

Well no : 2/07-20 Operator : PHILLIPS

Coordinates : 56 19 59.70 N UTM coord. : 6243336 N
 03 14 53.86 E 515352 E

Licence no : 18 Permit no : 566

Rig : DYVI STENA Rig type : SEMI-SUB.

Contractor : DYVI OFFSHORE A/S

Bottom hole temperature : 149 deg.C Elev. KB : 25 M

Spud. date : 87.10.15 Water depth : 70 M

Compl. date : 88.06.25 Total depth : 4512 M

Spud. class : WILDCAT Form. at TD : TRIASSIC

Compl. class : SUSP. OIL DISC. Prod. form :

Seisloca : NS 210 SP. 720

LICENSEES

13.040000 NORSK AGIP A/S
 0.304000 COFRANORD A/S (NORMINOL)
 0.399000 COPAREX NORGE A/S
 7.594000 ELF AQUITAINE NORGE A/S
 0.456000 EURAFREP NORGE A/S
 30.000000 NORSK FINA A/S
 6.700000 NORSK HYDRO PRODUKSJON A.S
 36.960000 PHILLIPS PETROLEUM COMPANY NORWAY
 1.000000 DEN NORSK STATTS OLJESELSKAP A.S
 3.547000 TOTAL NORGE 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	172.0	36	174.0	.
SURF.COND.	20	1069.0	26	1074.0	2.03
INTERM.	13 3/8	2439.0	17 1/2	2448.0	2.01
INTERM.	9 5/8	3800.0	12 1/4	3819.0	2.16
LINER	7	4278.0	8 1/2	4284.0	2.22
OPEN HOLE		4512.0	5 7/8	4512.0	.

CONVENTIONAL CORES

Core no.	Intervals cored meters	Recovery		Series
		M	%	
1	3071.0 - 3080.0	9.0	100.0	
2	4395.0 - 4400.0	5.0	100.0	
3	4400.0 - 4409.0	9.0	100.0	
4	4491.0 - 4509.0	18.0	100.0	

DRILL STEM TEST

INTERVALS AND PRESSURES

Test no.	interval meter	Choke size	Pressure (PSI)		
			WHP	BTHP	FFP
1.0	4099.000 - 4258.000	9.5	N/A	N/A	N/A
	Test temperature: N/A				

RECOVERY

Test no.	Oil Sm3/d	Gas Sm3/d	Oil grav. g/cm3	Gas grav. rel. air	GOR m3/m3
1.0	566	222600	N/A	N/A	365

DRILL BIT CUTTINGS AND WET SAMPLES

SAMPLE TYPE	INTERVAL BELOW KB	NUMBER OF SAMPLES
Cutting	1082-4508	450
Wet Samples	1164-4852	480

SHALLOW GAS

Interval below KB	REMARKS

AVAILABLE LOGS

LOG TYPE	INTERVALS	1/200	1/500	Div.
DIS LSS MSFL GR CAL	3503.000 - 8028.000	X	X	
DIL LSS	12502.000 -14057.000	X	X	
DIL LSS	14042.000 -14799.000	X	X	
LDL CNL GR	4900.000 - 5922.000	X	X	
LDL CNL NGL	8002.000 -12526.000	X	X	
LDL CNL NGL	12502.000 -14060.000	X	X	
LDL CNL	14042.000 -14802.000	X	X	
DLL MSFL	8002.000 -12500.000	X		
MWD FIELD LOG	565.000 - 3525.000		X	
CDM AP (MSD)	8004.000 -12527.000	X	X	
CDM AP (CYBERDIP)	12502.000 -14066.000	X		
CDM AP (CYPERDID)	14042.000 -14804.000	X		
CDM AP (CLUSTER)	12516.000 -14084.000	X	X	
NGS	4900.000 - 5890.000	X	X	
NGS	12505.000 -14060.000	X		
NGL RATIOS	10005.000 -12497.000	X	X	
NGT RATIOS	12502.000 -14060.000	X	X	

CAL LSS	8002.000 -12481.000	X	X
RFT	13339.000 -13856.000		
RFT	14042.000 -14750.000		
FMS	8002.000 -12528.000		
FMS CALIPERS	8002.000 -12528.000		
CBL VDL GR	300.000 - 7826.000	X	
CBL VDL CCL	7973.000 -11806.000	X	
CBL VDL CCL	7595.000 -12458.000	X	
CBL VDL CCL	9940.000 -10830.000	X	
CBL VDL CCL	9800.000 -10360.000	X	
CBL VDL CCL	12386.000 -13992.000	X	
CBL VDL CCL	12991.000 -14045.000	X	
MUD	8016.000 -10240.000	1:1750	
VELOCITY	3503.000 -14799.000		X
(Synthetic Seismogram Geogram 10cm/s			2 stk)
(Frequency Test, 10cm/s			4 stk)
(V.S.P., Power Spectrum,DISPL.			1 stk)
(V.S.P., Zero Offset V.S.P., 10cm/s			14 stk)

MAIN OPERATIONS FOR WELL: 000207 20

Main operation: DRILLING

Sub operations	Minutes	Hrs	% of total
BOP ACTIVITIES	26230	437,2	12,94
BOP/WELLHEAD EQ	2380	39,7	1,17
CASING	21980	366,3	10,85
CIRC/COND	10400	173,3	5,13
DRILL	80190	1336,5	39,57
OTHER	11230	187,2	5,54
PRESS DETECTION	1200	20,0	0,59
REAM	5340	89,0	2,64
SURVEY	2190	36,5	1,08
TRIP	38630	643,8	19,06
UNDERREAM	3510	58,5	1,73
Total	202630	3388,0	100,32

Main operation: FORMATION EVAL

Sub operations	Minutes	Hrs	% of total
CIRC SAMPLES	400	6,7	0,74
CIRC/COND	14270	237,8	26,27
CORE	2090	34,8	3,85
DST	12850	214,2	23,66
LOG	9660	161,0	17,78
OTHER	2230	37,2	4,11
RFT/FIT	2400	40,0	4,42
TRIP	10420	173,7	19,18
Total	54320	905,3	100,00

Main operation: INTERRUPTION

Sub operations	Minutes	Hrs	% of total
FISH	7710	128,5	9,34
LOST CIRC	660	11,0	0,80
MAINTAIN/REP	17080	284,7	20,69
OTHER	4340	72,3	5,26
SIDETRACK	6080	101,3	7,37
WAIT	6380	106,3	7,73
WELL CONTROL	40300	671,7	48,82
Total	82550	1375,8	100,00

Main operation: MOVING

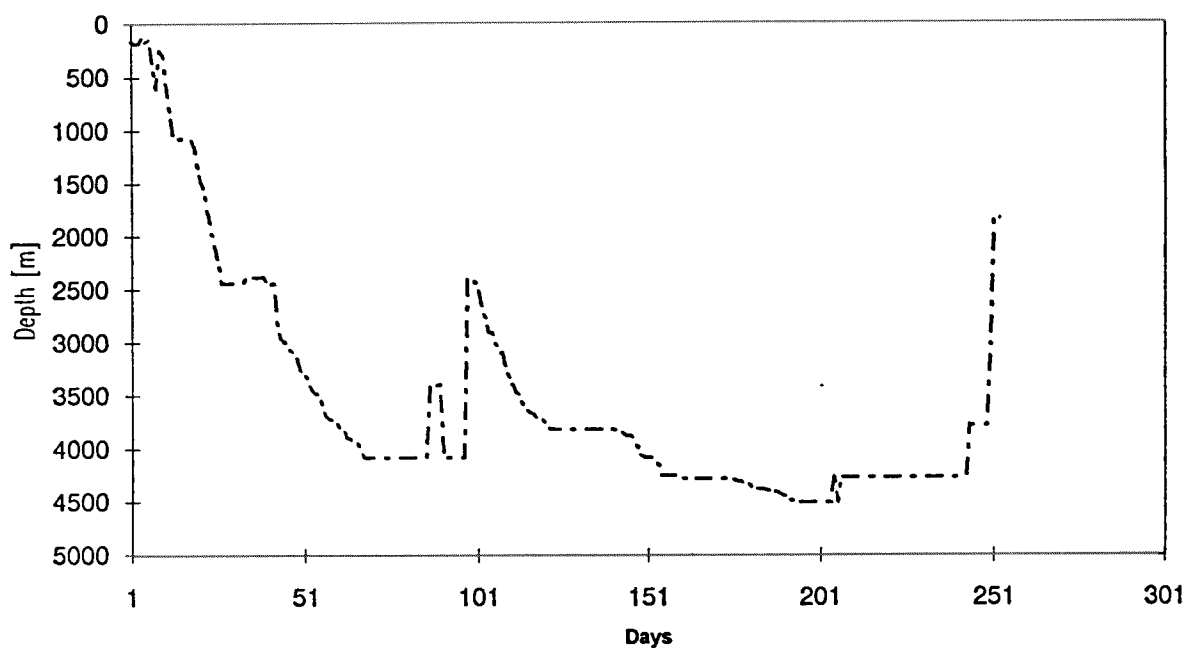
Sub operations	Minutes	Hrs	% of total
ANCHOR	670	11,2	48,20
POSITION	720	12,0	51,80
Total	1390	23,2	100,00

Main operation: PLUG & ABANDON

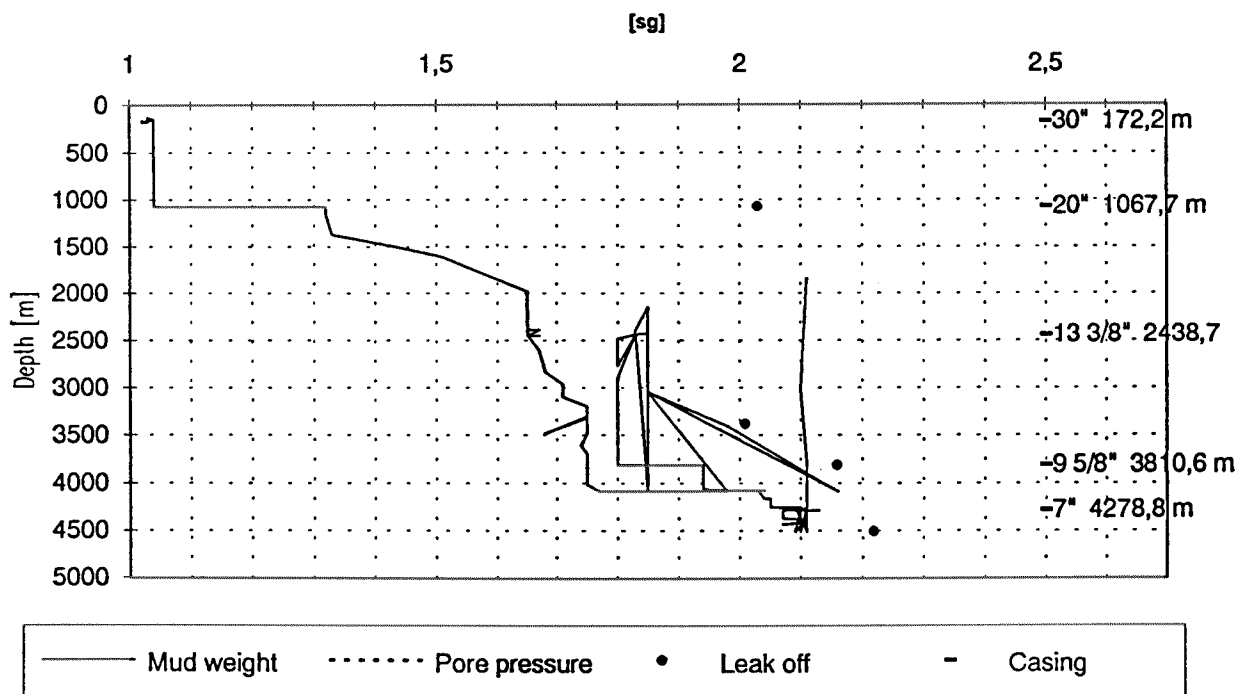
Sub operations	Minutes	Hrs	% of total
CEMENT PLUG	9940	165,7	41,04
CIRC/COND	2980	49,7	12,30
CUT	5290	88,2	21,84
EQUIP RECOVERY	1140	19,0	4,71
MECHANICAL PLUG	2490	41,5	10,28
OTHER	1480	24,7	6,11
SQUEEZE	900	15,0	3,72
Total	24220	403,7	100,00

Total time used 6096 hrs (254 days)

Depth v.s. time plot for well: 000207 20



Composite plot for well: 000207 20



Well History 2/7-20

GENERAL:

The well was drilled on the South Eldfisk structure. The objectives of the well were to test sands on the South Eldfisk structure below the Late Jurassic shales of the Mandal Formation, and to establish "economic" flow rates. At the time of drilling the cost of a subsea completion had been estimated to be US\$ 12 million which meant that flow rates in excess of 286 m³ oil/day were considered economic. Presence and hydrocarbon content of these sands had been established in the 2/7-9 well drilled in 1973.

OPERATIONS:

Wildcat well 2/7-20 was spudded 15 October 1987 by Stena Drilling semi-submersible rig Dyvi Stena and completed 25 June 1988 at a depth of 4510 m in Triassic rocks.

Problems in the beginning lead to the third re-spud 19 October. At 600 m there were indications of shallow gas. There was no kick. MWD unit was on, but did not indicate anything. Circulation was started and the hole collapsed. The tool was stuck at 252 m, and a sidetrack was made at 237 m 24 October 1987. 20" casing was set at 1068 m and 13 3/8" at 2439 m. There were some mechanical problems. At 3057 m there were a drill break at top Ekofisk with signs of show.

One core was cut in the interval 3103 - 3112 m with medium shows, low porosity and permeability.

At 4130 m a kick was experienced. Top Jurassic reservoir came in 150 m higher than prognosed, and was under high pressure. Heavy mud was pumped into the well, and careful circulation was started. Fluid was lost, and there were traces of gas and oil in the mud. After several unsuccessful attempts of controlling the well, it was decided to plug back above the critical interval. Cementing was started, but a problem with the drill string at 3650 m lead to cutting of the drill string at 3660 m. A plug was set between 3473 - 3650 m, and during sidetracking the drill string got stuck again at 2525 m and a new plug was set. A casing patch in the 13 3/8" casing was tested for 1 week.

A successful sidetrack was started at 2443 m 25 November 1987. At 3818 m there was a problem with influx of fluid.

The well was logged and 9 5/8" casing was set. After logging a loss of mud occurred. Several resirculations and changes lead to setting of the casing. There were several intrusions of fluid into the well down to top reservoir. No cores were cut due to the instability of the hole. At 4283 m logging was stopped due to the anticipation of drilling into Triassic.

RFT measurements showed good permeability. 7" casing was set, and two cores were cut in the interval 4395 - 4410 m in a sand with signs of shows. The results were not good. A bottom hole core was cut between 4493 and 4509.5 m.

The well was suspended as an oil discovery.

TESTING:

One DST test was performed in the interval 4099 - 4258 m. 7 zones were perforated and tested at the same time.

GEOLOGICAL TOPS

WELL: 2/7-20

Depth m (RKB)

<i>Nordland Group</i>	96.0
<i>Hordaland Group</i>	1603.0
<i>Rogaland Group</i>	2936.0
<i>Balder Fm.</i>	2936.0
<i>Sele Fm.</i>	2951.0
<i>Lista Fm.</i>	3001.0
<i>Våle Fm.</i>	3026.0
<i>Shetland Group</i>	3066.0
<i>Ekofisk Fm.</i>	3066.0
<i>Tor Fm.</i>	3146.0
<i>Hod Fm.</i>	3439.0
<i>Blodøks Fm.</i>	3890.0
<i>Hidra Fm.</i>	3906.0
<i>Cromer Knoll Group</i>	3965.0
<i>Sola Fm.</i>	3965.0
<i>Åsgard Fm.</i>	4013.0
<i>Tyne Fm.</i>	4060.0
<i>Mandal Fm.</i>	4060.0
<i>Rotliegendes Group ?</i>	4061.0
<i>T.D.</i>	4512.0