Generell informasjon

Brønnbane navn	16/5-4
Type	EXPLORATION
Formål	APPRAISAL
Status	P&A
Pressemelding	lenke til pressemelding
Faktakart i nytt vindu	lenke til kart
Hovedområde	NORTH SEA
Felt	JOHAN SVERDRUP
Funn	16/2-6 Johan Sverdrup
Brønn navn	16/5-4
Seismisk lokalisering	LN0902R12- inline 5085 & crossline 2899
Utvinningstillatelse	501
Boreoperatør	Lundin Norway AS
Boretillatelse	1468-L
Boreinnretning	BREDFORD DOLPHIN
Boredager	35
Borestart	23.08.2013
Boreslutt	28.09.2013
Frigitt dato	28.09.2015
Publiseringsdato	28.09.2015
Opprinnelig formål	APPRAISAL
Gjenåpnet	NO
Innhold	OIL
Funnbrønnbane	NO
1. nivå med hydrokarboner, alder	LATE JURASSIC
1. nivå med hydrokarboner, formasjon.	INTRA DRAUPNE FM SS
Avstand, boredekk - midlere havflate [m]	25.0
Vanndybde ved midlere havflate [m]	108.0
Totalt målt dybde (MD) [m RKB]	2100.0
Totalt vertikalt dybde (TVD) [m RKB]	2100.0
Maks inklinasjon [°]	0.8
Eldste penetrerte alder	TRIASSIC
Eldste penetrerte formasjon	SKAGERRAK FM
Geodetisk datum	ED50
NS grader	58° 42' 46.98'' N
ØV grader	2° 35' 55.7'' E

NS UTM [m]	6508319.66
ØV UTM [m]	476757.90
UTM sone	31
NPDID for brønnbanen	7258

Brønnhistorie

General

Well 16/5-4 was drilled on the south-western flank of the Johan Sverdrup Field on the Utsira High in the North Sea. The well was placed about 4.3 kilometres southwest of appraisal well 16/5-2 S and about 3.1 kilometres southeast of well 16/5-3. The objective of the well was to delineate the Johan Sverdrup discovery by examining the thickness, properties and depth of the reservoir, as well as determine the height of the oil column and clarify the oil-water contact in the south-western part.

Operations and results

Appraisal well 16/5-4 was spudded with the semi-submersible installation Bredford Dolphin on 23 August 2013 and drilled to TD at 2100 m in the Triassic Skagerrak Formation. No shallow gas was seen in the top holed including the 9 7/8" pilot hole. No significant problem was encountered in the operations. The well was drilled with seawater and hi-vis sweeps down to 701 m and with Performadril water based mud with glycols from 701 m to TD.

The well went directly from Cretaceous marls into Jurassic reservoir sandstones and no Draupne Formation shale was present in this location, as expected. The well encountered a 6 meters thick Intra-Draupne Formation sandstone section with top at 1930.4 m. This is thinner than predicted. The section consists of unconsolidated sandstones with excellent properties. The pressure measurements confirmed the reservoir to be in the same pressure regime as the Johan Sverdrup discovery. The well showed an oil-down-to situation and consequently no free water level was encountered. The Jurassic section is resting on Triassic sediments consisting of very fine to fine grained sandstones with minor stringers of claystones and siltstones. The only oil shows in the well were seen in the Intra Draupne Formation sandstone. These shows did not extend into the underlying Triassic rocks.

Two cores were cut in the interval 1920 to 1964.5 m with close 100% recovery. The core to log depth shift is -0.5 m for both cores. MDT fluid samples were taken at 1933.01 m (oil), 1943 m (water), and 1948.01 m (water).

The well was plugged abandoned on 28 November as an oil appraisal well.

Testing

Two EXPRO’s CaTS wireless gauge technology for long term post-abandonment monitoring of the Johan Sverdrup Field were installed at 1947.24 and 1931.7 m. The CATS gauges will measure pressure and temperature over a ca 5 years period. This is part of the planning process for an optimal recovery strategy for the discovery. No drill stem test was performed.

Borekaks i Sokkeldirektoratet

Borekaksprøve, topp dybde [m]	Borekaksprøve, bunn dybde [m]
710.00	2099.00

Borekaks tilgjengelig for prøvetaking?	YES

Borekjerner i Sokkeldirektoratet

Kjerneprøve nummer	Kjerneprøve - topp dybde	Kjerneprøve - bunn dybde	Kjerneprøve dybde - enhet
1	1920.0	1938.2	[m]
2	1938.3	1963.8	[m]

Total kjerneprøve lengde [m]	43.7
Kjerner tilgjengelig for prøvetaking?	YES

Oljeprøver i Sokkeldirektoratet

Test type	Flaske nummer	Topp dyp MD [m]	Bunn dyp MD [m]	Væske type	Test tidspunkt	Prøver tilgjengelig
DST		1933.00	0.00	OIL	19.10.2012 - 00:00	NO

Litostratigrafi

Topp Dyb [mMD RKB]	Litostrat. enhet
133	NORDLAND GP
133	UNDIFFERENTIATED
282	NO FORMAL NAME
416	UNDIFFERENTIATED
764	UTSIRA FM
915	UNDIFFERENTIATED
963	HORDALAND GP
963	SKADE FM
1028	NO FORMAL NAME
1371	NO FORMAL NAME
1403	ROGALAND GP
1403	BALDER FM

1422	SELE FM
1435	LISTA FM
1471	VÅLE FM
1487	SHETLAND GP
1487	EKOFISK FM
1491	TOR FM
1648	HOD FM
1778	BLODØKS FM
1784	SVARTE FM
1822	CROMER KNOLL GP
1822	RØDBY FM
1923	SOLA FM
1925	ÅSGARD FM
1930	VIKING GP
1930	DRAUPNE FM
1931	INTRA DRAUPNE FM SS
1936	HEGRE GP
1936	SKAGERRAK FM

Logger

Type logg	Topp dyp for logg [m]	Bunn dyp for logg [m]
GR MSIP PPC FMI	1862	2098
GR PEX HNGS ECS HRLA ADT	1862	2099
GR XPT CMR	1873	2095
MDT GR	1928	2070
MSCT GR	1877	2092
MWD - GR PWD RES DIR	1830	1918
MWD - GR PWD RES DIR SON	119	708
MWD - RES INC GR PWD DIR CAL DEN	660	1864
PWD GR RES DIR DEN CAL NEU SON	1838	2098
VSP GR	652	2089

Foringsrør og formasjonsstyrketester

Type utforing	Utforing diam. [tommer]	Utforing dybde [m]	Brønnbane diam. [tommer]	Brønnbane dyp [m]	LOT/FIT slam eqv. [g/cm3]	Type formasjonstest
CONDUCTOR	30	211.0	36	214.0	0.00	
SURF.COND.	20	694.0	26	701.0	1.75	FIT
PILOT HOLE		710.0	9 7/8	710.0	0.00	
INTERM.	9 5/8	1862.0	12 1/4	1871.0	1.64	LOT
LINER	7	2092.0	8 1/2	2100.0	0.00	

Boreslam

Dybde MD [m]	Egenvekt, slam [g/cm3]	Viskositet, slam [mPa.s]	Flytegrense [Pa]	Type slam	Dato, måling
133	1.50	300.0		Water Based	
133	1.04	15.0		Water Based	
183	1.40	300.0		Water Based	
734	1.35	29.0		Water Based	
1871	1.40	54.0		Water Based	
2100	1.15	36.0		Water Based	