	4008
VSI4 GR	2000	4040
ZAIT PPC MSIP PPC GPIT GR	3726	4066

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	36	496.0	42	498.0	0.00	LOT
SURF.COND.	20	980.0	26	984.0	1.66	LOT
INTERM.	13 3/8	2235.0	17 1/2	2240.0	1.92	LOT
INTERM.	9 5/8	3774.0	12 1/4	3781.0	2.06	LOT
LINER	7	4053.0	8 1/2	4063.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
2570	1.60	37.0		Versamud	
3910	1.80	41.0		Versamud	
3938	1.80	40.0		Versamud	
3992	1.80	41.0		Versamud	
4063	1.78	36.0		Versamud	
4063	0.00	53.0		Versamud	
4063	1.78	36.0		Versamud	
4063	1.03	1.0		Versamud	