

**General information**

Wellbore name	9/2-4 S
Type	EXPLORATION
Purpose	APPRAISAL
Status	RE-CLASS TO DEV
Factmaps in new window	link to map
Main area	NORTH SEA
Field	YME
Discovery	9/2-1 Yme
Well name	9/2-4
Seismic location	ST 9002-INLINE 178 & CROSSLINE 998
Production licence	114
Drilling operator	Den norske stats oljeselskap a.s
Drill permit	775-L
Drilling facility	DEEPSEA BERGEN
Drilling days	108
Entered date	25.12.1993
Completed date	11.04.1994
Release date	11.04.1996
Publication date	24.09.2002
Purpose - planned	APPRAISAL
Reclassified to wellbore	9/2-A-1
Reentry	NO
Content	OIL
Discovery wellbore	NO
1st level with HC, age	MIDDLE JURASSIC
1st level with HC, formation	SANDNES FM
Kelly bushing elevation [m]	23.0
Water depth [m]	91.5
Total depth (MD) [m RKB]	4417.0
Final vertical depth (TVD) [m RKB]	3313.0
Maximum inclination [°]	62.5
Bottom hole temperature [°C]	110
Oldest penetrated age	MIDDLE JURASSIC
Oldest penetrated formation	BRYNE FM
Geodetic datum	ED50
NS degrees	57° 49' 7.48" N
EW degrees	4° 31' 10.74" E
NS UTM [m]	6409689.37



EW UTM [m]	590278.65
UTM zone	31
NPDID wellbore	2258

Wellbore history

General

The main objective for the deviated well 9/2-4 S was to appraise commercial hydrocarbon reserves in the southern part of the Upper Jurassic Gamma structure on the Yme field. Further to prove continuation of the equivalent shallow marine sandstone seen in well 9/2-1, with similar reservoir properties, and finally, to gather data for improved seismic velocity analysis on the southern part of the Gamma structure.

Operations and results

Appraisal well 9/2-4 S was spudded with the semi-submersible installation "DeepSea Bergen" on 25 December 1993 and drilled to a total depth of 4417 m (3313 m TVD) in the Middle Jurassic Bryne Formation. No shallow gas was encountered in the top-hole section. The well was drilled to 4090m MD using water based mud with bentonite and bentonite/CMC EHV down to 647 m. The 17 1/2" section (647 m to 2215 m) was drilled from the top to Early Cretaceous (Top Early Cretaceous at 1590 m) with KCl polymer mud, then converted to Anco 2000 mud by adding 3% glycol. Due to hole stability problems, the well was plugged back to 3755 m and a sidetrack was performed to TD at 4417m using ester based mud. The top Sandnes Formation was penetrated 13.5 m higher than prognosed, and top reservoir sand 17.5 m higher than prognosed. The oil/water contact was not evident in this well. However, the results from the MWD/LWD gave no indication of a different OWC than anticipated in the well 9/2-1 (3210 m TVD MSL). The estimated Net/Gross for the reservoir section is 0.67, which is slightly less than for the 9/2 - 1 well. This is compensated by an increased thickness of high reservoir quality. One core was cut in the interval 4150m - 4168.5 m in the Sandnes Formation. A segregated FMT fluid sample from 4132.6 m gave an oil with density of 0.83 g/cc (at surface condition) and the four pressure measurements from the FMT-log gave an oil gradient of 0.70 g/cc. The well was tied back with 9 5/8" casing and suspended 11 April 1994 as an oil appraisal. The well was then re-classified to development well.

Testing

No drill stem test was performed

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
650.00	4090.00

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	4150.0	4166.9	[m]

Total core sample length [m]	16.9
Cores available for sampling?	YES

Core photos



4150-4155m



4155-4160m



4160-4165m



4165-4167m

Palynological slides at the Norwegian Offshore Directorate

Sample depth	Depth unit	Sample type	Laboratory
650.0	[m]	DC	GEOST
660.0	[m]	DC	GEOST
670.0	[m]	DC	GEOST
680.0	[m]	DC	GEOST
690.0	[m]	DC	GEOST
700.0	[m]	DC	GEOST
710.0	[m]	DC	GEOST
720.0	[m]	DC	GEOST
730.0	[m]	DC	GEOST
740.0	[m]	DC	GEOST
750.0	[m]	DC	GEOST
760.0	[m]	DC	GEOST
770.0	[m]	DC	GEOST
780.0	[m]	DC	GEOST
1590.0	[m]	DC	GEOST
1610.0	[m]	DC	GEOST
1620.0	[m]	DC	GEOST
1640.0	[m]	DC	GEOST
1650.0	[m]	DC	GEOST
1670.0	[m]	DC	GEOST



1680.0	[m]	DC	GEOST
1700.0	[m]	DC	GEOST
1710.0	[m]	DC	GEOST
1730.0	[m]	DC	GEOST
1740.0	[m]	DC	GEOST
1760.0	[m]	DC	GEOST
1770.0	[m]	DC	GEOST
1790.0	[m]	DC	GEOST
1800.0	[m]	DC	GEOST
1820.0	[m]	DC	GEOST
1850.0	[m]	DC	GEOST
1860.0	[m]	DC	GEOST
1880.0	[m]	DC	GEOST
1890.0	[m]	DC	GEOST
1910.0	[m]	DC	GEOST
1920.0	[m]	DC	GEOST
1940.0	[m]	DC	GEOST
1950.0	[m]	DC	GEOST
1970.0	[m]	DC	GEOST
1980.0	[m]	DC	GEOST
2000.0	[m]	DC	GEOST
2010.0	[m]	DC	GEOST
2030.0	[m]	DC	GEOST
2040.0	[m]	DC	GEOST
2060.0	[m]	DC	GEOST
2070.0	[m]	DC	GEOST
2090.0	[m]	DC	GEOST
2100.0	[m]	DC	GEOST
2120.0	[m]	DC	GEOST
2130.0	[m]	DC	GEOST
2150.0	[m]	DC	GEOST
2160.0	[m]	DC	GEOST
2180.0	[m]	DC	GEOST
2190.0	[m]	DC	GEOST
2210.0	[m]	DC	GEOST
2220.0	[m]	DC	GEOST
2240.0	[m]	DC	GEOST
2250.0	[m]	DC	GEOST
2270.0	[m]	DC	GEOST
2280.0	[m]	DC	GEOST



2300.0 [m]	DC	GEOST
2310.0 [m]	DC	GEOST
2330.0 [m]	DC	GEOST
2340.0 [m]	DC	GEOST
2360.0 [m]	DC	GEOST
2370.0 [m]	DC	GEOST
2390.0 [m]	DC	GEOST
2400.0 [m]	DC	GEOST
2420.0 [m]	DC	GEOST
2430.0 [m]	DC	GEOST
2450.0 [m]	DC	GEOST
2460.0 [m]	DC	GEOST
2480.0 [m]	DC	GEOST
2490.0 [m]	DC	GEOST
2510.0 [m]	DC	GEOST
2520.0 [m]	DC	GEOST
2540.0 [m]	DC	GEOST
2550.0 [m]	DC	GEOST
2570.0 [m]	DC	GEOST
2580.0 [m]	DC	GEOST
2600.0 [m]	DC	GEOST
2610.0 [m]	DC	GEOST
2630.0 [m]	DC	GEOST
2640.0 [m]	DC	GEOST
2660.0 [m]	DC	GEOST
2670.0 [m]	DC	GEOST
2690.0 [m]	DC	GEOST
2700.0 [m]	DC	GEOST
2720.0 [m]	DC	GEOST
2730.0 [m]	DC	GEOST
2740.0 [m]	DC	GEOST
2750.0 [m]	DC	GEOST
2760.0 [m]	DC	GEOST
2780.0 [m]	DC	GEOST
2790.0 [m]	DC	GEOST
2800.0 [m]	DC	GEOST
2810.0 [m]	DC	GEOST
2820.0 [m]	DC	GEOST
2840.0 [m]	DC	GEOST
2850.0 [m]	DC	GEOST



2860.0	[m]	DC	GEOST
2870.0	[m]	DC	GEOST
2890.0	[m]	DC	GEOST
2900.0	[m]	DC	GEOST
2910.0	[m]	DC	GEOST
2920.0	[m]	DC	GEOST
2930.0	[m]	DC	GEOST
2950.0	[m]	DC	GEOST
2960.0	[m]	DC	GEOST
2970.0	[m]	DC	GEOST
2980.0	[m]	DC	GEOST
2990.0	[m]	DC	GEOST
3010.0	[m]	DC	GEOST
3020.0	[m]	DC	GEOST
3030.0	[m]	DC	GEOST
3040.0	[m]	DC	GEOST
3050.0	[m]	DC	GEOST
3070.0	[m]	DC	GEOST
3080.0	[m]	DC	GEOST
3090.0	[m]	DC	GEOST
3100.0	[m]	DC	GEOST
3110.0	[m]	DC	GEOST
3130.0	[m]	DC	GEOST
3140.0	[m]	DC	GEOST
3150.0	[m]	DC	GEOST
3160.0	[m]	DC	GEOST
3170.0	[m]	DC	GEOST
3190.0	[m]	DC	GEOST
3200.0	[m]	DC	GEOST
3210.0	[m]	DC	GEOST
3220.0	[m]	DC	GEOST
3230.0	[m]	DC	GEOST
3250.0	[m]	DC	GEOST
3260.0	[m]	DC	GEOST
3270.0	[m]	DC	GEOST
3280.0	[m]	DC	GEOST
3290.0	[m]	DC	GEOST
3310.0	[m]	DC	GEOST
3320.0	[m]	DC	GEOST
3330.0	[m]	DC	GEOST



3340.0	[m]	DC	GEOST
3350.0	[m]	DC	GEOST
3370.0	[m]	DC	GEOST
3380.0	[m]	DC	GEOST
3390.0	[m]	DC	GEOST
3400.0	[m]	DC	GEOST
3410.0	[m]	DC	GEOST
3430.0	[m]	DC	GEOST
3440.0	[m]	DC	GEOST
3450.0	[m]	DC	GEOST
3460.0	[m]	DC	GEOST
3470.0	[m]	DC	GEOST
3490.0	[m]	DC	GEOST
3500.0	[m]	DC	GEOST
3510.0	[m]	DC	GEOST
3520.0	[m]	DC	GEOST
3530.0	[m]	DC	GEOST
3550.0	[m]	DC	GEOST
3560.0	[m]	DC	GEOST
3570.0	[m]	DC	GEOST
3580.0	[m]	DC	GEOST
3590.0	[m]	DC	GEOST
3610.0	[m]	DC	GEOST
3620.0	[m]	DC	GEOST
3630.0	[m]	DC	GEOST
3640.0	[m]	DC	GEOST
3650.0	[m]	DC	GEOST
3670.0	[m]	DC	GEOST
3680.0	[m]	DC	GEOST
3690.0	[m]	DC	GEOST
3700.0	[m]	DC	GEOST
3710.0	[m]	DC	GEOST
3730.0	[m]	DC	GEOST
3740.0	[m]	DC	GEOST
3750.0	[m]	DC	GEOST
3760.0	[m]	DC	GEOST
3770.0	[m]	DC	GEOST
3790.0	[m]	DC	GEOST
3800.0	[m]	DC	GEOST
3810.0	[m]	DC	GEOST



3820.0 [m]	DC	GEOST
3830.0 [m]	DC	GEOST
3850.0 [m]	DC	GEOST
3860.0 [m]	DC	GEOST
3870.0 [m]	DC	GEOST
3880.0 [m]	DC	GEOST
3890.0 [m]	DC	GEOST
3910.0 [m]	DC	GEOST
3920.0 [m]	DC	GEOST
3930.0 [m]	DC	GEOST
3940.0 [m]	DC	GEOST
3950.0 [m]	DC	GEOST
3970.0 [m]	DC	GEOST
3980.0 [m]	DC	GEOST
3990.0 [m]	DC	GEOST
4000.0 [m]	DC	GEOST
4010.0 [m]	DC	GEOST
4030.0 [m]	DC	GEOST
4040.0 [m]	DC	GEOST
4050.0 [m]	DC	GEOST
4060.0 [m]	DC	GEOST
4070.0 [m]	DC	GEOST
4090.0 [m]	DC	GEOST
4099.0 [m]	DC	GEOST
4108.0 [m]	DC	GEOST
4117.0 [m]	DC	GEOST
4126.0 [m]	DC	GEOST
4135.0 [m]	DC	GEOST
4144.0 [m]	DC	GEOST
4150.9 [m]	C	GEOST
4151.1 [m]	C	GEOST
4153.0 [m]	DC	GEOST
4158.4 [m]	C	GEOST
4159.5 [m]	C	GEOST
4166.6 [m]	C	GEOST
4174.0 [m]	DC	GEOST
4183.0 [m]	DC	GEOST
4192.0 [m]	DC	GEOST
4201.0 [m]	DC	GEOST
4210.0 [m]	DC	GEOST



4219.0 [m]	DC	GEOST
4228.0 [m]	DC	GEOST
4237.0 [m]	DC	GEOST
4246.0 [m]	DC	GEOST
4255.0 [m]	DC	GEOST
4264.0 [m]	DC	GEOST
4273.0 [m]	DC	GEOST
4282.0 [m]	DC	GEOST
4291.0 [m]	DC	GEOST
4300.0 [m]	DC	GEOST
4309.0 [m]	DC	GEOST
4318.0 [m]	DC	GEOST
4327.0 [m]	DC	GEOST
4336.0 [m]	DC	GEOST
4345.0 [m]	DC	GEOST
4354.0 [m]	DC	GEOST
4363.0 [m]	DC	GEOST
4372.0 [m]	DC	GEOST
4381.0 [m]	DC	GEOST
4390.0 [m]	DC	GEOST
4399.0 [m]	DC	GEOST
4408.0 [m]	DC	GEOST
4414.0 [m]	DC	GEOST

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
115	NORDLAND GP
521	HORDALAND GP
724	ROGALAND GP
724	BALDER FM
741	SELE FM
753	LISTA FM
774	VÅLE FM
784	SHETLAND GP
784	EKOFISK FM
855	TOR FM
1168	HOD FM
1545	BLODØKS FM



1581	CROMER KNOLL GP
1581	SOLA FM
1723	ÅSGARD FM
2730	BOKNEFJORD GP
2730	FLEKKEFJORD FM
3075	SAUDA FM
3875	TAU FM
3993	EGERSUND FM
4094	VESTLAND GP
4094	SANDNES FM
4295	BRYNE FM

Composite logs

Document name	Document format	Document size [MB]
2258	pdf	0.44

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

Document name	Document format	Document size [MB]
2258 9 2 4 S COMPLETION REPORT AND LOG	pdf	9.70

Logs

Log type	Log top depth [m]	Log bottom depth [m]
CBL VDL GR	1460	4376
CIM DIR	91	2215
DIFL ACL CHT GR	2197	2628
DIFL ACL GR	633	2208
DIR	2200	3925
FMT GR	4128	4163
MWD RLL	2215	4150
RLL DIR	182	645
SFD RLL	4310	4417
SLD RLL	4150	4300



**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	174.0	36	175.0	0.00	LOT
CONDUCTOR	20	635.0	26	637.0	1.74	LOT
INTERM.	13 3/8	2200.0	17 1/2	2202.0	1.85	LOT
INTERM.	9 5/8	3752.0	12 1/4	3755.0	0.00	LOT
LINER	7	4417.0	8 1/2	4417.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
645	1.03			WATER BASED	
647	1.30	27.0		WATER BASED	
650	1.10	18.0		WATER BASED	
1335	1.39	30.0		WATER BASED	
1574	1.39	30.0		DUMMY	
2215	1.39	29.0		WATER BASED	
2427	1.39	27.0		WATER BASED	
2836	1.39	26.0		WATER BASED	
2864	1.39	26.0		WATER BASED	
2930	1.39	26.0		WATER BASED	
3016	1.45	31.0		WATER BASED	
3080	1.45	33.0		WATER BASED	
3086	1.50	32.0		WATER BASED	
3106	1.50	33.0		WATER BASED	
3260	1.50	28.0		WATER BASED	
3275	1.50	25.0		WATER BASED	
3298	1.50	25.0		WATER BASED	
3343	1.50	29.0		WATER BASED	
3394	1.50	34.0		WATER BASED	
3409	1.50	41.0		WATER BASED	
3537	1.50	41.0		WATER BASED	
3666	1.50	40.0		WATER BASED	
3765	1.70	63.0		OIL BASED	
3774	1.70	39.0		WATER BASED	



3788	1.70	37.0		WATER BASED	
3811	1.70	63.0		OIL BASED	
3915	1.77	50.0		WATER BASED	
3930	1.70	59.0		OIL BASED	
3959	1.50	45.0		WATER BASED	
3997	1.70	58.0		OIL BASED	
4090	1.77	49.0		WATER BASED	
4123	1.70	58.0		OIL BASED	
4150	1.70	59.0		OIL BASED	
4169	1.70	57.0		OIL BASED	
4249	1.70	57.0		OIL BASED	
4264	1.70	58.0		OIL BASED	
4309	1.70	58.0		OIL BASED	
4310	1.70	58.0		OIL BASED	
4313	1.70	59.0		OIL BASED	
4336	1.70	58.0		OIL BASED	
4417	1.70	59.0		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]
2258 Formation pressure (Formasjonstrykk)	pdf	0.21

