Well no :	31/5-4 S	Operator :	HYDRO

Coordinates :	60° 43' 16.19" N 03° 33' 43.06" E	UTM coord. :	673202010 N 53066148 E
Licence no :	85	Permit no :	650
Rig :	TRANSOCEAN 8	Rig type :	SEMI-SUB.
Contractor :	TRANSNOR A/S		
Bottom hole temp:	57 °C	Elev. KB :	23 M
Spud. date :	90.09.13	Water depth :	317 M
Compl. date :	90.10.10	Total depth :	1909 M
Spud. class :	APPRAISAL	Form. at TD	
Compl. class :	P&A.	Prod.form. :	
Seisloca :	NH 9056 - 209, SP. 95		

LICENSEES

9,000000	NORSK HYDRO PRODUKSJON A.S
6,000000	SAGA PETROLEUM A.S.
82,000000	DEN NORSKE STATS OLJESELSKAP A.S
1,000000	TOTAL NORGE A.S
2,000000	ELF PETROLEUM NORGE A/S.

CASING AND LEAK-OFF TESTS

Type	Casing diam.	Depth below KB	Hole diam.	Hole depth below KB	Lot mud eqv. g/cm3
CONDUCTOR	30	424,0	36	425,0	
INTERM.	18 5/8	924,0	24	926,0	1,45
INTERM.	13 3/8	1567,0	17 1/2	1570,0	1,40

CONVENTIONAL CORES

Core no.	Intervals cored meters			Recovery M	%	Series
1	1647,5	-	1647,7	0,2	100,0	
2	1649,5	-	1649,7	0,2	100,0	
3	1650,0	-	1667,5	17,5	100,0	
4	1667,0	-	1672,4	5,4	100,0	
5	1675,0	-	1685,0	10,0	100,0	
6	1685,0	-	1703,0	18,0	100,0	
7	1703,0	-	1708,6	5,6	100,0	
8	1716,4	-	1731,2	14,8	100,0	
9	1731,2	-	1747,3	16,1	100,0	

MUD

Depth	Mud weight	Visc.	Mud type
376,000	1,05	20,0	WATER BASED
943,000	1,31	19,0	WATER BASED
1005,000	1,31	14,0	WATER BASED

Depth	Mud weight	Visc.	Mud type
1440,000	1,32	19,0	WATER BASED
1508,000	1,25	17,0	WATER BASED
1529,000	1,32	20,0	WATER BASED
1569,000	1,24	31,0	OIL BASED
1571,000	1,32	20,0	WATER BASED
1575,000	1,26	29,0	OIL BASED
1803,000	1,15	9,0	WATER BASED
1908,000	1,24	19,0	WATER BASED
2518,000	1,25	14,0	WATER BASED
2601,000	1,20	2,0	WATER BASED
2603,000	1,25	10,0	WATER BASED

DRILL BIT CUTTINGS AND WET SAMPLES

Sample type	Interval below KB	Number of samples
WET SAMPLES	950 - 1905	114
CUTTINGS	950 - 1800	150

SHALLOW GAS

Interval below KB	Remarks

AVAILABLE LOGS

Log type	Intervals			1/200	1/500	Div.
AMS	1567,0	-	1904,0		X	
CBL VDL CCL GR	1275,0	-	1562,0	X		
GCT CCL AMS	339,0	-	1556,0			
CDR/CDN/LWD	435,0	-	1907,0	X		
DLL MSFL AS AMS SP	1567,0	-	1904,0	X	X	
LDL CNL AMS	1567,0	-	1879,0		X	
LDL CNL AMS	1567,0	-	1724,0		X	
MUD	944,0	-	2603,0		X	
SHDT/CDM AP	1571,0	-	1880,0	X	X	
SHDT AMS	1567,0	-	1881,0	X		
VELOCITY	1200,0	-	1870,0			1:1000
SYNTHETIC SEISMOGRAM	20 cm/s	-	30 cm/s			4
TWO WAY TRAVEL TIME	20 cm/s					1
V.S.P.,	10 cm/s					2
V.S.P.,ZERO OFFSET	10 cm/s					1

Log type	Intervals	1/200	1/500	Div.
V.S.P., VERTICAL INCIDE	10 cm/s			1

Main operations for well: 31/5-4 S

Main operation: DRILLING

Sub operation:	Minutes:	Hours:	% of total:
BOP ACTIVITIES	2700	45,0	10,08
BOP/WELLHEAD EQ	210	3,5	0,78
CASING	5130	85,5	19,15
CIRC/COND	1920	32,0	7,17
DRILL	6510	108,5	24,30
HOLE OPEN	60	1,0	0,22
OTHER	120	2,0	0,45
REAM	420	7,0	1,57
SURVEY	420	7,0	1,57
TRIP	9300	155,0	34,71
Total	26790	446,5	100,00

Main operation: FORMATION EVAL

Sub operation:	Minutes:	Hours:	% of total:
CIRC/COND	870	14,5	12,50
CORE	1140	19,0	16,38
LOG	2520	42,0	36,21
OTHER	120	2,0	1,72
TRIP	2310	38,5	33,19
Total	6960	116,0	100,00

Main operation: INTERRUPTION

Sub operation:	Minutes:	Hours:	% of total:
LOST CIRC	180	3,0	3,87
MAINTAIN/REP	4260	71,0	91,61
OTHER	210	3,5	4,52
Total	4650	77,5	100,00

Main operation: MOVING

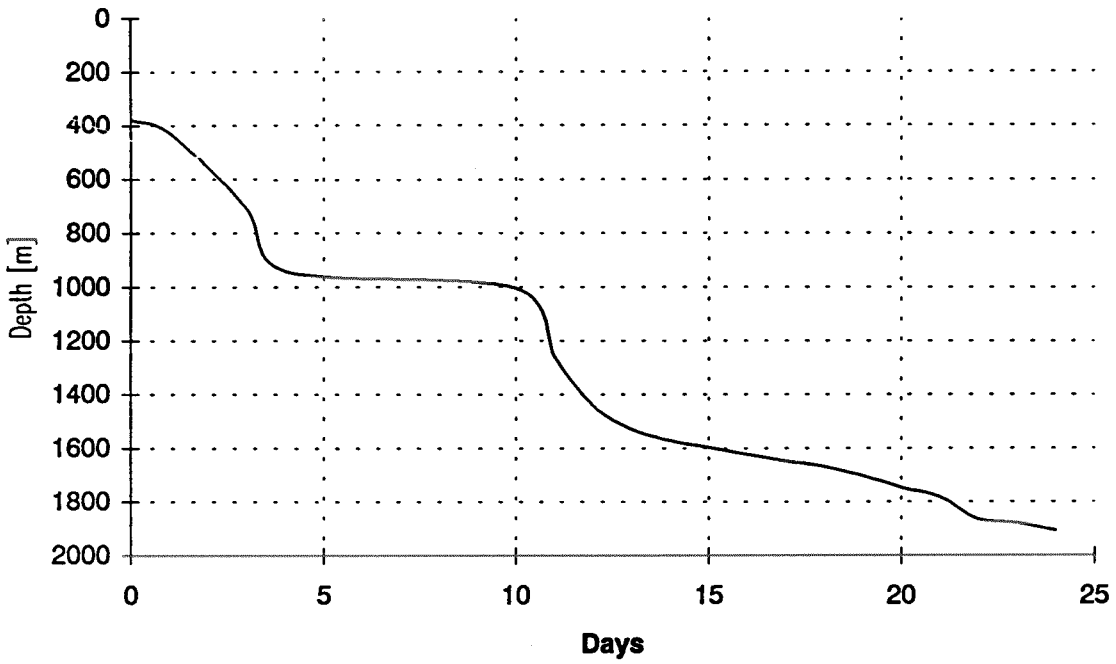
Sub operation:	Minutes:	Hours:	% of total:
ANCHOR	1650	27,5	40,15
TRANSIT	2460	41,0	59,85
Total	4110	68,5	100,00

Main operation: PLUG & ABANDON

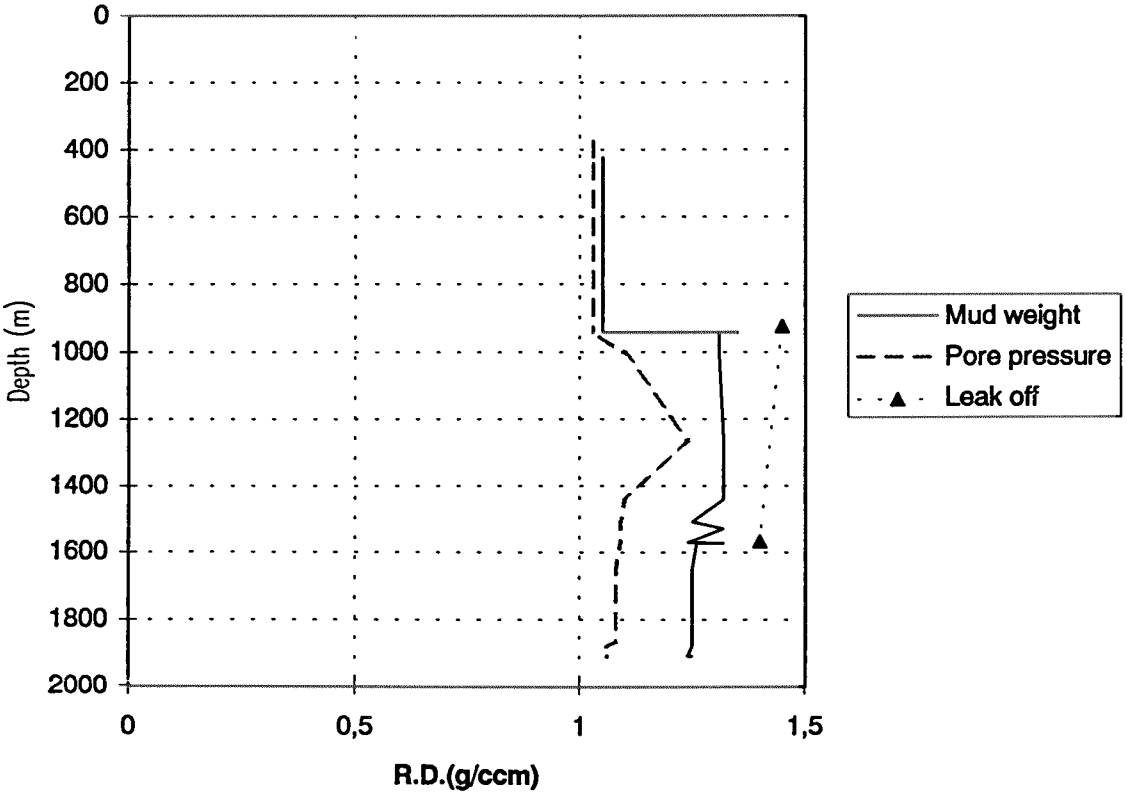
Sub operation:	Minutes:	Hours:	% of total:
CEMENT PLUG	180	3,0	26,09
CIRC/COND	120	2,0	17,39
TRIP	390	6,5	56,52
Total	690	11,5	100,00

Total time used: 720,0 Hours

Depth vs time for well: 31/5-4 S



Composite plot for well: 31/5-4 S



Well History 31/5-4 S.

General:

Well 31/5-4 S was designed to drill in a southern compartment of the Troll-West gas province, comprising most of the Central Fault Block. The Troll Field is situated on the western margin of the Horda Platform with the Viking Graben to the west, and the Sogn Graben to the north. The hydrocarbons are contained in three main easterly and southeasterly tilted fault blocks. The primary objective for the well would be a long term test production from the 13 m oil layer in the Sognefjord Formation. No shallow gas was interpreted at planned well location and the relief well locations. Other objectives of the well were to:

confirm the oil production potential from the Troll Gas Province.
obtain dynamic data from a potential development type well.
obtain static reservoir and geological data which provide proper understanding of well behaviour.
obtain data to improve the understanding of the well behaviour and to improve general knowledge of the Troll West Gas Province.

The Troll West Province is an easterly rotated fault block where the southern part is approximately 10 x 15 km with a general dip of 1 to 2 degrees at reservoir level.

Operations:

Appraisal well 31/5-4 S was spudded 13 September 1990 by the semi-submersible rig Transocean 8, and completed 10 October 1990 at a depth of 1909 m RKB in rocks of Jurassic age, the Fensfjord formation. No shallow gas was encountered in this well. A total of nine cores were cut in the Sognefjord formation from 1647.5 to 1747.3 m RKB. The well was kicked off at 1040 m RKB with a continous angle build up to 53° at 1571 m RKB. Thigh hole problems were experienced at several depths, and at 1360 m RKB the hole packed off and mud return was temporary lost. The well was plugged back to 1496 m RKB for sidetracking.

Testing:

No DST tests were performed in this part of the well.

Geological Tops.

Well:31/5-4 S

	Depth m (RKB).
Nordland Group	399,5
Hordaland Group	525,0
Rogaland Group	1205,5
Balder Fm	1205,5
Sele Fm	1292,0
Lista Fm	1392,0
Shetland Group	1449,0
Cromer Knoll Group	1470,0
Viking Group	1515,0
Draupne Fm	1515,0
Sognefjord Fm	1619,0
Heather Fm	1830,0
Fensfjord Fm	1879,0
T.D.	1908,5