

**General information**

Wellbore name	6506/11-6
Type	EXPLORATION
Purpose	APPRAISAL
Status	P&A
Factmaps in new window	link to map
Main area	NORWEGIAN SEA
Field	KRISTIN
Discovery	6406/2-3 Kristin
Well name	6506/11-6
Seismic location	HWM 94- INLINE 3194 & X-LINE 906
Production licence	134
Drilling operator	Den norske stats oljeselskap a.s
Drill permit	922-L
Drilling facility	DEEPSEA BERGEN
Drilling days	180
Entered date	24.02.1998
Completed date	22.08.1998
Release date	22.08.2000
Publication date	13.12.2005
Purpose - planned	APPRAISAL
Reentry	NO
Content	GAS/CONDENSATE
Discovery wellbore	NO
1st level with HC, age	MIDDLE JURASSIC
1st level with HC, formation	GARN FM
2nd level with HC, age	MIDDLE JURASSIC
2nd level with HC, formation	ILE FM
Kelly bushing elevation [m]	23.0
Water depth [m]	380.0
Total depth (MD) [m RKB]	5275.0
Final vertical depth (TVD) [m RKB]	5273.0
Bottom hole temperature [°C]	173
Oldest penetrated age	EARLY JURASSIC
Oldest penetrated formation	ÅRE FM
Geodetic datum	ED50
NS degrees	65° 1' 26.24" N
EW degrees	6° 25' 10.71" E
NS UTM [m]	7213786.47



EW UTM [m]	378448.14
UTM zone	32
NPDID wellbore	3306

Wellbore history

**General**

Well 6506/11-6 was drilled on a structure on the northern segment of the Kristin Discovery, ca 5 km west of the southern part of the Smørbukk Discovery offshore Mid Norway. The main objective was to evaluate and appraise the hydrocarbon potential of the Middle Jurassic Garn and Ile Formations.

Operations and results

Appraisal well 6506/11-6 was spudded with the semi-submersible installation Deepsea Bergen on 24 February 1998 and drilled to TD at 5275 m in Early Jurassic sediments of the Åre Formation. The well was drilled with bentonite spud mud down to 1412 m, with Glydril mud from 1412 m to 2739 m, and with Versapro oil based mud from 2739 m to TD.

The well proved gas/condensate in the Garn and Ile Formations. Isolated shows were recorded on sidewall cores at 3563 m (Lysing Formation) and at 4517 m (Lange Formation), both in thin sandstone stringers. Shows were recorded from top of the Garn Formation sand reservoir at 4645 m to the top of the Upper Ror Formation at 4891 m (MWD depth, correspond to 4896 m loggers depth). Shows were also observed from 4952 to 4980 m (MWD depth) in the Tofte Formation, but these are probably a result of mud invasion. Ten conventional cores were cut in the interval 4652 m to 5125 m in the Middle to Early Jurassic, recovering a total of 297 m of core from the Garn, Not, Ile, Upper Ror, Tofte and Tilje Formations. Several runs with the Schlumberger MDT tool were performed. Pressure points and sampling were attempted in the Lysing and Lange sands, but with no success due to poor reservoir quality. Formation pressure measurements and fluid samples (gas and water) were collected in the Garn, Ile, Tofte and Tilje Formations. For the Åre Formation pressure measurements were achieved but no cores or fluid samples were taken.

The well was permanently abandoned on 22 August 1998 as a gas and condensate appraisal well on the Kristin Discovery.

Testing

Three tests were performed, one in the Ile Formation and two in the Garn Formation.

DST 1 in the Ile Formation tested the interval 4839.2 m - 4849.2 m and produced 568000 Sm³ gas and 557 Sm³ condensate pr day on a 36/64" choke. The measured down hole DST temperature was 172.6 deg C.

DST2 in the Garn Formation tested the interval 4695 m to 4736.7 m and produced 78000 Sm³ gas and 105 Sm³ condensate pr day on a 12/64" choke. The measured down hole DST temperature was 162.8 deg C.

DST3 in the Garn Formation tested the interval 4649.4 m to 4668.3 m and produced 533000 Sm³ gas and 770 Sm³ condensate pr day on a 36/64" choke. The measured down hole DST temperature was 167.7 deg C.

Both wire line bottom hole temperatures and DST temperatures were recorded in this well. The wire line data from the final logging gave a Horner corrected temperature at final well TD of 173 deg C. The temperature data from well testing is believed to be the most reliable, but for all of the tests there were quite large pressure draw down and this reduces the quality of the evaluated temperature. DST 2 measurement had the largest pressure drop and lowest flow rate, and data from this test is considered the least reliable. At these high temperature and pressures Joule Thompson effects are assumed to give ca 7 deg C temperature increase in the flowing DST 1 and 3 well bore fluids compared to the true formation temperature.



Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
1420.00	5275.00

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	4652.0	4661.3	[m]
2	4661.3	4688.5	[m]
3	4688.5	4710.9	[m]
4	4711.0	4738.0	[m]
5	4738.0	4792.8	[m]
6	4813.0	4836.8	[m]
7	4837.0	4858.0	[m]
8	4858.0	4913.6	[m]
9	4952.0	4980.8	[m]
10	5098.0	5125.2	[m]

Total core sample length [m]	297.1
Cores available for sampling?	YES

Core photos



4652-4657m



4657-4661m



4661-4666m



4666-4671m



4671-4676m



4676-4681m



4681-4686m



4686-4688m



4688-4693m



4693-4698m



4698-4703m



4703-4708m



4708-4710m



4711-4716m



4716-4721m



4721-4726m



4726-4731m



4731-4736m



4736-4738m



4738-4743m



4743-4748m



4748-4753m



4753-4758m



4758-4763m



4763-4768m



4768-4773m



4773-4776m



4778-4783m



4783-4788m



4788-4792m



4813-4818m



4818-4823m



4823-4828m



4828-4833m



4833-4836m



4837-4842m



4842-4847m



4847-4852m



4852-4857m



4857-4858m



4858-4863m



4863-4868m



4868-4873m



4873-4878m



4878-4883m



4883-4888m



4888-4893m



4893-4898m



4898-4903m



4903-4908m



4908-4913m



4913-4914m



4952-4957m



4957-4962m



4962-4967m



4967-4972m



4972-4977m



4977-4980m



5098-5103m



5103-5108m



5108-5113m



5113-5118m



5118-5123m



5123-5125m

Palynological slides at the Norwegian Offshore Directorate

Sample depth	Depth unit	Sample type	Laboratory
1420.0	[m]	DC	RRI
1440.0	[m]	DC	RRI



1460.0 [m]	DC	RRI
1480.0 [m]	DC	RRI
1500.0 [m]	DC	RRI
1520.0 [m]	DC	RRI
1540.0 [m]	DC	RRI
1560.0 [m]	DC	RRI
1580.0 [m]	DC	RRI
1600.0 [m]	DC	RRI
1620.0 [m]	DC	RRI
1640.0 [m]	DC	RRI
1660.0 [m]	DC	RRI
1680.0 [m]	DC	RRI
1700.0 [m]	DC	RRI
1720.0 [m]	DC	RRI
1740.0 [m]	DC	RRI
1760.0 [m]	DC	RRI
1780.0 [m]	DC	RRI
1800.0 [m]	DC	RRI
1820.0 [m]	DC	RRI
1840.0 [m]	DC	RRI
1860.0 [m]	DC	RRI
1880.0 [m]	DC	RRI
1900.0 [m]	DC	RRI
1920.0 [m]	DC	RRI
1940.0 [m]	DC	RRI
1960.0 [m]	DC	RRI
1980.0 [m]	DC	RRI
2000.0 [m]	DC	RRI
2020.0 [m]	DC	RRI
2040.0 [m]	DC	RRI
2060.0 [m]	DC	RRI
2080.0 [m]	DC	RRI
2100.0 [m]	DC	RRI
2120.0 [m]	DC	RRI
2140.0 [m]	DC	RRI
2160.0 [m]	DC	RRI
2180.0 [m]	DC	RRI
2200.0 [m]	DC	RRI
2220.0 [m]	DC	RRI
2240.0 [m]	DC	RRI



2260.0	[m]	DC	RRI
2280.0	[m]	DC	RRI
2300.0	[m]	DC	RRI
2320.0	[m]	DC	RRI
2340.0	[m]	DC	RRI
2360.0	[m]	DC	RRI
2380.0	[m]	DC	RRI
2400.0	[m]	DC	RRI
2420.0	[m]	DC	RRI
2440.0	[m]	DC	RRI
2480.0	[m]	DC	RRI
2500.0	[m]	DC	RRI
2520.0	[m]	DC	RRI
2540.0	[m]	DC	RRI
2560.0	[m]	DC	RRI
2600.0	[m]	DC	RRI
2620.0	[m]	DC	RRI
2640.0	[m]	DC	RRI
2660.0	[m]	DC	RRI
2680.0	[m]	DC	RRI
2700.0	[m]	DC	RRI
2720.0	[m]	DC	RRI
2740.0	[m]	DC	RRI
2780.0	[m]	DC	RRI
2800.0	[m]	DC	RRI
2840.0	[m]	DC	RRI
2860.0	[m]	DC	RRI
2880.0	[m]	DC	RRI
2900.0	[m]	DC	RRI
2920.0	[m]	DC	RRI
2940.0	[m]	DC	RRI
2960.0	[m]	DC	RRI
2980.0	[m]	DC	RRI
3000.0	[m]	DC	RRI
3020.0	[m]	DC	RRI
3040.0	[m]	DC	RRI
3060.0	[m]	DC	RRI
3080.0	[m]	DC	RRI
3100.0	[m]	DC	RRI
3120.0	[m]	DC	RRI



3140.0	[m]	DC	RRI
3160.0	[m]	DC	RRI
3180.0	[m]	DC	RRI
3210.0	[m]	DC	RRI
3220.0	[m]	DC	RRI
3240.0	[m]	DC	RRI
3260.0	[m]	DC	RRI
3280.0	[m]	DC	RRI
3300.0	[m]	DC	RRI
3320.0	[m]	DC	RRI
3340.0	[m]	DC	RRI
3360.0	[m]	DC	RRI
3380.0	[m]	DC	RRI
3400.0	[m]	DC	RRI
3420.0	[m]	DC	RRI
3440.0	[m]	DC	RRI
3460.0	[m]	DC	RRI
3480.0	[m]	DC	RRI
3500.0	[m]	DC	RRI
3520.0	[m]	DC	RRI
3540.0	[m]	DC	RRI
3580.0	[m]	DC	RRI
3600.0	[m]	DC	RRI
3620.0	[m]	DC	RRI
3640.0	[m]	DC	RRI
3660.0	[m]	DC	RRI
3685.0	[m]	DC	RRI
3700.0	[m]	DC	RRI
3720.0	[m]	DC	RRI
3760.0	[m]	DC	RRI
3780.0	[m]	DC	RRI
3800.0	[m]	DC	RRI
3820.0	[m]	DC	RRI
3840.0	[m]	DC	RRI
3860.0	[m]	DC	RRI
3880.0	[m]	DC	RRI
3900.0	[m]	DC	RRI
3910.0	[m]	DC	RRI
3930.0	[m]	DC	RRI
3945.0	[m]	DC	RRI



3980.0 [m]	DC	RRI
4000.0 [m]	DC	RRI
4020.0 [m]	DC	RRI
4040.0 [m]	DC	RRI
4060.0 [m]	DC	RRI
4080.0 [m]	DC	RRI
4100.0 [m]	DC	RRI
4120.0 [m]	DC	RRI
4140.0 [m]	DC	RRI
4160.0 [m]	DC	RRI
4180.0 [m]	DC	RRI
4220.0 [m]	DC	RRI
4260.0 [m]	DC	RRI
4300.0 [m]	DC	RRI
4320.0 [m]	DC	RRI
4340.0 [m]	DC	RRI
4380.0 [m]	DC	RRI
4400.0 [m]	DC	RRI
4420.0 [m]	DC	RRI
4460.0 [m]	DC	RRI
4470.0 [m]	DC	RRI
4480.0 [m]	DC	RRI
4490.0 [m]	DC	RRI
4500.0 [m]	DC	RRI
4527.0 [m]	DC	RRI
4536.0 [m]	DC	RRI
4545.0 [m]	DC	RRI
4554.0 [m]	DC	RRI
4563.0 [m]	DC	RRI
4572.0 [m]	DC	RRI
4581.0 [m]	DC	RRI
4590.0 [m]	DC	RRI
4599.0 [m]	DC	RRI
4605.0 [m]	DC	RRI
4608.0 [m]	DC	RRI
4626.0 [m]	DC	RRI
4635.0 [m]	DC	RRI
4678.0 [m]	C	RRI
4684.0 [m]	C	RRI
4694.0 [m]	C	RRI



4709.0 [m]	C	RRI
4719.0 [m]	C	RRI
4739.0 [m]	C	RRI
4743.0 [m]	C	RRI
4764.0 [m]	C	RRI
4767.0 [m]	C	RRI
4773.0 [m]	C	RRI
4779.0 [m]	C	RRI
4788.0 [m]	C	RRI
4790.0 [m]	C	RRI
4809.0 [m]	DC	RRI
4815.0 [m]	C	RRI
4821.0 [m]	C	RRI
4827.0 [m]	C	RRI
4833.0 [m]	C	RRI
4838.0 [m]	C	RRI
4844.0 [m]	C	RRI
4850.0 [m]	C	RRI
4858.0 [m]	C	RRI
4864.0 [m]	C	RRI
4869.0 [m]	C	RRI
4883.0 [m]	C	RRI
4890.0 [m]	C	RRI
4893.0 [m]	C	RRI
4902.0 [m]	C	RRI
4905.0 [m]	C	RRI
4913.0 [m]	C	RRI
4955.0 [m]	C	RRI
4958.0 [m]	C	RRI
4965.0 [m]	C	RRI
4977.0 [m]	C	RRI
4980.0 [m]	C	RRI
5022.0 [m]	DC	RRI
5034.0 [m]	DC	RRI
5046.0 [m]	DC	RRI
5058.0 [m]	DC	RRI
5064.0 [m]	DC	RRI
5070.0 [m]	DC	RRI
5082.0 [m]	DC	RRI
5094.0 [m]	DC	RRI



5101.0	[m]	C	RRI
5106.0	[m]	C	RRI
5110.0	[m]	C	RRI
5116.0	[m]	C	RRI
5121.0	[m]	C	RRI
5122.0	[m]	C	RRI
5127.0	[m]	DC	RRI
5133.0	[m]	DC	RRI
5151.0	[m]	DC	RRI
5157.0	[m]	DC	RRI
5163.0	[m]	DC	RRI
5169.0	[m]	DC	RRI
5175.0	[m]	DC	RRI
5181.0	[m]	DC	RRI
5187.0	[m]	DC	RRI
5199.0	[m]	DC	RRI
5205.0	[m]	DC	RRI
5211.0	[m]	DC	RRI
5217.0	[m]	DC	RRI
5223.0	[m]	DC	RRI
5229.0	[m]	DC	RRI
5235.0	[m]	DC	RRI
5241.0	[m]	DC	RRI
5247.0	[m]	DC	RRI
5253.0	[m]	DC	RRI
5259.0	[m]	DC	RRI
5265.0	[m]	DC	RRI
5268.0	[m]	DC	RRI

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	4849.00	4839.00		06.07.1998 - 08:15	YES
DST	TEST2	4737.00	4695.00	CONDE NSATE	21.07.1998 - 01:12	YES
DST	TEST3	4669.00	4651.00	CONDE NSATE		YES

**Lithostratigraphy**

Top depth [mMD RKB]	Lithostrat. unit
403	NORDLAND GP
403	NAUST FM
1512	KAI FM
1940	HORDALAND GP
1940	BRYGGE FM
2260	ROGALAND GP
2260	TARE FM
2360	TANG FM
2406	SHETLAND GP
2406	SPRINGAR FM
2600	NISE FM
2760	KVITNOS FM
3537	CROMER KNOLL GP
3537	LYSING FM
3571	LANGE FM
4399	NO FORMAL NAME
4458	LANGE FM
4634	VIKING GP
4634	MELKE FM
4651	FANGST GP
4651	GARN FM
4769	NOT FM
4817	ILE FM
4896	BÅT GP
4896	ROR FM
4945	TOFTE FM
5078	ROR FM
5080	TILJE FM
5260	ÅRE FM

Composite logs

Document name	Document format	Document size [MB]
3306	pdf	0.69



**Geochemical information**

Document name	Document format	Document size [MB]
3306_1	pdf	3.65

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

Document name	Document format	Document size [MB]
3306_6506_11_6_COMPLETION_LOG	.pdf	4.71
3306_6506_11_6_COMPLETION_REPORT	.pdf	37.84

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	4839	4849	14.3
2.0	4695	4736	4.7
3.0	4649	4668	14.3

Test number	Final shut-in pressure [MPa]	Final flow pressure [MPa]	Bottom hole pressure [MPa]	Downhole temperature [°C]
1.0				172
2.0				163
3.0				168

Test number	Oil [Sm3/day]	Gas [Sm3/day]	Oil density [g/cm3]	Gas grav. rel.air	GOR [m3/m3]
1.0	557	568000	0.789	0.715	1019
2.0	105	78000	0.795	0.715	743
3.0	770	533000	0.795	0.715	692

Logs





Log type	Log top depth [m]	Log bottom depth [m]
AIT DSI GR	1019	2917
CMR IPLT	4611	5000
DITE DSI GR	4500	5275
IPL GR LEH-Q	2730	4400
LDT CNT GR	4500	5275
LDT CNT GR AMS	4495	4666
MDT	4519	4666
MDT	4652	4960
MDT	4652	4885
MDT GR	3432	4421
MDT GR	4666	4888
MDT GR	4749	4958
MDT GR	4959	5251
MWD - DPR RAW	403	2739
MWD - MPR MDP	2742	5275
OBDT GR	2850	5275
PEX HALS DSI	1400	2730
SWC	2766	4497
SWC	2898	4497
SWC	4517	5274
VSP	1750	5235

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	463.0	36	464.0	0.00	LOT
SURF.COND.	20	1402.0	26	1403.0	1.69	LOT
INTERM.	13 3/8	2730.0	17 1/2	2730.0	2.00	LOT
INTERM.	9 7/8	4493.0	12 1/4	4494.0	2.18	LOT
LINER	7	5275.0	8 1/2	5275.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
1300	1.20			BENTONITE/FW	



1412	1.20	34.0		BENTONITE/FW	
2185	1.64	38.0		GLYDRILL	
2739	1.66	42.0		GLYDRILL	
2839	1.64	31.0		VERSAPRO	
3685	1.75	48.0		VERSAPRO	
4290	1.80	54.0		VERSAPRO	
4643	2.06	57.0		VERSAPRO	
4648	2.02	63.0		VERSAPRO	
4695	2.06	71.0		VERSAPRO	
4837	2.02	60.0		VERSAPRO	
4980	2.02	64.0		VERSAPRO	
5275	2.02	55.0		VERSAPRO	

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]
3306 Formation pressure (Formasjonstrykk)	pdf	0.23

