L-20

7203

C O N F I D E N T I A L

WELL COMPLETION REPORT

PHILLIPS 7/11-3X

PRODUCTION LICENSE 018

WELL COMPLETION REPORT
PHILLIPS 7/11-3X
PRODUCTION LICENSE 018

C O N T E N T S

CONFIDENTIAL

SUMMARY

Well:	Phillips 7/11-3X.
Classification:	Dry Step-out Well.
Area:	Field 7, Block 11, Production License 018
Contractor and Rig:	ODECO Norway Inc., "Ocean Traveler"
Location:	Line P 022830, Shotpoint 73,
	57° 02' 58.8" N.,
	02° 28' 18.8" E.
Water Depth:	79 meters (260 feet) below mean sea level
Rotary Kelly Bushing:	26.5 meters (87 feet) above mean sea level
Objective:	To test the Paleocene
Results:	Tested water, with some gas and condensate from Paleocene
Status:	Plugged and abandoned.
Total Depth:	3350 meters (10992 feet)

DRILLING HISTORY

Dates of Operations

Spud:	17 October 1968
At Total Depth:	29 November 1968
Completed:	7 January 1969

Details of Operations

- Casing Program -

20-inch set at 172 meters RKB (563 feet) in 26-inch hole with 1000 sacks of cement.

13 3/8-inch set at 496 meters RKB (1627 feet) in 17½-inch hole with 700 sacks of cement.

9 5/8-inch set at 1972 meters RKB (6471 feet) in 12 1/4-inch hole with 800 sacks of cement.

7-inch set at 3341 meters RKB (10960 feet) with 750 sacks of cement.

- Mud Program -

Depth:	Weight (ppg)	Viscosity	Pv	Yp	Water Loss
0 - 1675 feet (0 - 510 meters)	8.8	100	-	-	-
1675 - 6540 feet (510 - 1933 meters)	12.0	53	39	12	5.2
6540 - 7540 feet (1933 - 2298 meters)	12.9	50	35	15	5
7540 - 8400 feet (2298 - 2560 meters)	14.5	60	50	10	4
8400 - 9600 feet (2560 - 2926 meters)	14.0	60	50	10	5
9600 - 10992 feet (2926 - 3350 meters)	13.9	50	35	14	5

Seawater was used for drilling to 3800 feet at which depth the system was changed to a Drispac-Flosal-Desco type. From 6540 feet to total depth a sodium chloride-saturated Drisco-Flosal-Desco system was used.

- Logging Program -

Schlumberger Tools:	Run:	Interval:
Induction Electric	1	6469 - 10993 feet
Gamma Ray/Sonic-Caliper	1	1621 - 5829 feet Gamma Ray to subsea
	2	5600 - 6539 feet
	3	6470 - 10990 "
Laterolog	1	9600 - 10991 feet
Microlaterlog/Microlog-Caliper	1	9600 - 10992 feet
Formation Density	1	9600 - 10820 feet
	-	10930 - 10991 "
Neutron	1	9600 - 10820 feet
Continuous Dipmeter	1	6471 - 10986 feet
Cement Bond (Gamma Ray-Casing Collar Locator)	1	6400 - 10798 feet

- Drilling Problems -

Minor trouble with sloughing shale occurred in the section above 6400 feet before the 9 5/8-inch casing was set. The most troublesome shale section was encountered between 6400 and 7540 feet in which hole collapse and intermittent bridging took place until mud weight was increased from 12.9 to 14.5 ppg.

- Hole Deviation -

Maximum vertical deviation reached 3° at 7060 feet and returned to 0° at total depth.

- Stuck Pipe -

Insignificant sticking occurred between 2700 and 5972 feet where the hole wall fell in unconsolidated section.

- Lost Circulation -

No lost circulation problems occurred.

- Coring -

Three cores were taken in the Paleocene sandstone section:

Core No. 1: 10086 - 10101 feet, recovered 25 feet, 100%

Core No. 2: 10147 - 10192 feet, recovered 40 feet, 90%

Core No. 3: 10369 - 10424 feet, recovered 55 feet, 100%

Core descriptions are covered in Appendix 1, and core analyses in Appendix 2.

- Testing -

Eight drill stem tests were made with the following results:

DST No. 1, 10629 - 10651' (22' perforated): IF 19 min, ISI 5 hrs 15 min, FF 4 hrs, FSI 4 hrs 2 min. Reversed out 88 bbls of formation water contaminated with diesel oil, mud and mud filtrate, and 4 bbls predominantly of diesel and mud. Lowest Cl^- 85,000 ppm. IFP_1 3885, IFP_2 3885, ISIP 5247, FFP_1 3910, FFP_2 3952, FSIP 5033.

DST No. 2, 10532 - 10603' (43' perforated): IF 15 min, ISI 3 hrs, FF 12 hrs 30 min, FSI 4 hrs 30 min. Reversed out 91 bbls: 60 bbls diesel, 5 bbls mud, 23 bbls water, 3 bbls contaminated mud. Lowest Cl^- 32,000 ppm. IFP_1 3925, IFP_2 3885, ISIP 5482, FFP_1 3942, FFP_2 4188, FSIP 5420.

DST No. 3, 10423 - 10506' (45' perforated): IF 15 min, ISI 2 hrs 55 min, FF 6 hrs 30 min, FSI 3 hrs 45 min. Reversed out 91 bbls: 78 bbls diesel, 3 bbls mud, 8 bbls water, 2

bbls water-cut mud. Lowest Cl^- 67,000 ppm. IFP_1 3950, IFP_2 3885, ISIP 5525, FFP_1 3926, FFP_2 4019, FSIP 5510.

DST No. 4, 10369 - 10408' (30' perforated): IF 15 min, ISI 2 hrs 30 min, FF 9 hrs 45 min, FSI 3 hrs 25 min. Reversed out 89 bbls: 65 bbls diesel, 5 bbls diesel-cut mud, 17 bbls water, 2 bbls water-cut mud. Lowest Cl^- 38,000 ppm. IFP_1 3825, IFP_2 3810, ISIP 5489, FFP_1 3800, FFP_2 4067, FSIP 5473.

DST No. 5, 10255 - 10315' (60 ' perforated): IF 16 min, ISI 5 hrs 9 min, FF 13 hrs 30 min, FSI 4 hrs 8 min. Reversed out 90 bbls: 66 bbls diesel, 5 bbls diesel-cut mud, 15 bbls water, 4 bbls water-cut mud. Lowest Cl^- 30,000 ppm. Stuck packer, unable to retrieve pressure recorder.

DST No. 6, 10158 - 10203' (45' perforated): IF 15 min, ISI 2 hrs 53 min, FF 3 hrs 53 min, FSI 2 hrs 49 min. Flowed at rate of 1032 BPD, recovered 154 bbls: 88 bbls diesel, 3 bbls diesel-cut mud, 56 bbls water, and reversed out 88 bbls water. Lowest Cl^- 18,500 ppm. IFP_1 3815, $FIFP_1$ 3943, ISIP 5513, IFP_2 4049, FFP_2 4491, FSIP 5331.

DST No. 7, 10125 - 10145' (20' perforated): IF 15 min, ISI 1 hr 48 min, FF 18 hrs 10 min. Flowed through ½" choke at rate of 120 MCFGPD, 90 BPD green-black 47° API oil, 340 BPD water lowest Cl^- 15,400 ppm. IFP_1 3734, $FIPP_1$ 3789, ISIP 5541, IFP_2 3832, FFP_2 3532, FSIP 5306. Mudline Flood

DST No. 8, 9960 - 9990' (30' perforated): IF 15 min, ISI 2 hrs 57 min, FF 1 hr, FSI 1 hr 30 min. IFP_1 3647, $FIFP_2$ 3639, FFP_2 3644, FSIP 3906.

- Plugging and Abandonment -

The 7-inch casing was plugged as follows:

9990 - 9840 feet RKB:	Cement plug set above final perforations.
8749 feet RKB:	Set Baker Model M bridge plug.
5000 feet RKB:	Set Baker Model K cement retainer-bridge plug; squeezed 25 sacks cement into 7" - 9 5/8" annulus through perforations between 5015 - 5017 feet.

Casing was cut as follows:

370 feet RKB:	7-inch
365 feet RKB:	9 5/8-inch
349 feet RKB:	13 3/8-inch
340 feet RKB (sea floor):	20-inch

A cement plug was laid from sea floor to 640 feet RKB.

GEOLOGY

Stratigraphic Units

Unit	Depth RKB Meters	Depth RKB Feet	Sea Level Meters	Sea Level Feet	Drilled Thickness Meters	Drilled Thickness Feet
QUATERNARY						
Recent	106	347	- 79	- 260	± 442	± 1453
Pleistocene						
TERTIARY						
Upper Pliocene	549 ±	1800	- 522	- 1713	± 247	± 810
Lower Pliocene	796	2610	- 769	- 2523	73	240
Upper Miocene	869	2850	- 842	- 2763	71	232
Middle Miocene	939	3082	- 913	- 2995	661	2168
Lower Miocene						
Burdigalian	1600	5250	- 1574	- 5163	213	699
Aquitanian	1813	5949	- 1787	- 5862	259	849
Oligocene	2072	6798	- 2046	- 6711	741	2432
U?-M? Eocene	2813	9230	- 2787	- 9143	166	544
L?Eocene-?Paleocene	2979	9774	- 2953	- 9687	53	174
Paleocene	3032	9948	- 3006	- 9861	301	988
Lower Paleocene						
Danian	3333	10936	- 3307	-10849	17+	56+
(Total Depth)	3350	10992	- 3324	-10905	-	-

Lithology

Quaternary

Recent-Pleistocene undifferentiated. Thickness ± 442 meters (± 1453 feet). This section was drilled without returns.

Tertiary

Upper Pliocene Clay Unit. Thickness ± 247 meters (± 810 feet). This unit consists of soft light grey clay with abundant shell fragments. Unconsolidated poorly sorted, subrounded coarse, medium and fine grained sand with traces of glauconite are interbedded with green-grey and light brown clay in the lower half. Thin beds of hard white silty limestone and limestone nodules appear in the lower quarter.

Lower Pliocene Clay Unit. Thickness 73 meters (240 feet). This unit consists of green-grey to light brown clay and minor beds of silt and silty sand, with traces of yellow chert, white limestone nodules and shell fragments.

Upper Miocene Clay Unit. Thickness 71 meters (232 feet). This unit is made up of soft light grey clay and silty clay, with a few thin interbeds of limestone, and traces of shell fragments.

Middle Miocene Clay Unit. Thickness 661 meters (2168 feet). The upper part of this unit is marked by a trace of light brown dolomitic limestone and fine sand, followed by soft light grey, grey-brown, white to light grey, and light brown to green clays composing the upper third of the unit, and thin beds of light brown limestone. This is followed by grey to dark grey clay with traces of lignite. Thin hard light brown to white limestone beds occur in the lower 600 feet within firm to soft, grey-brown to grey-green shale.

Lower Miocene Burdigalian Shale Unit. Thickness 213 meters (699 feet). This unit consists of medium hard to soft, grey, grey-brown, dark brown shale, in some beds silty, pyritic and carbonaceous. Traces of white siltstone, and white to light brown, occasionally sandy, limestone and crystalline limestone occur throughout.

Lower Miocene Aquitanian Shale Unit. Thickness 259 meters (849 feet). This unit consists of soft to medium hard brown to dark brown shale and light brown to red-brown clay with interbedded hard white to light brown microcrystalline limestone; traces of siltstone, and thin dolomite beds occur towards the base.

Oligocene Shale Unit. Thickness 741 meters (2432 feet). This unit consists of dark brown micaceous silty shale with thin interbedded white chalky limestone and traces of hard brown dolomite. Light grey to grey, soft gummy shales are interbedded with the dark shale. Pyrite is disseminated throughout.

Upper?-Middle? Eocene Shale Unit. Thickness 166 meters (544 feet). This unit consists of light grey to grey-green to brown firm and fissile, silty and sandy shale, in some places mottled, with considerable interbedded grey glauconitic siltstone. Brown to grey and sucrosic dolomite beds are common.

Lower? Eocene-?Paleocene Shale Unit. Thickness 53 meters (174 feet). This unit consists of light brown, white, and grey soft clayey shale with disseminated pyrite, and thin beds of brown dolomite and white chalky limestone. The basal 40 feet consists of very soft red-brown clay.

Upper Paleocene Cod Formation. Thickness 301 meters (988 feet). The upper 180 feet of this formation consist of grey to grey brown silty shale with thin white chalky limestones, light grey silty sandstone and silty shale. These are underlain by a continuous light grey to brown silty, very fine to fine, medium, and occasionally coarse grained micaceous sandstone, with grains commonly angular to subangular, and has a variably argillaceous or dolomitic matrix. Traces of glauconite, carbonaceous material, and quartz pebbles appear in places. The porous intervals of the sandstone are characterized by bleeding gas and light brown oil and stain, strong yellow fluorescence under ultraviolet light and cut in carbon tetra-chloride. Grey-brown to dark brown shale and silty shale are interbedded throughout, increasing in number of beds and thickness in the lower part of the section. One-to-three-foot thick, light brown to brown dense and white chalky, limestone beds occur at 25-to-50 foot intervals increasing in the lower part in number and in thickness to make up 50 percent of section, the remaining 50 percent consisting of sandstone and shale as above. The sandstone in the lower part is typically hard, calcareous and tight. Oil stains, however, are common.

Lower Paleocene Danian Limestone Unit. Thickness 17+ meters (56+ feet). This unit consists of white to light grey chalky and sandy limestone with thin streaks of grey shale, and traces of light brown translucent chert.

APPENDIX I (1)

DATE 20/11/68

PHILLIPS PETROLEUM CO.

CORE DESCRIPTION

SCALE 1:100
3 inches = 25 feet
LITHOLOGICAL SYMBOLS AS ON 1:500 SCALE GEOLOGICAL LOG

CORE NO. 1
SHEET NO. 1
WELL NO. 7/11/3

TEST AREA North Sea-Norway

GEOLOGIST J.G. Estill

DEPTH IN FEET	LOG	CORES	SHOWS	DESCRIPTION	REMARKS
				Core No 1: 10,086-10,111 (Cut 25' Recovered 25' 100%)	
10,086				10,086-10,101. Sh, dk gry, hd, v. slty (grades into arg slt/st) mic, rare glauc & py, abund carb. inclus, w/ inbd ss gry, f/v f gr sang, arg. Bed 1"-6" thick and comprise ±20% of intvl.	Slickensides noted @ 10,105-6
90				10,101-10102.5 Ss, gry, f/v f gr, s rd/s ang, m. std wh cly inclus, dol & cly cmt, v glauc (10%-15%), mic poor por & perm, f dissem py and carb. flecks and inclusions	
100				10 102.5-10 111 Inbd ss & sh aa, but ss is <5% of intvl < 1" thick. Dip is uniform 5-7° and the bedding is sub planar. The bottom 1.5" is badly bkn Live oil is visible along bedding planes. The ss has stn, yel fluor and flash cut in CCl_4. It is banded and appears to be concentrated along bedding planes	
110 10,111					

APPENDIX 1 (2)

DATE 22 Nov 1968

PHILLIPS PETROLEUM CO.

CORE DESCRIPTION

SCALE 1 : 100
3 inches = 25 feet
LITHOLOGICAL SYMBOLS AS ON 1:500 SCALE GEOLOGICAL LOG

CORE NO 2
SHEET NO 1
WELL NO 7/11-3X
GEOLOGIST J.G. Estill P.L.S. Maguire

TEST AREA Norway North Sea

DEPTH IN FEET	LOG	DIPS	SHOWS	DESCRIPTION	REMARKS
10,147'				**Core #2** **10,147' – 10,192' rec. 40' (90%)**	
				Sh, gry, hd.	
10,150				Ss, lt gry brn, f-m gr, sub ang-sub r, unsort, mass, fri-plty cmtd, sl dolic, sl argil, f mic, gr frosy, fr glau, f por.	
		0-5°		Sh, gry brn, hd.	
				Ssaa a sh lt brn finely inbed w/ coal & carb mat, blk, se cross bedding.	
10,1(				ss, lt gry brn, f-m gr, sub ang-sub r, unsort., fri-sl cmtd, sl calc, f mic, gr clr-fros., good por.	
				10,160, sh, dk brn, mic, sl slty.	
				10,164, ss, lt brn gry, f-crs gr w/ pebs of sh & qtz, dk brn, ss is hd, cmtd calc, poor por.	
10,170		0-5°	gas show	10,169 ss, lt brn gry, f-m gr, sub ang-sub r, unsort, fri-sl cmtd, vsl calc, mass, gr fros-clr-brn, f mic f-g por	
			strong yel-gold fluorescence, flash cut is cely		
				ss aa w/ thin beds of sh, gry hd w/ sks,	
10,180				ss aa w/ stringers of lig & carb mat, cross bedded,	
		0-5°	filled of brn oil	ss, lt brn gry, f-m gr aa, fri, f-g por.	
10,190				Possible 4' depth correction due to Bumper Sub would put base of cored interval at 10,188'.	

Shale breaks in core No. 2 interval.

10150.2 - 50.3 ft.
10151.5 - 51.8 ft.
10153.2 - 55.8 ft.) 2.6 ft. th.
10177.0 - 78.6 ft.) 1.6 ft. th.
10179.9 - 80.0 ft.
10182.3 - 82.5 ft.
10183.0 - 83.3 ft.

APPENDIX I (3)

DATE 23 Nov 1968

PHILLIPS PETROLEUM CO.

CORE DESCRIPTION

CORE NO. 3

SHEET NO. 1

WELL NO 7/11-3X

TEST AREA
Norway
North Sea

SCALE 1 100
3 inches = 25 feet
LITHOLOGICAL SYMBOLS AS ON 1:500 SCALE GEOLOGICAL LOG

GEOLOGIST P.L.S. Maguire

DEPTH IN FEET	LOG	CUTS	SHOWS	DESCRIPTION	REMARKS
10370				Core No 3 10,369' - 10,428' Rec. 55' (100%) ss, lt gry, f-m gr, mass. w/se crs gr & qtz pebs, sub r-sub ang, fri, unsort, tr glau, tr carb mat, se mica, se kao, wh, v sl calc, fair por.	
10380				10376 Band of sltstn, dk gry, v carb. ss, lt gry, f-m gr, se crs gr & qtz pebs, gr clr-fros-gry brn, sub r-sub ang, unsort, mass, fri-ptly cmtd, sl calc, f mic, tr glau, tr kao, tr carb mat & bitu p-f por Sh, dk gry, hd, mic, carb.	
10390		0-5°	Very slight dull yellow fluorescence slow cut in clr	ss, lt gry, f-crs gr as above. sltstn, dk gry-blk, v carb (thin band)	
10400		0-5°			
10410				ss, lt gry, f-m gr, and f-crs gr, mass, w/in frs abund qtz pebs, ss is sub r-sub ang, unsort, gr clr-fros-milky w/ se gry brn, fri-ptly cmtd, sl calc, sl kao, tr glau, sl mic, tr carb mat & bitu, f por.	
10420		0-5°			
10430					

Core gave off C1 & C2 when heated.

APPENDIX 2 (1)

Core Laboratories, Inc.
Petroleum Reservoir Engineering
Dallas, Texas

CORE ANALYSIS RESULTS

Company Phillips, Norway Formation _____ File _____

Well 7/11-3X Core Type _____ Date Report Dec. 2, 1968

Field _____ Drilling Fluid _____ Analysts _____

County North Sea State Norway Elev. _____ Location _____

Sample Number	Depth Feet	Permeability Millidarcys		Porosity Per Cent	Residual Saturation Per Cent Pore		Sample Description	
		Ka	Kl		Oil	Total Water	Dens	Gb
Core 1								
1	10101 - 02	.08	.05	11.1				
Core 2								
2	10148 - 49	5.1	3.8	23.6	3.8	70.0	2.18	6.2
3	52 - 53	.49	.32	16.0	4.3	79.0	2.39	2.7
4	58 - 59	12	10	22.8	12.7	57.1	2.25	6.9
5	60 - 61	5.5	4.1	24.8	10.1	48.8	2.34	10.2
6	62 - 63	20	16	24.8	12.5	57.2	2.33	7.3
7	66 - 67	8.0	6.1	23.3	12.9	59.5	2.34	6.5
8	69 - 70	9.9	7.7	25.3	11.9	61.2	2.36	6.8
9	71 - 72	12	10	25.3	13.8	57.3	2.33	7.3
10	73 - 74	.39	.25	24.1	0.0	68.3	2.32	7.6
11	79 - 80	19	15	24.1	13.3	70.6	2.49	3.9
12	82 - 83	2.7	1.9	26.2	8.8	61.8	2.25	7.7
13	86 - 87	148	133	25.1	13.2	62.5	2.19	6.1
Core 3								
14	10369 - 70	3.1	2.2	19.1	0.0	82.1	2.28	3.4
15	72 - 73	1.5	1.0	20.9	0.0	81.2	2.31	3.9
16	74 - 75	8.2	6.3	21.0	0.0	82.5	2.27	3.7
17	77 - 78	10.1	7.9	19.4	0.0	81.4	2.27	3.6
18	80 - 81	4.6	3.4	18.7				
19	82 - 83	7.1	5.4	21.1				
20	85 - 86	9.9	7.7	20.4				
21	97 - 98	8.9	6.9	15.2				
22	10402 - 03	2.8	2.0	16.6				

Core Laboratories, Inc.
Petroleum Reservoir Engineering
Dallas, Texas

CORE ANALYSIS RESULTS

Company Phillips Norway Formation _____ File _____

Well 7/11-3X Core Type _____ Date Report Dec. 2, 1968

Field _____ Drilling Fluid _____ Analysts _____

County North Sea State Norway Elev. _____ Location _____

Sample Number	Depth Feet	Permeability Millidarcys		Porosity Per Cent	Residual Saturation Per Cent Pore		Sample Description	
		Ka	Kl		Oil	Total Water	Dens	Gb
23	10404 - 05	1.03	.70	13.1				
24	05 - 06	11.4	8.9	18.6				
25	07 - 08	9.9	7.7	17.5				
26	10 - 11	9.9	7.7	20.5				
27	15 - 16	8.4	6.5	18.0				
28	16 - 17	5.3	4.0	14.9				
29	18 - 19	5.5	4.1	16.7				
30	23 - 24	1.2	0.8	13.8				

L-20 010 The Ministry of Industry

DATE 20/11/68

PHILLIPS PETROLEUM CO.

CORE DESCRIPTION

CORE NO. 1

SHEET NO. 1

WELL NO. 7/11/3

TEST AREA

North Sea-Norway

SCALE 1: 100
3 inches = 25 feet
LITHOLOGICAL SYMBOLS AS ON 1:500 SCALE GEOLOGICAL LOG

GEOLOGIST J.G. Estill

FORM.	DEPTH IN FEET	LOG	DIPS	SHOWS	DESCRIPTION	REMARKS
Paleocene Ss.	10,086				Core No 1: 10,086-101 (Cut 25' Recovered 25' 100%)	
	90				10,086-10,101 Sh, dk gry, hd, v. slty (grades into arg slt/st) mic, rare glauc & py, abund carb. inclus, w/ inb'd ss gry, f/v f gr sang, arg. Bed 1"-6" thick and comprise ±20% of intvl.	Slickensides noted @ 10,105-6
	100				10,101-10102.5 Ss, gry, f/v f gr, s rd/s ang, m. std wh cly inclus, dol & cly cmt, v glauc (10%-15%), mic poor por & perm, f dissem py and carb. flecks and inclusions	
	110				10 102.5-10 111 Inb'd ss & sh aa, but ss is <5% of intvl ≤ 1" thick.	
	10,111				Dip is uniform 5-7° and the bedding is sub planar. The bottom 1.5" is badly brkn. Live oil is visible along bedding planes. The ss has stn, yel fluor and flash cut in CCl4. It is banded and appears to be concentrated along bedding planes	

APPENDIX I (2)

DATE 22 Nov 1968

PHILLIPS PETROLEUM CO.

CORE DESCRIPTION

CORE NO 2

SHEET NO 2

TEST AREA Norway North Sea

SCALE 1" 100
3 inches = 25 feet
LITHOLOGICAL SYMBOLS AS ON 1:500 SCALE GEOLOGICAL LOG

WELL NO 7/11-3X

GEOLOGIST J.G. Estill P.L.S. Maguire

DEPTH IN FEET	LOG	SHOWS	DESCRIPTION	REMARKS
10,147'			**Core #2** **10,147' – 10,192' rec. 40' (90%)**	
10,150			Sh, gry, hd.	
			Ss, lt gry brn, f-m gr, sub ang-sub r, unsort, mass, fri-ptly cmtd, sl dolic, sl argil, f mic, gr frosy tr glau, f por.	
			Sh, gry brn, hd.	
			Ss aa & sh lt brn finely inbed w/ coal & carb mat, blk, se cross bedding.	
10,160			ss, lt gry brn, f-m gr, sub ang-sub r, unsort, fri-sl cmtd, sl calc, f mic, gr clr-frost, good por.	
			10,160, sh, dk brn, mic, sl slty.	
			10,164, ss, lt brn gry, f-crs gr w/ pebs of sh & qtz, dk brn, ss is hd, cmtd calc, poor por.	
10,170			10,169 ss, lt brn gry, f-m gr, sub ang-sub r, unsort, fri-sl cmtd, vsl calc, mass, gr frost-clr-brn, f mic f-g por	
			ss aa w/ thin beds of sh, gry hd w/ sks,	
10,180			ss aa w/ stringers of lig & carb mat, cross bedded,	
			ss, lt brn gry, f-m gr aa, fri, f-g por.	
10,190			Possible 4' depth correction due to Bumper Sub would put base of cored interval at 10,188'.	
			Shale breaks in core No. 2 interval. 10150.2 - 50.3 ft. 10151.5 - 51.8 ft. 10153.2 - 55.8 ft.) 2.6 ft. th. 10177.0 - 78.6 ft.) 1.6 ft. th. 10179.9 - 80.0 ft. 10182.3 - 82.5 ft. 10183.0 - 83.3 ft.	

Strong yel-gold fluorescence, flash cut in cem

Stain of brn oil

DATE 23 Nov 1968

TEST AREA
Norway
North Sea

PHILLIPS PETROLEUM CO.
CORE DESCRIPTION

SCALE 1: 100
3 inches = 25 feet
LITHOLOGICAL SYMBOLS AS ON 1:500 SCALE GEOLOGICAL LOG

CORE NO. 3
SHEET NO. 1
WELL NO 7/11-3X
GEOLOGIST P.L.S. Maguire

FORM	DEPTH IN FEET	LOG	DIPS	SHOWS	DESCRIPTION	REMARKS
Paleocene	10370		0-5°	Very slight dull yellow fluorescence in CCl4 slow cut	**Core No 3** 10,369' - 10,424' Ss, lt gry, f-m gr, mass. w/se crs gr & gtz pebs, sub r-sub ang, fri, unsort, tr glau, tr carb mat, se mica, se kao, wh, v sl calc, fair por. 10376 Band of sltstn, dk gry, v carb. Ss, lt gry, f-m gr, se crs gr & gtz pebs, gr clr-fros-gry brn, sub r-sub ang, unsort, mass, fri-plty cmtd, sl calc, f mic, tr glau, tr kao, tr carb mat & bitu p-f por Sh, dk gry, hd, mic, carb. Ss, lt gry, f-crs gr as above. sltstn, dk gry-blk, v carb (thin band) Ss, lt gry, f-m gr, and f-crs gr, mass, w/in pts abund gtz pebs, ss is sub r-sub ang, unsort, gr clr-fros-milky w/ se gry brn, fri-plty cmtd, sl calc, sl kao, tr glau, sl mic, tr carb mat & bitu, f por.	Core gave off C1 & C2 when heated.
	10380					
	10390					
	10400		0-5°			
	10410					
	10420		0-5°			

THE MINISTRY OF INDUSTRY – OIL SECTION
WELL LOGGING WORK SHEET

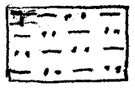
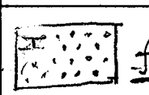
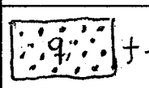
WELL No. 7/11-3
SHEET No. 1 of 1

Data furnished by licensee:

1		5		9		13		17	
2		6		10		14		18	
3		7		11		15		19	
4		8		12		16		20	

Geologist: BB Date: 31/3 -70 RTKB (MSL): ft Sea Bed (MSL): ft

from 10110 ft
to 10423 ft

BED BOUNDARIES DEPTH BELOW (MSL)	STRATIGRAFIC DIV. TIME UNIT	ROCK UNIT	PALAEO UNIT	SAMPLES USED	NAME OF ROCK	POROSITY AND PERMEABILITY	COLOUR	TEXTURE	HARDNESS AND CEMENTATION	ACCESSORY MINERALS	FOSSILS	STRATIFICATION AND SEDIMENTARY STRUCTURES	TECTONIC STRUCTURES	HYDROCARBON AND CARBON'S INDICATIONS	INTERPRETATION FACIES	RATING	REMARKS
10110				C		T T	dk Gy dull		hd. Cmb/ang Frac Brk HCl ÷			≠ - (=)					
10086				C TS		T T	dk Gy dull w/ lt Gy irreg. layers	The lt Gy layers appears > coarse. Grains: >75% <500µ, Qtz: >80% Glaucon. 10%. Mica. Sort: srt, rnd-sub.rnd. mod. sph, Matrix: Clay/ Lu ~5%. There are thin ll zones where the matrix const, >50%.	hd Cmb/ang Frac Brk HCl ÷	Glaucon. 5-10%. (See also under text.)	None obs.	(=) Indicated by the lt Gy layers. U Max thickness of lt Gy beds 2cm.	ll Fract.	o Black carb?matter scattered within thin zones.			TS is thick
10147				C TS	 f	(P) (Perm)	dk Gy dull. intermixed w/ lt Gy irreg. layers.	The lt.Gy zones are the coarsest Grains: >80% Av. 100µ Qtz: 95%. Min. am. of Mica (Srt), Subang - sub.rnd. low-mod. sph Matrix: Clay.	hd. cmb/ang Frac. Brk HCl ÷	Glaucon. Very scat.	None obs.	(=) S		o Black carb.(?) matter scattered.			Thin TS. is thick.
10151				C TS		P Perm	lt Gy dull. w/ dk. zones.	Grains: >95% Av: 0.15-0.3 Qtz: >95%. Mica, Dol/Calc, (srt), rnd-sub.rnd., mod. sph, Matrix: Clay / Dol(?)	hd. Cmb. Frac. Brk. HCl(+)	C	None obs.	(=) - ≡ (····)		o Very scattered black carb.(?) matter Faint yell. stain in the matrix.			TS is
10183 a 10183 b				C TS C	 f-f	(P) (Perm) T T	lt Gy dull vgt w/ dk beds dk Gy dull. w/ lt er beds.	Grains: >99% Av: 85-150µ Qtz: >95%. Mica, Dol(?) Plag. srt, rnd, mod.sph.	hd. cmb. Frac Brk. HCl ÷ Hd.	Glaucon. Very scattered.	None obs.	(=) (····) = mm-bd.		o Very scat, black carb.(?) matter.			TS is thick
10423 a b				C TS C	 f-f	(P) (Perm)	lt Gy, dull interbed. w/ darker zones. dk Gy, dull interbed. w/ lt zones.	Grains: > 95% Av: 50-200µ Qtz: > 95% Mica. (Srt), sub.rnd, low-mod, sph. Matrix. Clay / Dol. Politic.	hd cmb. Frac. Brk. HCl ÷ hd aug. Fr. Brk. HCl ÷	—	None obs. None obs.	= (S) -=-	ll J Fract. ll bed.	o Very scat, black carb.(?) matter. Yellowish stain of matrix (Oil)			The TS is not good, many open spaces.

7203

CORE

PETROLEUM RESERVOIR

FIELD DATA CORE ANALYSIS REPORT

DATE 21 DECEMBER 68

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS AIR	PERMEABILITY MILLIDARCYS LIQUID	POROSITY PERCENT	RESIDUAL LIQUID SATURATION OIL % VOL	RESIDUAL LIQUID SATURATION OIL % PORE	RESIDUAL LIQUID SATURATION TOTAL WATER % PORE	DENS	GD	REMARKS
1	10101-02	.08	.05	11.1		—	—	—	—	Core 1 100%
2	10148-49	5.1	3.8	23.6		3.8	70.0	2.18	6.2	Core 2 90%
3	52-53	.49	.32	16.0		4.3	79.0	2.39	2.7	
4	58-59	12	10	22.8		12.7	57.1	2.25	6.9	
5	60-61	5.5	4.1	24.8		10.1	48.8	2.34	10.2	
6	62-63	20	16	24.0		12.5	57.2	2.33	7.3	
7	66-67	8.0	6.1	23.3		12.9	59.5	2.34	6.5	
8	69-70	9.9	7.7	25.3		11.9	61.2	2.36	6.8	
9	71-72	12	10	25.3		13.8	57.3	2.33	7.3	
10	73-74	.39	.25	24.1		0.0	68.3	2.32	7.6	
11	79-80	19	15	24.1		13.3	70.6	2.49	3.9	
12	82-83	2.7	1.9	26.2		8.8	61.8	2.25	7.7	
13	86-87	148	133	25.1		13.2	62.5	2.19	6.1	
14	10369-70	3.1	2.2	19.1		0.0	82.1	2.28	3.4	Core 3 100%
15	72-73	1.5	1.0	20.9		0.0	82.2	2.31	3.9	
16	74-75	8.2	6.3	21.0		0.0	82.5	2.27	3.7	
17	77-78	10.1	7.9	19.4		0.0	81.4	2.27	3.6	
18	80-81	4.6	3.4	18.7	DST 4					
19	82-83	7.1	5.4	21.1						
20	85-86	9.9	7.7	20.4						
21	97-98	8.9	6.9	15.2						
22	10402-03	2.8	2.0	16.6						
23	04-05	1.03	.70	13.1	DST 4					
24	05-06	11.4	8.9	18.6						
25	07-08	9.9	7.7	17.5						
26	10-11	9.9	7.7	20.5						
27	15-16	8.4	6.5	18.0						
28	16-17	5.3	4.0	14.9						
29	18-19	5.5	4.1	16.7						
30	23-24	1.2	0.8	13.8						

PHILLIPS PETROLEUM RECEIVED 4 DEC 1968

COMPANY PHILLIPS PETR NORSK A/S WELL 7/11 - 3X

COUNTY NORTH SEA STATE NORWAY FIELD — ELEVATION —

LOCATION

CL 522

ROBERTSON RESEARCH COMPANY LIMITED

MICROPALAEONTOLOGICAL ANALYSIS CHART

DATE	ANALYST	LOCATION
29.12.68.	PR, CWH, JWC.	Norwegian North Sea Well 7/11-3X

FOR	CHART NO.
Phillips Petroleum Company, Norway	10000' - 11000'

LIMESTONE · DOLOMITE · OOLITIC LIMESTONE · CLAY · SHALE · SILTY/SANDY SHALE

SILTSTONE · SANDSTONE · CONGLOMERATE · GYPSUM · VOLCANICS · INTRUSIVES

S SALT · COAL · C CHERT · G Glauconite · P Pyrites · White Chalk

* Reworked Upper Cretaceous forms

LITHOLOGY ← DEPTH IN FEET — Age — SYSTEM — ~~STAGE~~ — ~~ZONE~~

100 Core 1

Core 2

200

300

400 Core 3

500

600

700

800

900

1000

PALAEOCENE

DANIAN

MICROFOSSILS

FORAMINIFERA

Globigerina trilocullinoides
Globigerina inaequispira
Haplophragmoides carinatum
Glomospirella woodi
Coscinodiscus sp.
Bathysiphon eocenicus
Haplophragmoides cf. obliquicameratus
Involutina pyrotecnica
Trochamminoides sp.
Cibicides proprius
Cyclammina challinori
Cribrostomoides sp. ?
Cyclammina incisa
Trochammina globigeriniformis
Trochammina globigeriniformis var. altiformis
Globigerina cf. pseudobulloides
Trochammina pintagona
Spiroplectammina spectabilis
Pseudotextularia elegans fructicosa *
Globigerina pseudobulloides
Osangularia lens
Globotruncana arca *
Rugoglobigerina rugosa rugosa *
Gavelinella bullata
Pseudotextularia elegans elegans *
Rugoglobigerina rugosa rotundata *
Allomorphina halli
Allomorphina paleocenica
Robulus turbinatus
Pullenia quaternaria

OTHER FOSSILS

Cibicides
Cibicides
Cibicides
Cibicides
Cibicides
Cibicides

Radiolaria

TAUSHETSPLINT