

**General information**

Wellbore name	16/2-18 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	16/2-4
Well name	16/2-18
Seismic location	3D survey:LN90STR11 inline 3884 & xline 3174
Production licence	265
Drilling operator	Statoil Petroleum AS
Drill permit	1438-L
Drilling facility	OCEAN VANGUARD
Drilling days	35
Entered date	05.07.2013
Completed date	08.08.2013
Release date	08.08.2015
Publication date	13.08.2015
Purpose - planned	WILDCAT
Reentry	NO
Content	OIL
Discovery wellbore	NO
1st level with HC, age	PRE-DEVONIAN
1st level with HC, formation	BASEMENT
Kelly bushing elevation [m]	22.0
Water depth [m]	112.0
Total depth (MD) [m RKB]	1970.0
Final vertical depth (TVD) [m RKB]	1969.0
Maximum inclination [°]	6.6
Bottom hole temperature [°C]	83
Oldest penetrated age	PRE-DEVONIAN
Oldest penetrated formation	BASEMENT
Geodetic datum	ED50
NS degrees	58° 49' 56.6" N
EW degrees	2° 27' 51.2" E
NS UTM [m]	6521662.41



EW UTM [m]	469067.54
UTM zone	31
NPDID wellbore	7220

Wellbore history

General

Well 16/2-18 S was drilled on the Cliffhanger North prospect west of the Johan Sverdrup Field on the Utsira High in the North Sea. The main objective was to prove hydrocarbons in the Late Jurassic intra-Draupne Formation sandstones and to verify the reservoir quality, fluid property, lateral extension and possible communication with the Johan Sverdrup discovery. The secondary objective of the well was to explore the hydrocarbon potential and reservoir properties in fractured and weathered granitic Basement.

Operations and results

Wildcat well 16/2-18 S was spudded with the semi-submersible installation Ocean Vanguard on 5 July 2013 and drilled to TD at 1970 m in fractured granitic basement rock. The well was drilled with a slightly deviated well path with the purpose of avoiding a prognosed shallow gas anomaly. A 9 7/8" pilot hole was drilled from 201 m to 455 m to check for shallow gas. No shallow gas was seen. No significant problem was encountered in the operations. The well was drilled with seawater and hi-vis sweeps down to 855 m and with KCl/Polymer/Glycol mud from 855 m to TD.

The Intra-Draupne Formation sandstone reservoir was not present at the well location; hence the primary objective of the well was not met. The secondary objective, however, was met by proving oil in weathered and fractured granitic Basement, which was encountered at 1864 m. An oil column of ca 15 m was estimated but no oil/water contact was established. Pressure data showed the discovery to be 2.6 bar higher and with a different oil gradient than in the Johan Sverdrup Field, and thus not in communication. However pressure and sampling data from the 16/2-4 Ragnarrok basement discovery has shown that the 16/2-18 S basement discovery is in communication, making 16/2-18 S well an appraisal of the Ragnarrok discovery. From the combined pressure data for these two wells the gas oil contact for the Ragnarrok discovery is found to be at ca 1862 m (1840 m MSL).

Shows were observed in the upper part of the Shetland Group and in the Basement. The uppermost Shetland Group (Ekofisk Formation) also had high gas readings.

An extensive sample and data acquisition programme was conducted in the upper part of the Basement. Four cores were drilled, but the first core was lost in the hole. Cores 2 - 4 recovered 19.9 m between 1855.5 m in the Åsgard Formation and 1876 m in the Basement. Three dual packer mini-DST's were performed showing limited production properties. Fluid samples were taken at 1866.2 m (gas, oil, and mud) and 1875.1 m (oil).

The well was permanently abandoned on 8 August 2013 as an oil appraisal.

Testing

No drill stem test was performed.

Cuttings at the Norwegian Offshore Directorate



Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
860.00	1970.00

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
2	1855.5	1864.9	[m]
3	1864.5	1870.0	[m]
4	1871.0	1876.1	[m]

Total core sample length [m]	20.0
Cores available for sampling?	YES

Palynological slides at the Norwegian Offshore Directorate

Sample depth	Depth unit	Sample type	Laboratory
881.0	[m]	DC	ROBERTSO
887.0	[m]	DC	ROBERT
893.0	[m]	DC	ROBERT
899.0	[m]	DC	ROBERT
905.0	[m]	DC	ROBERT
911.0	[m]	DC	ROBERT
917.0	[m]	DC	ROBERT
923.0	[m]	DC	ROBERT
927.0	[m]	DC	ROBERT
935.0	[m]	DC	ROBERT
941.0	[m]	DC	ROBERT
947.0	[m]	DC	ROBERT
953.0	[m]	DC	ROBERT
959.0	[m]	DC	ROBERT
965.0	[m]	DC	ROBERT
971.0	[m]	DC	ROBERT
977.0	[m]	DC	ROBERT
983.0	[m]	DC	ROBERT
989.0	[m]	DC	ROBERT
995.0	[m]	DC	ROBERT
1001.0	[m]	DC	ROBERT



1010.0	[m]	DC	ROBERT
1020.0	[m]	DC	ROBERT
1030.0	[m]	DC	ROBERT
1040.0	[m]	DC	ROBERT
1050.0	[m]	DC	ROBERT
1060.0	[m]	DC	ROBERT
1070.0	[m]	DC	ROBERT
1080.0	[m]	DC	ROBERT
1090.0	[m]	DC	ROBERT
1100.0	[m]	DC	ROBERT
1120.0	[m]	DC	ROBERT
1130.0	[m]	DC	ROBERT
1140.0	[m]	DC	ROBERT
1150.0	[m]	DC	ROBERT
1160.0	[m]	DC	ROBERT
1170.0	[m]	DC	ROBERT
1180.0	[m]	DC	ROBERT
1190.0	[m]	DC	ROBERT
1200.0	[m]	DC	ROBERT
1210.0	[m]	DC	ROBERT
1230.0	[m]	DC	ROBERT
1250.0	[m]	DC	ROBERT
1270.0	[m]	DC	ROBERT
1290.0	[m]	DC	ROBERT
1310.0	[m]	DC	ROBERT
1330.0	[m]	DC	ROBERT
1350.0	[m]	DC	ROBERT
1370.0	[m]	DC	ROBERT
1390.0	[m]	DC	ROBERT
1410.0	[m]	DC	ROBERT
1430.0	[m]	DC	ROBERT
1450.0	[m]	DC	ROBERT
1470.0	[m]	DC	ROBERT
1490.0	[m]	DC	ROBERT
1510.0	[m]	DC	ROBERT
1530.0	[m]	DC	ROBERT
1550.0	[m]	DC	ROBERT
1570.0	[m]	DC	ROBERT
1590.0	[m]	DC	ROBERT
1610.0	[m]	DC	ROBERT



1828.3	[m]	C	ROBERT
1841.0	[m]	DC	ROBERT
1847.0	[m]	DC	ROBERT
1853.0	[m]	DC	ROBERT

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		1875.12	0.00	OIL		YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
134	NORDLAND GP
134	UNDIFFERENTIATED
782	UTSIRA FM
830	UNDIFFERENTIATED
873	NO FORMAL NAME
914	UNDIFFERENTIATED
934	HORDALAND GP
934	SKADE FM
1034	UNDIFFERENTIATED
1085	NO FORMAL NAME
1141	UNDIFFERENTIATED
1521	ROGALAND GP
1521	BALDER FM
1543	SELE FM
1564	LISTA FM
1611	VÅLE FM
1614	SHETLAND GP
1614	EKOFISK FM
1631	TOR FM
1710	HOD FM
1808	BLODØKS FM
1810	SVARTE FM
1820	CROMER KNOLL GP



1820	RØDBY FM
1853	SOLA FM
1860	ÅSGARD FM
1864	BASEMENT

Logs

Log type	Log top depth [m]	Log bottom depth [m]
DP MFRAC	1850	1855
FMI SON GR	1170	1971
MDT DP CMR	1628	1960
MWD - ARC TELESCOPE	201	1970
UBI PEX HRLA HNGS	1628	1960
USIT CBL GR	791	1620
VSP	236	1944

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	197.0	36	201.0	0.00	
PILOT HOLE		455.0	9 7/8	455.0	0.00	
SURF.COND.	13 3/8	848.0	17 1/2	855.0	1.55	FIT
INTERM.	9 5/8	1628.0	12 1/4	1629.0	1.62	LOT
OPEN HOLE		1970.0	8 1/2	1970.0	0.00	

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
134	1.35	16.0		Spud Mud	
1607	1.21	27.0		KCl/Polymer/Glycol	
1626	1.20	24.0		KCl/Polymer/GEM	
1629	1.35	30.0		KCl/Polymer/GEM	
1855	1.20	29.0		KCl/Polymer/Glycol	
1904	1.21	29.0		KCl/Polymer/Glycol	
1970	1.22	26.0		KCl/Polymer/GEM	

