



Generell informasjon

Brønnbane navn	16/4-1
Type	EXPLORATION
Formål	WILDCAT
Status	P&A
Faktakart i nytt vindu	lenke til kart
Hovedområde	NORTH SEA
Brønn navn	16/4-1
Seismisk lokalisering	NH 8105 - 306 SP. 752
Utvinningstillatelse	087
Boreoperatør	Norsk Hydro Produksjon AS
Boretillatelse	432-L
Boreinnretning	TREASURE SEEKER
Boredager	72
Borestart	08.09.1984
Boreslutt	18.11.1984
Frigitt dato	18.11.1986
Publiseringsdato	24.09.2004
Opprinnelig formål	WILDCAT
Gjenåpnet	NO
Innhold	DRY
Funnbrønnbane	NO
Avstand, boredekk - midlere havflate [m]	25.0
Vanndybde ved midlere havflate [m]	96.0
Totalt målt dybde (MD) [m RKB]	2909.0
Totalt vertikalt dybde (TVD) [m RKB]	2909.0
Maks inklinasjon [°]	2.5
Temperatur ved bunn av brønnbanen [°C]	96
Eldste penetrerte alder	PRE-DEVONIAN
Eldste penetrerte formasjon	BASEMENT
Geodetisk datum	ED50
NS grader	58° 38' 18.33" N
ØV grader	2° 8' 17.03" E
NS UTM [m]	6500262.06
ØV UTM [m]	449959.99
UTM sone	31
NPDID for brønnbanen	229

**Brønnhistorie****General**

Well 16/4-1 is located on the Utsira High. The primary objective of the well was to test the Paleocene Heimdal Formation. Secondary objectives were Jurassic and Triassic sandstones, Zechstein carbonates and Rotliegendes conglomerates. The well was planned to reach TD at 2850 m + 100 m after having identified a seismic reflector at this depth, interpreted to represent Top Metamorphic Basement.

Operations and results

Wildcat well 16/4-1 was spudded with the semi-submersible installation Treasure Seeker on 8 September 1984 and drilled to TD at 2909 m in crystalline/metamorphic basement of Early Paleozoic age. Under the 30" casing shoe a 17 1/2" pilot hole was drilled. At 494 m in Pleistocene sand and shale, the well started to flow up the annulus from a small gas pocket. The well died out by itself but there were problems with lost circulation, so a cement plug was set from 494 - 415 m. The cement was drilled out to 480 m and the hole was underreamed to 26" before landing of the 20" casing. No other major problems occurred during drilling of this well. The well was drilled with seawater and bentonite down to 494 m, with KCl/polymer mud from 494 m to 2052 m, and with NaCl/polymer mud from 2052 m to TD.

The well 16/4-1 encountered water-bearing sandstones in the Paleocene Heimdal Formation as well as in the Triassic. The latter is a 36 m thick sand in between the Smith Bank Formation and the Zechstein Group. The Heimdal Formation Sandstones occur as interbedded sand/claystone in the upper part (2100 m to 2142 m) and as a massive sandstone, which is homogenous and very clean in the lower part (2142 m to 2277 m). The Triassic sandstones (2394 m to 2430 m) were very fine-to-fine grained with a considerable amount of silt and mica. Log evaluations over these sands gave the following results: The interval 2100 m to 2142 m gave a net/gross ratio of 0.095, with an average porosity of 23,06% and a shale volume of 43,58% after cut-off. The interval 2142 m to 2277 m had a N/G of 0,89 with 26,36% average porosity and 11,19% shale volume. The Triassic interval (2394 m to 2430 m) had a net/gross of 0,37 with 22,88% average porosity and 18,54% shale volume. All these values are calculated after a cut-off of 20% (1 mD). Twenty-five pressure tests (RFT) were performed from 2083 m to 2422.4 m. These gave a water gradient of 0,445 psi/ft (1.024 g/cc) in the Heimdal Fm sandstones. No pressure data were obtained from the Triassic.

Three cores were cut in this well, the first and second in sandstones of the Heimdal and Smith Bank formations respectively. The third core was taken in metamorphic/crystalline basement. Core 1 was cut from 2161 m to 2174 m in the Heimdal formation. The recovered core of 11 m (85%) consisted of very fine to medium grained, poorly sorted sandstone with claystone in the interval 2170-71 m. Core 2 was cut from 2404 m to 2422 m and 17.5 m (97%) was recovered. The core was cut in the Triassic sand under the Smith Bank Formation. It consisted of micaceous sandstones and siltstones with subordinate clay clasts. Core 3 was cut from 2907 m to 2909 m in the Basement and 100% was recovered. The core consisted of schist and granite. No fluid samples were collected. The well was permanently abandoned on 18 November 1984 as a dry well.

Testing

No drill stem test was performed



Borekaks i Sokkeldirektoratet

Borekaksprøve, topp dybde [m]	Borekaksprøve, bunn dybde [m]
210.00	2907.00

Borekaks tilgjengelig for prøvetaking?	YES
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Borekjerne i Sokkeldirektoratet

Kjerneprøve nummer	Kjerneprøve - topp dybde	Kjerneprøve - bunn dybde	Kjerneprøve dybde - enhet
1	2161.0	2172.0	[m]
2	2404.0	2421.5	[m]
3	2907.0	2909.0	[m]

Total kjerneprøve lengde [m]	30.5
Kjerner tilgjengelig for prøvetaking?	YES

Kjernebilder



2161-2166m



2166-2171m



2171-2172m



2404-2409m



2409-2414m



2414-2419m



2419-2421m



2907-2909m

Palynologiske preparater i Sokkeldirektoratet

Prøve dybde	Dybde enhet	Prøve type	Laboratorie
2035.0	[m]	SWC	RRI
2057.0	[m]	SWC	RRI



2073.0	[m]	SWC	RRI
2092.0	[m]	SWC	RRI
2108.0	[m]	SWC	RRI
2118.5	[m]	SWC	RRI
2131.0	[m]	SWC	RRI
2146.0	[m]	SWC	RRI
2161.0	[m]	C	RRI
2171.3	[m]	C	RRI
2172.0	[m]	C	RRI
2196.0	[m]	SWC	RRI
2258.0	[m]	SWC	RRI

Litostratigrafi

Topp Dyb [mMD RKB]	Litostrat. enhet
121	NORDLAND GP
761	UTSIRA FM
998	HORDALAND GP
1147	SKADE FM
1185	UNDIFFERENTIATED
1280	NO FORMAL NAME
1311	UNDIFFERENTIATED
1989	ROGALAND GP
1989	BALDER FM
2011	SELE FM
2036	LISTA FM
2142	HEIMDAL FM
2277	VÅLE FM
2285	SHETLAND GP
2315	CROMER KNOLL GP
2315	SOLA FM
2325	ÅSGARD FM
2333	VIKING GP
2333	INTRA DRAUPNE FM SS
2337	NO GROUP DEFINED
2337	SMITH BANK FM
2394	NO FORMAL NAME
2430	ZECHSTEIN GP
2430	UNDIFFERENTIATED



2619	KUPFERSCHIEFER FM
2621	ROTLIEGEND GP
2885	BASEMENT

Spleisede logger

Dokument navn	Dokument format	Dokument størrelse [KB]
229	pdf	0.59

Geokjemisk informasjon

Dokument navn	Dokument format	Dokument størrelse [KB]
229_1	pdf	0.62

Dokumenter - eldre Sokkeldirektoratets WDSS rapporter og andre relaterte dokumenter

Dokument navn	Dokument format	Dokument størrelse [KB]
229_01_WDSS_General_Information	pdf	0.22
229_02_WDSS_completion_log	pdf	0.28

Dokumenter - rapportert av utvinningstillatelsen (frigitt ihht til regelverk)

Dokument navn	Dokument format	Dokument størrelse [KB]
229_16_4_1_COMPLETION_LOG	pdf	1.92
229_16_4_1_COMPLETION_REPORT	pdf	12.08

Logger

Type logg	Topp dyp for logg [m]	Bunn dyp for logg [m]
CBL VDL	125	2015
CET CBL VDL	450	2015
CST	2035	2340
CST	2345	2896





ISF LSS GR SP	206	2027
ISF LSS GR SP	2406	2907
ISF MSFL LSS GR SP	2028	2666
LDL CNL CAL GR	472	2907
RFT	2083	2422
SHDT	2016	2908
VSP	200	2909

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	206.0	36	280.0	0.00	LOT
SURF.COND.	20	480.0	26	497.0	1.37	LOT
INTERM.	16	626.0	22	650.0	1.89	LOT
INTERM.	13 3/8	2028.0	17 1/2	2066.0	1.79	LOT
OPEN HOLE		2909.0	12 1/4	2909.0	0.00	LOT

Boreslam

Dybde MD [m]	Egenvekt, slam [g/cm3]	Viskositet, slam [mPa.s]	Flytegrense [Pa]	Type slam	Dato, måling
150	0.00			WATER BASED	14.11.1984
280	1.09	5.0	2.0	WATER BASED	10.09.1984
494	1.10			WATER BASED	12.09.1984
494	1.10			WATER BASED	13.09.1984
494	1.10			WATER BASED	14.09.1984
494	1.10			WATER BASED	16.09.1984
494	1.10			WATER BASED	17.09.1984
494	1.10			WATER BASED	18.09.1984
494	1.10			WATER BASED	13.09.1984
494	1.10			WATER BASED	17.09.1984
494	1.10			WATER BASED	18.09.1984
494	1.10			WATER BASED	20.09.1984
494	1.10			WATER BASED	19.09.1984
494	1.10			WATER BASED	20.09.1984
494	1.10			WATER BASED	14.09.1984
494	1.10			WATER BASED	16.09.1984
494	1.10			WATER BASED	19.09.1984



Faktasider

Brønnbane / Leting

Utskriftstidspunkt: 10.5.2024 - 19:33

497	1.15	17.0	95.0	WATER BASED	25.09.1984
572	1.25	15.0	7.0	WATER BASED	12.11.1984
625	1.16	16.0	9.0	WATER BASED	25.09.1984
625	1.16	14.0	9.0	WATER BASED	26.09.1984
625	1.16	14.0	10.0	WATER BASED	27.09.1984
625	1.16	14.0	11.0	WATER BASED	01.10.1984
625	1.16	14.0	11.0	WATER BASED	01.10.1984
625	1.16	14.0	9.0	WATER BASED	26.09.1984
625	1.16	14.0	10.0	WATER BASED	27.09.1984
650	1.15	15.0	8.0	WATER BASED	01.10.1984
712	1.16	19.0	8.0	WATER BASED	01.10.1984
1112	1.16	19.0	8.0	WATER BASED	01.10.1984
1507	1.18	19.0	10.0	WATER BASED	02.10.1984
1507	1.25	15.0	9.0	WATER BASED	03.10.1984
1507	1.25	15.0	9.0	WATER BASED	03.10.1984
1602	1.30	17.0	10.0	WATER BASED	04.10.1984
1813	1.30	18.0	8.0	WATER BASED	07.10.1984
1825	1.30	16.0	8.0	WATER BASED	14.10.1984
1870	1.25	16.0	8.5	WATER BASED	12.11.1984
1870	1.25	16.0	8.5	WATER BASED	14.11.1984
1870	1.25	16.0	8.5	WATER BASED	14.11.1984
1957	1.30	16.0	8.0	WATER BASED	07.10.1984
1988	1.30	24.0	13.0	WATER BASED	14.10.1984
2052	1.30	32.0	11.0	WATER BASED	14.10.1984
2052	1.30	9.0	10.0	WATER BASED	15.10.1984
2052	1.25	20.0	13.0	WATER BASED	16.10.1984
2052	1.30	18.0	9.0	WATER BASED	08.10.1984
2052	1.30	18.0	8.0	WATER BASED	10.10.1984
2052	1.30	15.0	8.0	WATER BASED	11.10.1984
2052	1.30	18.0	9.0	WATER BASED	08.10.1984
2052	1.30	18.0	8.5	WATER BASED	09.10.1984
2052	1.30	18.0	8.0	WATER BASED	10.10.1984
2052	1.30	15.0	8.0	WATER BASED	11.10.1984
2052	1.30	32.0	11.0	WATER BASED	14.10.1984
2052	1.30	9.0	10.0	WATER BASED	15.10.1984
2052	1.25	20.0	13.0	WATER BASED	16.10.1984
2052	1.30	18.0	12.0	WATER BASED	07.10.1984
2052	1.30	18.0	8.5	WATER BASED	09.10.1984
2066	1.23	16.0	8.0	WATER BASED	17.10.1984
2161	1.20	19.0	9.5	WATER BASED	18.10.1984



2161	1.20	14.0	5.0	WATER BASED	22.10.1984
2161	1.21	15.0	9.5	WATER BASED	21.10.1984
2161	1.21	15.0	9.5	WATER BASED	21.10.1984
2161	1.20	14.0	5.0	WATER BASED	22.10.1984
2174	1.20	13.0	7.0	WATER BASED	23.10.1984
2283	1.25	20.0	7.0	WATER BASED	24.10.1984
2355	1.25	18.0	7.0	WATER BASED	25.10.1984
2404	1.25	17.0	8.0	WATER BASED	29.10.1984
2440	1.25	18.0	9.0	WATER BASED	29.10.1984
2501	1.25	18.0	9.0	WATER BASED	29.10.1984
2573	1.25	46.0	10.0	WATER BASED	31.10.1984
2588	1.25	18.0	10.0	WATER BASED	31.10.1984
2588	1.25	18.0	10.0	WATER BASED	01.11.1984
2588	1.25	18.0	10.0	WATER BASED	01.11.1984
2672	1.25	19.0	9.0	WATER BASED	02.11.1984
2733	1.25	19.0	8.0	WATER BASED	05.11.1984
2795	1.25	19.0	8.0	WATER BASED	05.11.1984
2854	1.25	19.0	8.0	WATER BASED	05.11.1984
2892	1.25	45.0	25.0	WATER BASED	06.11.1984
2907	1.25	18.0	8.5	WATER BASED	07.11.1984
2909	1.25	18.0	8.5	WATER BASED	08.11.1984
2909	1.25	18.0	8.5	WATER BASED	09.11.1984
2909	1.25	15.0	7.0	WATER BASED	12.11.1984
2909	1.25	18.0	8.5	WATER BASED	09.11.1984
2909	1.25	15.0	7.0	WATER BASED	12.11.1984

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]
229 Formation pressure (Formasjonstrykk)	pdf	0.22

