



Generell informasjon

Brønnbane navn	2/4-8
Type	EXPLORATION
Formål	APPRAISAL
Status	P&A
Faktakart i nytt vindu	lenke til kart
Hovedområde	NORTH SEA
Felt	TOR
Funn	2/5-1 Tor
Brønn navn	2/4-8
Seismisk lokalisering	AFE NW 5603
Utvinningstillatelse	018
Boreoperatør	Phillips Petroleum Company Norway
Boretillatelse	63-L
Boreinnretning	ZAPATA EXPLORER
Boredager	124
Borestart	25.11.1971
Boreslutt	29.03.1972
Frigitt dato	29.03.1974
Publiseringsdato	02.04.2007
Opprinnelig formål	APPRAISAL
Gjenåpnet	NO
Innhold	OIL
Funnbrønnbane	NO
1. nivå med hydrokarboner, alder	PALEOCENE
1. nivå med hydrokarboner, formasjon.	EKOFISK FM
2. nivå med hydrokarboner, alder	LATE CRETACEOUS
2. nivå med hydrokarboner, formasjon	TOR FM
Avstand, boredekk - midlere havflate [m]	37.0
Vanndybde ved midlere havflate [m]	66.0
Totalt målt dybde (MD) [m RKB]	4075.0
Maks inklinasjon [°]	1.75
Temperatur ved bunn av brønnbanen [°C]	128
Eldste penetrerte alder	LATE PERMIAN
Eldste penetrerte formasjon	ZECHSTEIN GP
Geodetisk datum	ED50



NS grader	56° 38' 15.6" N
ØV grader	3° 18' 55" E
NS UTM [m]	6277238.17
ØV UTM [m]	519339.11
UTM sone	31
NPDID for brønnbanen	252

Brønnhistorie

General

Well 2/4-8 was drilled on the crest of the Tor Discovery structure in the southern Norwegian North Sea. The principal objective was to confirm the thick Danian-Cretaceous productive section present in the Amoco 2/5-1 well and to provide a means of evaluating the maximum anticipated productive section in the Tor Discovery. Jurassic sandstone was also defined as principal objective, while secondary prospects could exist in Paleocene sands. Prognosed top Jurassic was at 3691 m (12110 ft) with planned TD at 4572 m (15000 ft).

Operations and results

Appraisal well 2/4-8 was spudded with the jack-up installation Zapata Explorer on 25 November 1971. The original spud location was 56 deg 38' 15.6" N, 03 deg 18' 48" E. This hole was drilled to 570 m at which point the well kicked and bridged off. The drill pipe became stuck at 486 m and the hole was abandoned with the top of fish at 323 m. The rig was moved 120 meters east where the well was re-spudded and drilled to final TD at 4078 m in the Permian Zechstein Group. The well was drilled with seawater and hi-vis mud down to 488 m, with drill aid / DAP (di-ammonium phosphate) mud from 488 m to 1623 m, with drill aid / gypsum mud from 1623 m to 2211 m, with drill aid from 2211 m to 2984 m, with a lignosulphonate mud from 2984 m to 3810 m, and with Drispac / salt saturated mud from 3810 m to TD. Below 488 m 2 -6 % diesel was added to the mud.

At 2946 m the well penetrated a 3 m fine grained Paleocene sand with a calcite matrix. This sandstone exhibited a dull yellow fluorescence and a slow cut. Danian chalk was encountered at 2985 m and Late Cretaceous chalk was encountered at 3086 m. Gas and oil was tested from the Danian - Late Cretaceous chalk. Continuous zones of oil shows were observed on all cores down to 3203 m, below this depth shows were scattered.

Twenty cores with a total recovery of 176 m core were cut in the interval 2985 to 3242 m in Danian and Late Cretaceous chalk. No wire line fluid samples were taken.

The well was permanently abandoned on 29 March 1972 as an oil appraisal.

Testing

Seven drill stem tests were carried out through perforations in the 7" liner. Two of these were carried out in the Danian chalk (DST 6 and DST 7), the rest in the Late Cretaceous chalk. DST 1 and DST 2 were conducted without acidization and flowed only minor quantities of water. The other DST's flowed oil after acidization. The best flow was obtained in DST 5 from the interval 3091 - 3158 m in the uppermost Late Cretaceous with 655 Sm³/day. The oil gravity was 40.4 deg API and the GOR was 359 Sm³/Sm³.



Borekaks i Sokkeldirektoratet

Borekaksprøve, topp dybde [m]	Borekaksprøve, bunn dybde [m]
487.68	4075.18

Borekaks tilgjengelig for prøvetaking?	YES
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Borekjerne i Sokkeldirektoratet

Kjerneprøve nummer	Kjerneprøve - topp dybde	Kjerneprøve - bunn dybde	Kjerneprøve dybde - enhet
1	9795.0	9806.0	[ft]
2	9820.0	9846.0	[ft]
3	9852.0	9873.0	[ft]
4	9873.0	9891.0	[ft]
5	9913.0	9921.0	[ft]
6	9921.0	9953.0	[ft]
7	9959.0	9978.0	[ft]
8	9980.0	10007.0	[ft]
9	10007.0	10031.0	[ft]
10	10033.0	10092.5	[ft]
11	10094.0	10154.0	[ft]
12	10155.0	10190.0	[ft]
13	10197.0	10204.0	[ft]
14	10258.0	10269.0	[ft]
15	10270.0	10331.0	[ft]
16	10331.0	10392.0	[ft]
17	10392.0	10453.0	[ft]
18	10453.0	10514.0	[ft]
19	10514.0	10575.0	[ft]
20	10575.0	10653.0	[ft]

Total kjerneprøve lengde [m]	226.0
Kjerner tilgjengelig for prøvetaking?	YES

Palynologiske preparater i Sokkeldirektoratet

Prøve dybde	Dybde enhet	Prøve type	Laboratorie
3668.3	[m]	DC	HRS



3676.0	[m]	DC	HRS
3682.0	[m]	DC	HRS
3693.0	[m]	DC	HRS

Litostratigrafi

Topp Dyb [mMD RKB]	Litostrat. enhet
103	NORDLAND GP
1716	HORDALAND GP
2882	ROGALAND GP
2882	BALDER FM
2893	SELE FM
2920	LISTA FM
2974	VÅLE FM
2985	SHETLAND GP
2985	EKOFISK FM
3086	TOR FM
3383	HOD FM
3444	BLODØKS FM
3460	HIDRA FM
3484	CROMER KNOLL GP
3484	RØDBY FM
3677	TYNE GP
3677	MANDAL FM
3696	ZECHSTEIN GP

Geokjemisk informasjon

Dokument navn	Dokument format	Dokument størrelse [KB]
252_1	pdf	1.14
252_2	pdf	0.93
252_3	pdf	2.06

Dokumenter - eldre Sokkeldirektoratets WDSS rapporter og andre relaterte dokumenter

Dokument navn	Dokument format	Dokument størrelse [KB]
252_01 WDSS General Information	pdf	0.41





Dokumenter - rapportert av utvinningstillatelsen (frigitt ihht til regelverk)

Dokument navn	Dokument format	Dokument størrelse [KB]
252 01 2 4 8 (8AX) Completion Report and Completion log	pdf	33.89
252 02 2 4 8 (8AX) Individual Well Completion Record	pdf	0.09
252 03 2 4 8 (8AX) A Study of the Natural Fracture System	pdf	6.71
252 03 2 4 8 (8AX) Lithostratigraphy Sedimentology	pdf	163.61
252 03 2 4 8 (8X) Biostratigraphy and Paleogeography	pdf	0.65
252 03 2 4 8 (8X) Biostratigraphy of Core Samples	pdf	1.37
252 03 2 4 8 (8X) The Micropaleontology and Stratigraphy	pdf	2.78
252 03 2 4 8 Biostratigraphical Summary of the Lower Cretaceous	pdf	0.17
252 03 2 4 8 Biostratigraphic Summary Diagram	pdf	26.95
252 03 2 4 8 Geochemical Analysis Report	pdf	13.36
252 04 2 4 8 (8AX) Additional Conventional Core Analysis	pdf	0.18
252 04 2 4 8 (8AX) Core Analysis Result	pdf	1.77
252 04 2 4 8 (8AX) Core Lithological Descriptions	pdf	0.48
252 04 2 4 8 (8AX) Petrography of Selected Samples Dalian	pdf	18.25
252 04 2 4 8 (8AX) Porosity Permeability and Grain Density	pdf	0.27
252 04 2 4 8 (8AX) Special Core Analysis Study	pdf	3.42
252 04 2 4 8 (8AX) XRD Analysis of Selected Samples	pdf	0.34
252 05 2 4 8 (8AX) Capillary Pressure Gas-Oil and water-Oil	pdf	3.31
252 05 2 4 8 (8AX) DST Fluid and Samples Analysis	pdf	2.96





252 05 2 4 8 (8AX) DST Fluid and Sample Analysis	pdf	16.40
252 05 2 4 8 (8AX) Formation Testing Service Report	pdf	1.32
252 05 2 4 8 (8AX) Individual Well Production Test	pdf	0.12

Borestrengtester (DST)

Test nummer	Fra dybde MD [m]	Til dybde MD [m]	Reduksjonsven til størrelse [mm]
1.0	3194	3204	0.0
2.0	3185	3194	0.0
3.0	3181	3191	12.4
4.0	3194	3204	25.4
5.0	3091	3158	6.3
6.0	3014	3042	11.1
7.0	2996	3002	0.0

Test nummer	Endelig avstengningstrykk [MPa]	Endelig strømningstrykk [MPa]	Bunnhullstrykk [MPa]	Borehullstemperatur [°C]
1.0				
2.0				
3.0				
4.0				
5.0				
6.0				
7.0				

Test nummer	Olje produksjon [Sm3/dag]	Gass produksjon [Sm3/dag]	Oljetetthet [g/cm3]	Gasstygde rel. luft	GOR [m3/m3]
1.0					
2.0					
3.0	443	707028	0.885		1596
4.0	175	326025	0.822		1863
5.0	654	1316502	0.821		2013
6.0	360	519480	0.820		1443
7.0	71	133906			1886





Logger

Type logg	Topp dyp for logg [m]	Bunn dyp for logg [m]
BHC C	1611	4076
CBL	1829	3700
DL	2980	3731
FDC	2980	3726
GR BHC	479	1619
GR N	244	607
GR N	2956	3703
IES	479	4076
ML MLL	2982	3677
SNP	2980	4076
TS	1372	3619
VELOCITY	479	3721

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	137.0	36	138.0	0.00	LOT
SURF.COND.	20	548.0	26	548.0	0.00	LOT
INTERM.	13 3/8	1615.0	17 1/2	1616.0	0.00	LOT
INTERM.	9 5/8	3002.0	12 1/4	3003.0	0.00	LOT
LINER	7	3692.0	8 1/2	4078.0	0.00	LOT

Boreslam

Dybde MD [m]	Egenvekt, slam [g/cm3]	Viskositet, slam [mPa.s]	flytegrense [Pa]	Type slam	Dato, måling
450	1.13			seawater	
945	1.25	54.0	28.0	seawater	
1229	1.62	48.0	10.0	seawater	
3577	1.71	44.0	21.0	Barite	
3710	1.75	44.0	11.0	Ligno	
4075	1.77	55.0	30.0	Ligno	

