



Generell informasjon

Brønnbane navn	34/7-6
Type	EXPLORATION
Formål	APPRAISAL
Status	P&A
Faktakart i nytt vindu	lenke til kart
Hovedområde	NORTH SEA
Felt	SNORRE
Funn	34/4-1 Snorre
Brønn navn	34/7-6
Seismisk lokalisering	G/E - 106 SP. 420
Utvinningstillatelse	089
Boreoperatør	Saga Petroleum ASA
Boretillatelse	457-L
Boreinnretning	TREASURE SAGA
Boredager	75
Borestart	17.03.1985
Boreslutt	30.05.1985
Frigitt dato	30.05.1987
Publiseringsdato	12.01.2015
Opprinnelig formål	APPRAISAL
Gjenåpnet	NO
Innhold	OIL
Funnbrønnbane	NO
1. nivå med hydrokarboner, alder	EARLY JURASSIC
1. nivå med hydrokarboner, formasjon.	STATFJORD GP
2. nivå med hydrokarboner, alder	LATE TRIASSIC
2. nivå med hydrokarboner, formasjon	LUNDE FM
Avstand, boredekk - midlere havflate [m]	26.0
Vanndybde ved midlere havflate [m]	307.0
Totalt målt dybde (MD) [m RKB]	3685.0
Totalt vertikalt dybde (TVD) [m RKB]	3683.0
Maks inklinasjon [°]	3.5
Temperatur ved bunn av brønnbanen [°C]	125
Eldste penetrerte alder	MIDDLE TRIASSIC



Eldste penetrerte formasjon	TEIST FM (INFORMAL)
Geodetisk datum	ED50
NS grader	61° 27' 10.85" N
ØV grader	2° 8' 17.26" E
NS UTM [m]	6813713.92
ØV UTM [m]	454048.88
UTM sone	31
NPDID for brønnbanen	465

Brønnhistorie

General

Well 34/7-6 was drilled centrally on the Snorre Field in the Tampen Spur area of the North Sea. The objectives were to test the reservoir quality of the Statfjord Formation and the extent of the low GOR oil encountered in the 34/7-3 and 34/7-4 wells. Further objectives were to test the proposed subdivision and reservoir characteristics of the Triassic Lunde and Lomvi formations.

Operations and results

Appraisal well 34/7-6 was spudded with the semi-submersible installation Treasure Saga on 17 March and drilled to TD at 3685 m in the Triassic Teist Formation. No significant problem was encountered in the drilling phase. After DST 1 parts of the test string stuck, leaving a fish with top at 2533 m in the hole. The fish was pushed down 12 m to give space for further testing. The well was drilled with spud mud down to 965 m, with gypsum/polymer mud from 965 m to 3015 m, and with Drispac/Ligcon mud from 3015 m to TD.

Apart from the sandy Utsira Formation of Late Oligocene - Pliocene age, and sandstone units of Early Oligocene age (1215 - 1280 m) and Middle - Late Eocene age (1370 - 1420 m) within the Hordaland Group, the upper section down to the Jurassic proved mainly claystones. The Jurassic consists of a silty Dunlin Group and a sandy Statfjord Group. The Triassic had sandstones alternating and interbedded with claystones down to TD.

Silty laminae in the Shetland Group had traces of shows from about 2110 m. These were described as gold yellow fluorescence with no cut. From 2155 m and down to 2500 m silt and sandstone show golden yellow fluorescence and slow streaming cloudy yellow fluorescence cut. Occasionally light brown staining and weak odour are observed from 2500 m. Hydrocarbons were encountered from top Statfjord Group at 2510 m down to an oil-water contact at 2610 m in the uppermost part of the Upper Lunde Formation. The contact lie in a shaley interval and is set from pressure gradient measurements. There were no shows below the OWC.

A total of 151 m core was recovered in 13 cores. Ten cores were cut (recovered 93.6 m, 86.7%) in the Statfjord Group and across the stratigraphic border zone into the Upper Lunde Formation of the Hegre Group. Cores 11 and 12 were cut further down in Upper Lunde Formation (recovered 38.5 m, 96.3%). Core 13 was cut in the Lomvi Formation (recovered 18.5 m, 100%). The core - log depth shifts for the individual cores varied from -1.3 m to -5.0 m. FMT segregated fluid samples were taken at 2561.4 m, 2584.4 m, and 2595.4 m.

The well was permanently abandoned on 30 May 1985 as an oil appraisal well.



Testing

Four DST's were carried out in the Statfjord Group and Lunde Formation.

DST 1 tested the Upper Lunde at 2679 - 2687 m. The test produced water at a final rate of 225 m³/day. The bottom hole temperature was 93.7 °C.

DST 2 tested the Eiriksson Formation from perforations at 2549.5 - 2552.0 m, 2555.0 - 2563.0 m, and 2568.0 - 2572.5 m. The flow rate was 519 Sm³ oil/day through a 7.9 mm choke. The GOR was 66 Sm³/Sm³ at separator conditions (11.7 bar, 29.4 °C). The oil density was 0.834 g/cm³. The bottom hole temperature was 90.9 °C.

DST 3A tested the Nansen Formation at 2518.5 - 2522.5 m. The flow rate was 393 Sm³ oil/day through a 6.4 mm choke. The GOR was 52 Sm³/Sm³ at separator conditions (15 bar, 16.7 °C). The oil density was 0.837 g/cm³. The bottom hole temperature was 90.2 °C.

DST 3B tested both Eiriksson and Nansen formations from perforations at 2518.5 - 2522.5 m and 2526.5 - 2536.5 m. The flow rate was 1729 Sm³ oil/day through a 14.3 mm choke. The GOR was 49 Sm³/Sm³ at separator conditions (36.2 bar, 52.8 °C); at stock tank conditions, the GOR was 85 Sm³/Sm³. The oil density was 0.8389 g/cm³. The bottom hole temperature was 89.9 °C.

Borekaks i Sokkeldirektoratet

Borekaksprøve, topp dybde [m]	Borekaksprøve, bunn dybde [m]
470.00	3685.00

Borekaks tilgjengelig for prøvetaking?	YES
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Borekjerne i Sokkeldirektoratet

Kjerneprøve nummer	Kjerneprøve - topp dybde	Kjerneprøve - bunn dybde	Kjerneprøve dybde - enhet
1	2516.0	2524.6	[m]
2	2527.6	2542.6	[m]
5	2549.0	2556.8	[m]
6	2557.1	2568.7	[m]
7	2568.7	2582.0	[m]
8	2582.0	2594.5	[m]
9	2598.5	2612.0	[m]
10	2612.5	2624.0	[m]
11	2913.0	2925.5	[m]
12	2927.0	2953.2	[m]
13	3560.0	3578.5	[m]

Total kjerneprøve lengde [m]	151.0
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Kjerner tilgjengelig for prøvetaking? YES

Kjernebilder



2516-2520m



2520-2524m



2524-2530m



2530-2534m



2534-2538m



2538-2541m



2542-2550m



2550-2554m



2554-2558m



2558-2562m



2562-2566m



2566-2569m



2569-2573m



2573-2577m



2577-2580m



2581-2584m



2585-2589m



2589-2593m



2593-2600m



2600-2604m



2604-2608m



2608-2612m



2612-2616m



2616-2620m



2620-2624m



2913-2917m



2917-2921m



2921-2925m



2925-2930m



2930-2934m



2934-2938m



2938-2942m



2942-2946m



2946-2950m



2950-2953m



3560-3564m



3564-3568m



3568-3572m



3572-3576m



3576-3578m

Palynologiske preparater i Søkeldirektoratet

Prøve dybde	Dybde enhet	Prøve type	Laboratorie
1100.0	[m]	DC	RRI
1120.0	[m]	DC	RRI
1140.0	[m]	DC	RRI
1160.0	[m]	DC	RRI
1200.0	[m]	DC	RRI
1220.0	[m]	DC	RRI
1230.0	[m]	DC	RRI
1280.0	[m]	DC	RRI
1300.0	[m]	DC	RRI
1320.0	[m]	DC	RRI
1340.0	[m]	DC	RRI
1360.0	[m]	DC	RRI
3275.0	[m]	DC	RRI
3380.0	[m]	DC	RRI
3389.0	[m]	DC	RRI
3534.0	[m]	DC	RRI



3546.0 [m]	DC	RRI
3621.0 [m]	DC	RRI
3633.0 [m]	DC	RRI

Oljeprøver i Sokkeldirektoratet

Test type	Flaske nummer	Topp dyp MD [m]	Bunn dyp MD [m]	Væske type	Test tidspunkt	Prøver tilgjengelig
DST	DST2	2572.00	2549.00	OIL	16.05.1985 - 00:00	YES
DST	TEST3,2	2518.50	2522.50	OIL	26.05.1985 - 00:00	YES

Litostratigrafi

Topp Dyb [mMD RKB]	Litostrat. enhet
333	NORDLAND GP
1036	UTSIRA FM
1072	HORDALAND GP
1072	NO FORMAL NAME
1676	ROGALAND GP
1676	BALDER FM
1705	SELE FM
1764	LISTA FM
1846	SHETLAND GP
1846	JORSALFARE FM
2120	KYRRE FM
2437	CROMER KNOLL GP
2437	UNDIFFERENTIATED
2447	DUNLIN GP
2447	AMUNDSEN FM
2510	STATFJORD GP
2510	NANSEN FM
2527	EIRIKSSON FM
2586	RAUDE FM
2654	HEGRE GP
2654	LUNDE FM
3539	LOMVI FM
3632	TEIST FM



Geokjemisk informasjon

Dokument navn	Dokument format	Dokument størrelse [KB]
465_GCH_1	pdf	0.48
465_GCH_2	pdf	1.28
465_GCH_3	pdf	1.77
465_GCH_4	pdf	3.74
465_GCH_5	pdf	0.12

Dokumenter - eldre Sokkeldirektoratets WDSS rapporter og andre relaterte dokumenter

Dokument navn	Dokument format	Dokument størrelse [KB]
465_01_WDSS_General_Information	pdf	0.32
465_02_WDSS_completion_log	pdf	0.26

Dokumenter - rapportert av utvinningstillatelsen (frigitt ihht til regelverk)

Dokument navn	Dokument format	Dokument størrelse [KB]
465_34_7_6_Completion_log	pdf	4.13
465_34_7_6_Completion_report	pdf	20.72

Borestrengtester (DST)

Test nummer	Fra dybde MD [m]	Til dybde MD [m]	Reduksjonsven til størrelse [mm]
1.0	2687	2679	12.7
1.1	2687	2679	12.0
2.0	2550	2573	7.9
3.0	2519	2523	6.3
3.1	2527	2537	14.3

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





1.1		560.000	31.000	
2.0			36.000	
3.0		18.000	35.000	
3.1		15.000	37.000	

Test nummer	Olje produksjon [Sm3/dag]	Gass produksjon [Sm3/dag]	Oljetetthet [g/cm3]	Gasstyngde rel. luft	GOR [m3/m3]
1.0					
1.1					1
2.0	522	3000	0.834	0.862	63
3.0	391		0.837		
3.1	1725	83000	0.836	0.745	48

Logger

Type logg	Topp dyp for logg [m]	Bunn dyp for logg [m]
CDL CNL	1878	3011
CDL GR	935	1876
DIFL LS BHC GR	935	3676
DIP	1878	3008
DIP	2999	3676
DLL MLL GR	2452	3011
FMT	3084	3642
MWD	470	3685
SL	2450	3011
VSP	935	3676

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	455.0	36	556.0	0.00	LOT
SURF.COND.	20	935.0	26	965.0	1.55	LOT
INTERM.	13 3/8	1876.0	17 1/2	1895.0	1.91	LOT
INTERM.	9 5/8	3000.0	12 1/4	3017.0	2.01	LOT
OPEN HOLE		3685.0	8 1/2	3685.0	0.00	LOT



Boreslam

Dybde MD [m]	Egenvekt, slam [g/cm3]	Viskositet, slam [mPa.s]	Flytegrense [Pa]	Type slam	Dato, måling
556	1.08			WATER BASED	25.03.1985
759	1.10	8.0	47.0	WATER BASED	25.03.1985
965	1.11	8.0	47.0	WATER BASED	25.03.1985
970	1.10	47.0	16.0	WATER BASED	27.03.1985
1268	1.10	51.0	17.0	WATER BASED	28.03.1985
1551	1.20	51.0	25.0	WATER BASED	29.03.1985
1878	1.46	53.0	21.0	WATER BASED	01.04.1985
1895	1.50	59.0	25.0	WATER BASED	01.04.1985
2076	1.58	60.0	30.0	WATER BASED	03.04.1985
2287	1.68	25.0	17.0	WATER BASED	09.04.1985
2445	1.72	22.0	20.0	WATER BASED	09.04.1985
2514	1.70	17.0	19.0	WATER BASED	07.05.1985
2516	1.72	22.0	20.0	WATER BASED	09.04.1985
2600	1.72	60.0	14.0	WATER BASED	11.04.1985
2823	1.70	50.0	14.0	WATER BASED	15.04.1985
2940	1.70	53.0	15.0	WATER BASED	17.04.1985
3015	1.70	53.0	15.0	WATER BASED	19.04.1985
3017	1.64	53.0	15.0	WATER BASED	24.04.1985
3070	1.55	60.0	14.0	WATER BASED	25.04.1985
3149	1.55	59.0	15.0	WATER BASED	26.04.1985
3290	1.55	60.0	16.0	WATER BASED	29.04.1985
3394	1.55	59.0	14.0	WATER BASED	29.04.1985

Tynnslip i Sokkeldirektoratet

Dybde	Enhet
2605.75	[m]
2587.25	[m]
2572.50	[m]
2564.25	[m]
2561.00	[m]
2555.00	[m]
2541.00	[m]
2537.75	[m]
2524.50	[m]
2521.25	[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 brønnspar. Trykkdataene er rapportert inn til Oljedirektoratet og videre prosessert og kvalitetssikret av IHS Markit.

Dokument navn	Dokument format	Dokument størrelse [KB]
465 Formation pressure (Formasjonstrykk)	pdf	0.22

