Generell informasjon

Brønnbane navn	24/9-4
Type	EXPLORATION
Formål	APPRAISAL
Status	P&A
Faktakart i nytt vindu	lenke til kart
Hovedområde	NORTH SEA
Funn	24/9-3
Brønn navn	24/9-4
Seismisk lokalisering	FI89 X-1017 / FI89 Y-1804
Utvinningstillatelse	150
Boreoperatør	Fina Production Licenses AS
Boretillatelse	675-L
Boreinnretning	BYFORD DOLPHIN
Boredager	62
Borestart	17.04.1991
Boreslutt	17.06.1991
Frigitt dato	17.06.1993
Publiseringsdato	01.12.2004
Opprinnelig formål	WILDCAT
Gjenåpnet	NO
Innhold	OIL SHOWS
Funnbrønnbane	NO
Avstand, boredekk - midlere havflate [m]	24.5
Vanndybde ved midlere havflate [m]	119.0
Totalt målt dybde (MD) [m RKB]	2208.0
Totalt vertikalt dybde (TVD) [m RKB]	2206.0
Maks inklinasjon [°]	6.5
Temperatur ved bunn av brønnbanen [°C]	44
Eldste penetrerte alder	PALEOCENE
Eldste penetrerte formasjon	LISTA FM
Geodetisk datum	ED50
NS grader	59° 23' 21.95'' N
ØV grader	1° 47' 20.29'' E
NS UTM [m]	6584194.97
ØV UTM [m]	431209.79
UTM sone	31
NPDID for brønnbanen	1714

Brønnhistorie

General

Well 24/9-4 is located 1 km East of the border to British sector, on the northern outskirts of the 24/9-3 Discovery. The main objective of the well was to test the Early Eocene Frigg Formation forming a stratigraphic play in the western part of the block, where the reservoir was interpreted to result from a submarine fan deposition. The primary risk of the prospect was the presence of the reservoir. The prognosed gross thickness of the reservoir sequence was 230 metres with a net/gross ratio of 0.50 at the well location. No secondary targets were identified.

Operations and results

Well 24/9-4 was spudded with the semi-submersible installation Byford Dolphin on 17 April 1991 and drilled to TD at 2208 m in the Late Paleocene Lista Formation. Here, a wiper trip was performed. When back reaming the string stuck at 1864 m. It was not possible to circulate since the hole had packed off. Several fishing attempts were made, but all were unsuccessful, leaving an MWD tool and a CDR tool in the hole. The hole was then cemented to 1733 m. The sidetrack vas kicked off from 1753 m to an angle of four degrees before pulling out at 1842 m. A conventional packed hole assembly vas then run to try to drill to section TD. Drilling continued to 2021m where a viper trip vas performed to ream tight hole sections. Drilling resumed without incident to 2164 m where bottoms up vas circulated before tripping out. The string became differentially stuck whilst pulling out of the hole. After spotting a pill and jarring for several hours a back-off charge vas run leaving a 30 m fish in the hole, which included an MWD tool. Several unsuccessful fishing runs were attempted before running a VSP and E-logs. The well vas then plugged and abandoned at 2164 m.

Well 24/9-4 penetrated the top of the Frigg Formation sands at 1766 m, which was 51 metres deeper than prognosed. It consisted of very fine to fine grained well-sorted very argillaceous sandstone stringers commonly less than one metre thick. One major massive sand was seen from 1864.5 to 1906 m. The majority of the Frigg interval was grey claystone with occasional pyrite and glauconite grains. Thin limestone stringers were also seen.

The first shows observed in the well occurred at 1759 m with traces of an orange direct fluorescence with a fast white cut fluorescence and a white residue fluorescence. Gas levels increased sharply at 1766 m to 0.36% C1, 0.017% C2 with traces of C3 and C4, with an average reading of 0.123 % C1, 0.025% C2 and traces of C3 and C4 down to 1815 m. Below this depth levels fell to 0.07-0.10% C1, with traces of C2 and C3. Shows were good in the sandstone stringers encountered from 1766 to 1815 m with oil staining, direct and cut fluorescence. Below 1815 m, the shows diminished until below 1840 m, where only traces of cut fluorescence could be detected. The main sand interval between 1864.5 and 1906.0 m was water bearing. Only traces of light brown and occasional black residual oil were encountered in this interval.

Three cores were cut in the Lower Eocene section at the top of the Frigg Formation sands. A total of 22.0 metres were cored between 1773.0 and 1795.0 m, with a total recovery of 11.75 metres (53.4 %). The cores consist mainly of claystone and only three very thin sand stringers were present. Black oil was bleeding from these stringers. RFT points were taken throughout the four reservoir sections. The overall quality of the data is poor due to the type of reservoir (unconsolidated sandstone), the hole conditions (caliper log indicates values from 6.5 to 14 inches) and large drilling fluid invasion in the reservoir sections. Four attempts were made to collect representative reservoir fluid samples. On each run, a 2 3/4 and a one-gallon RFT chamber were used. The 23/4 chambers were full of mud/mud filtrate. Some oil shows were found but could not be used for laboratory analysis. Wire line logs in run no 4, the MWD/LWD logs in runs no 8

and 9, CST's, and RFT's were taken in the sidetrack. The conventional cores and all other logs were acquired in the first hole. Based on the analysis of the ditch cuttings, conventional cores and logs it was decided not to test the well. The well was plugged and abandoned as a dry well with oil shows on 18 June 1991.

Testing

No drill stem test was performed

Borekaks i Sokkeldirektoratet

Borekaksprøve, topp dybde [m]	Borekaksprøve, bunn dybde [m]
770.00	2161.00

Borekaks tilgjengelig for prøvetaking?	YES

Borekjerner i Sokkeldirektoratet

Kjerneprøve nummer	Kjerneprøve - topp dybde	Kjerneprøve - bunn dybde	Kjerneprøve dybde - enhet
1	1773.0	1778.9	[m]
2	1782.0	1787.3	[m]

Total kjerneprøve lengde [m]	11.2
Kjerner tilgjengelig for prøvetaking?	YES

Kjernebilder


1773-1776m


1776-1778m


1782-1785m


1785-1787m


1787-1791m

Litostratigrafi

Topp Dyb [mMD RKB]	Litostrat. enhet
144	NORDLAND GP

273	UTSIRA FM
740	HORDALAND GP
819	SKADE FM
850	NO FORMAL NAME
1067	GRID FM
1243	NO FORMAL NAME
1332	GRID FM
1371	NO FORMAL NAME
1766	FRIGG FM
1906	NO FORMAL NAME
1974	ROGALAND GP
1974	BALDER FM
2098	SELE FM
2170	LISTA FM

Geokjemisk informasjon

Dokument navn	Dokument format	Dokument størrelse [KB]
1714_1	pdf	0.51

Dokumenter - eldre Sokkeldirektoratets WDSS rapporter og andre relaterte dokumenter

Dokument navn	Dokument format	Dokument størrelse [KB]
1714_01_WDSS_General_Information	pdf	0.51
1714_02_WDSS_completion_log	pdf	0.14

Dokumenter - rapportert av utvinningstillatelsen (frigitt ihht til regelverk)

Dokument navn	Dokument format	Dokument størrelse [KB]
1714_24_9_4_COMPLETION_REPORT_AND_LOG	pdf	27.29

Logger

Type logg	Topp dyp for logg [m]	Bunn dyp for logg [m]
CBL VDL GR CCL	1300	1518
CST GR	1760	1850
DIL BHC CAL GR	1585	1792
DIL BHC CAL GR	1585	1857
DIL BHC LDL GR	1179	1617
DIL LSS GR AMS	1179	1443
DIL LSS LDL GR	750	1168
DIL SLS CAL GR	1585	1752
DLL MSFL GR CAL	1585	1855
LDL CNC GR CAL	1585	1857
MWD LWD - CDR	1650	2208
MWD LWD - GR RES	143	610
MWD LWD - GR RES	1753	2161
RFT HP GR	1766	1818
RFT HP GR	1766	1818
RFT HP GR	1766	1818
VSP	230	1820

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	205.5	36	211.0	0.00	LOT
INTERM.	20	750.0	26	756.0	1.21	LOT
INTERM.	13 3/8	1179.0	17 1/2	1180.0	1.53	LOT
INTERM.	9 5/8	1585.0	12 1/4	1654.0	1.68	LOT
OPEN HOLE		2208.0	8 1/2	2208.0	0.00	LOT

Boreslam

Dybde MD [m]	Egenvekt, slam [g/cm3]	Viskositet, slam [mPa.s]	Flytegrense [Pa]	Type slam	Dato, måling
170	1.03	130.0		WATER BASED	
210	1.20	31.0		WATER BASED	
650	1.20	31.0		WATER BASED	
756	1.03	140.0		WATER BASED	
1585	1.41	70.0		WATER BASED	

1654	1.35	75.0		WATER BASED	
1688	1.13	55.0		WATER BASED	
1903	1.41	63.0		WATER BASED	
1979	1.41	56.0		WATER BASED	
2208	1.25	53.0		WATER BASED	

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]
1714_Formation_pressure_(Formasjonstrykk)	pdf	0.20