

Well no :	31/2-16 S	Operator :	HYDRO
Coordinates :	60° 46' 00.00" N 03° 25' 27.55" E	UTM coord. :	673703198 N 52311887 E
Licence no :	54	Permit no :	622
Rig :	DEEPSEA BERGEN	Rig type :	SEMI-SUB.
Contractor :	ODFJELL DRILLING A/S	Elev. KB :	23 M
Bottom hole temp:	40 °C	Water depth :	354 M
Spud. date :	89.09.27	Total depth :	2390 M
Compl. date :	89.12.24	Form. at TD	L.JURASSIC
Spud. class :	APPRAISAL	Prod.form. :	
Compl. class :	SUSP. TEST W/PTS		
Seisloca :	NH 8901 - 1145 SP. 336		

LICENSEES

3,105000	ELF PETROLEUM NORGE A/S.
4,900000	NORSK HYDRO PRODUKSJON A.S
25,900000	A/S NORSKE SHELL
58,800000	DEN NORSKE STATS OLJESELSKAP A.S
1,000000	TOTAL NORGE A.S
6,295000	NORSKE CONOCO A/S

CASING AND LEAK-OFF TESTS

Type	Casing diam.	Depth below KB	Hole diam.	Hole depth below KB	Lot mud eqv. g/cm ³
CONDUCTOR	30	439,0	36	439,0	
INTERM.	20	1003,0	26	1020,0	1,79
INTERM.	13 3/8	1601,0	17 1/2	1607,0	1,45
INTERM.	9 5/8	1888,0	12 1/4	1891,0	
LINER	7	2390,0	8 1/2	2390,0	

MUD

Depth	Mud weight	Visc.	Mud type
439,000	1,05		WATER BASED
623,000	1,25	11,0	WATER BASED
1020,000	1,34	51,0	OIL BASED
1023,000	1,36	53,0	OIL BASED
1315,000	1,41	46,0	OIL BASED
1321,000	1,40	42,0	OIL BASED
1370,000	1,41	46,0	OIL BASED
1375,000	1,39	36,0	OIL BASED
1403,000	1,35	31,0	OIL BASED
1607,000	1,25	26,0	OIL BASED
1607,000	1,35	38,0	OIL BASED
1610,000	1,26	31,0	OIL BASED
1679,000	1,25	33,0	OIL BASED
1743,000	1,26	39,0	OIL BASED
1774,000	1,27	36,0	OIL BASED

Depth	Mud weight	Visc.	Mud type
1802,000	1,26	33,0	OIL BASED
1861,000	1,25	12,0	WATER BASED
1873,000	1,26	33,0	OIL BASED
1890,000	1,23	14,0	WATER BASED
1890,000	1,24	13,0	WATER BASED
1891,000	1,27	34,0	OIL BASED
1891,000	1,23	14,0	WATER BASED
1891,000	1,27	34,0	OIL BASED
1905,000	1,25	13,0	WATER BASED
1905,000	1,24	13,0	WATER BASED
2000,000	1,25	13,0	WATER BASED
2033,000	1,26	14,0	WATER BASED
2056,000	1,25	14,0	WATER BASED
2317,000	1,26	15,0	WATER BASED
2390,000	1,15	11,0	WATER BASED
2390,000	1,25	11,0	WATER BASED
2390,000	1,05	11,0	WATER BASED
2390,000	1,25	10,0	WATER BASED
2390,000	1,05	11,0	WATER BASED
2390,000	1,25	16,0	WATER BASED
2390,000	1,05	11,0	WATER BASED
2390,000	1,26	9,0	WATER BASED
2390,000	1,25	9,0	WATER BASED
2390,000	1,05	11,0	WATER BASED
2390,000	1,15	11,0	WATER BASED
2390,000	1,05	11,0	WATER BASED
2390,000	1,26	15,0	WATER BASED
2390,000	1,05	11,0	WATER BASED
2390,000	1,15	11,0	WATER BASED
2390,000	1,25	10,0	WATER BASED
2930,000	1,05	11,0	WATER BASED

DRILL BIT CUTTINGS AND WET SAMPLES

Sample type	Interval below KB	Number of samples
WET SAMPLES	1030 - 1890	90
CUTTING	1030 - 1890	90

SHALLOW GAS

Interval below KB	Remarks
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AVAILABLE LOGS

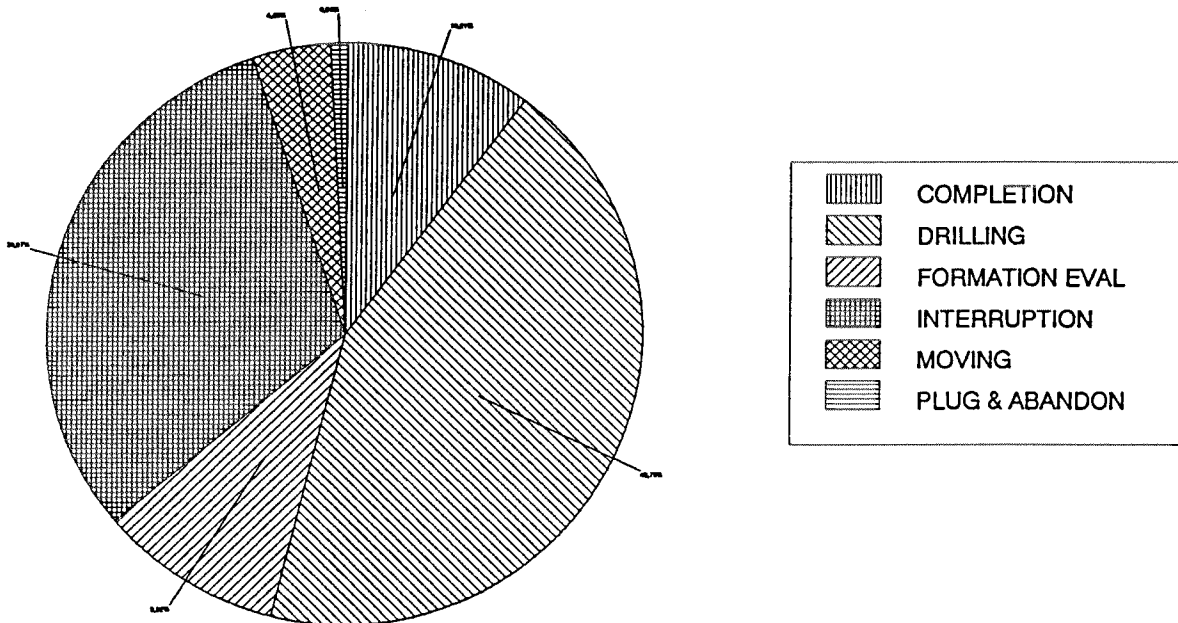
Log type	Intervals	1/200	1/500	Div.
4-ARM CALIPER LOG	350,0 - 1497,0	X		
AC CBL GR	1277,0 - 1599,0	X	X	*

Log type	Intervals		1/200	1/500	Div.
AC CBL GR	1410,0	- 1886,0	X	X	
CDL CNL GR	1599,0	- 1795,0	X	X	
CDL CNL GR	1599,0	- 1895,0	X	X	
MLL CDL CNL GR	1885,0	- 2385,0	X	X	
MUD LOG	439,0	- 2390,0		X	
LWD	355,0	- 2350,0	X	X	*
VSP		20 cm/s			
GR	1277,0	- 1599,0	X		

* BOTH 1:200 AND 1:500 ON THE SAME LOG.

Daily Drilling Report System (DDRS)

Operations for well: 31/2-16 S



Main operations	Minutes	Hours	% of total
COMPLETION	14010	233,50	10,21
DRILLING	60060	1001,00	43,75
FORMATION EVAL	13620	227,00	9,92
INTERRUPTION	42510	708,50	30,97
MOVING	5760	96,00	4,20
PLUG & ABANDON	1320	22,00	0,96
Total	137280	2288,00	100,00

Operations for well: 31/2-16 S**Main operation: COMPLETION**

Sub operations	Minutes	Hours	% of total
BOP/WELLHEAD EQ	4050	67,50	28,91
CIRC/COND	420	7,00	3,00
COMPL STRING	3420	57,00	24,41
OTHER	3270	54,50	23,34
WIRE LINE	2850	47,50	20,34
Total	14010	233,50	100,00

Main operation: DRILLING

Sub operations	Minutes	Hours	% of total
BOP ACTIVITIES	4320	72,00	7,19
BOP/WELLHEAD EQ	3270	54,50	5,44
CASING	10800	180,00	17,98
CIRC/COND	2790	46,50	4,65
DRILL	11370	189,50	18,93
HOLE OPEN	2280	38,00	3,80
OTHER	1290	21,50	2,15
REAM	780	13,00	1,30
SURVEY	900	15,00	1,50
TRIP	22260	371,00	37,06
Total	60060	1001,00	100,00

Main operation: FORMATION EVAL

Sub operations	Minutes	Hours	% of total
CIRC/COND	240	4,00	1,76
DST	5730	95,50	42,07
LOG	5490	91,50	40,31
OTHER	230	3,83	1,69
TRIP	1930	32,17	14,17
Total	13620	227,00	100,00

Main operation: INTERRUPTION

Sub operations	Minutes	Hours	% of total
FISH	15810	263,50	37,19
LOST CIRC	4260	71,00	10,02
MAINTAIN/REP	7500	125,00	17,64
OTHER	7260	121,00	17,08
WAIT	6390	106,50	15,03
WELL CONTROL	1290	21,50	3,03
Total	42510	708,50	100,00

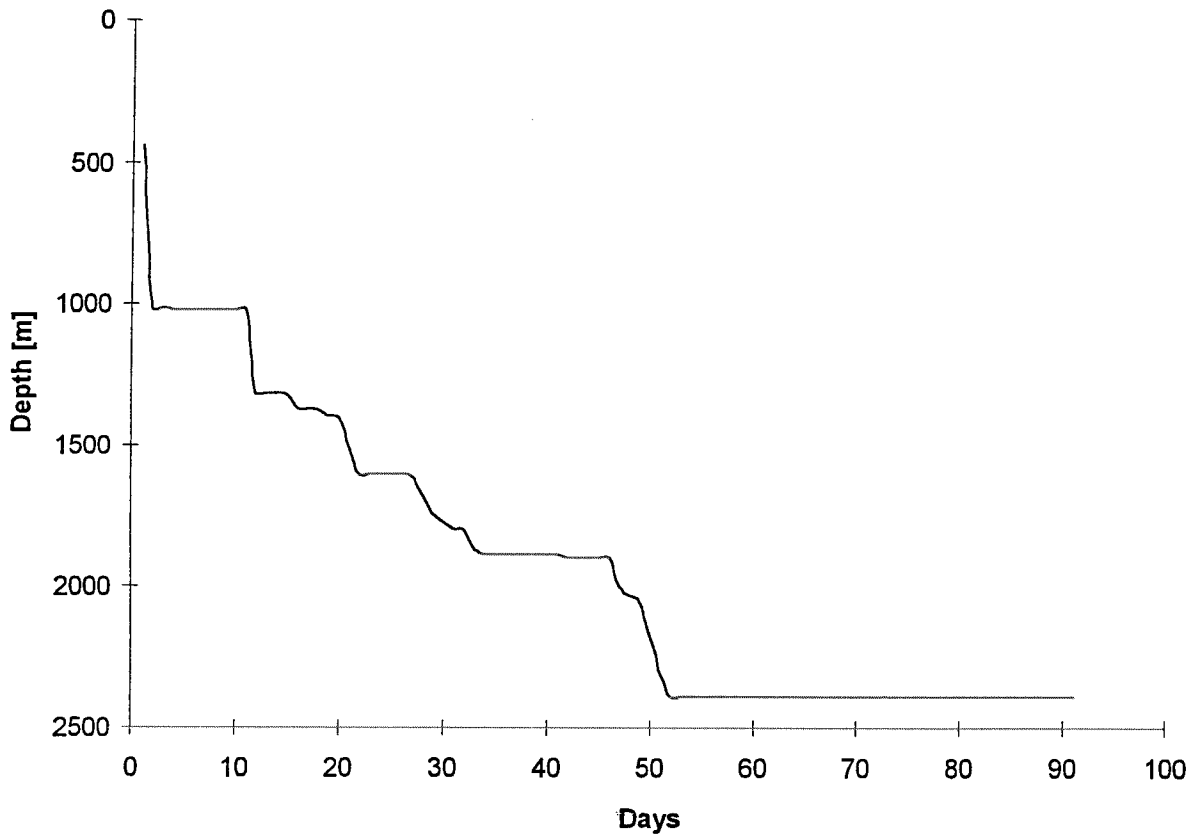
Main operation: MOVING

Sub operations	Minutes	Hours	% of total
ANCHOR	3480	58,00	60,42
TRANSIT	2280	38,00	39,58
Total	5760	96,00	100,00

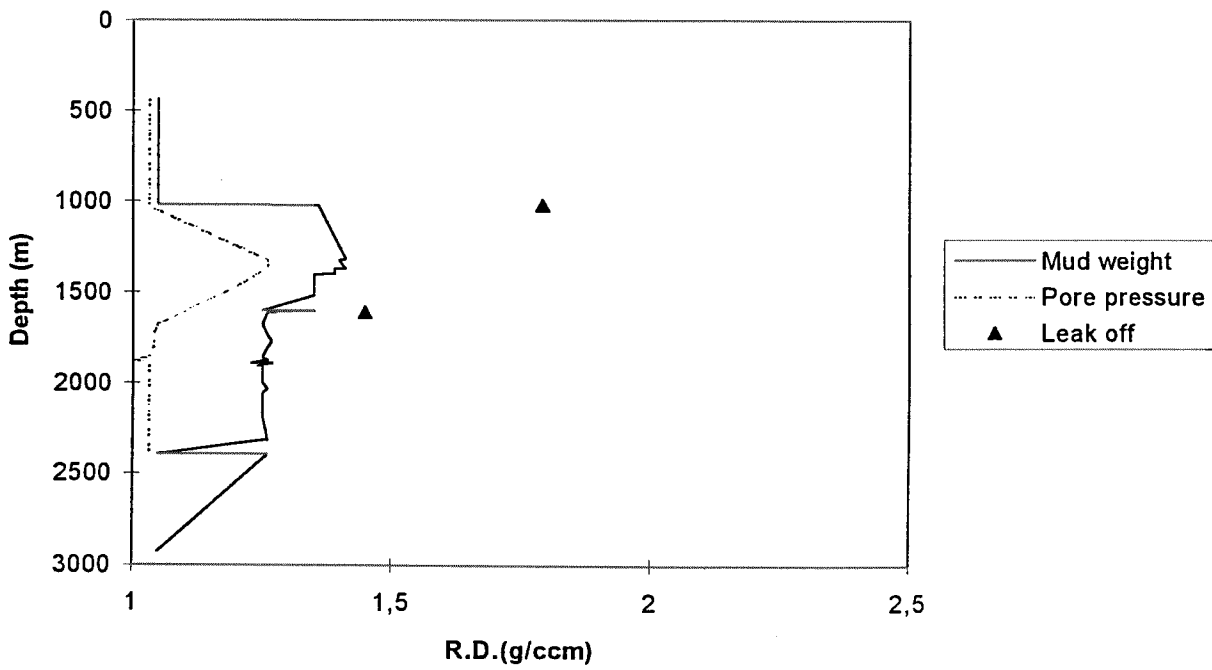
Main operation: PLUG & ABANDON

Sub operations	Minutes	Hours	% of total
OTHER	1320	22,00	100,00
Total	1320	22,00	100,00

Depth vs time for well: 31/02-16 S



Composite plot for well: 31/02-16 S



Well History 31/2-16 S.

General:

Well 31/2-16 S was designed to drill the crestal part of the Troll-West oil province close to well 31/2-5. The well was intended drilled horizontally at 1586.5 m RKB TVD, which is 18 m below the GOC at 1568.5 m RKB TVD. The objectives of the well were to:

- Secure a long term production from a horizontal well drilled 5 m above OWC in the 22 m thick oil column.

- Ensure reliable comparisons between horizontal and vertical well potential.

- Improve understanding of calcite cementation.

Operations:

Appraisal well 31/2-16 S was spudded 27 September 1989 by Deepsea Bergen and completed 24 Desember 1989 at a depth of 2390 m RKB in the Sognefjord Formation of Upper Jurassic age.

No shallow gas was encountered in this well. The well was drilled with a 8 1/2" horizontal hole in a north-easterly direction with a minimum distance to well 31/2-5 of approximately 100 m. The well was kicked off at 1000 m RKB and drilled horizontally out of the 9 5/8" casing for 500 m with a total horizontal displacement at TD of 1015.5 m. The reservoir holds a 23.5 m thick oil zone in the Sognefjord Formation, and the gas/oil contact was found at 1766 m RKB. No cores or sidewall cores were cut in this well. Some problems with lost circulation in the pilot hole were encountered. The well was temporary plugged and abandoned as a future oil producer.

Testing:

No DST tests were performed in this well.

Geological Tops.

Well: 31/2-16 S.

	Depth m (RKB).
Nordland Group	358.0
Hordaland Group	507.0
Rogaland Group	1358.0
Balder Fm	1358.0
Sele Fm	1413.0
Lista Fm	1453.0
Shetland Group	1650.0
Viking Group	1659.0
Sognefjord Fm	1659.0
T.D. MD	2390.0