



Generell informasjon

Brønnbane navn	15/9-13
Type	EXPLORATION
Formål	APPRAISAL
Status	P&A
Faktakart i nytt vindu	lenke til kart
Hovedområde	NORTH SEA
Felt	SLEIPNER ØST
Funn	15/9-9 Sleipner Øst
Brønn navn	15/9-13
Seismisk lokalisering	610 - 160 SP 110
Utvinningstillatelse	046
Boreoperatør	Den norske stats oljeselskap a.s
Boretillatelse	319-L
Boreinnretning	ROSS RIG (1)
Boredager	68
Borestart	21.03.1982
Boreslutt	27.05.1982
Frigitt dato	27.05.1984
Publiseringsdato	11.03.2015
Opprinnelig formål	APPRAISAL
Gjenåpnet	NO
Innhold	GAS/CONDENSATE
Funnbrønnbane	NO
1. nivå med hydrokarboner, alder	PALEOCENE
1. nivå med hydrokarboner, formasjon.	HEIMDAL FM
2. nivå med hydrokarboner, alder	MIDDLE JURASSIC
2. nivå med hydrokarboner, formasjon	HUGIN FM
Avstand, boredekk - midlere havflate [m]	25.0
Vanndybde ved midlere havflate [m]	81.0
Totalt målt dybde (MD) [m RKB]	3280.0
Totalt vertikalt dybde (TVD) [m RKB]	3279.0
Maks inklinasjon [°]	3.7
Temperatur ved bunn av brønnbanen [°C]	91
Eldste penetrerte alder	LATE PERMIAN



Eldste penetrerte formasjon	ZECHSTEIN GP
Geodetisk datum	ED50
NS grader	58° 22' 25.96" N
ØV grader	1° 56' 2.86" E
NS UTM [m]	6470978.02
ØV UTM [m]	437653.70
UTM sone	31
NPDID for brønnbanen	45

Brønnhistorie

**General**

Well 15/9-13 was drilled on the Sleipner East Field in the Viking Graben in the North Sea. The objective was to delineate the hydrocarbon accumulation found in the Heimdal Formation of the 15/9 Gamma structure. Secondary objectives were to test possible hydrocarbons in sandstones of Jurassic - Triassic age. The well is reference well for the Utsira and Skade formations.

Operations and results

Appraisal well 15/9-13 was spudded with the semi-submersible installation Ross Rig on 21 March 1982 and drilled to TD at 3280 m in the Permian Zechstein Group. No significant problem was encountered in the operations. The well was drilled with seawater and hi-vis slugs down to 518 m, with gel/lignosulphonate mud from 518 m to 1165 m, gypsum/lignosulphonate mud from 1165 m to 2642 m, and gel/lignosulphonate mud from 2642 m to TD.

The well proved gas and condensate in the Heimdal Formation. Shows on cores indicate that all sandstones in the Heimdal Formation are gas filled to a probable down-to contact in top Shetland Group at 2440 m. Gas and condensate were also encountered in a Jurassic sandstone from 2763 to a probable down-to contact at 2791 m. No hydrocarbons were found in Triassic sandstones. No shows were recorded outside of the hydrocarbon-bearing sections in the well.

Seven cores were cut. Cores 1 - 3 were cut from 2404 m in the Heimdal Formation to 2453.5 m in the Tor Formation with 84 to 100% recovery. Cores 4 - 7 were cut from 2763 m to 2801.6 m in the Hugin Formation with 90 to 100% recovery. Segregated RFT fluid samples were taken at 2400 m, 2437 m, 2765.8 m, and 2766.5 m.

The well was permanently abandoned on 27 May 1984 as a gas/condensate appraisal well.

Testing

Two DST's were performed on this well.

DST 1 tested gas and condensate from 2765 to 2769 m in the Jurassic sand through the 7" liner. During the main flow on a 64/64" choke, the test produced on average 804500 Sm³ gas and 388 Sm³ condensate /day. The GOR was 2073 Sm³/Sm³, the condensate density was 0.783 g/cm³ and the gas gravity was 0.742 (air = 1). The gas contained 0.8 ppm H₂S and 1.0 % CO₂. The gauge temperature at final build-up was 98.3 °C.

DST 2 tested gas and condensate from 2422 to 2427 m in the Heimdal sand through the 9 5/8" casing. During the clean-up period on a 64/64" choke, the test produced on average 758600 Sm³ gas and 401 Sm³ condensate /day. The GOR was 1891 Sm³/Sm³, the condensate density was 0.76 g/cm³ and the gas gravity was 0.702 (air=1). The gas contained 0.4 ppm H₂S and 0.3 % CO₂. The gauge temperature at final build-up was 90.3 °C.

Borekaks i Sokkeldirektoratet

Borekaksprøve, topp dybde [m]	Borekaksprøve, bunn dybde [m]
180.00	3278.00

Borekaks tilgjengelig for prøvetaking?	YES
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Borekjerne i Sokkeldirektoratet

Kjerneprøve nummer	Kjerneprøve - topp dybde	Kjerneprøve - bunn dybde	Kjerneprøve dybde - enhet
1	2404.0	2420.0	[m]
2	2423.0	2434.5	[m]
3	2435.0	2453.5	[m]
4	2763.0	2772.3	[m]
5	2772.7	2778.0	[m]
6	2778.0	2786.0	[m]
7	2787.0	2799.9	[m]

Total kjerneprøve lengde [m]	81.4
Kjerner tilgjengelig for prøvetaking?	YES

Kjernebilder



2404-2409m



2409-2414m



2414-2419m



2419-2420m



2423-2428m



2428-2433m



2433-2434m



2435-2440m



2440-2445m



2445-2450m



2450-2453m



2763-2768m



2768-2772m



2792-2797m



2772-2777m



2777-2778m



2778-2783m



2783-2788m



2787-2792m



2792-2797m



2797-2799m

Palynologiske preparater i Sjøkeldirektoratet

Prøve dybde	Dybde enhet	Prøve type	Laboratorie
800.0	[m]	DC	FUGRO
810.0	[m]	DC	FUGRO
820.0	[m]	DC	FUGRO
830.0	[m]	DC	FUGRO
840.0	[m]	DC	FUGRO
850.0	[m]	DC	FUGRO
860.0	[m]	DC	FUGRO
870.0	[m]	DC	FUGRO
880.0	[m]	DC	FUGRO
890.0	[m]	DC	FUGRO
900.0	[m]	DC	FUGRO
910.0	[m]	DC	FUGRO
920.0	[m]	DC	FUGRO
920.0	[m]	DC	FUGRO
930.0	[m]	DC	FUGRO
930.0	[m]	DC	FUGRO
940.0	[m]	DC	FUGRO
940.0	[m]	DC	FUGRO
950.0	[m]	DC	FUGRO
950.0	[m]	DC	FUGRO
960.0	[m]	DC	FUGRO
960.0	[m]	DC	FUGRO
970.0	[m]	DC	FUGRO



Faktasider

Brønnbane / Leting

Utskriftstidspunkt: 12.5.2024 - 05:54

970.0 [m]	DC	FUGRO
980.0 [m]	DC	FUGRO
980.0 [m]	DC	FUGRO
990.0 [m]	DC	FUGRO
990.0 [m]	DC	FUGRO
1000.0 [m]	DC	FUGRO
1000.0 [m]	DC	FUGRO
1010.0 [m]	DC	FUGRO
1030.0 [m]	DC	FUGRO
1040.0 [m]	DC	FUGRO
1050.0 [m]	DC	FUGRO
1060.0 [m]	DC	FUGRO
1070.0 [m]	DC	FUGRO
1080.0 [m]	DC	FUGRO
1090.0 [m]	DC	FUGRO
1100.0 [m]	DC	FUGRO
1170.0 [m]	DC	OD
1170.0 [m]	DC	OD
1190.0 [m]	DC	OD
1190.0 [m]	DC	OD
1250.0 [m]	DC	OD
1250.0 [m]	DC	OD
1280.0 [m]	DC	OD
1280.0 [m]	DC	OD
1300.0 [m]	DC	OD
1300.0 [m]	DC	OD
1310.0 [m]	DC	OD
1310.0 [m]	DC	OD
1320.0 [m]	DC	OD
1320.0 [m]	DC	OD
1330.0 [m]	DC	OD
1330.0 [m]	DC	OD
1340.0 [m]	DC	OD
1360.0 [m]	DC	OD
1370.0 [m]	DC	OD
1400.0 [m]	DC	OD
2215.0 [m]	SWC	STATOIL
2222.0 [m]	SWC	STATOI
2235.0 [m]	SWC	STATOI
2247.0 [m]	SWC	STATOI



2260.0	[m]	SWC	STATOI
2270.0	[m]	SWC	STATOI
2287.0	[m]	SWC	STATOI
2298.0	[m]	SWC	STATOI
2305.0	[m]	SWC	STATOI
2325.0	[m]	SWC	STATOI
2325.0	[m]	SWC	STATOI
2332.0	[m]	SWC	STATOI
2348.0	[m]	DC	
2350.0	[m]	SWC	STATOIL
2364.0	[m]	SWC	STATOI
2376.0	[m]	SWC	STATOI
2378.0	[m]	DC	
2399.0	[m]	SWC	STATOIL
2408.0	[m]	DC	
2453.0	[m]	DC	
2597.0	[m]	DC	
2630.0	[m]	DC	
2660.0	[m]	DC	
2690.0	[m]	DC	
2720.0	[m]	DC	
2747.0	[m]	SWC	RRI
2750.0	[m]	DC	RRI
2756.3	[m]	SWC	
2762.0	[m]	SWC	RRI
2762.9	[m]	SWC	RRI
2769.3	[m]	SWC	RRI
2771.1	[m]	SWC	RRI
2804.0	[m]	DC	
2834.0	[m]	DC	
2864.0	[m]	DC	
2894.0	[m]	DC	
2924.0	[m]	DC	
2954.0	[m]	DC	
2984.0	[m]	DC	
3014.0	[m]	DC	
3044.0	[m]	DC	
3074.0	[m]	DC	
3101.0	[m]	DC	
3134.0	[m]	DC	



3170.0	[m]	DC	
3191.0	[m]	DC	
3221.0	[m]	DC	
3251.0	[m]	DC	
3280.0	[m]	DC	

Oljeprøver i Sakkeldirektoratet

Test type	Flaske nummer	Topp dyp MD [m]	Bunn dyp MD [m]	Væske type	Test tidspunkt	Prøver tilgjengelig
DST	TEST1	2765.00	2769.00		16.05.1982 - 14:00	YES
DST	TEST2	2422.00	2427.00		20.05.1982 - 00:00	YES

Litostratigrafi

Topp Dyb [mMD RKB]	Litostrat. enhet
106	NORDLAND GP
869	UTSIRA FM
1053	UNDIFFERENTIATED
1143	HORDALAND GP
2198	ROGALAND GP
2198	BALDER FM
2246	SELE FM
2330	LISTA FM
2395	HEIMDAL FM
2440	SHETLAND GP
2440	TOR FM
2593	HOD FM
2650	BLODØKS FM
2664	SVARTE FM
2674	CROMER KNOLL GP
2674	RØDBY FM
2690	SOLA FM
2698	ÅSGARD FM
2741	VIKING GP
2741	DRAUPNE FM
2762	HEATHER FM



2764	VESTLAND GP
2764	HUGIN FM
2791	SMITH BANK FM
3256	ZECHSTEIN GP

Dokumenter - eldre Sökkeldirektoratets WDSS rapporter og andre relaterte dokumenter

Dokument navn	Dokument format	Dokument størrelse [KB]
45_01_WDSS_General_Information	pdf	0.18
45_02_WDSS_completion_log	pdf	0.26

Dokumenter - rapportert av utvinningstillatelsen (frigitt ihht til regelverk)

Dokument navn	Dokument format	Dokument størrelse [KB]
45_15_9_13_Completion_report_and_log	pdf	18.06

Borestrengtester (DST)

Test nummer	Fra dybde MD [m]	Til dybde MD [m]	Reduksjonsven til størrelse [mm]
1.0	2765	2769	25.4
2.0	2422	2427	25.4

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

Test nummer	Olje produksjon [Sm3/dag]	Gass produksjon [Sm3/dag]	Oljetetthet [g/cm3]	Gasstyngde rel. luft	GOR [m3/m3]
1.0	388	804000	0.783	0.742	2073
2.0	401	758000	0.760	0.702	1891





Logger

Type logg	Topp dyp for logg [m]	Bunn dyp for logg [m]
CBL GR	100	1172
CBL VDL GR	1050	2463
CBL VDL GR	2300	3139
CST	1287	2464
CST	2670	3189
CST	2701	3194
CST	2734	3189
DLL MSFL GR	2800	2950
GEODIP	2800	2950
HDT	2463	3202
ISF BHC GR	172	1191
ISF BHC MSFL GR	1178	3201
LDT CNL GR	1178	3202
LDT GR	498	1191
RFT	2923	3090
VELOCITY	175	3200

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	169.0	36	169.0	0.00	LOT
SURF.COND.	20	502.0	26	517.0	1.44	LOT
INTERM.	13 3/8	1150.0	17 1/2	1165.0	1.76	LOT
INTERM.	9 5/8	2623.0	12 1/4	2642.0	1.83	LOT
LINER	7	3240.0	8 1/2	3280.0	0.00	LOT

Boreslam

Dybde MD [m]	Egenvekt, slam [g/cm3]	Viskositet, slam [mPa.s]	flytegrense [Pa]	Type slam	Dato, måling
615	1.08			waterbased	
1215	1.12			waterbased	
1810	1.14			waterbased	
2220	1.11			waterbased	
2340	1.15			waterbased	



2505	1.20			waterbased	
2765	1.31			waterbased	
3080	1.30			waterbased	

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 brønnspar. Trykkdataene er rapportert inn til Oljedirektoratet og videre prosessert og kvalitetssikret av IHS Markit.

Dokument navn	Dokument format	Dokument størrelse [KB]
45 Formation pressure (Formasjonstrykk)	pdf	0.22

