

**General information**

Wellbore name	6407/4-1
Type	EXPLORATION
Purpose	WILDCAT
Status	P&A
Factmaps in new window	link to map
Main area	NORWEGIAN SEA
Discovery	6407/4-1 (Spinell Sør)
Well name	6407/4-1
Seismic location	HBGS 83 - 456 SP. 485
Production licence	106
Drilling operator	Den norske stats oljeselskap a.s
Drill permit	474-L
Drilling facility	ROSS ISLE
Drilling days	119
Entered date	20.07.1985
Completed date	15.11.1985
Release date	15.11.1987
Publication date	18.05.2004
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
Kelly bushing elevation [m]	22.0
Water depth [m]	225.0
Total depth (MD) [m RKB]	4835.0
Final vertical depth (TVD) [m RKB]	4832.0
Maximum inclination [°]	5.2
Oldest penetrated age	LATE TRIASSIC
Oldest penetrated formation	ÅRE FM
Geodetic datum	ED50
NS degrees	64° 35' 45.36" N
EW degrees	7° 8' 42.17" E
NS UTM [m]	7164900.01
EW UTM [m]	411212.79
UTM zone	32
NPDID wellbore	490



Wellbore history

General

Wildcat well 6407/4-1 was drilled on a structure in the Gimsan Basin on the Halten Terrace, in the central part of the block. The structure is an isolated domelike structure, all inside the block borders. Well 6407/4-1 is placed a little down flank on the biggest segment in the southeast part. The main objective was hydrocarbon accumulations in the Middle Jurassic, Garn Formation. The second objective was Middle Jurassic, Tilje Formation.

Operations and results

6407/4-1 was spudded with the semi-submersible rig Ross Isle on 20 July 1985 and drilled to TD at 4835 m in late Triassic sediments of the Åre Formation. The well was drilled with seawater and gel down to 849 m, with gypsum/polymer mud from 849 m to 2121 m, with gypsum/polymer/lignosulphonate mud from 2121 m to 3817 m, and with gel/lignosulphonate/lignite mud from 3817 m to TD. Drilling the well proceeded without significant problems.

Oil shows were recorded in sandstone in the interval 2467 m to 2720 m in Campanian-Santonian-Coniacian age sediments of the Shetland Group. Hydrocarbon bearing Middle Jurassic sandstones were encountered at 3890 m KB. Good and strong continuous shows were recorded throughout the Spekk and Melke Formations and the Fangst Group. Geochemical analyses recorded continuous shows in the Tilje Formation (down to ca 4330 m), some shows in sandstones of the Åre Formation, and they confined the oil-water contact in the Garn Formation to between 3952.8 m and 3960.0 m. Above ca 3780 metres the shows involve a light to medium gravity oil, whilst below this depth the oils are waxier and of medium gravity. Top reservoir, in Garn Formation, came in at 3889.5 m, 28 m higher than prognosed. Gas was produced from the reservoir, but reservoir qualities were poor. Geochemical analyses showed very good source rock potential in the Spekk Formation. The geochemistry also indicated that Spekk is not classically oil-prone in the area, but has a mixed potential for oil and gas. Fifteen cores were recovered from 2286 m to 2293 m and 2384 m to 2392.3 m in the Shetland Group (cores 1 and 2), 3889 m to 3981 m in through the Garn and into the Not Formation (cores 3 to 6), 4021 m to 4076.2 m in the upper part of the Ile Formation (cores 7 and 8), 4278 m to 4337.8 m in the upper part of the Tilje Formation (cores 9 to 14), and from 4605 m to 4619.3 m in the Åre Formation (core 15). A segregated sample was taken with RFT at 3898.5 m. The well was permanently abandoned on 15 November 1985 as a gas/condensate discovery.

Testing

Two Drill Stem Tests were performed, one in the Tofte Formation from 4159 m to 4166 m, and one in the Garn Formation from 3889 m to 3919 m.

The Tofte test produced water only at a rate of 30 Sm³/day. The maximum temperature in this test was 148°C.

The Garn test produced condensate at a rate of 20 Sm³/day and gas at a rate of 32500 Sm³/day, giving a GOR of 1625 Sm³/Sm³. The condensate density was 0.807 g/cm³ and the gas gravity was 0.81 (air = 1). The maximum temperature in this test was 142.5°C.



Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
330.00	4835.00

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	2286.0	2293.4	[m]
2	2384.0	2392.3	[m]
3	3889.0	3896.0	[m]
4	3898.0	3926.0	[m]
5	3926.0	3953.5	[m]
6	3953.0	3981.2	[m]
7	4021.0	4048.6	[m]
8	4048.6	4076.2	[m]
9	4278.0	4283.7	[m]
10	4284.0	4299.7	[m]
11	4301.0	4304.5	[m]
12	4304.5	4313.6	[m]
13	4314.0	4325.1	[m]
14	4327.0	4337.8	[m]
15	4605.0	4619.3	[m]

Total core sample length [m]	231.8
Cores available for sampling?	YES

Core photos



2285-2290m



4605-4611m



2291-2293m



4611-4617m



2384-2388m



4617-4619m



2389-2392m



3889-3894m



3895-3896m



3898-3903m



3904-3909m



3910-3915m



3916-3921m



3922-3925m



3926-3931m



3932-3937m



3938-3943m



3944-3949m



3950-3953m



3953-3958m



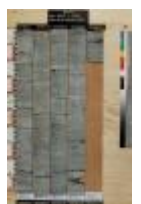
3959-3964m



3965-3970m



3971-3976m



3977-3981m



4021-4026m



4027-4032m



4033-4038m



4039-4044m



4045-4048m



4048-4053m



4054-4059m



4060-4065m



4066-4071m



4072-4076m



4278-4283m



4284-4289m



4290-4295m



4296-4299m



4301-4304m



4304-4309m



4310-4313m



4314-4319m



4320-4325m



4327-4332m



4333-4334m



4605-4611m



4611-4617m



4617-4619m

Palynological slides at the Norwegian Offshore Directorate

Sample depth	Depth unit	Sample type	Laboratory
2080.0	[m]	DC	STRAT
2140.0	[m]	DC	STRAT
2159.0	[m]	SWC	STRAT
2160.0	[m]	DC	STRAT
2170.0	[m]	DC	STRAT
2180.0	[m]	DC	STRAT
2190.0	[m]	DC	STRAT
2210.0	[m]	DC	STRAT
2220.0	[m]	DC	STRAT
2228.0	[m]	SWC	STRAT
2240.0	[m]	DC	STRAT
2260.0	[m]	DC	STRAT
2269.0	[m]	DC	STRAT
2281.0	[m]	DC	STRAT
2292.8	[m]	C	STRAT
2294.0	[m]	DC	STRAT



2306.0	[m]	DC	STRAT
2315.0	[m]	DC	STRAT
2324.0	[m]	DC	STRAT
2333.0	[m]	DC	STRAT
2342.0	[m]	DC	STRAT
2351.0	[m]	DC	STRAT
2359.5	[m]	SWC	STRAT
2369.0	[m]	DC	STRAT
2387.0	[m]	DC	STRAT
2387.1	[m]	C	STRAT
2405.0	[m]	DC	STRAT
2414.0	[m]	DC	STRAT
2432.0	[m]	DC	STRAT
2441.0	[m]	DC	STRAT
2459.0	[m]	DC	STRAT
2473.0	[m]	SWC	STRAT
2477.0	[m]	DC	STRAT
2486.0	[m]	DC	STRAT
2504.0	[m]	DC	STRAT
2528.0	[m]	DC	STRAT
2534.0	[m]	DC	STRAT
2552.0	[m]	DC	STRAT
2561.0	[m]	SWC	STRAT
2564.0	[m]	DC	STRAT
2579.0	[m]	DC	STRAT
2594.0	[m]	DC	STRAT
2609.0	[m]	DC	STRAT
2624.0	[m]	DC	STRAT
2628.8	[m]	SWC	STRAT
2639.0	[m]	DC	STRAT
2654.0	[m]	DC	STRAT
2669.0	[m]	DC	STRAT
2684.0	[m]	DC	STRAT
2699.0	[m]	DC	STRAT
2714.0	[m]	DC	STRAT
2725.0	[m]	SWC	STRAT
2729.0	[m]	DC	STRAT
2744.0	[m]	DC	STRAT
2762.0	[m]	DC	STRAT
2774.0	[m]	DC	STRAT



2789.0	[m]	DC	STRAT
2804.0	[m]	DC	STRAT
2819.0	[m]	DC	STRAT
2834.0	[m]	DC	STRAT
2849.0	[m]	DC	STRAT
2864.0	[m]	DC	STRAT
2879.0	[m]	DC	STRAT
2894.0	[m]	DC	STRAT
2909.0	[m]	DC	STRAT
2939.0	[m]	DC	STRAT
2954.0	[m]	DC	STRAT
2969.0	[m]	DC	STRAT
2984.0	[m]	DC	STRAT
2998.0	[m]	DC	STRAT
3014.0	[m]	DC	STRAT
3028.0	[m]	DC	STRAT
3042.0	[m]	DC	STRAT
3058.0	[m]	DC	STRAT
3074.0	[m]	DC	STRAT
3089.0	[m]	DC	STRAT
3104.0	[m]	DC	STRAT
3105.0	[m]	SWC	STRAT
3119.0	[m]	DC	STRAT
3134.0	[m]	DC	STRAT
3149.0	[m]	DC	STRAT
3164.0	[m]	DC	STRAT
3179.0	[m]	DC	STRAT
3182.9	[m]	SWC	STRAT
3194.0	[m]	DC	STRAT
3209.0	[m]	DC	STRAT
3222.0	[m]	DC	STRAT
3224.4	[m]	SWC	STRAT
3239.0	[m]	DC	STRAT
3254.0	[m]	DC	STRAT
3313.0	[m]	DC	STRAT
3359.0	[m]	DC	STRAT
3379.0	[m]	DC	STRAT
3384.0	[m]	DC	STRAT
3404.0	[m]	DC	STRAT
3488.0	[m]	SWC	STRAT



3494.0 [m]	DC	STRAT
3509.0 [m]	DC	STRAT
3524.0 [m]	DC	STRAT
3539.0 [m]	DC	STRAT
3554.0 [m]	DC	STRAT
3560.0 [m]	SWC	STRAT
3572.0 [m]	DC	STRAT
3599.0 [m]	DC	STRAT
3614.0 [m]	DC	STRAT
3628.0 [m]	DC	STRAT
3643.0 [m]	DC	STRAT
3658.0 [m]	DC	STRAT
3673.0 [m]	DC	STRAT
3688.0 [m]	DC	STRAT
3698.0 [m]	SWC	STRAT
3703.0 [m]	DC	STRAT
3710.0 [m]	SWC	STRAT
3712.0 [m]	DC	PETROSTR
3718.0 [m]	DC	STRAT
3721.0 [m]	DC	PETROSTR
3724.0 [m]	DC	PETROS
3729.0 [m]	SWC	STRAT
3730.0 [m]	DC	PETROSTR
3733.0 [m]	DC	STRAT
3739.0 [m]	DC	PETROSTR
3745.0 [m]	DC	PETROS
3748.0 [m]	DC	STRAT
3751.0 [m]	DC	PETROSTR
3754.0 [m]	SWC	STRAT
3760.0 [m]	DC	PETROSTR
3763.0 [m]	DC	STRAT
3766.0 [m]	DC	PETROSTR
3771.0 [m]	SWC	STRAT
3778.0 [m]	DC	STRAT
3780.0 [m]	SWC	STRAT
3790.0 [m]	DC	PETROSTR
3793.5 [m]	SWC	STRAT
3805.0 [m]	DC	STRAT
3822.0 [m]	SWC	STRAT
3823.0 [m]	DC	STRAT



3835.0	[m]	DC	PETROSTR
3838.0	[m]	DC	STRAT
3853.0	[m]	DC	STRAT
3864.0	[m]	SWC	STRAT
3868.0	[m]	DC	STRAT
3883.0	[m]	DC	STRAT
3886.0	[m]	DC	PETROSTR
3888.0	[m]	SWC	STRAT
3894.4	[m]	C	STRAT
3898.0	[m]	DC	STRAT
3899.5	[m]	C	STRAT
3906.3	[m]	C	STRAT
3913.0	[m]	DC	STRAT
3913.6	[m]	C	STRAT
3918.6	[m]	C	STRAT
3928.0	[m]	DC	STRAT
3928.2	[m]	C	STRAT
3943.0	[m]	DC	STRAT
3946.8	[m]	C	STRAT
3952.9	[m]	C	STRAT
3954.2	[m]	C	STRAT
3958.0	[m]	DC	STRAT
3959.7	[m]	C	STRAT
3966.5	[m]	C	STRAT
3973.0	[m]	DC	STRAT
3977.0	[m]	C	STRAT
3988.0	[m]	DC	STRAT
3997.5	[m]	SWC	STRAT
4003.0	[m]	DC	STRAT
4018.0	[m]	DC	STRAT
4018.5	[m]	SWC	STRAT
4021.1	[m]	C	STRAT
4027.8	[m]	C	STRAT
4033.0	[m]	DC	STRAT
4033.9	[m]	C	STRAT
4040.0	[m]	C	STRAT
4046.7	[m]	C	STRAT
4048.0	[m]	DC	STRAT
4052.7	[m]	C	STRAT
4059.9	[m]	C	STRAT



4063.0	[m]	DC	STRAT
4067.3	[m]	C	STRAT
4073.6	[m]	C	STRAT
4078.0	[m]	DC	STRAT
4093.0	[m]	DC	STRAT
4108.0	[m]	DC	STRAT
4113.0	[m]	SWC	STRAT
4123.0	[m]	DC	STRAT
4138.0	[m]	DC	STRAT
4153.0	[m]	DC	STRAT
4156.5	[m]	DC	STRAT
4168.0	[m]	DC	STRAT
4175.5	[m]	SWC	STRAT
4183.0	[m]	DC	STRAT
4198.0	[m]	DC	STRAT
4210.0	[m]	SWC	STRAT
4213.0	[m]	DC	STRAT
4228.0	[m]	DC	STRAT
4243.0	[m]	DC	STRAT
4258.0	[m]	DC	STRAT
4270.0	[m]	SWC	STRAT
4273.0	[m]	DC	STRAT
4279.3	[m]	C	STRAT
4286.4	[m]	C	STRAT
4288.0	[m]	DC	STRAT
4292.3	[m]	C	STRAT
4297.8	[m]	C	STRAT
4303.0	[m]	DC	STRAT
4304.5	[m]	C	STRAT
4310.0	[m]	C	STRAT
4318.0	[m]	DC	STRAT
4318.4	[m]	C	STRAT
4327.9	[m]	C	STRAT
4333.0	[m]	DC	STRAT
4348.0	[m]	DC	STRAT
4363.0	[m]	DC	STRAT
4378.0	[m]	DC	STRAT
4389.0	[m]	SWC	STRAT
4393.0	[m]	DC	STRAT
4408.0	[m]	DC	STRAT



4423.0 [m]	DC	STRAT
4438.0 [m]	DC	STRAT
4453.0 [m]	DC	STRAT
4465.0 [m]	SWC	STRAT
4468.0 [m]	DC	STRAT
4483.0 [m]	DC	STRAT
4492.0 [m]	DC	STRAT
4501.0 [m]	SWC	STRAT
4514.0 [m]	DC	STRAT
4526.0 [m]	DC	STRAT
4534.0 [m]	DC	STRAT
4540.0 [m]	DC	STRAT
4543.0 [m]	DC	STRAT
4549.0 [m]	DC	STRAT
4552.3 [m]	SWC	STRAT
4558.0 [m]	DC	STRAT
4566.3 [m]	SWC	STRAT
4567.0 [m]	DC	STRAT
4573.0 [m]	DC	STRAT
4576.0 [m]	DC	STRAT
4581.4 [m]	SWC	STRAT
4585.0 [m]	DC	STRAT
4603.0 [m]	DC	STRAT
4605.0 [m]	DC	STRAT
4605.9 [m]	C	STRAT
4609.0 [m]	C	STRAT
4611.6 [m]	C	STRAT
4612.7 [m]	C	STRAT
4613.9 [m]	C	STRAT
4618.0 [m]	C	STRAT
4618.1 [m]	C	STRAT
4624.0 [m]	DC	STRAT
4632.0 [m]	DC	STRAT
4639.0 [m]	DC	STRAT
4648.0 [m]	DC	STRAT
4654.0 [m]	DC	STRAT
4663.0 [m]	DC	STRAT
4678.0 [m]	DC	STRAT
4693.0 [m]	DC	STRAT
4705.0 [m]	DC	STRAT



4708.0	[m]	DC	STRAT
4723.0	[m]	DC	STRAT
4738.0	[m]	DC	STRAT
4744.0	[m]	DC	STRAT
4753.0	[m]	DC	STRAT
4762.0	[m]	DC	STRAT
4768.0	[m]	DC	STRAT
4783.0	[m]	DC	STRAT
4789.0	[m]	DC	STRAT
4795.0	[m]	DC	STRAT
4798.0	[m]	DC	STRAT
4801.0	[m]	DC	STRAT
4808.0	[m]	DC	STRAT
4810.0	[m]	DC	STRAT
4813.0	[m]	DC	STRAT
4828.0	[m]	DC	STRAT
4835.0	[m]	DC	STRAT

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	TEST2	3889.00	3919.00		04.11.1985 - 08:50	YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
247	NORDLAND GP
247	NAUST FM
1265	KAI FM
1430	HORDALAND GP
1430	BRYGGE FM
2098	ROGALAND GP
2098	TARE FM
2174	TANG FM
2265	SHETLAND GP
2265	SPRINGAR FM



2422	NISE FM
2598	KVITNOS FM
3010	CROMER KNOLL GP
3010	LANGE FM
3682	LYR FM
3710	VIKING GP
3710	SPEKK FM
3772	MELKE FM
3890	FANGST GP
3890	GARN FM
3969	NOT FM
4021	ILE FM
4106	BÅT GP
4106	ROR FM
4150	TOFTE FM
4209	ROR FM
4272	TILJE FM
4500	ÅRE FM

Composite logs

Document name	Document format	Document size [MB]
490	pdf	1.02

Geochemical information

Document name	Document format	Document size [MB]
490_1	pdf	6.54

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

Document name	Document format	Document size [MB]
490_01_WDSS_General_Information	pdf	0.31
490_02_WDSS_completion_log	pdf	0.38



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

Document name	Document format	Document size [MB]
490 6407 4 1 COMPLETION REPORT AND LOG	pdf	10.56
490 6407 4 1 COMPLETION REPORT	.PDF	101.71

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	4159	4166	0.0
2.0	3889	3919	17.5

Test number	Final shut-in pressure [MPa]	Final flow pressure [MPa]	Bottom hole pressure [MPa]	Downhole temperature [°C]
1.0				148
2.0				142

Test number	Oil [Sm3/day]	Gas [Sm3/day]	Oil density [g/cm3]	Gas grav. rel.air	GOR [m3/m3]
1.0					
2.0	20	32500	0.807	0.810	1625

Logs

Log type	Log top depth [m]	Log bottom depth [m]
CBL VDL GR	247	2121
CBL VDL GR	2095	3816
CBL VDL GR	3608	4529
CST GR	2160	3822
CST GR	3488	3768
CST GR	3825	4521
CST GR	4534	4611
DLL MSFL GR	2120	4519
ISF LSS MSFL GR	322	4836
LDT CNL GR	322	3793





LDT CNL SGR	3817	4523
LDT CNL SGR	4529	4837
MWD	320	4280
RFT GR	3891	3944
RFT GR	3891	4495
SHDT GR	2120	3828
VSP	2100	4740

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	320.0	36	322.0	0.00	LOT
SURF.COND.	20	849.0	26	867.0	1.60	LOT
INTERM.	13 3/8	2121.0	17 1/2	2134.0	1.83	LOT
INTERM.	9 5/8	3825.0	12 1/4	3828.0	2.03	LOT
LINER	7	4528.0	8 1/2	4540.0	2.10	LOT
OPEN HOLE		4835.0	6	4835.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
1368	1.18	11.0	3.8	WATER BASED	02.08.1985
1458	1.25	12.0	6.0	WATER BASED	05.08.1985
1860	1.35	14.0	12.8	WATER BASED	05.08.1985
1904	1.35	14.0	12.8	WATER BASED	05.08.1985
1920	1.40	14.0	12.8	WATER BASED	05.08.1985
2058	1.48	11.0	13.8	WATER BASED	05.08.1985
2134	1.51	11.0	13.8	WATER BASED	07.08.1985
2134	1.54	13.0	8.0	WATER BASED	08.08.1985
2134	1.54	13.0	8.0	WATER BASED	08.08.1985
2286	1.57	19.0	6.8	WATER BASED	12.08.1985
2384	1.76	21.0	9.0	WATER BASED	12.08.1985
2935	1.76	24.0	9.0	WATER BASED	19.08.1985
3076	1.76	51.0	7.5	WATER BASED	21.08.1985
3668	1.76	50.0	7.0	WATER BASED	02.09.1985
3743	1.76	49.0	8.0	WATER BASED	02.09.1985
3747	1.45	22.0	11.0	WATER BASED	12.09.1985



3825	1.76	48.0	7.0	WATER BASED	04.09.1985
4189	1.38	24.0	6.0	WATER BASED	24.09.1985
4510	1.39	26.0	11.0	WATER BASED	07.10.1985
4529	1.41	20.0	7.5	WATER BASED	07.10.1985

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]
490 Formation pressure (Formasjonstrykk)	pdf	0.23

