

Well no : 6407/09-02

Operator : SHELL

Coordinates : 64 24 01.31 N
07 48 11.26 E

UTM coord. : 7142349 N
442297 E

Licence no : 93

Permit no : 443

Rig : BORGNY DOLPHIN

Rig type : SEMI-SUB.

Contractor : DOLPHIN SERVICES A/S

Bottom hole temperature : 50.6 deg.C

Elev. KB : 25 M

Spud. date : 84.11.18

Water depth : 247 M

Compl. date : 85.02.02

Total depth : 1865 M

Spud. class : APPRAISAL

Form. at TD : M.JURASSIC

Compl. class : P&A. OIL DISCOVERY

Prod. form : L.JURASSIC

Seisloca : + 84-140 AND 84-113

LICENSEES

20.000000 BP PETROLEUM DEVELOPMENT OF NORWAY A.S
30.000000 A/S NORSKE SHELL
50.000000 DEN NORSKE STATS OLJESELSKAP 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	346.0	36	350.0	
SURF.COND.	20	800.0	26	810.0	1.46
INTERM.	13 3/8	1575.0	17 1/2	1587.0	1.67
INTERM.	9 5/8	1852.0	12 1/4	1865.0	

CONVENTIONAL CORES

Core no.	Intervals cored meters	Recovery		Series
		M	%	
1	1638.0 - 1640.0	1.3	65.0	UPPER JURASSIC
2	1640.0 - 1641	1.1	44.0	UPPER JURASSIC
3	1653.5 - 1670.0	16.5	91.7	UPPER JURASSIC
4	1671.5 - 1680.7	9.3	74.0	UPPER JURASSIC
5	1684.0 - 1686.7	2.7	67.5	UPPER JURASSIC
6	1688.0 - 1693.8	5.8	48.3	UPPER JURASSIC
7	1700.0 - 1702.0	0.0	0.0	MIDDLE JURASSIC
8	1702.0 - 1706.3	4.2	97.0	MIDDLE JURASSIC

MUD PROPERTIES

Depth below KB meter	Mud weight g/cm ³	Plastic viscosity mPa.s	Mud type
352.000	1.09	8.0	WATER BASED
810.000	1.11	5.0	WATER BASED
1057.000	1.33	19.0	WATER BASED
1233.000	1.37	18.0	WATER BASED
1452.000	1.41	24.0	WATER BASED
1584.000	1.42	25.0	WATER BASED
1604.000	1.23	15.0	WATER BASED
1702.000	1.24	16.0	WATER BASED
1865.000	1.23	18.0	WATER BASED

DRILL STEM TEST

INTERVALS AND PRESSURES

Test no.	interval meter	Choke size	Pressure (PSI)		
			WHP	BTHP	FFP
1.0	1670.000 - 1675.500	15.8	160	2300	
2.0	1651.000 - 1657.000	38	150	1901	

RECOVERY

Test no.	Oil Sm ³ /d	Gas Sm ³ /d	Oil grav. g/cm ³	Gas grav. rel. air	GOR m ³ /m ³
1.0					
2.0	1177		0.825	0.960	37

DRILL BIT CUTTINGS AND WET SAMPLES

SAMPLE TYPE	INTERVAL BELOW KB	NUMBER OF SAMPLES
Cutting	360 - 1866	200
Wet Samples	360 - 1866	240

SHALLOW GAS

Interval below KB	REMARKS
274 M 341 M 394 M	POSSIBLE GAS CHARGED SAND LAYERS

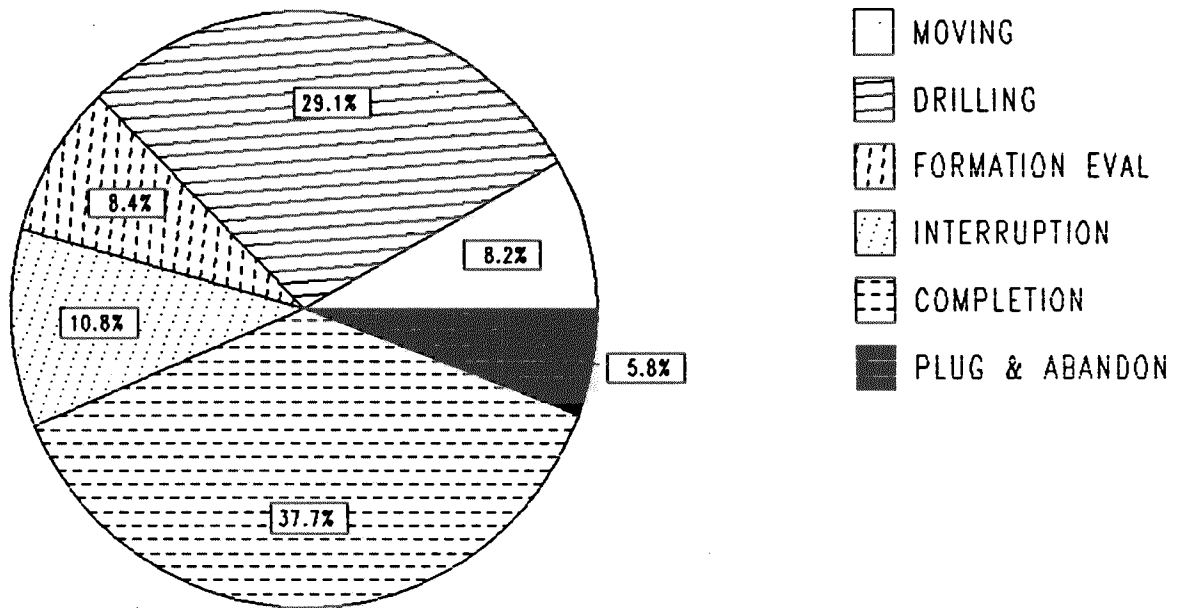
AVAILABLE LOGS

LOG TYPE	INTERVALS	1/200	1/500
ISF SLS GR	347 - 812	X	X
ISF SLS	800 - 1583	X	X
ISF SLS	1574 - 1862	X	X
LDL CNL	347 - 814	X	X
LDL CNL	800 - 1583	X	X
LDL CNL	1574 - 1862	X	X
DLL MSFL	1574 - 1858	X	X
CDM AP	1575 - 1855	X	X
SHDT	1574 - 1863	X	
BGT	347 - 810	X	X
NGT	1548 - 1863	X	
RFT-HP	1653 - 1746	1:100	
CBL VDL CCL	450 - 1574	X	
CBL VDL CCL	1054 - 1799	X	
MUD	346 - 1855		X
VELOCITY	347 - 1862	1:1000 X	

- (+ Airgun Well Velocity Survey and Calibr. data, 1 stk)
- (+ Synthetic Seismogram, Marine, 20 cm/s, 1 stk)
- (+ Synthetic Seismogram, 20 cm/s, 2 stk)
- (+ V.S.P., 20 cm/s, 9 stk)
- (+ Two Way Travel Time, 10 + 20 cm/s, 2 stk)

DAILY DRILLING REPORT SYSTEM

Main operation : 6407/09-02



Total : 1992 HRS

Main operation	Minutes	Hours	% of total
MOVING	9810	163.50	8.21
DRILLING	34800	580.00	29.12
FORMATION EVAL	9990	166.50	8.36
INTERRUPTION	12900	215.00	10.79
COMPLETION	45030	750.50	37.68
PLUG & ABANDON	6990	116.50	5.85

MAIN OPERATIONS WELL : 6407/09-02

MAIN OPERATION: DRILLING

Sub operations	Min	Hrs	% of total
TRIP	7935	132.25	22.80
OTHER	660	11.00	1.90
DRILL	6495	108.25	18.66
SURVEY	480	8.00	1.38
HOLE OPEN	300	5.00	0.86
REAM	180	3.00	0.52
CASING	5460	91.00	15.69
WAIT	2910	48.50	8.36
CIRC/COND	2160	36.00	6.21
BOP/WELLHEAD EQ	3600	60.00	10.34
UNDERREAM	2940	49.00	8.45
BOP ACTIVITIES	1680	28.00	4.83
TOTAL	34800	580.00	

MAIN OPERATION: MOVING

Sub operations	Min	Hrs	% of total
TRANSIT	8295	138.25	84.56
ANCHOR	1215	20.25	12.39
POSITION	300	5.00	3.06
TOTAL	9810	163.50	

MAIN OPERATION: FORMATION EVAL

Sub operations	Min	Hrs	% of total
LOG	4890	81.50	48.95
CIRC SAMPLES	90	1.50	0.90
TRIP	2973	49.55	29.76
CORE	1977	32.95	19.79
OTHER	60	1.00	0.60
TOTAL	9990	166.50	

MAIN OPERATION: INTERRUPTION

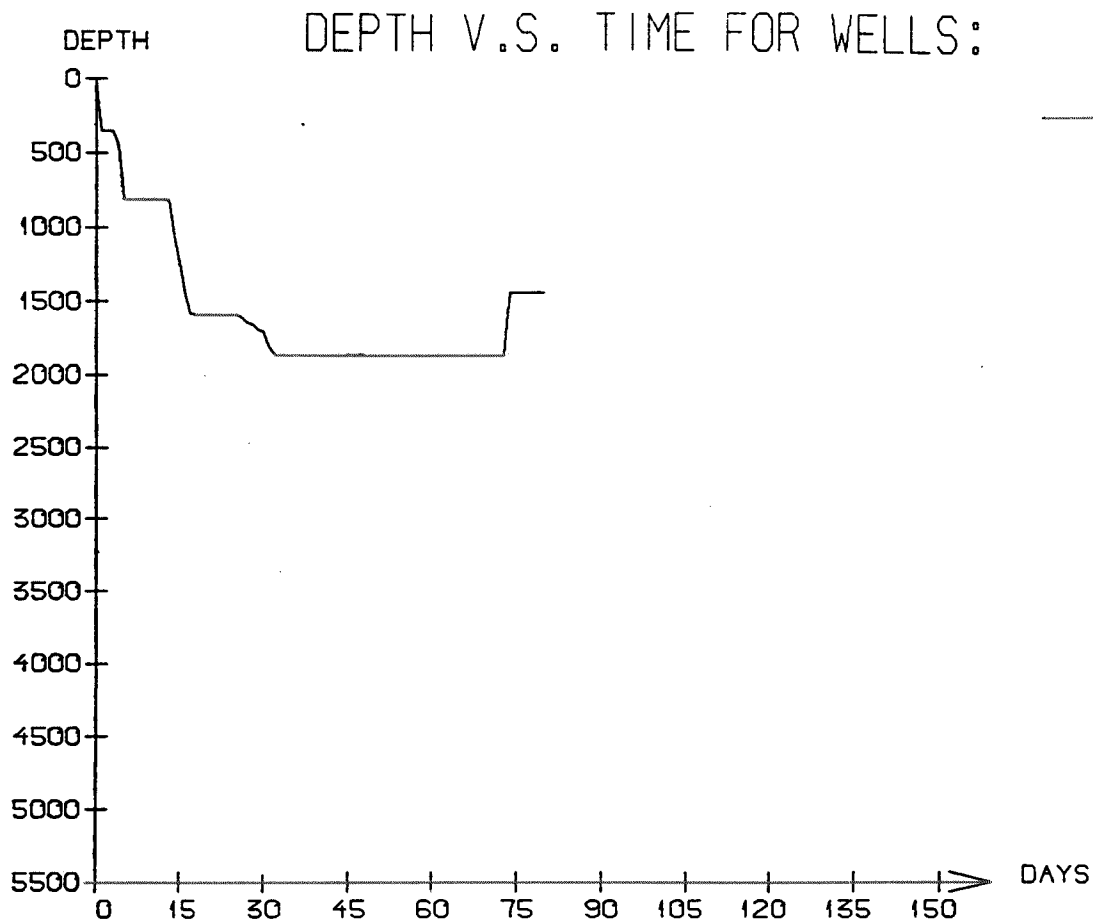
Sub operations	Min	Hrs	% of total
MAINTAIN/REP	7620	127.00	59.07
WAIT	3150	52.50	24.42
OTHER	1650	27.50	12.79
FISH	480	8.00	3.72
TOTAL	12900	215.00	

MAIN OPERATION: COMPLETION

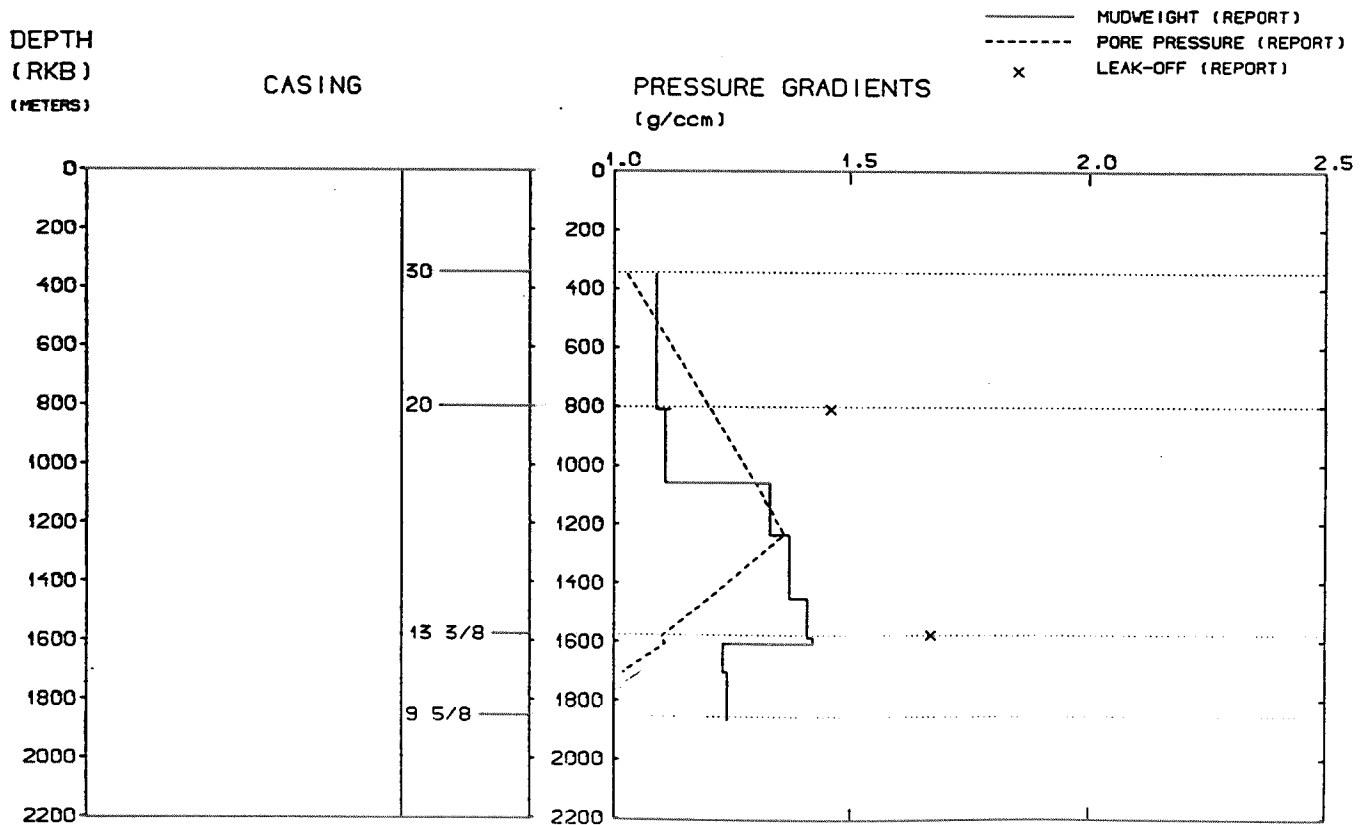
Sub operations	Min	Hrs	% of total
CIRC/COND	6075	101.25	13.49
OTHER	5971	99.52	13.26
COMPL STRING	10500	175.00	23.32
WIRE LINE	3839	63.98	8.53
PERFORATE	120	2.00	0.27
FLOW	14250	237.50	31.65
WAIT	1350	22.50	3.00
BOP/WELLHEAD EQ	600	10.00	1.33
SAND CONTROL	1620	27.00	3.60
STIMULATE	705	11.75	1.57
TOTAL	45030	750.50	

MAIN OPERATION: PLUG & ABANDON

Sub operations	Min	Hrs	% of total
TRIP	1980	33.00	28.33
CIRC/COND	180	3.00	2.58
CEMENT PLUG	480	8.00	6.87
MECHANICAL PLUG	300	5.00	4.29
OTHER	1530	25.50	21.89
EQUIP RECOVERY	1830	30.50	26.18
PERFORATE	120	2.00	1.72
SQUEEZE	420	7.00	6.01
CUT	150	2.50	2.15
TOTAL	6990	116.50	



WELL: 640709 02 PRESSURE COMPOSITE PLOT



Well History 6407/9-2

General:

Appraisal well 6407/9-2 was drilled as the second well in the Northern part of the structure in the Draugen Field, at the Halten area. The main objective of the well were:

- i) improve confidence in the estimation of oil in place.
- ii) evaluate the reservoir quality and sand development on the Northern flank of the structure.
- iii) calibration of the seismic time pick and velocity model
- iv) evaluate the oil deliverability and water injection characteristics.

Prognosed depth was 1835 m in the Drake Formation equivalent.

Operations:

Appraisal well 6407/9-2 was spudded 18 November 1984 by Dolphin Services A/S semi-submersibel rig Borgny Dolphin and completed 2 February 1985 at a T.D. of 1865 m RKB in the Middle Drake Formation (Ror Fm) equivalent of Lower Jurassic age. The well was plugged and abandoned 1 February 1985.

Frøya Formation reservoir rocks (Spekk Fm) came in twenty m below prognosed depth at 1651 m RKB and contained an oil column of 12.5 m. No shallow gas was encountered.

Oil/ water contact occurred at 1663.5 m RKB. Coring commenced at 1638 m RKB, and 8 cores were cut continuously to 1706.5 m RKB.

Testing:

Two DST tests were performed in the intervals 1651 to 1657 m in the oil zone, and 1670 to 1675.5 m in the water zone.

GEOLOGICAL TOPS

WELL: 6407/09-02

	<i>Depth m (RKB)</i>
<i>Nordland Group</i>	<i>247,0</i>
<i>Hordaland Group</i>	<i>789,0</i>
<i>Rogaland Group</i>	<i>1384,0</i>
<i>Tare Fm</i>	<i>1384,0</i>
<i>Tang Fm</i>	<i>1421,0</i>
<i>Shetland Group</i>	<i>1566,0</i>
<i>Cromer Knoll Group</i>	<i>1594,0</i>
<i>Viking Group</i>	<i>1617,0</i>
<i>Spekk Fm</i>	<i>1617,0</i>
<i>Rogn Fm</i>	<i>1650,0</i>
<i>Fangst Group</i>	<i>1702,0</i>
<i>Garn Fm</i>	<i>1702,0</i>
<i>Not Fm</i>	<i>1780,0</i>
<i>Ile Fm</i>	<i>1827,0</i>
<i>T.D.</i>	<i>1865,0</i>
