

**General information**

Wellbore name	30/2-3
Type	EXPLORATION
Purpose	APPRAISAL
Status	P&A
Factmaps in new window	link to map
Main area	NORTH SEA
Field	HULDRA
Discovery	30/2-1 Huldra
Well name	30/2-3
Seismic location	ST 8830-313 & COL. 842
Production licence	051
Drilling operator	Den norske stats oljeselskap a.s
Drill permit	731-L
Drilling facility	ROSS ISLE
Drilling days	117
Entered date	11.06.1992
Completed date	05.10.1992
Release date	05.10.1994
Publication date	07.01.2015
Purpose - planned	APPRAISAL
Reentry	NO
Content	GAS/CONDENSATE
Discovery wellbore	NO
1st level with HC, age	MIDDLE JURASSIC
1st level with HC, formation	TARBERT FM
2nd level with HC, age	MIDDLE JURASSIC
2nd level with HC, formation	NESS FM
Kelly bushing elevation [m]	22.0
Water depth [m]	123.0
Total depth (MD) [m RKB]	4325.0
Maximum inclination [°]	7.5
Bottom hole temperature [°C]	160
Oldest penetrated age	EARLY JURASSIC
Oldest penetrated formation	EIRIKSSON FM
Geodetic datum	ED50
NS degrees	60° 50' 49.05" N
EW degrees	2° 39' 19.68" E
NS UTM [m]	6745949.82



EW UTM [m]	481275.16
UTM zone	31
NPDID wellbore	1970

Wellbore history

**General**

Well 30/2-2 was drilled on the Huldra Field in the North Sea. The objective was to appraise the gas/condensate discovery in the Brent Group and reduce the gas-in-place estimates for the field.

Operations and results

Appraisal well 30/2-2 was spudded with the semi-submersible installation Ross Isle on 11 June 1992 and drilled to TD at 4325 m in the Early Jurassic Eiriksson Formation. A pilot hole was drilled to 520 m to check for shallow gas. No gas was detected. Drilling proceeded without significant problems. Tool sticking was common in the reservoir section during logging runs. The well was drilled with seawater down to 209 m, with gel spud mud from 209 m to 1115 m, with gypsum/polymer mud from 1115 m to 2298 m, and with Ancotherm mud from 2298 m to TD.

Although a well-defined Gas-Water-contact was encountered in 30/2-3 at 3896 m, this was some 75 m shallower than the previously deepest gas-down-to for well 30/2-2. This indicates that the Huldra Field is more complex than previously thought. Good porosity and permeability were encountered in all gas bearing intervals, reducing uncertainties regarding well productivity. There were no shows above Brent reservoir level. Below the GWC weak shows on sandstone in the cores gradually diminished down to 3962 m where shows disappeared altogether.

A total of 178.4 m core was recovered in 17 cores, from 3749 m in the Heather Formation through all of the Brent Group and down to 3985 m at top Drake Formation. The core-to-log depth correction varied between -0.4 to +1.9 m. No wire line fluid samples were taken.

The well was permanently abandoned on 5 October 1992 as a gas/condensate appraisal well.

Testing

Three drill stem tests were performed in the Brent Group.

DST 1 tested the interval 3895 - 3898 m in the Ness Formation. The average production rates towards the end of the Cleanup/ Main Flow period were approximately 43000 Sm³/d of gas, 24 Sm³/d of condensate and 129 Sm³/d of formation water. This proved a GWC in the tested interval. The condensate density was 0.810 g/cm³ and the gas gravity was 0.720 (air =1). The temperature at reference depth 3895 m was 149.0 °C.

DST 2 tested the interval 3874 - 3881 m in the Ness Formation. The average gas and condensate production rates during the Main Flow were 671000 Sm³/d and 319 Sm³/d respectively through a 12.7 mm (32/64") choke size. This gave a GOR close to 2100 Sm³/Sm³ at the prevailing separator conditions. The condensed or dissolved water production was approx. 6-8 m³/d. The condensate density was 0.0.800 g/cm³ and the gas gravity was 0.700 (air =1). DST 2 confirmed very good reservoir properties in the tested interval. The temperature at reference depth 3895 m was 147.5 °C.

DST 3 tested the interval 3794 -3803 m in the Tarbert Formation. The average gas and condensate production rates during the Main Flow were 466800 Sm³/d and 215 Sm³/d respectively through a 12.7 mm (32/64") choke size. This gave a GOR of approx. 2170 Sm³/Sm³ at the prevailing separator conditions. The condensed or dissolved water production was approx. 4-6 m³/d. The condensate density was 0.0.797 g/cm³ and the gas gravity was 0.0.690 (air =1). DST 3 confirmed moderate reservoir properties in the tested interval. The temperature at reference depth 3895 m was 146.0 °C.



Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
1120.00	4323.00

Cuttings available for sampling?	YES
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Cores at the Norwegian Offshore Directorate

Core sample number	Core sample - top depth	Core sample - bottom depth	Core sample depth - uom
1	3749.0	3755.9	[m]
2	3756.0	3761.1	[m]
3	3792.0	3813.3	[m]
4	3816.0	3829.1	[m]
5	3830.0	3836.3	[m]
6	3836.3	3855.0	[m]
7	3855.1	3867.0	[m]
8	3868.0	3873.9	[m]
9	3857.0	3886.5	[m]
10	3886.5	3897.0	[m]
11	3897.7	3915.0	[m]
12	3915.6	3928.0	[m]
13	3928.1	3932.0	[m]
15	3954.5	3962.0	[m]
16	3962.0	3968.8	[m]
17	3968.8	3986.0	[m]

Total core sample length [m]	194.4
Cores available for sampling?	YES

Core photos



3749-3754m



3754-3755m



3756-3761m



3761-3761m



3793-3798m



3798-3803m



3803-3808m



3808-3813m



3813-3813m



3816-3821m



3821-3826m



3826-3829m



3830-3835m



3835-3836m



3836-3841m



3846-3851m



3851-3855m



3855-3860m



3860-3865m



3865-3867m



3865-3873m



3873-3873m



3875-3880m



3880-3885m



3885-3886m



3886-3891m



3891-3896m



3896-3897m



3897-3902m



3902-3907m



3907-3912m



3912-3915m



3915-3920m



3920-3925m



3925-3928m



3928-3932m



3954-3959m



3959-3962m



3962-3967m



3967-3968m



3968-3973m



3973-3978m



3978-3983m



3983-3906m

Palynological slides at the Norwegian Offshore Directorate

Sample depth	Depth unit	Sample type	Laboratory
1130.0	[m]	DC	GEOST
1160.0	[m]	DC	GEOST
1190.0	[m]	DC	GEOST
1210.0	[m]	DC	GEOST
1230.0	[m]	DC	GEOST
1300.0	[m]	DC	GEOST
1342.0	[m]	DC	GEOST
1354.0	[m]	DC	GEOST
1420.0	[m]	DC	GEOST
1447.0	[m]	DC	GEOST
1477.0	[m]	DC	GEOST
1492.0	[m]	DC	GEOST
1501.0	[m]	DC	GEOST
1516.0	[m]	DC	GEOST
1528.0	[m]	DC	GEOST
1543.0	[m]	DC	GEOST
1558.0	[m]	DC	GEOST
1564.0	[m]	DC	GEOST
1579.0	[m]	DC	GEOST
1600.0	[m]	DC	GEOST
1645.0	[m]	DC	GEOST
1660.0	[m]	DC	GEOST
1675.0	[m]	DC	GEOST



1702.0 [m]	DC	GEOST
1759.0 [m]	DC	GEOST
1783.0 [m]	DC	GEOST
1804.0 [m]	DC	GEOST
1825.0 [m]	DC	GEOST
1846.0 [m]	DC	GEOST
1858.0 [m]	DC	GEOST
1882.0 [m]	DC	GEOST
2191.0 [m]	DC	GEOST
2257.0 [m]	DC	GEOST
2278.0 [m]	DC	GEOST
2296.0 [m]	DC	GEOST
2320.0 [m]	DC	GEOST
2340.0 [m]	DC	GEOST
2360.0 [m]	DC	GEOST
2380.0 [m]	DC	GEOST
2400.0 [m]	DC	GEOST
2420.0 [m]	DC	GEOST
2440.0 [m]	DC	GEOST
2460.0 [m]	DC	GEOST
2480.0 [m]	DC	GEOST
2500.0 [m]	DC	GEOST
2520.0 [m]	DC	GEOST
2540.0 [m]	DC	GEOST
2560.0 [m]	DC	GEOST
2580.0 [m]	DC	GEOST
2600.0 [m]	DC	GEOST
2620.0 [m]	DC	GEOST
2640.0 [m]	DC	GEOST
2660.0 [m]	DC	GEOST
2680.0 [m]	DC	GEOST
2700.0 [m]	DC	GEOST
2720.0 [m]	DC	GEOST
2740.0 [m]	DC	GEOST
2770.0 [m]	DC	GEOST
2780.0 [m]	DC	GEOST
2800.0 [m]	DC	GEOST
2820.0 [m]	DC	GEOST
2840.0 [m]	DC	GEOST
2860.0 [m]	DC	GEOST



2880.0	[m]	DC	GEOST
2900.0	[m]	DC	GEOST
2920.0	[m]	DC	GEOST
2940.0	[m]	DC	GEOST
2960.0	[m]	DC	GEOST
2980.0	[m]	DC	GEOST
3000.0	[m]	DC	GEOST
3020.0	[m]	DC	GEOST
3040.0	[m]	DC	GEOST
3060.0	[m]	DC	GEOST
3080.0	[m]	DC	GEOST
3100.0	[m]	DC	GEOST
3120.0	[m]	DC	GEOST
3140.0	[m]	DC	GEOST
3160.0	[m]	DC	GEOST
3180.0	[m]	DC	GEOST
3200.0	[m]	DC	GEOST
3220.0	[m]	DC	GEOST
3240.0	[m]	DC	GEOST
3260.0	[m]	DC	GEOST
3280.0	[m]	DC	GEOST
3300.0	[m]	DC	GEOST
3320.0	[m]	DC	GEOST
3340.0	[m]	DC	GEOST
3360.0	[m]	DC	GEOST
3380.0	[m]	DC	GEOST
3400.0	[m]	DC	GEOST
3420.0	[m]	DC	GEOST
3520.0	[m]	DC	GEOST
3540.0	[m]	DC	GEOST
3560.0	[m]	DC	GEOST
3580.0	[m]	DC	GEOST
3600.0	[m]	DC	GEOST
3618.0	[m]	DC	GEOST
3624.0	[m]	DC	GEOST
3627.0	[m]	DC	GEOST
3636.0	[m]	DC	GEOST
3645.0	[m]	DC	GEOST
3654.0	[m]	DC	GEOST
3672.0	[m]	DC	GEOST



3681.0 [m]	DC	GEOST
3690.0 [m]	DC	GEOST
3699.0 [m]	DC	GEOST
3708.0 [m]	DC	GEOST
3708.5 [m]	SWC	STATO
3717.0 [m]	SWC	STATO
3717.0 [m]	DC	GEOST
3728.0 [m]	SWC	STATO
3729.0 [m]	DC	GEOST
3735.0 [m]	SWC	STATO
3738.0 [m]	DC	GEOST
3747.0 [m]	DC	GEOST
3749.5 [m]	C	GEOST
3758.5 [m]	C	GEOST
3765.0 [m]	DC	GEOST
3774.0 [m]	DC	GEOST
3783.0 [m]	DC	GEOST
3789.5 [m]	SWC	STATO
3791.5 [m]	SWC	STATO
3792.0 [m]	DC	GEOST
3792.5 [m]	SWC	STATO
3794.8 [m]	C	GEOST
3804.6 [m]	C	GEOST
3807.7 [m]	C	GEOST
3812.0 [m]	C	GEOST
3821.7 [m]	C	GEOST
3830.2 [m]	C	GEOST
3837.3 [m]	C	GEOST
3845.2 [m]	C	GEOST
3852.2 [m]	C	GEOST
3860.0 [m]	C	GEOST
3867.0 [m]	C	GEOST
3875.7 [m]	C	GEOST
3883.8 [m]	C	GEOST
3887.2 [m]	C	GEOST
3894.3 [m]	C	GEOST
3902.8 [m]	C	GEOST
3910.2 [m]	C	GEOST
3919.3 [m]	C	GEOST
3927.6 [m]	C	GEOST



3932.7 [m]	C	GEOST
3934.5 [m]	SWC	STATO
3938.0 [m]	SWC	STATO
3944.0 [m]	SWC	STATO
3949.5 [m]	SWC	STATO
3954.5 [m]	C	GEOST
3962.5 [m]	C	GEOST
3967.6 [m]	C	GEOST
3973.0 [m]	C	GEOST
3974.6 [m]	C	GEOST
3979.4 [m]	C	GEOST
3981.3 [m]	C	GEOST
3986.2 [m]	C	GEOST
3990.0 [m]	DC	GEOST
3999.0 [m]	DC	GEOST
4008.0 [m]	DC	GEOST
4017.0 [m]	DC	GEOST
4026.0 [m]	DC	GEOST
4035.0 [m]	DC	GEOST
4044.0 [m]	DC	GEOST
4053.0 [m]	DC	GEOST
4062.0 [m]	DC	GEOST
4071.0 [m]	DC	GEOST
4080.0 [m]	DC	GEOST
4095.0 [m]	DC	GEOST
4098.0 [m]	DC	GEOST
4107.0 [m]	DC	GEOST
4116.0 [m]	DC	GEOST
4128.0 [m]	DC	GEOST
4134.0 [m]	DC	GEOST
4146.0 [m]	DC	GEOST
4152.0 [m]	DC	GEOST
4161.0 [m]	DC	GEOST
4170.0 [m]	DC	GEOST
4179.0 [m]	DC	GEOST
4188.0 [m]	DC	GEOST
4197.0 [m]	DC	GEOST
4206.0 [m]	DC	GEOST
4215.0 [m]	DC	GEOST
4224.0 [m]	DC	GEOST



4233.0	[m]	DC	GEOST
4242.0	[m]	DC	GEOST
4251.0	[m]	DC	GEOST
4260.0	[m]	DC	GEOST
4269.0	[m]	DC	GEOST
4278.0	[m]	DC	GEOST
4287.0	[m]	DC	GEOST
4293.0	[m]	DC	GEOST
4299.0	[m]	DC	GEOST
4308.0	[m]	DC	GEOST
4317.0	[m]	DC	GEOST
4323.0	[m]	DC	GEOST

Oil samples at the Norwegian Offshore Directorate

Test type	Bottle number	Top depth MD [m]	Bottom depth MD [m]	Fluid type	Test time	Samples available
DST	DST1	3895.00	0.00		09.09.1992 - 01:00	YES
DST	DST2	3874.00	0.00		15.09.1992 - 22:00	YES
DST	DST3	3794.00	0.00		23.09.1992 - 13:00	YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
145	NORDLAND GP
815	UTSIRA FM
879	HORDALAND GP
879	NO FORMAL NAME
1936	ROGALAND GP
1936	BALDER FM
2011	SELE FM
2077	LISTA FM
2185	SHETLAND GP
2185	JORSALFARE FM
2438	KYRRE FM
3419	TRYGGVASON FM



3543	BLODØKS FM
3599	CROMER KNOLL GP
3599	RØDBY FM
3620	SOLA FM
3642	ÅSGARD FM
3672	VIKING GP
3672	DRAUPNE FM
3709	HEATHER FM
3792	BRENT GP
3792	TARBERT FM
3808	NESS FM
3934	ETIVE FM
3944	RANNOCH FM
3974	OSEBERG FM
3983	DUNLIN GP
3983	DRAKE FM
4161	COOK FM
4199	BURTON FM
4241	AMUNDSEN FM
4288	STATFJORD GP
4288	NANSEN FM
4294	EIRIKSSON FM

Geochemical information

Document name	Document format	Document size [MB]
1970_GCH_1	pdf	0.54
1970_GCH_2	pdf	3.15
1970_GCH_3	pdf	1.15
1970_GCH_4	pdf	1.93

Documents - older Norwegian Offshore Directorate WDSS reports and other related documents

Document name	Document format	Document size [MB]
1970_01_WDSS_General_Information	pdf	0.60
1970_02_WDSS_completion_log	pdf	0.24





Documents - reported by the production licence (period for duty of secrecy expired)

Document name	Document format	Document size [MB]
1970 30 2 3 Completion Report and log	pdf	22.86

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	3895	3898	12.7
2.0	3874	3881	12.7
3.1	3794	3803	12.7

Test number	Final shut-in pressure [MPa]	Final flow pressure [MPa]	Bottom hole pressure [MPa]	Downhole temperature [°C]
1.0		4.000		
2.0	53.000	40.000		
3.1		14.000		

Test number	Oil [Sm3/day]	Gas [Sm3/day]	Oil density [g/cm3]	Gas grav. rel.air	GOR [m3/m3]
1.0	24	4300	0.810	0.720	1790
2.0	319	671000	0.800	0.700	2100
3.1	215	466800	0.797	0.690	2180

Logs

Log type	Log top depth [m]	Log bottom depth [m]
CBL VDL GR	1650	2283
CBL VDL GR	2972	3692
CBL VDL GR	3550	4041
CST GR	1118	2227
CST GR	3708	3952
CST GR	3717	3722
DIL BHC MSFL GR	3706	4323
DIL SLS GR CAL	1099	3723





DLL GR	3706	3875
FMS GR	3706	4000
LDL CNL GR	2280	3722
LDL CNL NGT	3706	4325
MWD	209	4325
RFT HP GR	3797	4317
VSP	1780	4324

Casing and leak-off tests

Casing type	Casing diam. [inch]	Casing depth [m]	Hole diam. [inch]	Hole depth [m]	LOT/FIT mud eqv. [g/cm3]	Formation test type
CONDUCTOR	30	205.0	36	206.0	0.00	LOT
INTERM.	20	1099.0	26	1100.0	1.70	LOT
INTERM.	13 3/8	2283.0	17 1/2	2285.0	1.91	LOT
INTERM.	9 5/8	3706.0	12 1/4	3708.0	2.05	LOT
LINER	7	4088.0	8 1/2	4325.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
520	1.03			WATER BASED	
756	1.03			WATER BASED	
1099	1.03			WATER BASED	
1115	1.03			WATER BASED	
1597	1.39	35.0		WATER BASED	
2298	1.59	42.0		WATER BASED	
2301	1.64	33.0		WATER BASED	
2346	1.67	35.0		WATER BASED	
2604	1.75	40.0		WATER BASED	
2742	1.75	32.0		WATER BASED	
2859	1.75	36.0		WATER BASED	
2894	1.78	37.0		WATER BASED	
2973	1.78	38.0		WATER BASED	
3044	1.78	36.0		WATER BASED	
3149	1.78	36.0		WATER BASED	
3284	1.78	30.0		WATER BASED	
3545	1.82	28.0		WATER BASED	



3560	1.82	28.0		WATER BASED	
3723	1.85	37.0		WATER BASED	
3723	1.85	37.0		WATER BASED	
3727	1.85	27.0		WATER BASED	
3749	1.85	26.0		WATER BASED	
3756	1.85	26.0		WATER BASED	
3791	1.87	43.0		WATER BASED	
3792	1.89	30.0		WATER BASED	
3793	1.85			DUMMY	
3816	1.85			DUMMY	
3830	1.87			DUMMY	
3855	1.87	32.0		WATER BASED	
3886	1.87	30.0		WATER BASED	
3911	1.87	32.0		WATER BASED	
3953	1.87	33.0		WATER BASED	
3968	1.87	29.0		WATER BASED	
4011	1.87	26.0		WATER BASED	
4091	1.87	27.0		WATER BASED	
4325	1.86	18.0		WATER BASED	
4325	1.87	17.0		WATER BASED	

Pressure plots

The pore pressure data is sourced from well logs if no other source is specified. In some wells where pore pressure logs do not exist, information from Drill stem tests and kicks have been used. The data has been reported to the NPD, and further processed and quality controlled by IHS Markit.

Document name	Document format	Document size [MB]
1970 Formation pressure (Formasjonstrykk)	pdf	0.21

