

**General information**

Wellbore name	6406/2-7
Type	EXPLORATION
Purpose	WILDCAT
Status	P&A
Press release	link to press release
Factmaps in new window	link to map
Main area	NORWEGIAN SEA
Field	KRISTIN
Discovery	6406/2-7 (Erlend)
Well name	6406/2-7
Seismic location	HMW-94 LINE 1588 X-OVER LINE 1277
Production licence	199
Drilling operator	Saga Petroleum ASA
Drill permit	965-L
Drilling facility	TRANSOCEAN ARCTIC
Drilling days	96
Entered date	22.09.1999
Completed date	26.12.1999
Plugged and abandon date	01.10.2014
Release date	26.12.2001
Publication date	18.12.2002
Purpose - planned	WILDCAT
Reentry	NO
Content	GAS/CONDENSATE
Discovery wellbore	YES
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]	24.0
Water depth [m]	293.0
Total depth (MD) [m RKB]	4981.0
Final vertical depth (TVD) [m RKB]	4977.0
Maximum inclination [°]	5.7
Bottom hole temperature [°C]	177
Oldest penetrated age	EARLY JURASSIC
Oldest penetrated formation	TILJE FM
Geodetic datum	ED50



NS degrees	64° 50' 22.89" N
EW degrees	6° 20' 31.18" E
NS UTM [m]	7193415.64
EW UTM [m]	373929.11
UTM zone	32
NPDID wellbore	3878

Wellbore history

General

Well 6406/2-7 was the fourth wildcat drilled in the PL 199 license. The well was drilled on the eastern part of the Erlend structure in the western part of block 6406/2, southwest of the Kristin Field and northwest of the 6406/2-6 Ragnfrid discovery on Haltenbanken. The Erlend structure is an easterly dipping segmented horst. Well 6406/2-7 was drilled high on the Erlend structure's southeastern high. The main objective of well 6406/2-7 was to test the hydrocarbon potential of the Erlend structure within the Early to Middle Jurassic Fangst and Båt Group sandstones. Late Cretaceous Lysing and Lange sandstones were secondary targets for the well.

Operations and results

Wildcat well 6406/2-7 was spudded with the semi-submersible installation "Transocean Arctic" on 22 September 1999 and drilled to TD at 4981 m (4977 m TVD) in the Early Jurassic Tilje Formation. Shallow gas was not encountered in this well. Drilling went without major problems, but leakage in the 7" liner lap led to 8 days NPT. The well was drilled with water based bentonite mud down to 1406 m, with water based KCl mud from 1406 m to 2719 m, and with oil base mud from 2719 m to TD. Pore pressures of the Jurassic units were very high, reaching a gradient of 1.99 g/cc BMW in the upper part of the Garn Formation, and the overpressures in lower Tofte and lower Ile Formations were the highest measured in the area to date. The main result of well 6406/2-7 was the Erlend discovery of gas/condensate in the Garn and Ile Formations as proven by a DST in Garn and further MDT fluid samples in both formations. Increasing amounts of gas were measured in MDT samples upwards in Tofte Formation. In addition there were good indications of hydrocarbons in Lower Lange sandstones, but no hydrocarbon fluid samples were obtained from these units due to poor reservoir quality. The Tilje Formation appeared to be water bearing in the well position. Three conventional cores covering an 81,5 m section were cut in Not, Ile and Tofte Formations, with 97.4 % recovery. MDT samples were collected from the Garn (4558.5 m), Ile (4614.4 m and 4637.6 m), and Tofte (4712 m, 4721,7 m and 4738 m) Formations. The samples from the Garn, Upper Ile and Upper Tofte Formations contained free hydrocarbons. The deepest sample from 4738.0 m in Tofte was from a water column, whereas the other two sampled depths were in a transition zone. The samples collected from the lower Ile and Tofte Formations contained water. The well was suspended for possible later side-tracking as a gas and condensate discovery on 26 December 1999.

Testing

The well was production tested from perforation interval 4558-4573 m in the Garn Formation. At the end of the flow period rates were measured to 496000 Sm³/D gas and 678 Sm³/D condensate (12.7 mm choke). The Gas to Oil Ratio at separator conditions 40 bar and 40 deg C was 746 Sm³/Sm³.



Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
1410.00	4980.00

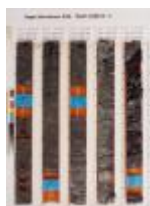
Cuttings available for sampling?	YES
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Cores at the Norwegian Offshore Directorate

Core sample number	Core sample - top depth	Core sample - bottom depth	Core sample depth - uom
1	4573.0	4599.3	[m]
2	4625.0	4656.9	[m]
3	4709.0	4730.2	[m]

Total core sample length [m]	79.3
Cores available for sampling?	YES

Core photos



4573-4578m



4578-4583m



4583-4588m



4588-4593m



4593-4598m



4598-4628m



4628-4633m



4633-4638m



4638-4643m



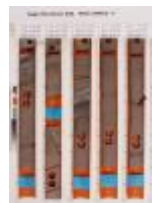
4643-4648m



4648-4653m



4653-4710m



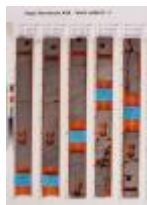
4710-4715m



4715-4720m



4720-4725m



4725-4730m



4730-4730m

Palynological slides at the Norwegian Offshore Directorate

Sample depth	Depth unit	Sample type	Laboratory
1420.0	[m]	DC	STRAT
1440.0	[m]	DC	STRAT
1460.0	[m]	DC	STRAT
1480.0	[m]	DC	STRAT
1500.0	[m]	DC	STRAT
1540.0	[m]	DC	STRAT
1560.0	[m]	DC	STRAT
1580.0	[m]	DC	STRAT
1600.0	[m]	DC	STRAT
1620.0	[m]	DC	STRAT
1640.0	[m]	DC	STRAT
1660.0	[m]	DC	STRAT
1680.0	[m]	DC	STRAT
1700.0	[m]	DC	STRAT
1720.0	[m]	DC	STRAT
1740.0	[m]	DC	STRAT
1760.0	[m]	DC	STRAT
1780.0	[m]	DC	STRAT
1800.0	[m]	DC	STRAT
1840.0	[m]	DC	STRAT
1860.0	[m]	DC	STRAT
1900.0	[m]	DC	STRAT
1920.0	[m]	DC	STRAT
1940.0	[m]	DC	STRAT
1960.0	[m]	DC	STRAT
1980.0	[m]	DC	STRAT
2000.0	[m]	DC	STRAT
2020.0	[m]	DC	STRAT
2040.0	[m]	DC	STRAT



2060.0	[m]	DC	STRAT
2080.0	[m]	DC	STRAT
2100.0	[m]	DC	STRAT
2120.0	[m]	DC	STRAT
2140.0	[m]	DC	STRAT
2160.0	[m]	DC	STRAT
2180.0	[m]	DC	STRAT
2200.0	[m]	DC	STRAT
2220.0	[m]	DC	STRAT
2240.0	[m]	DC	STRAT
2260.0	[m]	DC	STRAT
2280.0	[m]	DC	STRAT
2300.0	[m]	DC	STRAT
2320.0	[m]	DC	STRAT
2340.0	[m]	DC	STRAT
2360.0	[m]	DC	STRAT
2380.0	[m]	DC	STRAT
2400.0	[m]	DC	STRAT
2420.0	[m]	DC	STRAT
2440.0	[m]	DC	STRAT
2460.0	[m]	DC	STRAT
2480.0	[m]	DC	STRAT
2500.0	[m]	DC	STRAT
2520.0	[m]	DC	STRAT
2540.0	[m]	DC	STRAT
2560.0	[m]	DC	STRAT
2580.0	[m]	DC	STRAT
2620.0	[m]	DC	STRAT
2640.0	[m]	DC	STRAT
2660.0	[m]	DC	STRAT
2680.0	[m]	DC	STRAT
2700.0	[m]	DC	STRAT
2720.0	[m]	DC	STRAT
2740.0	[m]	DC	STRAT
2760.0	[m]	DC	STRAT
2780.0	[m]	DC	STRAT
2800.0	[m]	DC	STRAT
2820.0	[m]	DC	STRAT
2840.0	[m]	DC	STRAT
2860.0	[m]	DC	STRAT



2880.0	[m]	DC	STRAT
2895.0	[m]	SWC	STRAT
2920.0	[m]	DC	STRAT
2940.0	[m]	DC	STRAT
2960.0	[m]	DC	STRAT
2980.0	[m]	DC	STRAT
3000.0	[m]	DC	STRAT
3020.0	[m]	DC	STRAT
3040.0	[m]	DC	STRAT
3060.0	[m]	DC	STRAT
3080.0	[m]	DC	STRAT
3100.0	[m]	DC	STRAT
3120.0	[m]	DC	STRAT
3140.0	[m]	DC	STRAT
3160.0	[m]	DC	STRAT
3180.0	[m]	DC	STRAT
3200.0	[m]	DC	STRAT
3220.0	[m]	DC	STRAT
3240.0	[m]	DC	STRAT
3260.0	[m]	DC	STRAT
3280.0	[m]	DC	STRAT
3300.0	[m]	DC	STRAT
3320.0	[m]	DC	STRAT
3340.0	[m]	DC	STRAT
3360.0	[m]	DC	STRAT
3380.0	[m]	DC	STRAT
3400.0	[m]	DC	STRAT
3420.0	[m]	DC	STRAT
3440.0	[m]	DC	STRAT
3460.0	[m]	DC	STRAT
3480.0	[m]	DC	STRAT
3500.0	[m]	DC	STRAT
3508.0	[m]	SWC	STRAT
3520.0	[m]	DC	STRAT
3522.0	[m]	SWC	STRAT
3532.0	[m]	SWC	STRAT
3560.0	[m]	DC	STRAT
3580.0	[m]	DC	STRAT
3600.0	[m]	DC	STRAT
3620.0	[m]	DC	STRAT



3640.0	[m]	DC	STRAT
3660.0	[m]	DC	STRAT
3680.0	[m]	DC	STRAT
3700.0	[m]	DC	STRAT
3720.0	[m]	DC	STRAT
3740.0	[m]	DC	STRAT
3742.0	[m]	SWC	STRAT
3780.0	[m]	DC	STRAT
3782.5	[m]	SWC	STRAT
3800.0	[m]	DC	STRAT
3820.0	[m]	DC	STRAT
3840.0	[m]	DC	STRAT
3860.0	[m]	DC	STRAT
3880.0	[m]	DC	STRAT
3900.0	[m]	DC	STRAT
3920.0	[m]	DC	STRAT
3940.0	[m]	DC	STRAT
3955.0	[m]	DC	STRAT
3980.0	[m]	DC	STRAT
4000.0	[m]	DC	STRAT
4020.0	[m]	DC	STRAT
4040.0	[m]	DC	STRAT
4055.0	[m]	DC	STRAT
4080.0	[m]	DC	STRAT
4100.0	[m]	DC	STRAT
4120.0	[m]	DC	STRAT
4140.0	[m]	DC	STRAT
4160.0	[m]	DC	STRAT
4180.0	[m]	DC	STRAT
4200.0	[m]	DC	STRAT
4220.0	[m]	DC	STRAT
4240.0	[m]	DC	STRAT
4260.0	[m]	DC	STRAT
4280.0	[m]	DC	STRAT
4300.0	[m]	DC	STRAT
4320.0	[m]	DC	STRAT
4340.0	[m]	DC	STRAT
4360.0	[m]	DC	STRAT
4380.0	[m]	DC	STRAT
4389.5	[m]	SWC	STRAT



4390.5 [m]	SWC	STRAT
4400.0 [m]	DC	STRAT
4420.0 [m]	DC	STRAT
4440.0 [m]	DC	STRAT
4460.0 [m]	DC	STRAT
4480.0 [m]	DC	STRAT
4500.0 [m]	DC	STRAT
4500.0 [m]	SWC	STRAT
4520.0 [m]	DC	STRAT
4530.0 [m]	DC	STRAT
4540.0 [m]	DC	STRAT
4555.0 [m]	DC	STRAT
4560.0 [m]	DC	STRAT
4576.5 [m]	C	STRAT
4577.1 [m]	C	STRAT
4578.0 [m]	C	STRAT
4583.0 [m]	C	STRAT
4588.0 [m]	C	STRAT
4590.0 [m]	C	STRAT
4592.0 [m]	C	STRAT
4594.4 [m]	C	STRAT
4595.0 [m]	DC	STRAT
4598.0 [m]	C	STRAT
4602.0 [m]	DC	STRAT
4625.0 [m]	DC	STRAT
4632.3 [m]	C	STRAT
4640.5 [m]	C	STRAT
4645.0 [m]	C	STRAT
4650.0 [m]	C	STRAT
4654.7 [m]	C	STRAT
4668.0 [m]	DC	STRAT
4695.0 [m]	DC	STRAT
4704.0 [m]	DC	STRAT
4705.0 [m]	SWC	STRAT
4709.9 [m]	C	STRAT
4712.5 [m]	C	STRAT
4714.0 [m]	SWC	STRAT
4716.6 [m]	C	STRAT
4737.0 [m]	DC	STRAT
4746.0 [m]	DC	STRAT



4773.0	[m]	DC	STRAT
4800.0	[m]	DC	STRAT
4818.0	[m]	DC	STRAT
4839.0	[m]	DC	STRAT
4852.0	[m]	SWC	STRAT
4866.0	[m]	DC	STRAT
4884.0	[m]	DC	STRAT
4902.0	[m]	DC	STRAT
4925.5	[m]	SWC	STRAT
4927.5	[m]	SWC	STRAT
4929.0	[m]	DC	STRAT
4932.0	[m]	DC	STRAT
4938.0	[m]	DC	STRAT
4947.0	[m]	DC	STRAT
4956.0	[m]	DC	STRAT
4974.0	[m]	DC	STRAT
4980.0	[m]	DC	STRAT

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
317	NORDLAND GP
317	NAUST FM
1607	KAI FM
1987	HORDALAND GP
1987	BRYGGE FM
2441	ROGALAND GP
2441	TARE FM
2506	TANG FM
2566	SHETLAND GP
2566	SPRINGAR FM
2705	NISE FM
2908	KVITNOS FM
3516	CROMER KNOLL GP
3516	LYSING FM
3530	LANGE FM
4545	LYR FM
4558	FANGST GP
4558	GARN FM



4574	NOT FM
4599	ILE FM
4701	BÅT GP
4701	ROR FM
4708	TOFTE FM
4916	TILJE FM

Composite logs

Document name	Document format	Document size [MB]
3878	pdf	0.85

Geochemical information

Document name	Document format	Document size [MB]
3878_1	pdf	1.74
3878_2	pdf	1.85
3878_3	pdf	1.96
3878_4	pdf	1.95
3878_5	pdf	1.32
3878_6	pdf	0.77
3878_7	pdf	1.52

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

Document name	Document format	Document size [MB]
3878_6406_2_7_COMPLETION_LOG	.pdf	6.32
3878_6406_2_7_COMPLETION_REPORT	.pdf	48.14

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	4558	4573	0.0





Test number	Final shut-in pressure [MPa]	Final flow pressure [MPa]	Bottom hole pressure [MPa]	Downhole temperature [°C]
1.0	50.000	78.000		164

Test number	Oil [Sm3/day]	Gas [Sm3/day]	Oil density [g/cm3]	Gas grav. rel.air	GOR [m3/m3]
1.0	678	496000	0.806		731

Logs

Log type	Log top depth [m]	Log bottom depth [m]
AITB IPLT	2710	4463
AITB IPLT DSI AMS	4465	4807
HALS PEX DSI	1401	2713
LDT AMS GR	4465	4579
MDT AMS GR	4559	4559
MDT AMS GR	4560	4742
MDT GR	2710	4390
MDT GR	4560	4712
MDT GR	4742	4928
MLWD - CDR ISONIC	2710	4579
MLWD - CDR ISONIC ADN	4465	4712
MSCT GR	2895	4429
MSCT GR	4500	4928
MSCT GR	4500	4802
MWD - MPR	317	2713
VSP	0	0

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	379.0	36	379.0	0.00	LOT
SURF.COND.	18 5/8	1399.0	24	1406.0	1.80	LOT
INTERM.	13 3/8	2707.0	17 1/2	2719.0	1.96	LOT
INTERM.	9 5/8	4458.0	12 1/4	4464.0	2.18	LOT
LINER	7	4981.0	8 1/2	4981.0	0.00	LOT

**Drilling mud**

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
512	1.03			WATER BASED	
1406	1.05			WATER BASED	
1406	1.39	22.0		KCL MUD	
1463	1.39	19.0		KCL MUD	
2562	1.68	35.0		KCL MUD	
2719	1.68	50.0		OIL BASED	
3648	1.72	44.0		OIL BASED	
4040	1.72	43.0		OIL BASED	
4200	1.86	52.0		OIL BASED	
4315	1.86	48.0		OIL BASED	
4401	1.86	48.0		OIL BASED	
4417	1.87	46.0		OIL BASED	
4463	1.87	46.0		OIL BASED	
4464	1.88	47.0		OIL BASED	
4469	2.04	50.0		OIL BASED	
4555	2.04	50.0		OIL BASED	
4573	2.04	50.0		OIL BASED	
4594	2.06	51.0		OIL BASED	
4600	2.06	53.0		OIL BASED	
4625	2.06	54.0		OIL BASED	
4729	2.06	55.0		OIL BASED	
4930	1.35			BRINE	
4930	2.06	14.0		OIL BASED	
4981	2.06	56.0		OIL 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]
3878 Formation pressure (Formasjonstrykk)	pdf	0.23

