



Generell informasjon

Brønnbane navn	31/4-8
Type	EXPLORATION
Formål	APPRAISAL
Status	P&A
Faktakart i nytt vindu	lenke til kart
Hovedområde	NORTH SEA
Felt	BRAGE
Funn	31/4-3 Brage
Brønn navn	31/4-8
Seismisk lokalisering	NH 8501 - 077 SP. 172
Utvinningstillatelse	055
Boreoperatør	Norsk Hydro Produksjon AS
Boretillatelse	508-L
Boreinnretning	TREASURE HUNTER
Boredager	52
Borestart	21.03.1986
Boreslutt	11.05.1986
Frigitt dato	11.05.1988
Publiseringsdato	01.04.2014
Opprinnelig formål	APPRAISAL
Gjenåpnet	NO
Innhold	OIL/GAS
Funnbrønnbane	NO
1. nivå med hydrokarboner, alder	EARLY JURASSIC
1. nivå med hydrokarboner, formasjon.	STATFJORD GP
Avstand, boredekk - midlere havflate [m]	25.0
Vanndybde ved midlere havflate [m]	124.0
Totalt målt dybde (MD) [m RKB]	2611.0
Totalt vertikalt dybde (TVD) [m RKB]	2611.0
Maks inklinasjon [°]	1.9
Eldste penetrerte alder	LATE TRIASSIC
Eldste penetrerte formasjon	LUNDE FM
Geodetisk datum	ED50
NS grader	60° 31' 22.82" N
ØV grader	3° 0' 9.59" E
NS UTM [m]	6709817.47



ØV UTM [m]	500146.24
UTM sone	31
NPDID for brønnbanen	312

Brønnhistorie

**General**

Well 31/4-8 was drilled on the Brage field in the North Sea to appraise the Statfjord Group oil discovery made in well 31/4-7. The Cook Formation of the Dunlin Group was the secondary target. This sandstone was found water bearing in well 31/4-7. Chances for finding hydrocarbons in well 31/4-9 were good since the formation would be penetrated in a structurally higher position. Prognosed TD was 2565 m or 50 m into Triassic rocks.

Operations and results

Appraisal well 31/4-8 was spudded with the semi-submersible installation Treasure Hunter on 11 May 1986 and drilled to TD at 2611 m in the Late Triassic Lunde Formation. The 13 3/8" casing got stuck at 1855 m. Diesel and spot fluid was pumped down the hole and the casing was worked free. The well was drilled with spud mud down to 900 m and with KCl/polymer mud from 900 m to TD. From 2030 m to ca 2400 m the KCl/polymer mud contained 1% diesel as a result of the problem with the stuck casing.

The well 31/4-8 encountered hydrocarbon bearing sandstones and siltstones in the Viking Group, the Statfjord Group and the Lunde Formation. Of these, only the Statfjord reservoir is produceable. The Viking Group consisted of a thin Draupne Formation from 2085 m to 2088 m and a 29 m thick Fensfjord Formation with poorly developed, generally very fine-fine sandstones grading into and interbedded with siltstones and claystones. Some residual hydrocarbons were encountered in the best sands. Net pay in the Fensfjord Formation was 0.61 m, water saturation was 59.9% and the average porosity was 25.5%. The Cook Formation was found water bearing without traces of shows. Average porosity in the Cook sand was 17.7%. The Statfjord Group had a gross oil column of 60 m from 2346 to the OWC at 2406 m. This is practically the same as the OWC found in 31/4-7. The sandstones in the formation consisted of interbedded claystones/siltstones and very fine to very coarse quartz sands with an average porosity of 23.8%. The average porosity above OWC was 23.4%. The average permeability in the Statfjord formation was 1630 mD. The average water saturation of the oil zone in the Statfjord Group sands is 28.9%. The Lunde Formation consisted predominantly of claystones with occasional fine to coarse sandstone beds and limestone stringers. Traces of residual hydrocarbons were found locally in the Lunde sands. A net pay of 1.1 m was calculated, with average porosity of 20.7% and water saturation of 57.3% in the net pay zones. No oil shows were recorded above top Viking Group.

Six cores were cut in the interval 2347 - 2451 m in the Dunlin and Statfjord groups, with recovery between 74 % and 100 %. A wire line SFT segregated sample at 2350.1 m recovered gas and oil.

The well was permanently abandoned on 11 May 1986 as an oil and gas appraisal well.

Testing

Two DST tests were performed in this well:

DST 1 tested the interval 2349.1 - 2397.6 m through a 1/2 inch choke. It flowed 502.7 Sm³ oil and 19900 Sm³ gas /day. The GOR was 40 Sm³/Sm³, the oil density was 0.83 g/cm³, and the gas gravity 0.82 (air = 1) with 2 % CO₂ and no H₂S. The test temperature was 95°C.

DST 2 tested water from the interval 2421.7 - 2437.4 m through a 2 inch choke. The water flow rate was 1024 Sm³/day.

The test temperature was 98°C.



Borekaks i Sokkeldirektoratet

Borekaksprøve, topp dybde [m]	Borekaksprøve, bunn dybde [m]
910.00	2610.00
Borekaks tilgjengelig for prøvetaking?	YES

Borekjerne i Sokkeldirektoratet

Kjerneprøve nummer	Kjerneprøve - topp dybde	Kjerneprøve - bunn dybde	Kjerneprøve dybde - enhet
1	2347.0	2355.9	[m]
2	2359.0	2375.0	[m]
3	2377.0	2395.6	[m]
4	2395.0	2413.6	[m]
5	2413.6	2432.3	[m]
6	2432.3	2451.1	[m]

Total kjerneprøve lengde [m]	99.6
Kjerner tilgjengelig for prøvetaking?	YES

Kjernebilder



2347-2352m



2352-2355m



2359-2364m



2364-2369m



2369-2374m



2374-2375m



2377-2382m



2382-2387m



2387-2392m



2392-2395m



2395-2400m



2400-2405m



2405-2410m



2410-2413m



2413-2418m



2418-2423m



2423-2428m



2428-2432m



2432-2437m



2437-2442m



2442-2447m



2447-2451m

Litostratigrafi

Topp Dyb [mMD RKB]	Litostrat. enhet
149	NORDLAND GP
668	UTSIRA FM
827	HORDALAND GP
1837	ROGALAND GP
1837	BALDER FM
1900	SELE FM
1937	LISTA FM
2024	SHETLAND GP
2079	CROMER KNOLL GP
2085	VIKING GP
2085	DRAUPNE FM
2088	FENSEFJORD FM
2117	DUNLIN GP
2117	DRAKE FM
2222	COOK FM



2255	AMUNDSEN FM
2346	STATEFJORD GP
2438	HEGRE GP
2438	LUNDE FM

Geokjemisk informasjon

Dokument navn	Dokument format	Dokument størrelse [KB]
312_1	pdf	0.26
312_2	pdf	0.46

Dokumenter - eldre Sökkeldirektoratets WDSS rapporter og andre relaterte dokumenter

Dokument navn	Dokument format	Dokument størrelse [KB]
312_01_WDSS_General_Information	pdf	0.36
312_02_WDSS_completion_log	pdf	0.21

Dokumenter - rapportert av utvinningstillatelsen (frigitt ihht til regelverk)

Dokument navn	Dokument format	Dokument størrelse [KB]
312_31_4_8_COMPLETION_REPORT_AND_LOG	pdf	12.00

Borestrengtester (DST)

Test nummer	Fra dybde MD [m]	Til dybde MD [m]	Reduksjonsven til størrelse [mm]
1.0	2349	2398	12.7
2.0	2422	2437	50.8

Test nummer	Endelig avstengningstrykk [MPa]	Endelig strømningstrykk [MPa]	Bunnhullstrykk [MPa]	Borehullstemperatur [°C]
1.0				95
2.0				98





Test nummer	Olje produksjon [Sm3/dag]	Gass produksjon [Sm3/dag]	Oljetetthet [g/cm3]	Gasstygde rel. luft	GOR [m3/m3]
1.0	503	19900	0.830	0.820	40
2.0					

Logger

Type logg	Topp dyp for logg [m]	Bunn dyp for logg [m]
CBL	652	2011
CBL	1916	2546
CDL CAL GR	876	1989
CDL SGR CAL	1868	2571
CST	2036	2562
DIL LSS GR SP	876	2571
DLL MSFL GR SP CAL	2011	2572
DWLD	242	900
FED GR	2011	2570
SFT	2075	2406
SFT	2350	2350
SFT	2386	2386
SFT	2406	2552
VSP	833	2570

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	237.0	36	242.0	0.00	LOT
SURF.COND.	20	875.0	26	903.0	0.00	LOT
INTERM.	13 3/8	2012.0	17 1/2	2030.0	1.60	LOT
INTERM.	9 5/8	2596.0	12 1/4	2611.0	0.00	LOT

Boreslam

Dybde MD [m]	Egenvekt, slam [g/cm3]	Viskositet, slam [mPa.s]	Flytegrense [Pa]	Type slam	Dato, måling
190	1.03			SEAWATER	11.05.1986
236	1.03			WATER	23.03.1986



Faktasider

Brønnbane / Leting

Utskriftstidspunkt: 14.5.2024 - 00:25

240	1.10			WATER	23.03.1986
242	1.03			WATER	24.03.1986
242	0.00			WATER	25.03.1986
507	1.03			WATER	31.03.1986
609	1.03			WATER	31.03.1986
900	1.03			WATER	31.03.1986
900	0.00			WATER	01.04.1986
903	1.20	18.0	10.0	WATERBASED	02.04.1986
1231	1.26	21.0	11.0	WATERBASED	03.04.1986
1506	1.35	25.0	14.0	WATERBASED	07.04.1986
1828	1.35	24.0	13.0	WATERBASED	07.04.1986
2015	1.35	24.0	12.0	WATERBASED	07.04.1986
2030	1.40	20.0	13.0	WATER BASED	10.04.1986
2030	0.00	16.0	9.0	WATERBASED	09.04.1986
2030	0.00	16.0	10.0	WATERBASED	10.04.1986
2044	1.21	11.0	8.0	WATERBASED	13.04.1986
2222	1.21	11.0	7.0	WATERBASED	13.04.1986
2340	1.21	14.0	10.0	WATERBASED	11.05.1986
2347	1.20	13.0	8.0	WATERBASED	13.04.1986
2359	1.20	13.0	8.0	WATERBASED	14.04.1986
2391	1.20	13.0	8.0	WATERBASED	15.04.1986
2414	1.21	14.0	10.0	WATERBASED	16.04.1986
2444	1.20	13.0	9.0	WATERBASED	20.04.1986
2487	1.20	13.0	7.0	WATERBASED	20.04.1986
2553	0.00	14.0	10.0	WATERBASED	30.04.1986
2553	0.00	14.0	10.0	WATERBASED	05.05.1986
2553	1.20	14.0	10.0	WATERBASED	25.04.1986
2553	0.00	14.0	10.0	WATERBASED	28.04.1986
2553	0.00	14.0	10.0	WATERBASED	01.05.1986
2553	0.00	14.0	10.0	WATERBASED	04.05.1986
2553	0.00	13.0	10.0	WATERBASED	06.05.1986
2553	0.00	13.0	9.0	WATERBASED	08.05.1986
2556	1.20	13.0	6.0	WATERBASED	25.04.1986
2570	1.20	16.0	7.0	WATERBASED	20.04.1986
2570	0.00	17.0	7.0	WATERBASED	20.04.1986
2570	0.00	12.0	7.0	WATERBASED	21.04.1986
2570	0.00	12.0	7.0	WATERBASED	22.04.1986
2572	1.20	12.0	7.0	WATERBASED	23.04.1986
2611	1.20	13.0	6.0	WATERBASED	24.04.1986



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]
312 Formation pressure (Formasjonstrykk)	pdf	0.21

