Generell informasjon

Brønnbane navn	6407/7-3
Type	EXPLORATION
Formål	APPRAISAL
Status	P&A
Faktakart i nytt vindu	lenke til kart
Hovedområde	NORWEGIAN SEA
Felt	NJORD
Funn	6407/7-1 S Njord
Brønn navn	6407/7-3
Seismisk lokalisering	NH 8604 ROW 763 COL. 745
Utvinningstillatelse	107
Boreoperatør	Norsk Hydro Produksjon AS
Boretillatelse	573-L
Boreinnretning	POLAR PIONEER
Boredager	77
Borestart	03.03.1988
Boreslutt	18.05.1988
Plugget og forlatt dato	17.09.2014
Frigitt dato	18.05.1990
Publiseringsdato	09.03.2009
Opprinnelig formål	WILDCAT
Gjenåpnet	NO
Innhold	OIL
Funnbrønnbane	NO
1. nivå med hydrokarboner, alder	MIDDLE JURASSIC
1. nivå med hydrokarboner, formasjon.	ILE FM
2. nivå med hydrokarboner, alder	EARLY JURASSIC
2. nivå med hydrokarboner, formasjon	BÅT GP
Avstand, boredekk - midlere havflate [m]	23.0
Vanndybde ved midlere havflate [m]	332.0
Totalt målt dybde (MD) [m RKB]	3222.0
Totalt vertikalt dybde (TVD) [m RKB]	3220.0
Maks inklinasjon [°]	6.9
Temperatur ved bunn av brønnbanen [°C]	120

Eldste penetrerte alder	LATE TRIASSIC
Eldste penetrerte formasjon	GREY BEDS (INFORMAL)
Geodetisk datum	ED50
NS grader	64° 16' 44.34'' N
ØV grader	7° 9' 0.13'' E
NS UTM [m]	7129582.24
ØV UTM [m]	410422.66
UTM sone	32
NPDID for brønnbanen	1229

Brønnhistorie

General

Well 6407/7-3 was drilled on the northern part of the A structure of the Njord Field. The main objectives of the well were to test the hydrocarbon potential of the Ile Formation, to test the hydrocarbon potential of the Tilje Formation above the oil down to level in the Tilje Formation in well 6407/7-1, and to obtain formation pressure data to indicate the relationship between the A-north and the A-east/A-central compartments.

Operations and results

Well 6407/7-3 was spudded with the semi-submersible installation Polar Pioneer on 3 March 1988 and drilled to TD at 3222 m in the Triassic Grey Beds. At 891 m, after setting of 30" casing, gas started to stream out of the casing. It was assumed that the gas came from the bottom of the hole, since there were no previous peaks on the MWD log. Three cement plugs were set in the interval 780 - 891 m, but the gas continued to stream. A plug was then set in the interval 510 - 570 m, and the gas stream decreased. The hole was drilled up again to 525 m, where 20" casing was set, originally not a part of the program. Two zones had shallow gas, 553 - 570 m and 652 - 685 m, which was in agreement with what was assumed in the site survey. Further drilling proceeded without any significant problems. The well was drilled with spud mud down to 536 m, with gel and seawater from 536 m to 1098 m, with Newdrill/KCl/PAC from 1098 m to 3048 m, and with Newdrill/PAC.

Top Jurassic was encountered at 2795 with a 12 m thick Spekk Formation overlying the Middle Jurassic Not Formation. Top of the reservoir sections was encountered at 2851 m. Light oil was encountered in two differently pressured reservoir zones. The upper reservoir was the Ile Formation from 2851 to 2867 m with a net pay of 10.8 m. The lower reservoir was the Tilje Formation and into the Åre Formation. The oil bearing interval was from 2936.5 m and down to siltstones at 3068 m with a total net pay of 50.4 m. The Åre Formation (below 3014 m) was composed of siltstones, sandstones of low porosity and stringers of claystones. It constituted a minor part of the net pay.

Shows were recorded in sandstones in the Nise, Kvitnos, and Lange Formations in the intervals 2062 - 2325 m and 2487 - 2872 m. Weak shows were recorded also below the oil bearing reservoirs down to 3205 m.

Fourteen cores were cut in the well. Two were cut in the interval 2852 - 2893 m and the remaining from 2937 to 3103 m. While cutting the fourth core, there was an invasion of formation fluid into the hole due to a sudden increase in pore pressure. Heavy mud was circulated into the hole, and the well was brought under control. RFT pressures were recorded and a segregated sample was taken at 2855 m. It recovered ten litres of water, a small amount of gas, and no oil.

The well was permanently abandoned on 18 May 1988 as an oil appraisal.

Testing

Three DST tests were performed in the well. DST 1 tested the interval 3046.8 - 3067.8 m and produced 16 Sm3 oil /day through a 25.4 mm choke. The oil density was 0.831 g/cm3. The down hole temperature in the test, measured at 3003.3 m, was 116 deg C.

Two tests were planned from the interval 2990 - 3014 m. DST 2A produced 527 sm3 oil and 119389 Sm3 gas /day through a 50.8 mm choke. The GOR was 227 Sm3/Sm3, the oil density was 0.809 g/cm3, the gas gravity was 0.737 (air = 1) with 1% CO2 and less than 1 ppm H2S. The down hole temperature in the test, measured at 2889.1 m, was 113.7 deg C. DST 2B was not performed because the bottom hole pressure tool was lost during test 2A and the hole had to be killed.

DST 3 tested the interval 2852.1 - 2867.9 m and produced 950 Sm3 oil and 396150 Sm3 gas /day through a 25.4 mm choke. The GOR was 417 Sm3/Sm3, the oil density was 0.808 g/cm3, the gas gravity was 0.745 (air = 1) with 2% CO2 and less than 1 ppm H2S. The down hole temperature in the test, measured at 2795.5 m, was 111.9 deg C.

Borekaks i Sokkeldirektoratet

Borekaksprøve, topp dybde [m]	Borekaksprøve, bunn dybde [m]
560.00	3222.00

Borekaks tilgjengelig for prøvetaking?	YES

Borekjerner i Sokkeldirektoratet

Kjerneprøve nummer	Kjerneprøve - topp dybde	Kjerneprøve - bunn dybde	Kjerneprøve dybde - enhet
1	2852.0	2871.7	[m]
2	2873.0	2892.5	[m]
3	2937.0	2946.2	[m]
4	2946.3	2952.9	[m]
5	2953.0	2967.6	[m]
6	2967.0	2984.4	[m]
7	2984.4	3012.3	[m]
8	3012.3	3025.5	[m]
9	3025.5	3030.6	[m]
10	3030.6	3043.4	[m]
11	3043.5	3069.0	[m]
12	3069.0	3070.4	[m]
13	3071.0	3085.0	[m]

14	3086.0	3100.5	[m]

Total kjerneprøve lengde [m]	201.4
Kjerner tilgjengelig for prøvetaking?	YES

Palynologiske preparater i Sokkeldirektoratet

Prøve dybde	Dybde enhet	Prøve type	Laboratorie
1221.5	[m]	SWC	HYDRO
1292.0	[m]	SWC	HYDRO
1410.3	[m]	SWC	HYDRO
1558.3	[m]	SWC	HYDRO
1681.5	[m]	SWC	HYDRO
1729.0	[m]	SWC	HYDRO
1769.5	[m]	SWC	HYDRO
1814.8	[m]	SWC	HYDRO
1868.0	[m]	SWC	HYDRO
1900.0	[m]	SWC	HYDRO
1947.5	[m]	SWC	HYDRO
1999.6	[m]	SWC	HYDRO
2016.8	[m]	SWC	HYDRO
2078.8	[m]	SWC	HYDRO
2134.3	[m]	SWC	HYDRO
2184.5	[m]	SWC	HYDRO
2225.0	[m]	SWC	HYDRO
2267.2	[m]	SWC	HYDRO
2309.2	[m]	SWC	HYDRO
2350.5	[m]	SWC	HYDRO
2390.5	[m]	SWC	HYDRO
2449.0	[m]	SWC	HYDRO
2628.5	[m]	SWC	HYDRO
2673.0	[m]	SWC	HYDRO
2702.2	[m]	SWC	HYDRO
2730.0	[m]	SWC	HYDRO
2755.0	[m]	SWC	HYDRO
2765.0	[m]	SWC	HYDRO
2782.0	[m]	SWC	HYDRO
2790.0	[m]	SWC	HYDRO
2796.0	[m]	SWC	HYDRO

2797.0	[m]	SWC	HYDRO
2800.0	[m]	SWC	HYDRO
2805.0	[m]	SWC	HYDRO
2815.0	[m]	SWC	HYDRO
2823.0	[m]	SWC	HYDRO
2833.0	[m]	SWC	HYDRO
2837.5	[m]	SWC	HYDRO
2840.0	[m]	SWC	HYDRO
2845.0	[m]	SWC	HYDRO
2850.0	[m]	SWC	HYDRO
2852.5	[m]	C	HYDRO
2856.0	[m]	C	HYDRO
2856.8	[m]	C	HYDRO
2861.5	[m]	C	HYDRO
2868.0	[m]	C	HYDRO
2873.3	[m]	C	HYDRO
2876.0	[m]	C	HYDRO
2881.2	[m]	C	HYDRO
2887.0	[m]	C	HYDRO
2887.0	[m]	C	HYDRO
2890.0	[m]	C	HYDRO
2892.5	[m]	C	HYDRO
2915.0	[m]	SWC	HYDRO
2925.0	[m]	SWC	HYDRO
2933.0	[m]	SWC	HYDRO
2939.0	[m]	C	HYDRO
2944.0	[m]	C	HYDRO
2949.0	[m]	C	HYDRO
2953.0	[m]	C	HYDRO
2959.0	[m]	C	HYDRO
2969.2	[m]	C	HYDRO
2976.0	[m]	C	HYDRO
2984.4	[m]	C	HYDRO
2985.4	[m]	C	HYDRO
2990.0	[m]	C	HYDRO
2995.6	[m]	C	HYDRO
3010.9	[m]	C	HYDRO
3013.0	[m]	C	HYDRO
3030.6	[m]	C	HYDRO
3032.9	[m]	C	HYDRO

3035.0	[m]	C	HYDRO
3039.8	[m]	C	HYDRO
3047.4	[m]	C	HYDRO
3052.3	[m]	C	HYDRO
3064.4	[m]	C	HYDRO
3072.8	[m]	C	HYDRO
3084.7	[m]	C	HYDRO
3094.7	[m]	C	HYDRO
3108.0	[m]	SWC	HYDRO
3135.0	[m]	SWC	HYDRO
3155.0	[m]	SWC	HYDRO
3168.5	[m]	SWC	HYDRO
3180.0	[m]	SWC	HYDRO
3195.5	[m]	SWC	HYDRO

Oljeprøver i Sokkeldirektoratet

Test type	Flaske nummer	Topp dyp MD [m]	Bunn dyp MD [m]	Væske type	Test tidspunkt	Prøver tilgjengelig
DST	DST2A	2990.00	3014.00		08.05.1988 - 00:00	YES
DST	DST3	2852.00	2867.00		11.05.1988 - 00:00	YES

Litostratigrafi

Topp Dyb [mMD RKB]	Litostrat. enhet
355	NORDLAND GP
355	NAUST FM
1100	KAI FM
1152	HORDALAND GP
1152	BRYGGE FM
1762	ROGALAND GP
1762	TARE FM
1825	TANG FM
2000	SHETLAND GP
2000	SPRINGAR FM
2027	NISE FM
2232	KVITNOS FM

2563	CROMER KNOLL GP
2563	LANGE FM
2795	VIKING GP
2795	SPEKK FM
2807	FANGST GP
2807	NOT FM
2851	ILE FM
2867	BÅT GP
2867	ROR FM
2937	TILJE FM
3014	ÅRE FM
3128	GREY BEDS (INFORMAL)

Geokjemisk informasjon

Dokument navn	Dokument format	Dokument størrelse [KB]
1229_1	pdf	0.31
1229_2	pdf	2.46

Dokumenter - eldre Sokkeldirektoratets WDSS rapporter og andre relaterte dokumenter

Dokument navn	Dokument format	Dokument størrelse [KB]
1229_01_WDSS_General_Information	pdf	0.56
1229_02_WDSS_completion_log	pdf	0.25

Dokumenter - rapportert av utvinningstillatelsen (frigitt ihht til regelverk)

Dokument navn	Dokument format	Dokument størrelse [KB]
1229_01_6407_7_3_Completion_report	pdf	10.13
1229_02_6407_7_3_Completion_log	pdf	4.68

Borestrengtester (DST)

Test nummer	Fra dybde MD [m]	Til dybde MD [m]	Reduksjonsven til størrelse [mm]
1.0	3047	3068	25.4

2.0	2990	3014	50.8
3.0	2852	2868	25.4

Test nummer	Endelig avstengningstrykk [MPa]	Endelig strømningstrykk [MPa]	Bunnhullstrykk [MPa]	Borehullstemperatur [°C]
1.0				
2.0				
3.0				

Test nummer	Olje produksjon [Sm3/dag]	Gass produksjon [Sm3/dag]	Oljetetthet [g/cm3]	Gasstyngde rel. luft	GOR [m3/m3]
1.0	16		0.831		
2.0	527	119000	0.809	0.737	227
3.0	950	396000	0.808	0.745	417

Logger

Type logg	Topp dyp for logg [m]	Bunn dyp for logg [m]
AMS	1020	2748
AMS	2736	3222
CBL VDL GR	450	1095
CBL VDL GR	2075	2730
CST GR	1221	2730
CST GR	2755	3195
CST GR	2755	3180
DIL BHC GR SP	400	1057
DIL BHC GR SP	1020	2748
DIL SDT GR SP	2736	3225
DLL MSFL SGR	2736	3222
EVA SONIC	2997	3210
EVA SONIC	3080	3120
FMS AMS GR	2740	3226
LDL CNL CAL GR	1020	2748
LDL CNL NGS CAL	2736	3222
MWD - GR RES DIR	363	1116
MWD - GR RES DIR	2753	3221
NGS	2736	3222

RFT GR	2855	2880
RFT GR	2855	3144
RFT GR	2860	3004
SHDT GR	1099	2749
VSP	700	2700
VSP	900	3150

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	440.0	36	442.0	0.00	LOT
SURF.COND.	20	520.0	26	536.0	1.37	LOT
INTERM.	13 3/8	1098.0	17 1/2	1116.0	1.78	LOT
INTERM.	9 5/8	2731.0	12 1/4	2750.0	1.75	LOT
LINER	7	3218.0	8 1/2	3222.0	0.00	LOT

Boreslam

Dybde MD [m]	Egenvekt, slam [g/cm3]	Viskositet, slam [mPa.s]	Flytegrense [Pa]	Type slam	Dato, måling
394	1.03			WATER BASED	03.03.1988
440	1.03			WATER BASED	04.03.1988
442	1.03			WATER BASED	07.03.1988
480	1.61	18.0	5.0	WATER BASED	19.05.1988
480	0.00			WATER BASED	20.05.1988
510	1.08			WATER BASED	08.03.1988
525	1.05			WATER BASED	09.03.1988
525	1.05			WATER BASED	10.03.1988
536	1.07	5.0	7.0	WATER BASED	11.03.1988
811	1.14	5.0	7.0	WATER BASED	14.03.1988
891	1.03			WATER BASED	07.03.1988
1116	1.14	6.0	11.0	WATER BASED	14.03.1988
1116	1.15	7.0	12.0	WATER BASED	14.03.1988
1116	1.14	5.0	9.0	WATER BASED	15.03.1988
1176	1.53	12.0	7.0	WATER BASED	16.03.1988
1649	1.60	15.0	9.0	WATER BASED	17.03.1988
2151	1.60	18.0	9.0	WATER BASED	18.03.1988
2233	1.60	17.0	8.0	WATER BASED	21.03.1988

2407	1.60	18.0	14.0	WATER BASED	21.03.1988
2465	1.60	15.0	13.0	WATER BASED	21.03.1988
2560	1.60	16.0	13.0	WATER BASED	22.03.1988
2658	1.60	18.0	8.0	WATER BASED	24.03.1988
2711	1.60	18.0	9.0	WATER BASED	24.03.1988
2745	1.61	18.0	5.0	WATER BASED	19.05.1988
2750	1.60	14.0	6.0	WATER BASED	25.03.1988
2750	1.60	17.0	9.0	WATER BASED	28.03.1988
2750	1.60	18.0	10.0	WATER BASED	28.03.1988
2750	1.60	10.0	5.0	WATER BASED	28.03.1988
2753	1.59	12.0	13.0	WATER BASED	29.03.1988
2841	1.46	18.0	5.0	WATER BASED	05.04.1988
2873	1.46	19.0	5.0	WATER BASED	06.04.1988
2898	1.46	16.0	5.0	WATER BASED	06.04.1988
2922	1.60	15.0	5.0	WATER BASED	16.05.1988
2922	1.60	15.0	6.0	WATER BASED	16.05.1988
2922	1.61	18.0	5.0	WATER BASED	16.05.1988
2937	1.46	20.0	6.0	WATER BASED	06.04.1988
2947	1.46	20.0	6.0	WATER BASED	06.04.1988
2965	1.52	22.0	6.0	WATER BASED	06.04.1988
2984	1.52	22.0	6.0	WATER BASED	06.04.1988
3018	1.52	22.0	6.0	WATER BASED	06.04.1988
3030	1.52	22.0	6.0	WATER BASED	07.04.1988
3041	1.60	22.0	4.0	WATER BASED	02.05.1988
3041	1.60	21.0	4.0	WATER BASED	03.05.1988
3041	1.60	18.0	6.0	WATER BASED	05.05.1988
3041	1.60	16.0	5.0	WATER BASED	06.05.1988
3041	1.60	16.0	6.0	WATER BASED	09.05.1988
3041	1.60	19.0	6.0	WATER BASED	13.05.1988
3041	1.60	21.0	6.0	WATER BASED	10.05.1988
3041	1.60	18.0	6.0	WATER BASED	04.05.1988
3041	1.60	18.0	6.0	WATER BASED	09.05.1988
3048	1.52	19.0	4.0	WATER BASED	08.04.1988
3071	1.52	21.0	5.0	WATER BASED	11.04.1988
3102	1.52	22.0	5.0	WATER BASED	11.04.1988
3162	1.52	23.0	6.0	WATER BASED	11.04.1988
3222	1.52	22.0	5.0	WATER BASED	12.04.1988
3222	1.52	19.0	5.0	WATER BASED	14.04.1988
3222	1.52	24.0	5.0	WATER BASED	15.04.1988
3222	1.52	27.0	4.0	WATER BASED	19.04.1988

3222	1.52	23.0	6.0	WATER BASED	19.04.1988
3222	1.52	29.0	5.0	WATER BASED	19.04.1988
3222	1.56	24.0	5.0	WATER BASED	20.04.1988
3222	1.56	21.0	6.0	WATER BASED	22.04.1988
3222	1.60	23.0	7.0	WATER BASED	22.04.1988
3222	1.60	24.0	5.0	WATER BASED	27.04.1988
3222	1.60	23.0	5.0	WATER BASED	27.04.1988
3222	1.60	25.0	5.0	WATER BASED	27.04.1988
3222	1.60	23.0	4.0	WATER BASED	27.04.1988
3222	1.60	23.0	4.0	WATER BASED	29.04.1988
3222	1.60	22.0	5.0	WATER BASED	02.05.1988
3222	1.52	19.0	5.0	WATER BASED	13.04.1988
3222	1.52	25.0	4.0	WATER BASED	19.04.1988
3222	1.60	23.0	4.0	WATER BASED	02.05.1988

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]
1229_Formation_pressure_(Formasjonstrykk)	pdf	0.23