



Generell informasjon

Brønnbane navn	25/2-13
Type	EXPLORATION
Formål	APPRAISAL
Status	P&A
Faktakart i nytt vindu	lenke til kart
Hovedområde	NORTH SEA
Felt	HUGIN
Funn	25/2-5 Lille Frøy
Brønn navn	25/2-13
Seismisk lokalisering	EL 8801 RAD 367 & KOLONNE 483
Utvinningstillatelse	026
Boreoperatør	Elf Petroleum Norge AS
Boretillatelse	617-L
Boreinnretning	WEST VANGUARD
Boredager	142
Borestart	06.09.1989
Boreslutt	25.01.1990
Plugget og forlatt dato	06.08.2015
Frigitt dato	25.01.1992
Publiseringsdato	15.08.2008
Opprinnelig formål	APPRAISAL
Gjenåpnet	NO
Innhold	OIL/GAS
Funnbrønnbane	NO
1. nivå med hydrokarboner, alder	MIDDLE JURASSIC
1. nivå med hydrokarboner, formasjon.	HUGIN FM
2. nivå med hydrokarboner, alder	MIDDLE JURASSIC
2. nivå med hydrokarboner, formasjon	SLEIPNER FM
3. nivå med hydrokarboner, alder	EARLY JURASSIC
3. nivå med hydrokarboner, formasjon	STATFJORD GP
Avstand, boredekk - midlere havflate [m]	22.0
Vanndybde ved midlere havflate [m]	117.0
Totalt målt dybde (MD) [m RKB]	3908.0
Totalt vertikalt dybde (TVD) [m RKB]	3903.0



Maks inklinasjon [°]	6.2
Temperatur ved bunn av brønnbanen [°C]	128
Eldste penetrerte alder	LATE TRIASSIC
Eldste penetrerte formasjon	SMITH BANK FM
Geodetisk datum	ED50
NS grader	59° 47' 37.69" N
ØV grader	2° 27' 12.52" E
NS UTM [m]	6628728.80
ØV UTM [m]	469325.46
UTM sone	31
NPDID for brønnbanen	1459

Brønnhistorie

General

Well 25/2-13 was drilled in the central part of the Viking Graben, east of the Frigg area. The block straddles the eastern flank of the graben and the north-western part of the Utsira High. It was the first appraisal well on the 25/2-5 discovery, which discovered oil in different reservoirs of the Vestland Group and the Statfjord Formation. The structure is a north-south trending horst, which is located on a terrace in the southern part of the block. Well 25/2-13 was drilled close to a major normal fault bounding the structure. The main objective was to evaluate the western panel. The well should test the fluid columns in both the Vestland Group and the Statfjord Formation, obtain data for fluid characterisation and productivity, and try to define the hydrocarbon contacts of the reservoirs.

Operations and results

Appraisal well 25/2-13 was spudded 6 June 1989 by the semi-submersible installation West Vanguard drilled to TD at 3909 m in the Triassic Smith Bank Formation. The well was drilled to 13" 3/8 casing point (2043 m) without problems, but at 2178 m the bit got stuck and a sidetrack was needed. The sidetrack was kicked off from 2070 m. The first attempt failed, but the second was successful. During coring of the Vestland Group, the core barrel was lost in hole and a second sidetrack was decided after unsuccessful fishing. This sidetrack was kicked off from 3306. The mud that was used in the Jurassic section (3318 - 3887 m) was an FCL type mud which was based on fresh water with added bentonite, polymers, lignosulfonate and barite.

Top Vestland Group came in at 3342 m as prognosed, and with mobile hydrocarbons in two layers; oil in the top ca 40 - 60 m of the reservoir with an unclear OWC in the interval 3382 - 3415 m, and with oil shows down to 3423 m; and gas-condensate in an isolated layer in the Lower Vestland Group with a gross thickness = 33 m. However, the reservoir properties in the Vestland Group were not as good as in 25/2-5. Top Statfjord came in at 3695.5 m, 50 m deeper than prognosed with thickness as expected, but with mobile oil only in a thin zone at the very top. A very tentative OWC was placed at 3709 m, based on RFT pressure data logs, and some moveable oil in DST 2A. Fair shows were recorded down to 3729 m.

A total of 19 cores were cut in this well. Cores 1 and 2 were cut in the original hole from 3340 to 3394.5 m, while cores 3 to 19 were cut in the sidetracked hole from 3387 to 3468.5 m. The core to log depth shifts for cores #1 to #7 are in the range 2.75 to 7.75 m.



The core to log depth shifts for cores #11 to #19 are in the range 4.2 to 5.5 m. RFT samples were taken at 3696.5 m (mud filtrate with traces of oil very little gas) and 3727.5 m (mud filtrate with very little gas).

The well was suspended 25 January 1990 as an oil / gas / condensate appraisal.

Testing

Seven drill stem tests were conducted in this well (DST 1,2A & 2B, 3A & 3B, 4, 5). Tests 1 and 2 were conducted in the Statfjord Formation while tests 3, 4 and 5 were conducted in the Vestland Group.

DST #1 tested the interval 3759 - 3785 m and produced a total of 42.5 m³ formation water. The final shut-in temperature was 124.4 deg C.

DST #2A tested the interval 3706 - 3713 m, which produced no formation fluids to surface.

DST #2B tested the interval 3695 - 3698 m in addition to the DST2 #A interval. The test flowed 69 sm³ oil and 29400 Sm³ gas /day on a 16/64" choke with a WHP of 85 bar and GOR of 425 sm³/sm³. The oil density was 0.821 g/cm³. The final shut-in temperature was 122.8 deg C.

DST #3A tested the interval 3480 - 3491. This zone was very tight and flowed 154 litres only. Due to the low rates the movable formation fluid could not be identified. The test confirmed that the zone was in a separate and higher pressure regime than the Vestland Group hydrocarbon reservoirs above it.

DST #3B tested the intervals 3437 - 3447 plus 3449.8 - 3460 in addition to the DST #3A interval. The test flowed 242000 sm³ gas-condensate /day with a GOR of 1115 sm³/sm³ and WHP of 170 bar on a 32/64" choke. The condensate density was 0.789 g/cm³. The final shut-in temperature was 115 deg C.

DST #4 tested the interval 3411.5 - 3423 and produced a total of 2856 litres Formation water. The final shut-in temperature was 112.8 deg C.

DST #5 tested the intervals 3343 - 3370 plus 3376.5 - 3382. The test flowed 651 sm³ oil and 213600 Sm³ gas /day on a 40/64" choke with a WHP of 125 bar and GOR of 328 sm³/sm³. The oil density was 0.825 g/cm³ and the gas gravity was 0.816 (air = 1). The final shut-in temperature was 111.8 deg C.

Borekaks i Sokkeldirektoratet

Borekaksprøve, topp dybde [m]	Borekaksprøve, bunn dybde [m]
205.00	3907.50

Borekaks tilgjengelig for prøvetaking?	YES
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Borekjerter i Sokkeldirektoratet

Kjerneprøve nummer	Kjerneprøve - topp dybde	Kjerneprøve - bunn dybde	Kjerneprøve dybde - enhet
1	3340.0	3341.8	[m]



2	3367.0	3394.8	[m]
3	3387.0	3406.0	[m]
4	3405.0	3423.0	[m]
5	3429.0	3441.0	[m]
6	3441.0	3469.0	[m]
7	3459.0	3468.6	[m]
8	3649.0	3667.1	[m]
9	3667.1	3669.7	[m]
11	3709.0	3726.3	[m]
12	3727.0	3744.7	[m]
13	3745.0	3763.0	[m]
14	3763.0	3781.5	[m]
15	3781.5	3792.0	[m]
16	3792.0	3810.6	[m]
17	3810.5	3828.8	[m]
18	3829.0	3847.0	[m]
19	3847.0	3854.2	[m]

Total kjerneprøve lengde [m]	280.8
Kjerner tilgjengelig for prøvetaking?	YES

Kjernebilder



3340-3345m



3345-3350m



3350-3355m



3355-3360m



3360-3361m



3367-3372m



3372-3377m



3377-3382m



3382-3387m



3387-3392m



3392-3394m



3387-3392m



3392-3397m



3397-3402m



3402-3405m



3405-3410m



3410-3415m



3415-3420m



3420-3423m



3423-3428m



3428-3433m



3433-3438m



3438-3441m



3441-3446m



3446-3451m



3451-3456m



3456-3459m



3459-3464m



3464-3468m



3709-3714m



3714-3719m



3719-3724m



3724-3726m



3727-3732m



3732-3737m



3737-3742m



3742-3744m



3745-3750m



3750-3755m



3755-3760m



3760-3763m



3763-3768m



3768-3773m



3737-3778m



3778-3781m



3781-3786m



3786-3791m



3791-3792m



3792-3797m



3797-3802m



3802-3807m



3807-3810m



3810-3815m



3815-3820m



3820-3825m



3825-3828m



3829-3834m



3834-3839m



3839-3844m



3844-3847m



3847-3852m



3852-3854m

Palynologiske preparater i Sökkeldirektoratet

Prøve dybde	Dybde enhet	Prøve type	Laboratorie
3341.0	[m]	C	APT
3341.5	[m]	C	APT
3342.3	[m]	C	APT



3344.6	[m]	C	APT
3345.7	[m]	C	APT
3353.3	[m]	C	APT
3357.5	[m]	C	APT
3367.6	[m]	C	APT
3369.6	[m]	C	APT
3371.6	[m]	C	APT
3378.7	[m]	C	APT
3379.6	[m]	C	APT
3381.9	[m]	C	APT
3397.5	[m]	C	APT
3399.6	[m]	C	APT
3404.7	[m]	C	APT
3405.7	[m]	C	APT
3410.4	[m]	C	APT
3414.9	[m]	C	APT
3418.0	[m]	C	APT
3420.8	[m]	C	APT
3422.7	[m]	C	APT
3423.7	[m]	C	APT
3426.2	[m]	C	APT
3427.2	[m]	C	APT
3433.0	[m]	C	APT
3433.3	[m]	C	APT
3439.3	[m]	C	APT
3439.8	[m]	C	APT
3444.2	[m]	C	APT
3445.6	[m]	C	APT
3446.0	[m]	C	APT
3447.8	[m]	C	APT
3450.9	[m]	C	APT
3452.6	[m]	C	APT
3457.4	[m]	C	APT
3459.8	[m]	C	APT
3460.1	[m]	C	APT
3465.0	[m]	C	APT
3465.0	[m]	C	APT
3465.1	[m]	C	APT
3468.5	[m]	C	APT
3469.3	[m]	C	APT



3469.6 [m]	C	APT
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Oljeprøver i Sokkeldirektoratet

Test type	Flaske nummer	Topp dyp MD [m]	Bunn dyp MD [m]	Væske type	Test tidspunkt	Prøver tilgjengelig
DST		2252.00	0.00		14.02.1986 - 00:00	NO
DST	DST2B	2706.00	2713.00		20.12.1989 - 00:00	YES
DST	DST3B	3396.96	0.00	WATER	01.01.1990 - 00:00	NO
DST	DST4	3403.00	3411.00	WATER	07.01.1990 - 15:43	YES
DST	DST5	3343.00	3382.00	WATER	15.01.1990 - 00:00	YES
DST	DST5	3343.00	3382.00		15.01.1990 - 00:00	YES
DST	DST5	3343.00	3382.00		15.01.1990 - 00:00	YES

Litostratigrafi

Topp Dyb [mMD RKB]	Litostrat. enhet
139	NORDLAND GP
437	UTSIRA FM
1067	HORDALAND GP
2170	ROGALAND GP
2170	BALDER FM
2240	HERMOD FM
2400	LISTA FM
2586	TY FM
2651	VÅLE FM
2706	SHETLAND GP
2706	HARDRÅDE FM
3032	KYRRE FM
3187	TRYGGVASON FM
3268	BLODØKS FM
3286	SVARTE FM



3318	VIKING GP
3318	DRAUPNE FM
3329	HEATHER FM
3342	VESTLAND GP
3342	HUGIN FM
3409	SLEIPNER FM
3491	DUNLIN GP
3491	DRAKE FM
3565	COOK FM
3645	AMUNDSEN FM
3696	STATFJORD GP
3887	NO GROUP DEFINED
3887	SMITH BANK FM

Dokumenter - eldre Sokkeldirektoratets WDSS rapporter og andre relaterte dokumenter

Dokument navn	Dokument format	Dokument størrelse [KB]
1459_01_WDSS_General_Information	pdf	0.26
1459_02_WDSS_completion_log	pdf	0.22

Dokumenter - rapportert av utvinningstillatelsen (frigitt ihht til regelverk)

Dokument navn	Dokument format	Dokument størrelse [KB]
1459_25_2_13_COMPLETION_REPORT_AND_LOG	pdf	34.10

Borestrengtester (DST)

Test nummer	Fra dybde MD [m]	Til dybde MD [m]	Reduksjonsven til størrelse [mm]
1.0	3785	3774	4.7
2.0	3713	3706	0.0
2.3	3713	3695	6.3
3.1	3460	3437	12.5
5.0	3382	3343	15.8





Test nummer	Endelig avstengningstrykk [MPa]	Endelig strømningstrykk [MPa]	Bunnhullstrykk [MPa]	Borehullstemperatur [°C]
1.0	10.000	10.000		124
2.0				
2.3	8.500			123
3.1	16.000			115
5.0	12.500			112

Test nummer	Olje produksjon [Sm3/dag]	Gass produksjon [Sm3/dag]	Oljetetthet [g/cm3]	Gasstygde rel. luft	GOR [m3/m3]
1.0					
2.0					
2.3	69	29400	0.823	0.880	425
3.1	210	242000	0.800	0.800	1120
5.0	650	213600	0.829	0.818	330

Logger

Type logg	Topp dyp for logg [m]	Bunn dyp for logg [m]
CBL CCL GR	1575	3300
CBL VDL GR	1330	2044
DIL BHC LDL GR	700	2022
DIL LSS GR	3300	3903
DIL MSFL GR AMS SP	3300	3529
DIL SLS LDL GR	2044	3319
DLL MSFL GR	3675	3900
FMS GR	3299	3700
FMS GR	3650	3812
LDL CNL NGL	3300	3529
LDL CNL NGT	3476	3901
MWD - GR RES DIR	202	3908
RFT	3346	3418
RFT	3354	3489
RFT	3482	3886
RFT	3696	3696
SHDT GR	2044	3312



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	199.0	36	201.0	0.00	LOT
INTERM.	20	700.0	26	714.0	1.20	LOT
INTERM.	13 3/8	2043.0	17 1/2	2057.0	1.72	LOT
INTERM.	9 5/8	3301.0	12 1/4	3315.0	1.90	LOT
LINER	7	3903.0	8 1/2	3908.0	0.00	LOT

Boreslam

Dybde MD [m]	Egenvekt, slam [g/cm3]	Viskositet, slam [mPa.s]	flytegrense [Pa]	Type slam	Dato, måling
1314	1.16	20.0	6.8	WATER BASED	18.09.1989
1331	1.17	24.0	7.8	WATER BASED	18.09.1989
1631	1.17	22.0	5.8	WATER BASED	18.09.1989
1747	1.17	27.0	8.8	WATER BASED	19.09.1989
2036	1.17	20.0	5.8	WATER BASED	20.09.1989
2057	1.18	24.0	7.8	WATER BASED	21.09.1989
2188	1.20	26.0	11.7	WATER BASED	25.09.1989
2238	1.27	39.0	14.2	WATER BASED	04.10.1989
2301	1.27	36.0	13.2	WATER BASED	05.10.1989
2502	1.27	32.0	11.7	WATER BASED	09.10.1989
2502	1.27	32.0	10.7	WATER BASED	06.10.1989
2739	1.27	31.0	11.2	WATER BASED	09.10.1989
2807	1.27	33.0	12.2	WATER BASED	10.10.1989
2875	1.27	33.0	13.2	WATER BASED	12.10.1989
2938	1.27	34.0	12.2	WATER BASED	12.10.1989
3009	1.27	33.0	11.7	WATER BASED	13.10.1989
3159	1.20	37.0	10.7	WATER BASED	07.11.1989
3201	1.27	32.0	11.2	WATER BASED	16.10.1989
3215	1.27	33.0	11.2	WATER BASED	17.10.1989
3282	1.27	34.0	12.2	WATER BASED	18.10.1989
3315	1.27	32.0	10.7	WATER BASED	19.10.1989
3340	1.27	33.0	11.7	WATER BASED	27.10.1989
3395	1.27	30.0	8.8	WATER BASED	27.10.1989
3423	1.20	39.0	13.2	WATER BASED	07.11.1989
3525	1.20	34.0	10.2	WATER BASED	08.11.1989



3799	1.20	36.0	7.3	WATER BASED	21.11.1989
3811	1.20	38.0	8.3	WATER BASED	22.11.1989
3847	1.20	38.0	8.8	WATER BASED	22.11.1989
3856	1.21	38.0	9.8	WATER BASED	23.11.1989
3908	1.20	36.0	13.7	WATER BASED	24.11.1989

Tynnslip i Sokkeldirektoratet

Dybde	Enhet
3340.10	[m]
3360.25	[m]
3405.24	[m]
3367.42	[m]
3421.10	[m]
3404.10	[m]
3394.67	[m]
3887.10	[m]
3441.05	[m]
3440.45	[m]
3424.20	[m]
3468.00	[m]
3459.30	[m]
3458.10	[m]

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]
1459 Formation pressure (Formasjonstrykk)	pdf	0.23

