

**General information**

Wellbore name	7121/4-1
Type	EXPLORATION
Purpose	WILDCAT
Status	P&A
Factmaps in new window	link to map
Main area	BARENTS SEA
Field	SNØHVIT
Discovery	7121/4-1 Snøhvit
Well name	7121/4-1
Seismic location	ST 8310 - 369 SP. 1083
Production licence	099
Drilling operator	Den norske stats oljeselskap a.s
Drill permit	428-L
Drilling facility	WEST VANGUARD
Drilling days	83
Entered date	06.08.1984
Completed date	27.10.1984
Release date	27.10.1986
Publication date	03.08.2021
Purpose - planned	WILDCAT
Reentry	NO
Content	OIL/GAS
Discovery wellbore	YES
1st level with HC, age	MIDDLE JURASSIC
1st level with HC, formation	STØ FM
2nd level with HC, age	EARLY JURASSIC
2nd level with HC, formation	NORDMELA FM
Kelly bushing elevation [m]	22.0
Water depth [m]	335.0
Total depth (MD) [m RKB]	2609.0
Final vertical depth (TVD) [m RKB]	2609.0
Maximum inclination [°]	1.2
Bottom hole temperature [°C]	88
Oldest penetrated age	LATE TRIASSIC
Oldest penetrated formation	FRUHOLMEN FM
Geodetic datum	ED50
NS degrees	71° 35' 59.68" N
EW degrees	21° 9' 22.79" E



NS UTM [m]	7944529.35
EW UTM [m]	505507.86
UTM zone	34
NPDID wellbore	135

Wellbore history

General

Exploration well 7121/4-1 was drilled in the Hammerfest Basin in the Troms I area. The primary objective was to test possible hydrocarbon accumulations in sandstones of Middle to Early Jurassic age.

Operations and results

Well 7121/4-1 was spudded with the semi-submersible rig West Vanguard on 6 August 1984 and drilled to TD at 2609 m in Late Triassic sediments (Fruholmen Formation). Loss of circulation occurred at TD in 12 1/4" section at 2285 m, and several times during drilling of 8 1/2" hole but otherwise operations went without significant problems. The well was drilled with spud mud down to 817 m, with gypsum/Celpol from 817 m to 2285 m, and with gel/chromium-lignosulphonate from 2285 m to TD.

Hydrocarbon accumulations were discovered in two separated sandstone sequences. The uppermost sequence between 2318 m and 2442 m in the Stø and Nordmela formations contained gas over oil, while the lower sequence was gas bearing between 2468.5 m and 2473 m in the uppermost few meters of the Tubåen Formation. The gas/oil contact in the upper reservoir was seen from RFT to be at 2425. The oil zone, 2425 m to 2442 m in the Nordmela Formation, consists of an interbedded sandstone/shale sequence with fair/poor reservoir properties. There is a sealing shale between 2444 and 2468.5 m that screens off the upper gas-oil system from the lower Tubåen gas reservoir. The lower gas zone has good reservoir properties. The sandstone continues to TD at 2587 m, interrupted by some minor shale beds and one major shale bed at 2532 m to 2560 m. Four cores were cut in the reservoir interval from 2321 m to 2416.35 m in the Middle Jurassic down into the Early Jurassic. Three segregated RFT samples were taken. For all three samples the 2 3/4 gallon chambers were bled off at well site. Sample 1 from 2365 m recovered gas, black condensate, and mud filtrate. Sample 2 from 2470 m recovered gas, brown condensate, and mud filtrate. Sample 3 from 2412 m recovered gas, brown condensate and mud filtrate.

The well was permanently abandoned on 27 October 1984 as the Snøhvit oil and gas discovery.

Testing

Four intervals in the Middle to Early Jurassic sequence were perforated and production tested: 2497.6 m to 2504.2 m (DST 1 in Tubåen Formation), 2465.93 m to 2471.93 m (DST 2 in Nordmela to Tubåen formations), 2419.85 m to 2434.85 m (DST 3 in Nordmela Formation), and 2353 m to 2385 m (DST 4 in Stø Formation).

DST 1 was a water test and produced 346 m3 water / day through a 25.4 + 1.75 mm choke.

DST 2 was a gas test, perforated just 1 m above the gas/water contact. This caused a very high water production starting at about 7 % with an increase to more than 99 % water of the total fluids produced (water-coning) before the well was shut in. In the middle of the main flow the test produced 34.8 Sm3 condensate, 391400 Sm3 gas, and 309.4 m3 water per day through a 19 mm choke. This gives a GOR of 11203 Sm3/Sm3.



DST 3 was an oil test and produced 81.6 Sm³ oil and 88300 Sm³ gas per day through a 12.7 mm choke. This gives a GOR of 1083 Sm³/Sm³. Gas gravity was 0.734 (air =1) and oil density was 0.856 g/cm³. The gas contained 6 % CO₂ while the H₂S content was nil. No water was produced. Hydrate formation in the choke manifold and down hole was reported in this test.

DST 4 was a gas test. The first attempt was aborted due to a leak in the tester valve. The second and successful test was named DST 4A. This test produced 109 Sm³ condensate and 844300 Sm³ gas / day during the main flow through a 25.4 mm choke. This gives a GOR of 7744 Sm³/Sm³.

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
430.00	2583.00

Cuttings available for sampling?	YES
----------------------------------	-----

Cores at the Norwegian Offshore Directorate

Core sample number	Core sample - top depth	Core sample - bottom depth	Core sample depth - uom
1	2321.0	2339.2	[m]
2	2339.2	2366.7	[m]
3	2366.7	2394.0	[m]
4	2394.0	2416.4	[m]

Total core sample length [m]	95.4
Cores available for sampling?	YES

Core photos

2321-2327m



2327-2333m



2333-2339m



2339-2339m



2339-2345m



2345-2351m



2351-2356m



2352-2357m



2357-2363m



2363-2366m



2363-2367m



2366-2372m



2367-2373m



2372-2378m



2373-2379m



2378-2384m



2379-2384m



2384-2390m



2385-2391m



2390-2394m



2391-2394m



2394-2400m



2400-2406m



2406-2412m



2412-2416m



2412-2416m

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	2497.00	2504.00	WATER	07.04.1985 - 00:00	YES
DST	DST2	2471.00	2465.00	CONDE NSATE	05.10.1984 - 00:04	YES
DST	DST3	2419.80	2434.80	OIL	10.10.1984 - 00:00	YES
DST	DST4	2353.00	2385.00	CONDE NSATE	17.10.1984 - 00:00	YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
357	NORDLAND GP
447	SOTBAKKEN GP
447	TORSK FM
1016	NYGRUNNEN GP
1016	KVEITE FM
1052	ADVENTDALEN GP
1052	KOLMULE FM
1817	KOLJE FM
2136	KNURR FM
2237	HEKKINGEN FM
2307	FUGLEN FM
2318	KAPP TOSCANA GP
2318	STØ FM
2396	NORDMELA FM
2469	TUBÅEN FM
2532	FRUHOLMEN FM

Composite logs

Document name	Document format	Document size [MB]
135	pdf	0.37





Geochemical information

Document name	Document format	Document size [MB]
135_1	pdf	1.08
135_2	pdf	0.24
135_3	pdf	5.38
135_4	pdf	4.58

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

Document name	Document format	Document size [MB]
135_01_WDSS_General_Information	pdf	0.25
135_02_WDSS_completion_log	pdf	0.23

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

Document name	Document format	Document size [MB]
135_01_Completion_Report	pdf	13.29
135_02_Completion_log	pdf	1.35

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	2498	2504	25.4
2.0	2466	2472	19.1
3.0	2420	2435	12.7
4.0	2353	2385	25.4

Test number	Final shut-in pressure [MPa]	Final flow pressure [MPa]	Bottom hole pressure [MPa]	Downhole temperature [°C]
1.0				86
2.0	13.000			
3.0	18.000			86
4.0				86





Test number	Oil [Sm3/day]	Gas [Sm3/day]	Oil density [g/cm3]	Gas grav. rel.air	GOR [m3/m3]
1.0					
2.0	67	771600	0.850	0.730	11516
3.0	94	89000	0.850	0.730	946
4.0	109	846000	0.760	0.700	7760

Logs

Log type	Log top depth [m]	Log bottom depth [m]
CBL VDL GR	700	1330
CBL VDL GR	1100	2520
CST	863	1337
CST	1367	2270
CST	2275	2586
GR CCL SH	2047	2984
ISF SONIC GR	357	2584
ISF SONIC GR MSFL	2258	2364
LDT CNL NGT	2259	2587
LDT GR	418	2275
RFT	2391	2559
SHDT GR	800	2586
VELOCITY	1000	2580

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	419.0	36	425.0	0.00	LOT
SURF.COND.	20	800.0	26	817.0	1.64	LOT
INTERM.	13 3/8	1330.0	17 1/2	1358.0	1.57	LOT
INTERM.	9 5/8	2259.0	12 1/4	2288.0	1.61	LOT
LINER	7	2609.0	8 1/2	2609.0	0.00	LOT

Drilling mud



Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
422	1.05	900.0		WATER BASED	
750	1.07	400.0		WATER BASED	
817	1.05	400.0		WATER BASED	
1120	1.12	1900.0		WATER BASED	
1355	1.12	1800.0		WATER BASED	
1445	1.20	1700.0		WATER BASED	
1866	1.27	1600.0		WATER BASED	
2073	1.30	1600.0		WATER BASED	
2285	1.39	1700.0		WATER BASED	
2288	1.45	1800.0		WATER BASED	
2366	1.45	1900.0		WATER BASED	
2587	1.30	1600.0		WATER BASED	

Thin sections at the Norwegian Offshore Directorate

Depth	Unit
2410.90	[m]
2401.75	[m]
2385.00	[m]
2358.00	[m]
2342.00	[m]
2331.80	[m]

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]
135_Formalion_pressure_(Formasjonstrykk)	pdf	0.28

