



Generell informasjon

Brønnbane navn	34/4-5
Type	EXPLORATION
Formål	WILDCAT
Status	P&A
Faktakart i nytt vindu	lenke til kart
Hovedområde	NORTH SEA
Funn	34/4-5
Brønn navn	34/4-5
Seismisk lokalisering	SG 8320 - 442 SP 188
Utvinningstillatelse	057
Boreoperatør	Saga Petroleum ASA
Boretillatelse	395-L
Boreinnretning	TREASURE SAGA
Boredager	146
Borestart	13.11.1983
Boreslutt	06.04.1984
Frigitt dato	06.04.1986
Publiseringsdato	18.05.2004
Opprinnelig formål	WILDCAT
Gjenåpnet	NO
Innhold	OIL
Funnbrønnbane	YES
1. nivå med hydrokarboner, alder	EARLY JURASSIC
1. nivå med hydrokarboner, formasjon.	COOK FM
2. nivå med hydrokarboner, alder	EARLY JURASSIC
2. nivå med hydrokarboner, formasjon	STATFJORD GP
Avstand, boredekk - midlere havflate [m]	26.0
Vanndybde ved midlere havflate [m]	379.0
Totalt målt dybde (MD) [m RKB]	3917.0
Totalt vertikalt dybde (TVD) [m RKB]	3910.0
Maks inklinasjon [°]	8.1
Temperatur ved bunn av brønnbanen [°C]	140
Eldste penetrerte alder	LATE TRIASSIC
Eldste penetrerte formasjon	LUNDE FM



Geodetisk datum	ED50
NS grader	61° 41' 9.49" N
ØV grader	2° 17' 52" E
NS UTM [m]	6839561.78
ØV UTM [m]	462840.14
UTM sone	31
NPDID for brønnbanen	37

Brønnhistorie

General

Wildcat well 34/4-5 was drilled on the Mort Horst in the Northeastern part of the block. The purpose of the well was to test the Zeta structure for hydrocarbons and to test the stratigraphy below the Base Cretaceous Unconformity. The well encountered hydrocarbons in the Cook Formation and in the Statfjord Formation.

Operations and results

The well was spudded with the semi-submersible installation Treasure Saga on November 13 1983 and drilled to TD at 3917 m in Early - Middle Triassic sediments of the Lunde Formation. The well was drilled with seawater and bentonite down to 533 m, with bentonite/gypsum mud from 533 m to 1113 m, with gypsum/polymer mud from 1113 m to 2025 m, with gypsum/lignosulfonate (Unical) mud from 2025 m to 3200 m, and with lignosulfonate from 3200 m to TD.

Due to severe boulder problems in the 26" hole section, the well had to be re-spudded three times before the 20" casing could be run and cemented. The 20" casing had to be worked and washed down to the planned depth. This action most likely buckled or partly collapsed the 20" casing. It took approximately 5 days to drill/mill out the bottom section of the 20" casing. Circulation was lost at 2026 m when drilling the 17 1/2" hole. Due to the lost circulation, the 13 3/8" casing had to be set at 2011 m. The 12 1/4" section had to be plugged back from 3106 m to 3005 m due to severe hole deviation problems. The maximum hole angle was 8.75°. Re-drilling this hole section and deepening it down to 3200 m the hole angle varied between 3° and 4°. The 9 5/8" casing was set at 3195 m. The 8 1/2" hole section was drilled down to 3424 m, where the first core was cut. The core recovered shale, and it was decided to drill ahead. The hole was drilled down to 3470 m, where a new drill break occurred. While circulating bottoms up for samples a kick was taken. A total of 43 bbls were gained before closing in the well. Six cores were cut down to 3538 m. Analysis of the formation indicated that the potential reservoir section had not been reached. The hole was this time drilled down to 3561 m, where a new drill break occurred. This time 10 cores were cut down to 3648,6 m. A 7" liner was run in the 8 1/2" hole with the liner shoe set at 3757 m.

The well proved a stratigraphic section ranging in age from possibly Early Triassic to Pleistocene. Minor sand development was penetrated in Miocene and Oligocene. The Cretaceous section was composed of claystones. In the Jurassic two sandstone horizons were encountered, the Cook Formation (3416 m to 3520 m) and the Statfjord Formation (3558.5 m to 3599 m). The Triassic rocks were inter-bedded sandstones, siltstones and claystones. Several unconformities were observed in the well, four in Tertiary, two in Cretaceous, a major unconformity at 3245 m between Callovian and Valanginian, one in Middle Jurassic and a fault cut out in Early Jurassic. Gas peaks up to 7.5 % with shows in limestone stringers were observed in the interval 2137 m to 2600 m in the Late Cretaceous Shetland Group. Weak shows was observed on the core from 3424 m to 3438 m. Good shows with up to 39 % gas was observed in the Cook



Formation from 3454 m to 3483 m, from 3483 m shows gradually decreased in intensity. From 3564 good shows appeared in sandstones, and from 3571 m to 3586 m good shows were observed in massive sandstone of the Statfjord Formation. Below 3586 m shows gradually disappeared. No shows were observed below 3603 m. Testing of the two sandstones proved movable oil present in the Cook Formation and immovable oil in the Statfjord Formation. Both sandstones were tightly cemented, with poor reservoir qualities. A total of 17 cores were cut as described above. The overall recovery was 95%. Logging operations were hampered by tool sticking, causing considerable discrepancies between drillers and loggers depth. This did not affect the Cook and Statfjord Formation Sands. No fluid samples were taken on wire line. The well was permanently abandoned on 6 April 1983 as a non-commercial oil discovery.

Testing

Two drill stem test were carried out, one in the Statfjord sand and one in the Intra Cook sand. The Statfjord drill stem test, 3589.0 m to 3598.5 m produced water with traces of oil. A rate of 27 Sm³ water/day was obtained through an 8/64 inch choke with a wellhead pressure of 2.51 MPa.

The Cook drill stem test, 3462.7 m to 3480.7 m, produced oil with 19 per cent water. A rate of 48 Sm³ liquid/day was obtained through a 10/64 inch choke and a wellhead pressure of 13.65 MPa. The GOR was measured to 240 Sm³/Sm³ at separator conditions of 1.14 MPa and 40.6 °C. The dead oil density was 0.83 g/cc. At the end of the Cook drill stem test, a hydrate plug was formed in the test string. It was removed by circulating hot mud in the riser and hot tapping of the test string.

Borekaks i Sokkeldirektoratet

Borekaksprøve, topp dybde [m]	Borekaksprøve, bunn dybde [m]
510.00	3868.00

Borekaks tilgjengelig for prøvetaking?	NO
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Borekjerne i Sokkeldirektoratet

Kjerneprøve nummer	Kjerneprøve - topp dybde	Kjerneprøve - bunn dybde	Kjerneprøve dybde - enhet
1	3423.0	3437.7	[m]
2	3473.0	3481.4	[m]
3	3484.0	3496.2	[m]
4	3496.0	3507.6	[m]
5	3508.0	3518.0	[m]
6	3519.0	3526.7	[m]
7	3527.0	3536.7	[m]
8	3564.0	3569.5	[m]
9	3571.0	3580.0	[m]
10	3580.0	3588.5	[m]
11	3588.0	3595.0	[m]



12	3595.0	3604.2	[m]
13	3605.0	3609.0	[m]
14	3610.0	3617.0	[m]
15	3617.0	3621.2	[m]
16	3621.0	3630.2	[m]
17	3630.0	3648.8	[m]

Total kjerneprøve lengde [m]	156.7
Kjerner tilgjengelig for prøvetaking?	YES

Kjernebilder



3423-3426m



3427-3430m



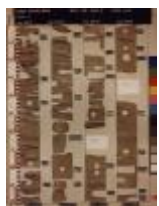
3431-3434m



3435-3437m



3473-3476m



3477-3480m



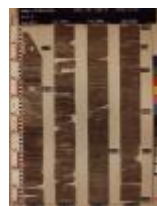
3481-3482m



3483-3486m



3487-3490m



3491-3494m



3495-3496m



3496-3499m



3500-3503m



3504-3507m



3508-3511m



3512-3515m



3516-3517m



3518-3521m



3522-3525m



3526-3527m



3527-3530m



3531-3534m



3535-3536m



3564-3567m



3568-3569m



3571-3574m



3575-3578m



3579-3580m



3580-3583m



3584-3587m



3588-3589m



3589-3592m



3593-3594m



3595-3598m



3599-3602m



3603-3604m



3605-3608m



3609-3610m



3610-3613m



3614-3616m



3617-3620m



3621-3624m



3625-3628m



3629-3630m



3630-3633m



3634-3637m



3638-3641m



3642-3645m



3646-3648m



Palynologiske preparater i Søkeldirektoratet

Prøve dybde	Dybde enhet	Prøve type	Laboratorie
2059.0	[m]	SWC	RRI
2090.0	[m]	SWC	RRI
2166.0	[m]	SWC	RRI
2198.0	[m]	SWC	RRI
2240.0	[m]	SWC	RRI
2282.0	[m]	SWC	RRI
2292.0	[m]	SWC	RRI
2343.0	[m]	SWC	RRI
2374.5	[m]	SWC	RRI
2415.0	[m]	SWC	RRI
2468.0	[m]	SWC	RRI
2510.2	[m]	SWC	RRI
2574.0	[m]	SWC	RRI
2771.0	[m]	SWC	RRI
2895.7	[m]	SWC	RRI
2944.5	[m]	SWC	RRI
3000.0	[m]	SWC	RRI
3015.0	[m]	SWC	RRI
3024.5	[m]	SWC	RRI
3031.0	[m]	SWC	RRI
3085.0	[m]	SWC	RRI
3098.0	[m]	SWC	RRI
3104.0	[m]	SWC	RRI
3115.0	[m]	SWC	RRI
3233.0	[m]	SWC	RRI
3280.0	[m]	SWC	RRI
3300.0	[m]	SWC	RRI
3320.0	[m]	SWC	RRI
3345.0	[m]	SWC	RRI
3370.0	[m]	SWC	RRI
3414.5	[m]	SWC	RRI
3420.0	[m]	SWC	RRI

Oljeprøver i Søkeldirektoratet



Test type	Flaske nummer	Topp dyp MD [m]	Bunn dyp MD [m]	Væske type	Test tidspunkt	Prøver tilgjengelig
DST	DST2	3462.70	3480.70		30.03.1984 - 16:15	YES

Litostratigrafi

Topp Dyb [mMD RKB]	Litostrat. enhet
405	NORDLAND GP
1240	UTSIRA FM
1332	HORDALAND GP
1805	ROGALAND GP
1805	BALDER FM
1838	LISTA FM
1925	SHETLAND GP
1925	JORSALFARE FM
2145	KYRRE FM
3015	TRYGGVASON FM
3235	CROMER KNOLL GP
3235	RØDBY FM
3241	ÅSGARD FM
3245	VIKING GP
3245	HEATHER FM
3266	DUNLIN GP
3266	DRAKE FM
3416	COOK FM
3520	AMUNDSEN FM
3559	STATFJORD GP
3599	HEGRE GP
3599	LUNDE FM

Spleisede logger

Dokument navn	Dokument format	Dokument størrelse [KB]
37	pdf	0.70





Geokjemisk informasjon

Dokument navn	Dokument format	Dokument størrelse [KB]
37_1	pdf	3.31
37_2	pdf	6.33

Dokumenter - eldre Sokkeldirektoratets WDSS rapporter og andre relaterte dokumenter

Dokument navn	Dokument format	Dokument størrelse [KB]
37_01_WDSS_General_Information	pdf	0.24
37_02_WDSS_completion_log	pdf	0.33

Dokumenter - rapportert av utvinningstillatelsen (frigitt ihht til regelverk)

Dokument navn	Dokument format	Dokument størrelse [KB]
37_34_4_5_COMPLETION_REPORT_AND_LOG	pdf	17.97

Borestrengtester (DST)

Test nummer	Fra dybde MD [m]	Til dybde MD [m]	Reduksjonsven til størrelse [mm]
1.0	3599	3589	3.2
2.0	3481	3463	4.0

Test nummer	Endelig avstengningstrykk [MPa]	Endelig strømningstrykk [MPa]	Bunnhullstrykk [MPa]	Borehullstemperatur [°C]
1.0	2.060			132
2.0	13.680		62.550	128

Test nummer	Olje produksjon [Sm3/dag]	Gass produksjon [Sm3/dag]	Oljetetthet [g/cm3]	Gasstyngde rel. luft	GOR [m3/m3]
1.0					
2.0	48	11520	0.834	0.820	240





Logger

Type logg	Topp dyp for logg [m]	Bunn dyp for logg [m]
CDL CNL GR	3195	3766
CDL CNL GR	3600	3915
CDL CNL SP	0	0
CDL GR	1080	2022
CDL GR	2011	3197
COREGUN	0	0
COREGUN	0	0
DIFL BHC GR	503	1112
DIFL BHC GR	1080	2022
DIFL BHC GR	2011	3197
DIFL BHC GR	3195	3770
DIFL BHC GR	3595	3916
DLL MLL GR	3217	3769
FMT	3239	3627
FMT	3464	3904
GR	405	1112
SHDT	3195	3766
SP	3185	3530
VELOCITY	3195	3916
VSP	510	3900

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	504.0	36	514.0	0.00	LOT
SURF.COND.	20	1102.0	26	1103.0	1.55	LOT
INTERM.	13 3/8	2011.0	17 1/2	2020.0	1.89	LOT
INTERM.	9 5/8	3187.0	12 1/4	3200.0	2.15	LOT
LINER	7	3917.0	8 1/2	3917.0	0.00	LOT

Boreslam



Dybde MD [m]	Egenvekt, slam [g/cm3]	Viskositet, slam [mPa.s]	Fløtegrense [Pa]	Type slam	Dato, måling
525	1.04	6.0	19.0	WATER BASED	
600	1.07	7.0	19.0	WATER BASED	
700	1.08	10.0	18.0	WATER BASED	
900	1.13	10.0	22.0	WATER BASED	
1355	1.20	16.0	20.0	WATER BASED	
1610	1.26	16.0	22.0	WATER BASED	
1830	1.38	22.0	27.0	WATER BASED	
2030	1.47	26.0	27.0	WATER BASED	
2190	1.62	21.0	29.0	WATER BASED	
2350	1.71	28.0	26.0	WATER BASED	
2985	1.68	17.0	24.0	WATER BASED	
3260	1.74	19.0	12.0	WATER BASED	
3650	1.87	21.0	12.0	WATER BASED	

Tynnslip i Sokkeldirektoratet

Dybde	Enhet
3601.25	[m]
3595.75	[m]
3584.50	[m]
3579.00	[m]
3572.75	[m]
3568.00	[m]
3508.95	[m]
3487.60	[m]
3483.38	[m]
3480.75	[m]
3476.50	[m]
3474.20	[m]
3564.25	[m]
3572.50	[m]
3575.50	[m]
3579.25	[m]
3586.00	[m]
3591.00	[m]
3595.25	[m]
3599.25	[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 brønnspark. Trykkdataene er rapportert inn til Oljedirektoratet og videre prosessert og kvalitetssikret av IHS Markit.

Dokument navn	Dokument format	Dokument størrelse [KB]
37 Formation pressure (Formasjonstrykk)	pdf	0.21

