

**General information**

Wellbore name	16/2-12
Type	EXPLORATION
Purpose	APPRAISAL
Status	P&A
Press release	link to press release
Factmaps in new window	link to map
Main area	NORTH SEA
Field	JOHAN SVERDRUP
Discovery	16/2-6 Johan Sverdrup
Well name	16/2-12
Seismic location	inline 4258 & xline 3757 - ST11313
Production licence	265
Drilling operator	Statoil Petroleum AS
Drill permit	1400-L
Drilling facility	OCEAN VANGUARD
Drilling days	44
Entered date	25.07.2012
Completed date	06.09.2012
Release date	06.09.2014
Publication date	06.01.2015
Purpose - planned	WILDCAT
Reentry	NO
Content	OIL
Discovery wellbore	NO
1st level with HC, age	LATE JURASSIC
1st level with HC, formation	INTRA DRAUPNE FM SS
2nd level with HC, age	PRE-DEVONIAN
2nd level with HC, formation	BASEMENT
Kelly bushing elevation [m]	22.0
Water depth [m]	115.0
Total depth (MD) [m RKB]	2067.0
Final vertical depth (TVD) [m RKB]	2067.0
Maximum inclination [°]	0.6
Bottom hole temperature [°C]	87
Oldest penetrated age	PRE-DEVONIAN
Oldest penetrated formation	BASEMENT
Geodetic datum	ED50
NS degrees	58° 53' 4.27" N



EW degrees	2° 29' 18.11" E
NS UTM [m]	6527456.29
EW UTM [m]	470505.67
UTM zone	31
NPDID wellbore	6952

Wellbore history

**General**

Well 16/2-12 was drilled on the Geitungen Prospect on the Utsira High in the North Sea. The prospect is situated on a basement terrace north-west of the Johan Sverdrup Field. The main objectives were to investigate the hydrocarbon potential, reservoir quality, and lateral distribution of Intra-Draupne Formation sandstones, and the underlying sandstones of the Hugin and Sleipner Formations. The secondary objectives were to explore the hydrocarbon potential and reservoir properties in the fractured granitic Basement.

Operations and results

Well 16/2-12 was spudded with the semi-submersible installation Ocean Vanguard on 25 July 2012 and drilled to TD at 2067 m in granite Basement. There was a pre-drill shallow gas warning at 707 m, ca 100 m below 20" casing shoe, but no gas was observed when drilling. The well was drilled with seawater down to 211 m and with PerformaDril water based mud from 211 m to TD.

The well penetrated rocks of Quaternary, Neogene, Paleogene, Cretaceous and Jurassic age. No indication of hydrocarbons were recorded above top Intra Draupne Formation sandstone, which was picked at 1894 m, 12 m deeper than prognosed. The reservoir had excellent reservoir properties and contained oil. The top of the Basement was picked at 1938 m, 5 m deeper than prognosed. The fractures in the uppermost part of Basement were oil-filled. The oil/water contact was not encountered, but pressure measurements indicate a connection between this segment and the rest of the Johan Sverdrup discovery. Extensive data acquisition and sampling was carried out. The gas/oil ratio is 51.8 Sm³/Sm³ and the oil density is estimated at 0.81 g/cm³ in the Intra-Draupne reservoir.

Four cores were cut in the interval 1893 m to 1951.7 m, covering the whole Jurassic interval and 13.7 m of the Basement. The difference between the cores depth and wireline logs depth is less than 50 cm. Core 1 was dripping with oil and had excellent shows. The same type of shows continued on core 2 down to 1930 m. From 1930 – 1940 m, the shows disappeared. From 1940 m, oil was observed in fractures in the granitic Basement. Due to less fractures in core 4 shows disappeared. The deepest indication of weak shows were seen at 1950 m.

Reservoir fluid samples were obtained at four depths, with three MDT runs in the well. Large diameter probe was used on MDT wireline runs 5 and 7, and dual straddle packer was used on MDT wireline Run 8. In Run 5, samples were taken in Intra-Draupne Formation sandstone at 1901.3 m (oil) and in the Basement at 1940.0 m (oil with water and filtrate). In Run 7 samples were taken in Intra-Draupne Formation sandstone at 1928.3 m (oil), In Run 8 samples were taken in the Basement at 1940.1 m (oil with water and filtrate) and at 1945 m (water).

The well was permanently abandoned on 6 September 2010. It was planned and drilled as a wildcat well. However, after performing data acquisition, and acquiring formation pressure testing data in the reservoir section, the well was reclassified as an appraisal of the Johan Sverdrup field.

Testing

Formation tests (mini-DST) were conducted in the bedrock, revealing stable flow rates of both oil and water in different levels in the fractured and weathered bedrocks.

Cuttings at the Norwegian Offshore Directorate



Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
615.00	2067.00

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	1893.0	1919.4	[m]
2	1920.0	1942.8	[m]
3	1942.8	1947.1	[m]
4	1947.1	1951.7	[m]

Total core sample length [m]	58.1
Cores available for sampling?	YES

Palynological slides at the Norwegian Offshore Directorate

Sample depth	Depth unit	Sample type	Laboratory
615.0	[m]	DC	FUGRO
630.0	[m]	DC	FUGRO
650.0	[m]	DC	FUGRO
670.0	[m]	DC	FUGRO
690.0	[m]	DC	FUGRO
710.0	[m]	DC	FUGRO
730.0	[m]	DC	FUGRO
750.0	[m]	DC	FUGRO
770.0	[m]	DC	FUGRO
790.0	[m]	DC	FUGRO
810.0	[m]	DC	FUGRO
830.0	[m]	DC	FUGRO
850.0	[m]	DC	FUGRO
870.0	[m]	DC	FUGRO
890.0	[m]	DC	FUGRO
910.0	[m]	DC	FUGRO
930.0	[m]	DC	FUGRO
950.0	[m]	DC	FUGRO
970.0	[m]	DC	FUGRO
990.0	[m]	DC	FUGRO



1010.0	[m]	DC	FUGRO
1030.0	[m]	DC	FUGRO
1050.0	[m]	DC	FUGRO
1100.0	[m]	DC	FUGRO
1120.0	[m]	DC	FUGRO
1140.0	[m]	DC	FUGRO
1160.0	[m]	DC	FUGRO
1180.0	[m]	DC	FUGRO
1200.0	[m]	DC	FUGRO
1220.0	[m]	DC	FUGRO
1240.0	[m]	DC	FUGRO
1260.0	[m]	DC	FUGRO
1280.0	[m]	DC	FUGRO
1300.0	[m]	DC	FUGRO
1320.0	[m]	DC	FUGRO
1340.0	[m]	DC	FUGRO
1360.0	[m]	DC	FUGRO
1380.0	[m]	DC	FUGRO
1400.0	[m]	DC	FUGRO
1420.0	[m]	DC	FUGRO
1440.0	[m]	DC	FUGRO
1460.0	[m]	DC	FUGRO
1480.0	[m]	DC	FUGRO
1500.0	[m]	DC	FUGRO
1520.0	[m]	DC	FUGRO
1540.0	[m]	DC	FUGRO
1560.0	[m]	DC	FUGRO
1580.0	[m]	DC	FUGRO
1600.0	[m]	DC	FUGRO
1620.0	[m]	DC	FUGRO
1640.0	[m]	DC	FUGRO
1660.0	[m]	DC	FUGRO
1670.0	[m]	DC	FUGRO
1676.0	[m]	DC	FUGRO
1680.0	[m]	DC	FUGRO
1686.0	[m]	DC	FUGRO
1692.0	[m]	DC	FUGRO
1695.0	[m]	DC	FUGRO
1704.0	[m]	DC	FUGRO
1713.0	[m]	DC	FUGRO



1722.0	[m]	DC	FUGRO
1800.0	[m]	DC	FUGRO
1806.0	[m]	DC	FUGRO
1815.0	[m]	DC	FUGRO
1821.0	[m]	DC	FUGRO
1830.0	[m]	DC	FUGRO
1836.0	[m]	DC	FUGRO
1842.0	[m]	DC	FUGRO
1848.0	[m]	DC	FUGRO
1854.0	[m]	DC	FUGRO
1860.0	[m]	DC	FUGRO
1866.0	[m]	DC	FUGRO
1869.0	[m]	DC	FUGRO
1875.0	[m]	DC	FUGRO
1881.0	[m]	DC	FUGRO
1887.0	[m]	DC	FUGRO
1890.0	[m]	DC	FUGRO
1893.0	[m]	C	FUGRO
1895.8	[m]	C	FUGRO
1897.0	[m]	C	FUGRO
1899.7	[m]	C	FUGRO
1928.9	[m]	C	FUGRO
1929.0	[m]	C	FUGRO
1929.9	[m]	C	FUGRO
1939.6	[m]	C	FUGRO

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		1901.30	0.00	OIL		YES
MDT		1928.30	0.00	OIL		YES
MDT		1940.00	0.00	OIL		YES

Lithostratigraphy



Top depth [mMD RKB]	Lithostrat. unit
137	NORDLAND GP
772	UTSIRA FM
846	UNDIFFERENTIATED
897	HORDALAND GP
906	SKADE FM
1078	UNDIFFERENTIATED
1530	ROGALAND GP
1530	BALDER FM
1551	SELE FM
1587	LISTA FM
1665	VÅLE FM
1672	SHETLAND GP
1672	EKOFISK FM
1678	TOR FM
1747	HOD FM
1801	BLODØKS FM
1803	SVARTE FM
1817	CROMER KNOLL GP
1817	RØDBY FM
1873	SOLA FM
1883	ÅSGARD FM
1894	VIKING GP
1894	INTRA DRAUPNE FM SS
1930	VESTLAND GP
1930	HUGIN FM
1939	BASEMENT

Logs

Log type	Log top depth [m]	Log bottom depth [m]
CMR ECS GR	1673	2064
FMI HNGS HRLA	1673	2067
LWD - ARCVRES6 GVR6 TELE	1676	1893
LWD - ARCVRES6 TELE	1893	2067
MDT	1895	1940
MSIP GPIT PEX	1231	2056
MWD - ARCVRES8 PDX5 TELE	1213	1676



MWD - ARCVRES9 TELE	211	1223
PEX DSI	525	1215
VSP	600	2067

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	211.0	36	215.0	0.00	
SURF.COND.	20	602.0	26	610.0	1.56	LOT
INTERM.	13 3/8	1213.0	17 1/2	1223.0	1.69	LOT
INTERM.	9 5/8	1673.0	12 1/4	1676.0	1.56	LOT
OPEN HOLE		2067.0	8 1/2	2067.0	0.00	

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
149	1.35	10.0		Spud Mud	
610	1.30	36.0		Performadril	
973	1.30	33.0		Performadril	
1242	1.35	33.0		Performadril	
1394	1.24	33.0		Performadril	
1676	1.35	35.0		Performadril	
1893	1.20	29.0		Performadril	
1947	1.21	34.0		Performadril	
1952	1.22	34.0		Performadril	
2067	1.20	31.0		Performadril	

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]
6952 Formation pressure (Formasjonstrykk)	pdf	0.20

