General information

Wellbore name	16/10-1
Type	EXPLORATION
Purpose	WILDCAT
Status	P&A
Factmaps in new window	link to map
Main area	NORTH SEA
Well name	16/10-1
Seismic location	ST 8315 - 303 SP. 946
Production licence	101
Drilling operator	Norsk Agip AS
Drill permit	515-L
Drilling facility	DYVI STENA
Drilling days	51
Entered date	25.05.1986
Completed date	14.07.1986
Release date	14.07.1988
Publication date	27.02.2004
Purpose - planned	WILDCAT
Reentry	NO
Content	DRY
Discovery wellbore	NO
Kelly bushing elevation [m]	25.0
Water depth [m]	84.0
Total depth (MD) [m RKB]	3151.0
Final vertical depth (TVD) [m RKB]	3151.0
Bottom hole temperature [°C]	123
Oldest penetrated age	LATE PERMIAN
Oldest penetrated formation	ZECHSTEIN GP
Geodetic datum	ED50
NS degrees	58° 3' 23.68'' N
EW degrees	2° 3' 14.05'' E
NS UTM [m]	6435546.75
EW UTM [m]	444163.52
UTM zone	31
NPDID wellbore	901

Wellbore history

General

Well 16/10-1 was the first well drilled in block 16/10 operated by Norsk Agip. Among the various structures defined within block 16/10, the one called "Alpha", located in the southwestern area, was selected as the first one to be drill. Main reason for this choice was the presence of a deep basin (Witch Ground Graben) to the south west of the block, where the Viking Group shales was believed to have generated hydrocarbons since Cretaceous time. The tectonic evolution of the structure is probably of pre-Cretaceous age, well before hydrocarbon generation started.

The purpose of the well was to explore all main reservoirs down to Triassic. The primary targets were the Jurassic and Triassic sandstone units, expected at 2850 m and 2980 m, respectively. Prognosed TD was at 3175 m.

Operations and results

Wildcat well 16/10-1 was spudded 25 May 1986 by Dyvi Offshore A/S semi-submersible rig Dyvi Stena and drilled to TD at 3151 m in the Late Permian Zechstein Group. The well was drilled with Seawater and hi-vis pills down to 514 m, with KCl/Polymer mud from 524 m to 2565 m, and with lignosulphonate mud from 2565 m t TD. Drilling proceeded without any significant problems. Electrical logs were run already in the 26" section from 195 m. No shallow gas was encountered.

The Quaternary/Tertiary sequence, 2280.5 m thick, is represented by Nordland, Hordaland and Rogaland groups and is predominantly constituted by marine claystones. A 513.5 m Cretaceous section represented by the limestones of the Chalk Group and by the reddish marl and calcareous shales of the Cromer Knoll Group was penetrated. It was nearly a complete sequence except for two possible hiatus: the first in the Late Santonian and the second between the Cenomanian and the Aptian-Albian. The base Cretaceous Unconformity overlies the Late Jurassic shales of the Viking Group (top at 2794 m), which proved to have a thickness of 211 m. The top of the Jurassic sandstones of the Vestland Group was encountered at 3005 m. The "Oxfordian Sandstone Unit" (Hugin Formation) was 33m thick with very good reservoir properties. Below this was a 15 m thick "coal unit" of the Sleipner Formation, containing a major coal sequence with interbedded carbonaceous claystone/shale. Below the Mid Kimmerian Unconformity, a 58 m thick sequence of arenaceous sediments of the Triassic Skagerrak Formation was drilled. The interval was a monotonous sequence of clastics, with the typical continental red iron colour. At 3116 m the top of the Permian evaporites of the Zechstein Group was touched and penetrated until the depth of 3151 m (TD). Two cores were cut in the Heather Formation, the first from 2855 m to 2873 m, and the second from 2925 m to 2934 m. No fluid samples were taken. The well was permanently abandoned on 14 July 1986 as a dry hole.

Testing

No drill stem test was performed

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
510.00	3147.00

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	2855.0	2873.0	[m]
2	2925.0	2934.0	[m]

Total core sample length [m]	27.0
Cores available for sampling?	YES

Core photos


2855-2859m


2860-2864m


2865-2869m


2870-2872m


2925-2929m


2930-2933m

Palynological slides at the Norwegian Offshore Directorate

Sample depth	Depth unit	Sample type	Laboratory
2760.2	[m]	SWC	RRI
2793.0	[m]	DC	RRI
2798.4	[m]	SWC	RRI
2799.0	[m]	DC	RRI
2811.5	[m]	SWC	RRI
2814.0	[m]	DC	RRI
2826.0	[m]	DC	RRI
2841.0	[m]	DC	RRI
2844.0	[m]	DC	RRI

2855.0	[m]	C	RRI
2860.0	[m]	C	RRI
2864.0	[m]	C	RRI
2867.0	[m]	C	RRI
2873.0	[m]	C	RRI
2874.0	[m]	DC	RRI
2877.0	[m]	DC	RRI
2889.0	[m]	DC	RRI
2892.0	[m]	DC	RRI
2903.0	[m]	SWC	RRI
2907.0	[m]	DC	RRI
2910.0	[m]	DC	RRI
2924.0	[m]	DC	RRI
2926.0	[m]	C	RRI
2929.0	[m]	C	RRI
2932.0	[m]	C	RRI
2934.0	[m]	C	RRI
2949.0	[m]	DC	RRI
2953.5	[m]	DC	RRI
2964.0	[m]	DC	RRI
2975.0	[m]	SWC	RRI
2979.0	[m]	DC	RRI
2994.0	[m]	DC	RRI
3007.6	[m]	SWC	RRI
3009.0	[m]	DC	RRI
3018.5	[m]	SWC	RRI
3024.0	[m]	DC	RRI
3028.1	[m]	SWC	RRI
3036.0	[m]	DC	RRI
3042.0	[m]	DC	RRI
3063.0	[m]	DC	RRI
3066.0	[m]	DC	RRI
3081.0	[m]	DC	RRI
3100.0	[m]	DC	RRI
3108.0	[m]	SWC	RRI
3114.0	[m]	DC	RRI
3129.0	[m]	DC	RRI
3144.0	[m]	DC	RRI
3151.0	[m]	DC	RRI

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
109	NORDLAND GP
1024	UTSIRA FM
1035	UNDIFFERENTIATED
1197	HORDALAND GP
2120	ROGALAND GP
2120	BALDER FM
2136	SELE FM
2189	LISTA FM
2245	VÅLE FM
2281	SHETLAND GP
2281	EKOFISK FM
2349	TOR FM
2475	HOD FM
2683	BLODØKS FM
2691	SVARTE FM
2750	CROMER KNOLL GP
2750	SOLA FM
2763	ÅSGARD FM
2794	VIKING GP
2794	DRAUPNE FM
2853	HEATHER FM
3005	VESTLAND GP
3005	HUGIN FM
3038	SLEIPNER FM
3053	NO GROUP DEFINED
3053	SKAGERRAK FM
3116	ZECHSTEIN GP

Composite logs

Document name	Document format	Document size [MB]
901	pdf	0.53

Geochemical information

Document name	Document format	Document size [MB]
901_1	pdf	4.38

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

Document name	Document format	Document size [MB]
901_01_WDSS_General_Information	pdf	0.21
901_02_WDSS_completion_log	pdf	0.24

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

Document name	Document format	Document size [MB]
901_16_10_1_COMPLETION_REPORT_AND_LOG	pdf	61.92

Logs

Log type	Log top depth [m]	Log bottom depth [m]
CBL VDL GR	100	1396
CBL VDL GR	950	2777
CST	2780	3142
DIL BHC GR	161	392
DIL SLS GR	407	1315
DITE SLS GR	1396	2798
DITE SLS GR	2777	3150
GR	104	161
LDT CNL NGS	2777	3150
MWD - GR RES DIR	407	1405
MWD - GR RES DIR	1396	2798
MWD - GR RES DIR	2777	3150
RFT	2803	3120
SHDT GR	1396	2798
SHDT GR	2777	3150
VSP	400	3150

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	195.0	36	195.0	0.00	LOT
SURF.COND.	20	505.0	26	522.0	1.61	LOT
INTERM.	13 3/8	1409.0	17 1/2	1424.0	1.82	LOT
INTERM.	9 5/8	2540.0	12 1/4	2565.0	1.82	LOT
OPEN HOLE		3151.0	8 1/2	3151.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
109	1.10			WATER BASED	23.05.1986
146	1.10			WATER BASED	23.05.1986
196	1.10			WATER BASED	05.06.1986
218	1.05			WATER BASED	05.06.1986
329	1.05			WATER BASED	05.06.1986
400	1.05			WATER BASED	05.06.1986
515	1.05			WATERBASED	05.06.1986
515	1.15	15.0	3.0	WATER BASED	05.06.1986
536	1.15	15.0	3.0	WATER BASED	05.06.1986
619	1.16	17.0	6.0	WATER BASED	05.06.1986
715	1.16	17.0	6.0	WATER BASED	05.06.1986
811	1.18	18.0	7.0	WATER BASED	05.06.1986
831	1.20	19.0	7.5	WATERBASED	05.06.1986
918	1.22	19.0	7.5	WATER BASED	05.06.1986
1054	1.22	19.0	7.5	WATER BASED	05.06.1986
1121	1.21	20.0	9.0	WATER BASED	08.06.1986
1207	1.24	23.0	6.0	WATER BASED	08.06.1986
1419	1.24	28.5	6.5	WATER BASED	08.06.1986
1424	1.23	21.0	8.0	WATER BASED	11.06.1986
1515	1.27	23.0	6.0	WATER BASED	11.06.1986
1582	1.27	23.0	6.0	WATER BASED	11.06.1986
1621	1.27	24.0	8.0	WATER BASED	15.06.1986
1718	1.27	24.0	8.0	WATER BASED	15.06.1986
1734	1.27	24.0	8.0	WATER BASED	15.06.1986

1740	1.32	23.0	6.5	WATER BASED	15.06.1986
1824	1.32	19.0	6.0	WATER BASED	15.06.1986
1873	1.32	16.0	4.0	WATER BASED	15.06.1986
1923	1.32	16.0	4.5	WATER BASED	15.06.1986
1970	1.37	23.0	6.0	WATER BASED	15.06.1986
1988	1.37	23.0	6.0	WATER BASED	15.06.1986
2027	1.42	23.0	6.0	WATER BASED	15.06.1986
2080	1.42	32.0	9.0	WATER BASED	15.06.1986
2125	1.42	30.0	10.5	WATER BASED	16.06.1986
2229	1.42	27.0	7.0	WATER BASED	17.06.1986
2243	1.42	27.0	7.0	WATER BASED	17.06.1986
2257	1.42	34.0	15.0	WATER BASED	17.06.1986
2349	1.42	39.0	18.0	WATER BASED	18.06.1986
2422	1.42	38.0	16.0	WATER BASED	19.06.1986
2604	1.25	15.0	7.0	WATER BASED	26.06.1986
2639	1.30	18.0	7.5	WATER BASED	29.06.1986
2695	1.30	20.0	6.0	WATER BASED	29.06.1986
2759	1.30	20.0	5.5	WATER BASED	29.06.1986
2782	1.30	20.0	6.5	WATER BASED	30.06.1986
2824	1.35	21.0	6.0	WATER BASED	30.06.1986
2857	1.35	24.0	6.5	WATER BASED	01.07.1986
2873	1.35	21.0	6.5	WATER BASED	02.07.1986
2908	1.35	20.0	6.0	WATER BASED	03.07.1986
2983	1.35	25.0	7.5	WATER BASED	06.07.1986
3083	1.35	24.0	6.5	WATER BASED	06.07.1986
3151	1.35	21.0	6.5	WATER BASED	08.07.1986