



Generell informasjon

Brønnbane navn	1/6-5
Type	EXPLORATION
Formål	WILDCAT
Status	P&A
Faktakart i nytt vindu	lenke til kart
Hovedområde	NORTH SEA
Brønn navn	1/6-5
Seismisk lokalisering	CNI/88 - 36 & SP. 590
Utvinningstillatelse	144
Boreoperatør	Conoco Norway Inc.
Boretillatelse	645-L
Boreinnretning	DYVI STENA
Boredager	45
Borestart	20.07.1990
Boreslutt	02.09.1990
Frigitt dato	02.09.1992
Publiseringsdato	15.06.2011
Opprinnelig formål	WILDCAT
Gjenåpnet	NO
Innhold	SHOWS
Funnbrønnbane	NO
Avstand, boredekk - midlere havflate [m]	25.0
Vanndybde ved midlere havflate [m]	70.0
Totalt målt dybde (MD) [m RKB]	1854.0
Totalt vertikalt dybde (TVD) [m RKB]	1854.0
Maks inklinasjon [°]	1.7
Temperatur ved bunn av brønnbanen [°C]	104
Eldste penetrerte alder	LATE PERMIAN
Eldste penetrerte formasjon	ZECHSTEIN GP
Geodetisk datum	ED50
NS grader	56° 32' 21.57" N
ØV grader	2° 48' 4.77" E
NS UTM [m]	6266264.75
ØV UTM [m]	487781.59
UTM sone	31
NPDID for brønnbanen	1508

**Brønnhistorie****General**

Well 1/6-5 is located in the Feda Graben between the Flyndre and Tommeliten Gamma discovery in the North Sea. The well was drilled on the crest of a major salt diapir. The objective of the well was to test the existence of a chalk raft and the presence of reservoir hydrocarbons.

Operations and results

Wildcat well 1/6-5 was spudded with the semi-submersible installation Dyvi Stena on 20 July 1990 and drilled to TD at 1854 in Late Permian salt of the Zechstein Group. An 8 1/2" pilot hole was drilled from 156m to 600m. The hole was control drilled at 30m/hr maximum ROP as a precaution for encountering shallow gas. No shallow gas was encountered. Pore pressure prediction while drilling in the 1/6-5 well was difficult as the only pore pressure detection parameters that appeared to work were gas measurements, resistivity and sonic log measurements. Other parameters such as shale cuttings density, Electric log density, D-exponent and rate of penetration were not successful in determining high pore pressure zones. However, despite the abnormally high pressures and temperatures encountered drilling went forth without major incidents. A minor salt water flow accompanied by a 37.1 % gas peak occurred during a trip at core point at 1725 m. The mud weight was increased from 15 ppg to 15.3 ppg and finally 15.5 ppg as a result of this flow. In the following coring 119 bbls of mud was lost to the formation, but this was cured by setting an LCM pill. The well was drilled with seawater and viscous pre-hydrated bentonite sweeps down to 600 m and with fresh water polymer mud/Duponol WBS 200 wellbore stabilizer from 600 m to TD.

From 864 m gas readings showed all components from C1 to C4. Gas peaks from the formation were experienced all the way down to the Ekofisk Formation, some of which originated from thin sandstone beds. Oil shows were first observed at 1434 and 1585 m, both in thin limestone beds of Oligocene age. On reaching the top Ekofisk Formation at 1721 m, limestone with oil stain and bright yellow fluorescence was observed.

Two cores were cut. Core 1 was cut from 1725 to 1742.5 m in the Tor and Hod Formations. Only 22% was recovered and most of it was rubble, indicating a highly fractured limestone. Core 2 was cut from 1742.5 to 1751.5 m in the salt. Ten RFT pressure tests were taken in the Shetland Group of which 6 were classified as valid tests. They indicated a formation pressure in the range of 4520 to 4540 psi, being equivalent to 15.6 ppg equivalent mud weight. No obvious pressure gradient could be derived from these 6 points.

The well was permanently abandoned on 2 September 1990 as a dry well with shows.

Testing

One drill stem test was performed from perforations in the Shetland Group from 1722 to 1740.9 m. The well flowed only salt water at a rate of 231 m³/day on a 24/64" choke. There was no trace of oil and the gas content was too low to be measured. The shut-in pressure after final build-up was 4531 psia. The maximum bottom hole temperature recorded in the test was 98.3 deg C. This corresponds to a mean gradient of 56 deg C/km, assuming 6 deg C at the sea floor. This is an exceptionally high temperature gradient for the Norwegian North Sea.



Borekaks i Sokkeldirektoratet

Borekaksprøve, topp dybde [m]	Borekaksprøve, bunn dybde [m]
620.00	1854.00
Borekaks tilgjengelig for prøvetaking?	YES

Borekjerne i Sokkeldirektoratet

Kjerneprøve nummer	Kjerneprøve - topp dybde	Kjerneprøve - bunn dybde	Kjerneprøve dybde - enhet
1	1725.0	1728.9	[m]
2	1742.5	1751.1	[m]
Total kjerneprøve lengde [m]	12.5		
Kjerner tilgjengelig for prøvetaking?	YES		

Kjernebilder



1725-1728m



1742-1747m



1747-1751m

Litostratigrafi

Topp Dyb [mMD RKB]	Litostrat. enhet
95	NORDLAND GP
1140	HORDALAND GP
1695	ROGALAND GP
1695	BALDER FM
1701	SELE FM
1710	LISTA FM
1715	VÅLE FM
1721	SHETLAND GP



1721	EKOFISK FM
1725	TOR FM
1732	HOD FM
1742	ZECHSTEIN GP

Spleisede logger

Dokument navn	Dokument format	Dokument størrelse [KB]
1508 1 6 5	pdf	0.30

Dokumenter - eldre Sokkeldirektoratets WDSS rapporter og andre relaterte dokumenter

Dokument navn	Dokument format	Dokument størrelse [KB]
1508 01 WDSS General Information	pdf	0.22
1508 02 WDSS completion log	pdf	0.14

Dokumenter - rapportert av utvinningstillatelsen (frigitt ihht til regelverk)

Dokument navn	Dokument format	Dokument størrelse [KB]
1508 1 6 5 Completion Log	pdf	1.15
1508 1 6 5 Completion report 1	pdf	29.72
1508 1 6 5 Completion report 2	pdf	20.44

Borestrengtester (DST)

Test nummer	Fra dybde MD [m]	Til dybde MD [m]	Reduksjonsven til størrelse [mm]
1.0	1722	1741	9.5

Test nummer	Endelig avstengningstrykk [MPa]	Endelig strømningstrykk [MPa]	Bunnhullstrykk [MPa]	Borehullstemperatur [°C]
1.0				98





Test nummer	Olje produksjon [Sm3/dag]	Gass produksjon [Sm3/dag]	Oljetetthet [g/cm3]	Gasstyngde rel. luft	GOR [m3/m3]
1.0					

Logger

Type logg	Topp dyp for logg [m]	Bunn dyp for logg [m]
BHC GR	1521	1854
CST	1550	1754
DIL GR SP AMS	1521	1854
DIL LSS GR SP LDL AMS	1126	1509
DIL SLS LDL GR CAL SP AMS	156	598
DLL MSFL GR	1521	1854
FMS	1521	1854
LDL CNL NGT	1521	1854
LDL GR CAL	588	1055
LSS GR	588	1055
MWD - DPR GR TEMP DIR	156	1855
RFT	1722	1740
VSP	1135	1854

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	156.0	36	156.0	0.00	LOT
INTERM.	20	588.0	26	600.0	0.00	LOT
INTERM.	16	1126.0	22	1132.0	1.42	LOT
INTERM.	9 5/8	1521.0	12 1/4	1530.0	1.74	LOT
LINER	7	1843.0	8 1/2	1854.0	0.00	LOT

Boreslam

Dybde MD [m]	Egenvekt, slam [g/cm3]	Viskositet, slam [mPa.s]	Flytegrense [Pa]	Type slam	Dato, måling
156	1.88	26.0	18.5	WATER BASED	24.07.1990
208	1.44	25.0	12.5	WATER BASED	24.07.1990
600	1.05			WATER BASED	24.07.1990



600	1.05			WATER BASED	24.07.1990
600	1.03			WATER BASED	25.07.1990
600	1.19	14.0	10.5	WATER BASED	26.07.1990
667	1.19	11.0	9.5	WATER BASED	27.07.1990
1036	1.23	19.0	6.5	WATER BASED	31.07.1990
1132	1.33	26.0	17.5	WATER BASED	31.07.1990
1132	1.41	26.0	14.5	WATER BASED	31.07.1990
1132	1.41	24.0	14.0	WATER BASED	31.07.1990
1132	1.41	24.0	21.0	WATER BASED	01.08.1990
1132	1.41	22.0	12.0	WATER BASED	02.08.1990
1132	1.23	33.0	10.5	WATER BASED	03.08.1990
1132	1.41	20.0	7.0	WATER BASED	06.08.1990
1275	1.45	30.0	13.0	WATER BASED	06.08.1990
1387	1.56	32.0	14.0	WATER BASED	06.08.1990
1530	1.64	37.0	8.0	WATER BASED	09.08.1990
1530	1.64	30.0	11.0	WATER BASED	10.08.1990
1533	1.64	33.0	8.0	WATER BASED	13.08.1990
1650	1.71	36.0	8.0	WATER BASED	13.08.1990
1725	1.83	36.0	9.0	WATER BASED	13.08.1990
1725	1.85	42.0	9.0	WATER BASED	14.08.1990
1743	1.85	42.0	9.0	WATER BASED	15.08.1990
1756	1.85	35.0	11.0	WATER BASED	16.08.1990
1854	1.85	21.0	6.0	WATER BASED	27.08.1990
1854	1.85	32.0	16.0	WATER BASED	20.08.1990
1854	1.85	30.0	15.0	WATER BASED	20.08.1990
1854	1.85	37.0	16.0	WATER BASED	20.08.1990
1854	1.85	33.0	12.0	WATER BASED	21.08.1990
1854	1.85	28.0	14.0	WATER BASED	22.08.1990
1854	1.85	20.0	4.0	WATER BASED	23.08.1990
1854	1.85	21.0	4.0	WATER BASED	27.08.1990
1854	1.85	21.0	6.0	WATER BASED	27.08.1990
1854	1.85	20.0	6.0	WATER BASED	27.08.1990
1854	1.85	22.0	6.0	WATER BASED	28.08.1990

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]
1508 Formation pressure (Formasjonstrykk)	PDF	0.18

