



Generell informasjon

Brønnbane navn	6407/2-3
Type	EXPLORATION
Formål	APPRAISAL
Status	P&A
Faktakart i nytt vindu	lenke til kart
Hovedområde	NORWEGIAN SEA
Felt	ÅSGARD
Funn	6507/11-1 Midgard
Brønn navn	6407/2-3
Seismisk lokalisering	SG 8571 - 296 SP. 520
Utvinningstillatelse	074
Boreoperatør	Saga Petroleum ASA
Boretillatelse	531-L
Boreinnretning	TREASURE SAGA
Boredager	78
Borestart	07.11.1986
Boreslutt	23.01.1987
Frigitt dato	23.01.1989
Publiseringsdato	09.03.2009
Opprinnelig formål	WILDCAT
Gjenåpnet	NO
Innhold	GAS/CONDENSATE
Funnbrønnbane	NO
1. nivå med hydrokarboner, alder	MIDDLE JURASSIC
1. nivå med hydrokarboner, formasjon.	GARN FM
2. nivå med hydrokarboner, alder	MIDDLE JURASSIC
2. nivå med hydrokarboner, formasjon	ILE FM
Avstand, boredekk - midlere havflate [m]	26.0
Vanndybde ved midlere havflate [m]	250.0
Totalt målt dybde (MD) [m RKB]	3050.0
Totalt vertikalt dybde (TVD) [m RKB]	3050.0
Maks inklinasjon [°]	10.3
Temperatur ved bunn av brønnbanen [°C]	104
Eldste penetrerte alder	EARLY JURASSIC



Eldste penetrerte formasjon	ÅRE FM
Geodetisk datum	ED50
NS grader	64° 56' 1.39" N
ØV grader	7° 39' 53.04" E
NS UTM [m]	7201913.99
ØV UTM [m]	436877.75
UTM sone	32
NPDID for brønnbanen	935

Brønnhistorie

**General**

Well 6407/2-3 was drilled down dip on the Delta structure on the southern fault compartment of the Midgard Field off shore mid Norway. The primary objectives were to test for hydrocarbons in the Middle Jurassic Fangst Group, and establish the hydrocarbon contact. Secondary objectives were testing the thickness and facies development of reservoir units in response to growth faulting. Shallow gas was expected at several levels due to experience from nearby wells. Fangst Group was prognosed to come in at 2417 m, gas/oil contact at 2514 m, and the oil/water contact at 2525 m. TD was expected to be 3050 m.

Operations and results

Well 6407/2-3 was spudded with the semi-submersible installation Treasure Saga on 7 November 1986 and drilled to TD at 3050 m in Early Jurassic sediments of the Åre Formation. Gas peaks above 1% gas value were observed at 532 m, 590 m, 630 m, 755 m, and 802 m, the two latter showing the highest values at approximately 1.8%. The whole section was drilled using relatively high mud weights around 1.15 g/cm, which makes the recorded gas values significant. While tripping out at 2645 m prior to logging, the string got stuck. After nine days of fishing it was decided to sidetrack. The 9/58" casing was set at 2371 m and the sidetrack was kicked off at 2387 m. The well was drilled with spud mud down to 915 m and with gypsum/polymer mud from 915 m to 2645 m where the pipe stuck. No wire line logs were run in the interval 2432 - 2465 in this hole, only MWD. The final 8 1/2" sidetrack from 2371 m to TD was drilled with gel mud.

The Fangst Group came in at 2427 m, ten meters below prognosis. It was gas-filled down to a gas/water contact at 2523 m (2521 m TVD RKB). No oil leg could be seen. No shows were seen in cuttings, but poor shows with good hydrocarbon odour were described on cores down to 2526 m in the Ile Formation. Fluorescence was very weak blue white and cut reaction very slow. Weak dark yellow brown fluorescence was recorded in sandstone in the Tilje core at 2760 - 2764 m. No stain, cut, or odour was associated with his fluorescence.

Eight cores were cut from 2428 - 2573.1 m (recovered 142.8 m, 96.5%) in the Fangst Group and across the GWC contact. Down to the GWC it consisted of two sandstone units (Garn and Ile Formations) separated by one silty shale zone (the Not Formation). These cores were cut in the original hole, before side tracking. Core number 9 was cut in the side track hole from 2741 - 2769 m in the Tilje Formation (recovered 28 m, 100%). The lithology was sandstone interlaminated with shale. Porosity was predominantly poor. Segregated fluid samples were taken at 2428, 2430, and 2510.5 m.

The well was permanently abandoned on 23 January 1987 as a gas/condensate discovery.

Testing

Two production tests were carried out and both produced a lean gas similar to what is found in the rest of the Midgard Field.

Test No. 1 (2508.7 - 2518.2 m RKB, 2480.7 - 2490.2 TVD m MSL) perforated the Ile Formation and produced gas at a maximum rate of 1.285.000 Sm³/day through a 38.1 mm choke at a well head pressure of 88 bar. The condensate/gas ratio was 0.000211 Sm³/Sm³ (GOR = 4740 Sm³/Sm³). The down-hole temperature recorded in the test was 91.8 deg C. API gravity of the dead condensate was 49.3 deg.

Test No. 2 (2427.8 - 2435.8 m RKB, 2400.3 - 2408.3 TVD m MSL) perforated the Garn Formation and produced gas at a maximum rate of 1.320.500 Sm³/day through a 38.1 mm choke at a well head pressure of 88.7 bar. The condensate/gas ratio was 0.000161 Sm³/Sm³ (GOR = 6210 Sm³/Sm³). The down-hole temperature recorded in the test was 89.2 deg C. API gravity of the dead condensate was 49.0 deg.



Borekaks i Sokkeldirektoratet

Borekaksprøve, topp dybde [m]	Borekaksprøve, bunn dybde [m]
400.00	3049.00
Borekaks tilgjengelig for prøvetaking?	YES

Borekjerper i Sokkeldirektoratet

Kjerneprøve nummer	Kjerneprøve - topp dybde	Kjerneprøve - bunn dybde	Kjerneprøve dybde - enhet
1	2428.0	2455.5	[m]
2	2455.5	2476.5	[m]
3	2476.5	2502.4	[m]
4	2502.5	2511.0	[m]
5	2511.0	2538.7	[m]
6	2538.5	2556.5	[m]
7	2557.0	2558.0	[m]
8	2558.0	2571.6	[m]
10	2741.0	2769.0	[m]

Total kjerneprøve lengde [m]	171.2
Kjerper tilgjengelig for prøvetaking?	YES

Kjernebilder



2428-2433m



2433-2438m



2438-2443m



2443-2448m



2448-2453m



2453-2457m



2457-2462m



2462-2467m



2467-2472m



2472-2476m



2476-2481m



2481-2486m



2486-2491m



2491-2496m



2496-2501m



2501-2505m



2505-2510m



2510-2515m



2515-2520m



2520-2525m



2525-2530m



2530-2535m



2535-2539m



2539-2544m



2544-2549m



2549-2554m



2554-2559m



2559-2564m



2564-2569m



2569-2743m



2743-2748m



2748-2753m



2753-2758m



2758-2763m



2763-2768m



2768-2769m



Palynologiske preparater i Sokkeldirektoratet

Prøve dybde	Dybde enhet	Prøve type	Laboratorie
409.0	[m]	SWC	RRI
429.5	[m]	SWC	RRI
452.5	[m]	SWC	RRI
468.0	[m]	SWC	RRI
473.5	[m]	SWC	RRI
489.1	[m]	SWC	RRI
500.0	[m]	SWC	RRI
528.0	[m]	SWC	RRI
544.5	[m]	SWC	RRI
570.0	[m]	SWC	RRI
593.0	[m]	SWC	RRI
615.0	[m]	SWC	RRI
632.0	[m]	SWC	RRI
640.5	[m]	SWC	RRI
668.5	[m]	SWC	RRI
689.5	[m]	SWC	RRI
695.9	[m]	SWC	RRI
708.6	[m]	SWC	RRI
730.0	[m]	SWC	RRI
752.0	[m]	SWC	RRI
775.2	[m]	SWC	RRI
807.0	[m]	SWC	RRI
837.0	[m]	SWC	RRI
862.0	[m]	SWC	RRI
899.0	[m]	SWC	RRI
972.0	[m]	SWC	RRI
1010.0	[m]	SWC	RRI
1030.0	[m]	SWC	RRI
1060.0	[m]	SWC	RRI
1190.0	[m]	SWC	RRI
1260.0	[m]	SWC	RRI
1290.0	[m]	SWC	RRI
1310.0	[m]	SWC	RRI
1340.0	[m]	SWC	RRI
1426.0	[m]	SWC	RRI



1470.0	[m]	SWC	RRI
1506.0	[m]	SWC	RRI
1553.0	[m]	SWC	RRI
1584.0	[m]	SWC	RRI
1630.0	[m]	SWC	RRI
1650.0	[m]	SWC	RRI
1856.0	[m]	SWC	RRI
1900.0	[m]	SWC	RRI
2070.0	[m]	SWC	RRI
2106.5	[m]	SWC	RRI
2150.5	[m]	SWC	RRI
2200.0	[m]	SWC	RRI
2232.0	[m]	SWC	RRI
2260.0	[m]	SWC	RRI
2280.0	[m]	SWC	RRI
2315.0	[m]	SWC	RRI
2323.0	[m]	SWC	RRI
2347.0	[m]	SWC	RRI
2360.0	[m]	SWC	RRI
2383.0	[m]	SWC	RRI
2398.0	[m]	SWC	RRI

Oljeprøver i Sökkeldirektoratet

Test type	Flaske nummer	Topp dyp MD [m]	Bunn dyp MD [m]	Væske type	Test tidspunkt	Prøver tilgjengelig
DST	DST1	2518.20	2508.70		06.01.1987 - 16:10	YES
DST	DST 2	2427.80	2435.80		13.01.1987 - 13:30	YES

Litostratigrafi

Topp Dyb [mMD RKB]	Litostrat. enhet
276	NORDLAND GP
1311	KAI FM
1966	ROGALAND GP
1966	TARE FM
2025	TANG FM



2072	SHETLAND GP
2320	CROMER KNOLL GP
2393	VIKING GP
2393	SPEKK FM
2399	MELKE FM
2427	FANGST GP
2427	GARN FM
2480	NOT FM
2509	ILE FM
2581	BÅT GP
2581	ROR FM
2739	TILJE FM
2910	ÅRE FM

Geokjemisk informasjon

Dokument navn	Dokument format	Dokument størrelse [KB]
935_1	pdf	0.54
935_2	pdf	0.51
935_3	pdf	5.18

Dokumenter - eldre Sökkeldirektoratets WDSS rapporter og andre relaterte dokumenter

Dokument navn	Dokument format	Dokument størrelse [KB]
935_01_WDSS_General_Information	pdf	0.44
935_02_WDSS_completion_log	pdf	0.28

Dokumenter - rapportert av utvinningstillatelsen (frigitt ihht til regelverk)

Dokument navn	Dokument format	Dokument størrelse [KB]
935_01_6407_2_3_Competition_report	pdf	7.67
935_02_6407_2_3_Completion_log	pdf	2.28

Borestrengtester (DST)





Test nummer	Fra dybde MD [m]	Til dybde MD [m]	Reduksjonsven til størrelse [mm]
1.0	2518	2509	38.1
2.0	2436	2428	38.1

Test nummer	Endelig avstengningstrykk [MPa]	Endelig strømningstrykk [MPa]	Bunnhullstrykk [MPa]	Borehullstemperatur [°C]
1.0	9.000	17.000		92
2.0	9.000	17.000		89

Test nummer	Olje produksjon [Sm3/dag]	Gass produksjon [Sm3/dag]	Oljetetthet [g/cm3]	Gasstyngde rel. luft	GOR [m3/m3]
1.0	271	1285000	0.766	0.705	4740
2.0	213	1321000	0.768	0.705	6210

Logger

Type logg	Topp dyp for logg [m]	Bunn dyp for logg [m]
ACBL VDL	684	1952
ACBL VDL BHC GR	1690	2610
CDL	900	1953
CNL CDL GR	1952	2431
CNL LDC SPECTRA GR	2368	3051
COREGUN	920	1935
COREGUN	1952	2429
COREGUN	2369	3047
DIFL LSBHC GR	399	913
DIFL LSBHC GR	900	1969
DIFL LSBHC GR	1952	2431
DIFL LSBHC GR	2369	3049
DIPLOG	1952	2429
DIPLOG	2368	3047
DLL MLL GR	2368	3047
FMT	2428	2741
MWD - GR RES DIR	399	3047
VSP	384	3006
ZDENS	2368	3034



Foringsrør og formasjonsstyrketester

Type utforing	Utforing diam. [tommer]	Utforing dybde [m]	Brønnbane diam. [tommer]	Brønnbane dyp [m]	LOT/FIT slam eqv. [g/cm ³]	Type formasjonstest
CONDUCTOR	30	398.0	36	403.0	0.00	LOT
SURF.COND.	20	900.0	26	915.0	1.51	LOT
INTERM.	13 3/8	1954.0	17 1/2	2104.0	1.83	LOT
INTERM.	9 5/8	2371.0	12 1/4	2645.0	1.69	LOT
LINER	7	2625.0	8 1/2	3050.0	0.00	LOT

Boreslam

Dybde MD [m]	Egenvekt, slam [g/cm ³]	Viskositet, slam [mPa.s]	Flytegrense [Pa]	Type slam	Dato, måling
286	1.06			WATER BASED	10.11.1986
327	1.06			WATER BASED	11.11.1986
403	1.06			WATER BASED	17.11.1986
531	1.13	5.0	19.2	WATER BASED	17.11.1986
915	1.14	6.0	17.3	WATER BASED	17.11.1986
915	1.18	7.0	19.2	WATER BASED	17.11.1986
915	1.20	8.0	14.4	WATER BASED	18.11.1986
915	1.10	25.0	16.8	WATER BASED	19.11.1986
915	1.10	24.0	15.9	WATER BASED	18.11.1986
925	1.18	6.0	17.3	WATER BASED	17.11.1986
1119	1.12	15.0	8.7	WATER BASED	20.11.1986
1345	1.15	13.0	5.8	WATER BASED	21.11.1986
1770	1.30	18.0	9.1	WATER BASED	24.11.1986
1968	1.45	16.0	5.3	WATER BASED	24.11.1986
1968	1.45	20.0	6.3	WATER BASED	24.11.1986
1968	1.45	16.0	5.3	WATER BASED	02.12.1986
2104	1.50	28.0	9.1	WATER BASED	02.12.1986
2115	1.58	18.0	6.3	WATER BASED	02.12.1986
2115	1.58	19.0	10.1	WATER BASED	02.12.1986
2115	1.58	21.0	9.1	WATER BASED	02.12.1986
2115	1.58	24.0	7.2	WATER BASED	02.12.1986
2115	1.58	17.0	8.2	WATER BASED	05.12.1986
2115	1.58	15.0	6.3	WATER BASED	08.12.1986
2115	1.58	15.0	6.8	WATER BASED	08.12.1986



Faktasider

Brønnbane / Leting

Utskriftstidspunkt: 12.5.2024 - 21:42

2115	1.58	15.0	6.8	WATER BASED	09.12.1986
2115	1.58	18.0	6.8	WATER BASED	02.12.1986
2228	0.00	16.0	7.2	WATER BASED	13.01.1987
2228	0.00	16.0	6.8	WATER BASED	09.01.1987
2288	0.00	16.0	7.2	WATER BASED	12.01.1987
2345	0.00	12.0	6.8	WATER BASED	15.01.1987
2371	0.00	15.0	6.8	WATER BASED	22.12.1986
2386	1.58	14.0	6.8	WATER BASED	16.12.1986
2386	1.58	14.0	6.8	WATER BASED	17.12.1986
2386	1.27	14.0	5.3	WATER BASED	22.12.1986
2387	1.27	15.0	6.8	WATER BASED	22.12.1986
2425	0.00	16.0	7.2	WATER BASED	12.01.1987
2505	0.00	14.0	6.3	WATER BASED	22.12.1986
2557	1.58	13.0	6.8	WATER BASED	05.12.1986
2573	1.58	13.0	6.3	WATER BASED	05.12.1986
2588	0.00	14.0	6.8	WATER BASED	14.01.1987
2640	0.00	15.0	6.8	WATER BASED	09.01.1987
2640	0.00	14.0	4.8	WATER BASED	02.01.1987
2640	0.00	15.0	5.3	WATER BASED	05.01.1987
2640	0.00	15.0	5.3	WATER BASED	06.01.1987
2640	0.00	14.0	5.3	WATER BASED	08.01.1987
2645	1.48	15.0	7.7	WATER BASED	09.12.1986
2645	1.58	15.0	8.7	WATER BASED	11.12.1986
2645	1.58	18.0	8.2	WATER BASED	11.12.1986
2645	1.58	17.0	8.7	WATER BASED	10.12.1986
2645	1.58	16.0	7.2	WATER BASED	15.12.1986
2645	1.58	16.0	7.7	WATER BASED	16.12.1986
2645	1.58	17.0	6.3	WATER BASED	16.12.1986
2645	1.59	15.0	7.2	WATER BASED	16.12.1986
2647	0.00	16.0	7.7	WATER BASED	22.12.1986
2741	0.00	17.0	7.2	WATER BASED	29.12.1986
2798	0.00	16.0	7.7	WATER BASED	29.12.1986
3036	0.00	19.0	8.2	WATER BASED	29.12.1986
3050	0.00	19.0	7.7	WATER BASED	29.12.1986
3050	0.00	16.0	6.8	WATER BASED	02.01.1987
3050	0.00	18.0	6.8	WATER BASED	02.01.1987
3050	0.00	19.0	7.7	WATER BASED	02.01.1987
3050	0.00	15.0	5.3	WATER BASED	05.01.1987
3050	0.00	16.0	5.8	WATER BASED	05.01.1987



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]
935 Formation pressure (Formasjonstrykk)	PDF	0.27

