



Generell informasjon

Brønnbane navn	25/11-18
Type	EXPLORATION
Formål	APPRAISAL
Status	P&A
Faktakart i nytt vindu	lenke til kart
Hovedområde	NORTH SEA
Felt	GRANE
Funn	25/11-15 Grane
Brønn navn	25/11-18
Seismisk lokalisering	NH 9301-INLINE 604&CROSSLINE 1413
Utvinningstillatelse	169
Boreoperatør	Norsk Hydro Produksjon AS
Boretillatelse	794-L
Boreinnretning	WEST VANGUARD
Boredager	76
Borestart	10.08.1994
Boreslutt	24.10.1994
Frigitt dato	24.10.1996
Publiseringsdato	29.08.2003
Opprinnelig formål	APPRAISAL
Gjenåpnet	NO
Innhold	OIL
Funnbrønnbane	NO
1. nivå med hydrokarboner, alder	PALEOCENE
1. nivå med hydrokarboner, formasjon.	HEIMDAL FM
Avstand, boredekk - midlere havflate [m]	22.0
Vanndybde ved midlere havflate [m]	128.0
Totalt målt dybde (MD) [m RKB]	1875.0
Totalt vertikalt dybde (TVD) [m RKB]	1874.0
Maks inklinasjon [°]	9.3
Temperatur ved bunn av brønnbanen [°C]	83
Eldste penetrerte alder	LATE CRETACEOUS
Eldste penetrerte formasjon	HOD FM
Geodetisk datum	ED50
NS grader	59° 9' 8.45" N



ØV grader	2° 28' 28.79" E
NS UTM [m]	6557285.94
ØV UTM [m]	469950.36
UTM sone	31
NPDID for brønnbanen	2358

Brønnhistorie

**General**

Well 25/11 -18 was drilled to appraise the 25/11-15 Grane discovery drilled in 1991. The primary objectives of 25/11-18 were to confirm beyond reasonable doubt recoverable oil reserves greater than 30 million Sm³ in the Heimdal Formation in the Grane Discovery prior to initiating PDO activities; to obtain an Utsira formation water sample and water production rates in order to design the water injection system for the Grane Field; to confirm top and base reservoir, reservoir development, continuity, and quality of Heimdal sand in order to reduce the uncertainties in the resource estimates; to obtain velocity information as input to depth conversion model for the Grane Field; and to test coiled tubing drilling/coring technology as concept for future cost savings.

Operations and results

Appraisal well 25/11-18 was spudded with the semi-submersible installation "West Vanguard" on 10 August 1994 and drill to a total depth of 1875 m in the Late Cretaceous limestones of the Hod Formation. Due to technical problems it was not possible to do wire line logging at TD of the original well. The well was technically sidetracked (25/11-18 T2) with kick-off at 1390 m. The well was drilled with spud mud through the 36" and 24" sections down to 563 m, with polymer mud through the 17 1/2" section to 1183 m, with "ANCO 2000" mud from 1183 through the 8 1/2" section and into the slim 4 1/8" section down to 1690 m where the hole was displaced to "AQUACOL" mud. & Drilling of the 4 1/8" section continued with "AQUACOL" mud down to TD at 1860 m. The technical sidetrack was drilled as a 6" hole to final TD at 1875 m using KCl / Polymer mud. Coiled tubing drilling and coring and slim hole logging was proven possible from an offshore floater with acceptable quality on geological information. Operations, however, were hampered by problems related to junk and hole instability due to low mud weights.

A thin, 1 m thick oil bearing sand was encountered near the top of the Balder Formation at 1675 m. Heimdal Sand was penetrated at 1741.5 m in well 25/11-18 T2. A gross reservoir thickness of 55.5m was defined, giving a net pay of 47.1m. Good oil shows were seen on cores in the interval 1720 m to 1794 m in the original well and at 1606 m (SWC) and in the interval 1720 m to 1743 m in the sidetrack. The pressure data from the Heimdal Formation indicates a possible 1.2 bar pressure difference to well 25/11-15. Oil-water contact in well 25/11-18 was at 1765.2 m TVD, 2 m deeper than in well 25/11-15. Oil composition in 25/11-18 appears geochemically identical to oil in 25/11-15. No free gas cap was found in the sandstones. The well proved the Grane Field reserves to be greater than 30 million Sm³, confirming the reservoir and seismic models. Velocity information from the well indicated local / extended pull up of top and base of reservoir.

The Utsira water sample was of excellent quality. Dynamic test data of good quality were obtained. A total of 16 cores were cut in the interval from 1690 m to 1805 m in the Sele, Lista, and Heimdal Formations. The twelve first cores were cut in the 4 1/8" section of the original hole with recovery from 0 % to 93.3%. The last four cores were cut in the 6" technical sidetrack in the interval 1712 m to 1743.7 m with 75% to 96% recovery. A SRFT wire line fluid sample was recovered from 1755 m in the Heimdal Formation. The well was permanently abandoned as an oil appraisal well on 24. October 1993.

Testing

A DST was performed over the interval 815 m to 865 m in the Utsira Formation. The test produced at maximum rate 3934 Sm³ water and no gas pr day, at sampling rate 1045 Sm³ water and 1081 Sm³ gas pr day. No sand was produced at either rate. The gas gravity was 0.63 (air = 1).



Borekaksprøve, topp dybde [m]	Borekaksprøve, bunn dybde [m]
570.00	1875.00

Borekaks tilgjengelig for prøvetaking?	YES
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Kjernebilder



1690-1691m



1690-1691m



1699-1700m



1699-1700m



1728-1729m



1720-1722m



1720-1722m



1720-1722m



1720-1722m



1747-1750m



1747-1750m



1747-1750m



1747-1750m



1747-1750m



1751-1756m



1751-1756m



1751-1756m



1751-1756m



1751-1756m



1751-1756m



1751-1756m



1751-1756m



1751-1756m



1769-1772m



1769-1172m



1769-1772m



1769-1772m



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1769-1772m



1778-1782m



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1787-1794m



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1787-1794m



1787-1749m



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1733-1742m



1733-1742m

Palynologiske preparater i Sokkeldirektoratet

Prøve dybde	Dybde enhet	Prøve type	Laboratorie
1720.0	[m]	C	0D
1728.0	[m]	C	OD
1728.1	[m]	C	0D



1740.1	[m]	C	0D
1747.0	[m]	C	0D
1751.1	[m]	C	0D
1778.0	[m]	C	0D
1796.0	[m]	C	0D
1799.0	[m]	C	0D
1804.0	[m]	C	0D
1805.0	[m]	DC	0D
1810.0	[m]	DC	0D
1820.0	[m]	DC	0D

Oljeprøver i Søkeldirektoratet

Test type	Flaske nummer	Topp dyp MD [m]	Bunn dyp MD [m]	Væske type	Test tidspunkt	Prøver tilgjengelig
DST		0.00	0.00	WATER	14.10.1994 - 00:00	YES

Litostratigrafi

Topp Dyb [mMD RKB]	Litostrat. enhet
150	NORDLAND GP
664	UTSIRA FM
744	NO FORMAL NAME
811	HORDALAND GP
811	SKADE FM
1048	UNDIFFERENTIATED
1108	NO FORMAL NAME
1114	UNDIFFERENTIATED
1437	GRID FM
1464	NO FORMAL NAME
1674	ROGALAND GP
1674	BALDER FM
1690	SELE FM
1695	LISTA FM
1742	HEIMDAL FM
1798	LISTA FM
1807	VÅLE FM



1834	SHETLAND GP
1834	EKOFISK FM
1850	TOR FM
1865	HOD FM

Spleisede logger

Dokument navn	Dokument format	Dokument størrelse [KB]
2358	pdf	0.25

Geokjemisk informasjon

Dokument navn	Dokument format	Dokument størrelse [KB]
2358_1	pdf	1.91
2358_10	pdf	1.90
2358_11	pdf	1.93
2358_12	pdf	1.42
2358_2	pdf	1.20
2358_3	pdf	1.78
2358_4	pdf	1.82
2358_5	pdf	1.78
2358_6	pdf	1.79
2358_7	pdf	1.84
2358_8	pdf	1.76
2358_9	pdf	1.59

Dokumenter - rapportert av utvinningstillatelsen (frigitt ihht til regelverk)

Dokument navn	Dokument format	Dokument størrelse [KB]
2358_25_1_18_COMPLETION_REPORT_AND_LOG	pdf	49.53

Borestrengtester (DST)





Test nummer	Fra dybde MD [m]	Til dybde MD [m]	Reduksjonsven til størrelse [mm]
1.0	815	865	0.0

Test nummer	Endelig avstengningstrykk [MPa]	Endelig strømningstrykk [MPa]	Bunnhullstrykk [MPa]	Borehullstemperatur [°C]
1.0				33

Test nummer	Olje produksjon [Sm3/dag]	Gass produksjon [Sm3/dag]	Oljetetthet [g/cm3]	Gasstygde rel. luft	GOR [m3/m3]
1.0		1081		0.630	

Logger

Type logg	Topp dyp for logg [m]	Bunn dyp for logg [m]
BGF-A	1480	1862
CST GR	1390	1830
DLL MSFL LDL CNL LSS BGT GR SP A	502	1070
DLL MSFL LDL CNL LSS GR SP AMS	1096	1662
DSI HLDT CNT NGT AMS	1373	1867
FMS-B GR AMS	1600	1868
IRTJ ECD-C GR	1650	1732
MWD - GR RES DIR	105	1684
MWD - GR RES DIR	1380	1876
SMRS MDLT GR SP AMS	1373	1867
SRFT GR	1675	1797
USIT CBL VDL GR CCL	1650	1732
VSP	1096	1662

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
SURF.COND.	30	235.0	36	235.0	0.00	LOT
INTERM.	18 5/8	563.0	24	563.0	0.00	LOT



INTERM.	13 3/8	1180.0	17 1/2	1180.0	1.77	LOT
INTERM.	7	1688.0	8 1/2	1688.0	1.86	LOT
OPEN HOLE		1875.0	6	1875.0	0.00	LOT

Boreslam

Dybde MD [m]	Egenvekt, slam [g/cm3]	Viskositet, slam [mPa.s]	Flytegrense [Pa]	Type slam	Dato, måling
563	1.03	16.0		WATER BASED	
1028	1.30	28.0		WATER BASED	
1180	1.06	16.0		WATER BASED	
1183	1.13	25.0		WATER BASED	
1207	1.30	28.0		WATER BASED	
1290	1.28	23.0		WATER BASED	
1385	1.30	27.0		WATER BASED	
1585	1.28	23.0		WATER BASED	
1688	1.20	21.0		WATER BASED	
1690	1.04	28.0		DUMMY	
1701	1.08	285.0		DUMMY	
1702	1.04	24.0		DUMMY	
1702	1.04	23.0		DUMMY	
1712	1.30	32.0		WATER BASED	
1720	1.08	28.0		DUMMY	
1732	1.08	24.0		DUMMY	
1740	1.25	18.0		WATER BASED	
1778	1.08	28.0		DUMMY	
1819	1.30	35.0		WATER BASED	
1860	1.25	38.0		DUMMY	
1875	1.30	35.0		WATER BASED	

Trykkplott

Porertrykksdataene kommer fra logging i brønnen hvis ingen annen kilde er oppgitt. I noen brønner der trykk ikke er logget, er det brukt informasjon fra formasjonstester eller brønnspark. Trykkdataene er rapportert inn til Oljedirektoratet og videre prosessert og kvalitetssikret av IHS Markit.

Dokument navn	Dokument format	Dokument størrelse [KB]
2358 Formation pressure (Formasjonstrykk)	pdf	0.17

