

3

BA-87-1436-1  
20 OKT. 1987  
**REGISTRERT**  
**OLJEDIREKTORATET**

NORSK HYDRO A.S.

FINAL WELL REPORT

WELL 30/6-21

LICENCE 053 AND 079

20 OKT. 1987

0010b  
sn, LTS

BA-87-1436-1

LIST OF CONTENTS FOR 30/6-21

Preface	Page I
Location of well 30/6-21	Page II
Summary of well data	Page III
Section A	Geology
Section B	Operations
Section C	Completion Log

PREFACE

The well 30/6-21 on the Alpha North structure includes the Oseberg Unit (Lic. 053/079, Brent Group) and Outside Deposits (053).

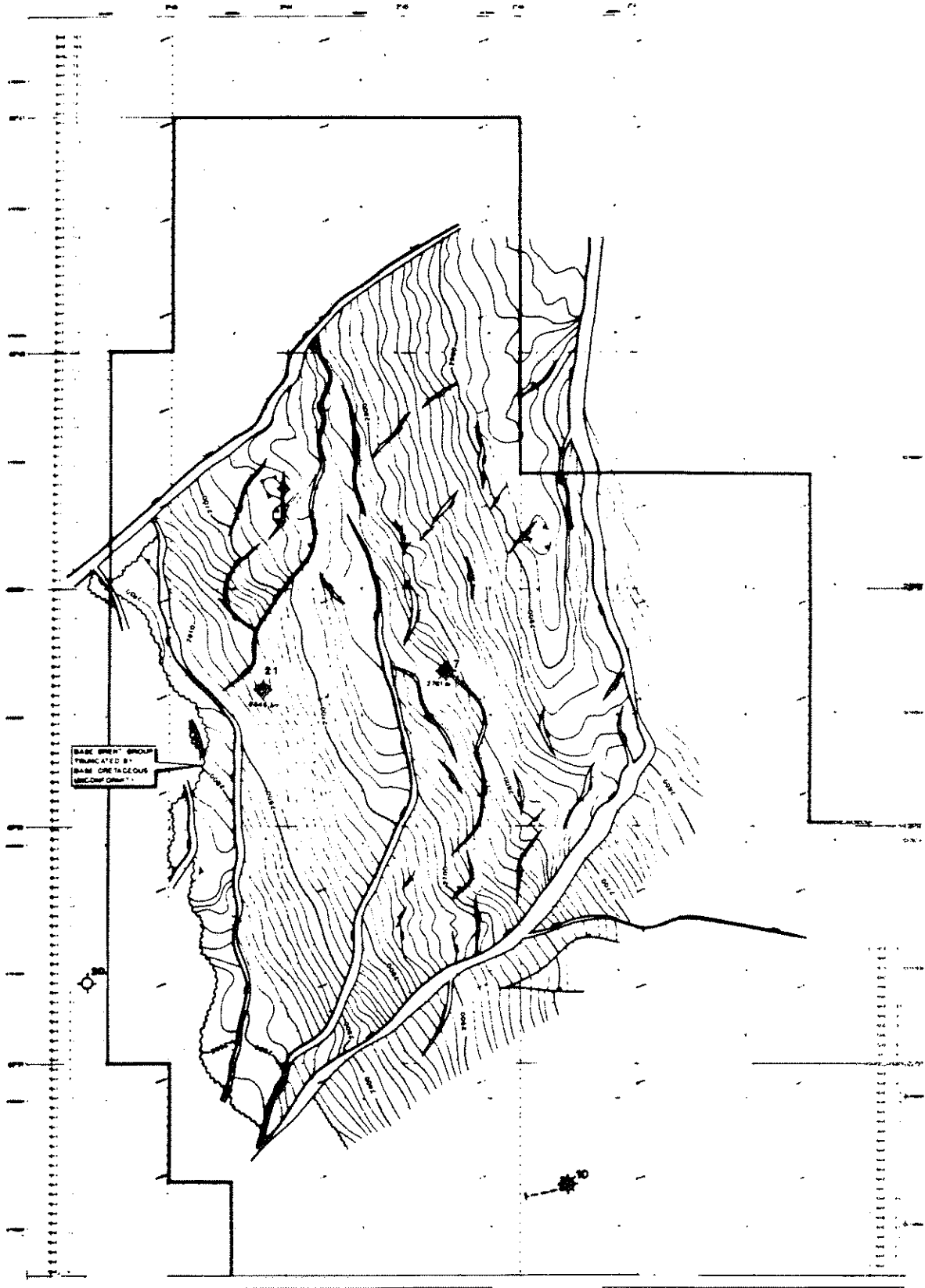
The lisenca 053 and 079 were awarded the Statoil/Hydro/Saga/Elf/Mobil/Total group with Norsk Hydro Production a.s. as operator.

The group consists of the following companies:

Den Norske Stats oljeselskap:	63.24%
Norsk Hydro Produksjon a.s. :	13.75%
Saga Petroleum a.s. :	8.61%
Elf Aquitaine Norge :	6.40%
Mobil :	4.80%
Total Marine Norge :	3.20%

Well 30/6-21 was drilled by Norsk Hydro Production a.s on behalf of this group.

# ALPHA NORTH



DEPTH MAP  
BASE BRENT

FIG.

LOCATION OF WELL 30/6-21

 **HYDRO**  
Oseberg Produksjon



SECTION A  
GEOLOGY

0010b  
sn, LTS

TABLE OF CONTENTS  
SECTION A

		<u>Page</u>
1	OBJECTIVES	2
2	PETROPHYSICAL EVALUATION AND RFT RESULTS	3
	2.1 Petrophysical Evaluation	3
	2.2 RFT Results	6
3	STRATIGRAPHY	12
	3.1 Lithostratigraphy	12
	3.2 Biostratigraphy	25
4	HYDROCARBON SHOWS	27
	4.1 Gas Records	27
	4.2 Oil Stain and Fluorescence	28
5	CORING	31
	5.1 Conventional Cores	31
	5.2 Sidewall Cores	32
6	WIRELINER/MWD LOGGING	33
	APPENDIX I	Core descriptions Wellsite core log
	APPENDIX II	Well summary Geological Well summary
	APPENDIX III	Sidewall core descriptions
	APPENDIX IV	CPI log
	APPENDIX V	Completion log

## 1 OBJECTIVES

The objectives for the well 30/6-21 were to:

- \* Prove oil in the Etive/Oseberg Formations on the Alpha North Structure
- \* Define the oil/water contact in the Oseberg Formation on the Alpha North by RFT pressure gradients
- \* Reduce the uncertainties in the volume estimates
- \* Locate the well in a position where it later can be utilized as a subsea oil producer/PTS well.



## 2. PETROPHYSICAL EVALUATION AND RFT RESULTS.

### 2.1 Petrophysical evaluation.

#### General.

The Brent Formation was covered with two log runs (3 and 4). An intermediate run (No.3), which was done after coring 8m into Dunlin and with a final run after having drilled 50m into the Statfjord formation.

The gamma ray from NGT (SGR), is affected by sticking in the lower part of the Oseberg Formation. Apart from this, the logs are of good quality.

Average values of both log evaluation and core data are presented. Log evaluation is presented in table 2.1.2, and the core data results in table 2.1.3.

A CPI plot is enclosed (Appendix 3).

#### Interpretation methods.

The shale volume (VSH), was calculated from the gamma ray log.

The porosity was calculated using the density log. The hydrocarbon correction was done by using Sw as Sxo.

The water saturation was calculated from the Poupon equation, using the deep induction log as Rt.

Cut-off's.

Only porosity and shale volume cut-off's have been applied.

Cut-off's used:

$\phi \leq 12\%$

VSH  $\geq 40\%$

Petrophysical results.

The well discovered Oseberg sand of good quality, and two thin sands in the Ness formation.

The results presented are all preliminary.

Table 2.1.1

RESERVOIR ZONATION
WELL 30/6-21

FORMATION	TOP (m RKB)		BOTTOM (m RKB)		GROSS (m)	
	MD	TVD	MD	TVD	MD	TVD
NESS	2575.0	2575.0	2615.0	2615.0	40.0	40.0
ETIVE	2615.0	2615.0	2626.0	2626.0	11.0	11.0
OSEBERG	2626.0	2626.0	2670.5	2670.5	44.5	44.5
TOTAL	2575.0	2575.0	2670.5	2670.5	95.5	95.5

LOG EVALUATION RESULTS.  
WELL 30/6-21.

FORMATION	INTERVAL MD/TVD (m RKB)	GROSS MD/TVD (m)	NET SAND MD/TVD (m)	N/G (dec)	φ (%)	Sw (%)
NESS	2575.0 - 2615.0	40.0	7.9	.2	22.5	27.6
ETIVE	2615.0 - 2626.0	11.0	11.0	1.0	24.3	13.9
OSEBERG	2626.0 - 2670.5	44.5	43.4	.97	24.8	14.3
TOTAL	2575.0 - 2670.5	95.5	62.3	.65	24.4	15.7

Table 2.1.3

CORE DATA RESULTS

INTERVAL MD (m RKB)	φ <sub>log</sub> (%)	φ <sub>core</sub> (%)	φ <sub>l</sub> /φ <sub>c</sub> (dec)	HOR. PERM (mD)		VERT. PERM. (mD)	
				arit.	geom.	arit.	geom.
2675.0 - 2615.0	22.5	24.5	.92	1277	283	566	45
2615.0 - 2626.0	24.3	23.6	1.03	1973	580	1293	275
2626.0 - 2670.0	24.8	25.8	.96	3198	2175	2154	963
2675.0 - 2670.0	24.4	25.4	.96	2720	1339	1763	503

## 2.2 RFT RESULTS.

Five RFT runs, including 3 successful segregated samplings were performed. Samplings were tried to be taken with a pretest probe, and pretest were tried to be taken with a sampling probe (Martino), to save extra runs in the hole. This did not work out good and explains several unsuccessful sampling tries.

Several pretests, or intervals were repeated in the subsequent runs. The reason for this was to tie in to the same RFT gradient for all runs.

The H.P.-gauge broke down after pretest No. 4E/7, the pretest were carried on with the strain gauge only.

The RFT data showed that the Oseberg and Ness formations were oilfilled, with a fluid density of .66 g/cc.  
The Cook- and Statfjord formations were both waterfilled.

Table 2.2.1

PRETESTS

NO	PRESSURE DEPTH		FORMATION PRESSURE	
	MD (m RKB)	TVD (m RKB)	S. GAUGE (psia)	H.P. GAUGE (psia)
3A/1	2578.0	2578.0	4126.6	4125.7
3A/2	2590.0	2590.0	4150.3	4151.1
3A/3	2613.8	2613.8	4160.2	4158.9
3A/4	2617.0	2617.0	4162.3	4161.4
3A/5	2626.5	2626.5	4171.0	4169.8
3A/6	2637.0	2637.0	4180.4	4179.6
3A/7	2643.0	2643.0	4186.0	4185.4
3A/8	2646.0	2646.0	4188.6	4188.1
3A/9	2656.0	2656.0	4197.5	4198.3
+ 3A/10	2660.0	2660.0	4200.9	4202.7
3A/11	2590.0	2590.0	4152.3	4153.1
* 3B/1	2660.0	2660.0	4204.7	4204.4
* 3C/1	2619.0	2619.0	4165.6	4165.7
* 4D/1	2590.0	2590.0	4149.5	4147.9
4D/2	2619.0	2619.0	4161.8	4160.9
4D/3	2660.0	2660.0	4200.5	4200.4

\* Sample points, + Sample try

Table 2.2.1

PRETESTS

NO	PRESSURE DEPTH		FORMATION PRESSURE	
	MD (m RKB)	TVD (m RKB)	S. GAUGE (psia)	H.P. GAUGE (psia)
4D/4	2665.0	2665.0	4205.1	4202.7
4E/1	2617.0	2617.0	4160.2	4159.8
4E/2	2660.0	2660.0	4200.6	4200.0
4E/3	2668.5	2668.5	4208.5	4208.3
4E/4	2670.2	2670.2	4210.1	4211.0
+ 4E/5	2862.0	2862.0	4817.4	4820.5
4E/6	2872.0	2872.0	4832.2	4835.0
4E/7	2880.5	2880.5	4843.1	4845.3
4E/8	2890.0	2890.0	4855.7	
4E/9	2899.5	2899.5	4869.2	
4E/10	2906.8	2906.8	4880.7	
4E/11	2920.0	2920.0	4899.7	
4E/12	3057.0	3057.0	5129.6	
4E/13	3065.5	3065.5	5141.4	
4E/14	3075.0	3075.0	5154.6	
4E/15	3080.5	3080.5	5163.7	

+ Sample try.

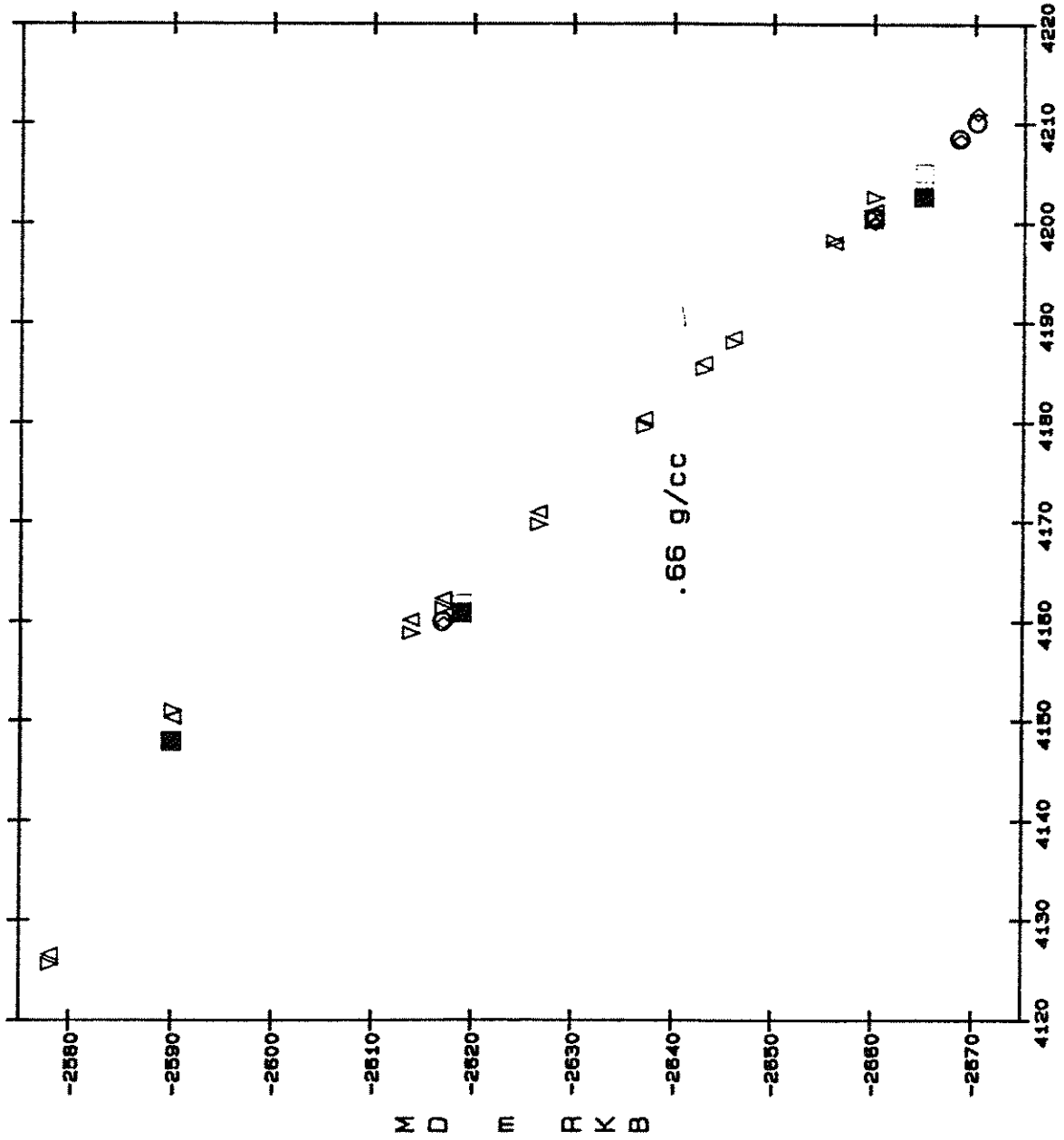
Table 2.2.1

PRETESTS

NO	PRESSURE DEPTH		FORMATION PRESSURE	
	MD (m RKB)	TVD (m RKB)	S. GAUGE (psia)	H.P. GAUGE (psia)
4E/16	3082.5	3082.5	5168.3	
4E/17	3093.0	3093.0	5180.1	
+ 4E/18	2860.5	2860.5	4815.4	

+ Sample try

RFT PLOT WELL 30/6-21 (BRENT FM.)

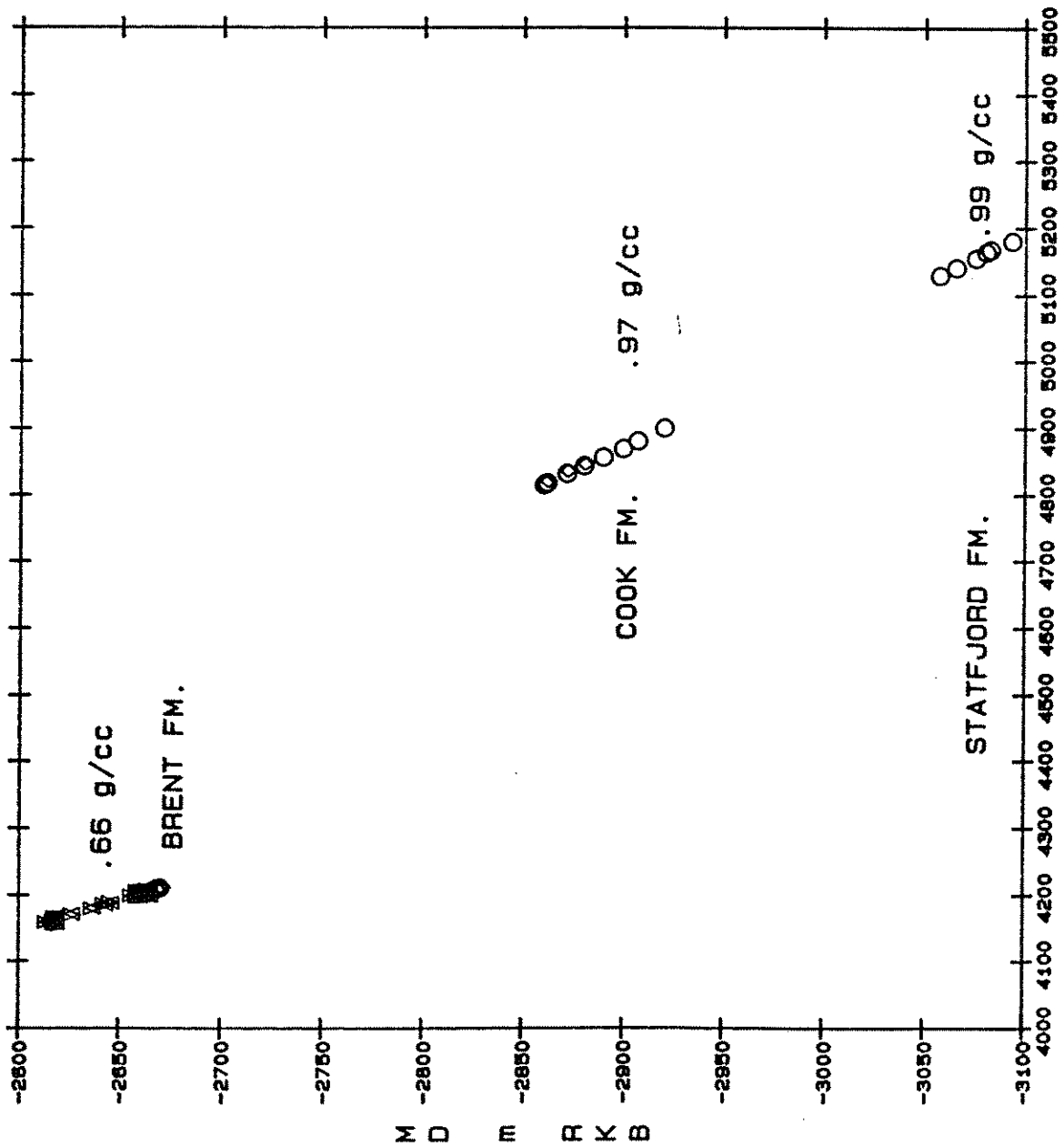


- △ Strain Gauge (run # 3A)
- ▽ H.P. Gauge (run # 3A)
- Strain Gauge (run # 3D)
- H.P. Gauge (run # 3D)
- Strain gauge (run # 3E)
- ◇ H.P. Gauge (run # 3E)

Formation Pressure (psia)



RFT PLOT WELL 30/6-21 (BRENT-, COOK AND STATFJORD FM.)



- △ Strain Gauge (run # 3A)
- ▽ H.P. Gauge (run # 3A)
- Strain Gauge (run # 3D)
- H.P. Gauge (run # 3D)
- Strain gauge (run # 3E)
- ◇ H.P. Gauge (run # 3E)

Formation Pressure (psia)

3 STRATIGRAPHY

3.1 Lithostratigraphy

Depths referred to are m RKB.

NORDLAND GROUP

The Nordland Group is subdivided in three intervals.

137-665 m

This interval was drilled with returns to seabed. The lithology as inferred from MWD log appears to be clays with interbeds of sands down to approximately 240 m, alternating sands and clays between 240 and 340 m and clays with occasional stringers of sands below.

665-706 m: Clay, rarely Sand, trace shell fragments

Clay; olive grey to medium dark grey, soft locally sticky, amorphous to blocky, calcareous, micromicaceous, glauconitic and locally silty to very fine sandy.

Sand; clear Quartz, coarse, subangular.

Utsira Formation: 706-895.5 m

706-895.5 m: Sand, Sandstone, minor Clay

Sand; clear, locally frosty and smoky Quartz, fine to very coarse, predominantly medium to fine, subrounded, locally subangular, poorly to locally moderately sorted, glauconitic, traces of Mica and traces of shell fragments.

Sandstone; light olive grey clear Quartz, very fine to medium, predominantly fine, friable, subangular to subrounded, moderately to poorly sorted, friable, locally abundant clay matrix, locally calcareous cemented, locally silica cemented, trace Glauconite, rare Mica, poor visible porosity.

Clay; greenish black to dark greenish grey, soft, amorphous to blocky, non to slightly calcareous, traces of micromica, abundant Glauconite, locally silty and sandy.

HORDALAND GROUP: 895.5-1993 m

The lithology of the Hordaland Group comprises Claystones with some intervals of Sands developed at the upper part. Stringer of Limestones and Dolomites are common throughout.

895.5-1169 m: Claystone, rarely Sand and Limestone

Claystone; dusky yellowish brown to olive grey, soft to firm, subfissile to amorphous, non to locally moderately calcareous, traces of Glauconite, micromicaceous, generally slightly silty, in part very silty and very fine sandy.

Sand; clear to milky Quartz, medium to coarse, loose, subangular to subrounded.

Limestone; white, soft, blocky, argillaceous in laminae, microcrystalline.

1169-1292 m: Claystone, minor Sandstone, trace Limestone

Claystone; olive grey to dusky yellowish brown, soft to locally firm, in part subfissile, locally blocky, non to slightly calcareous, traces of Glauconite, locally carbonaceous, rarely shell fragments, non to locally silty, locally very fine sandy.

Sandstone; light grey to light olive grey, clear to milky Quartz, very fine to medium, angular to subrounded, poorly sorted, argillaceous matrix, locally calcareous cemented, traces of Glauconite, traces of shell fragments.

Limestone; greyish white to light brown, white, soft to firm, amorphous, locally hard, blocky, argillaceous, locally sandy, microcrystalline.

1292-1455 m: Sand, minor Sandstone, Claystone,

traces of Limestone

Sand; clear to milky Quartz, fine to medium, rarely coarse, subangular to subrounded, moderately sorted, loose, traces of Mica, traces of Glauconite.

Sandstone; light grey, clear to milky Quartz, very fine to medium, angular to subrounded, poorly sorted, friable, argillaceous matrix, locally silica cemented, traces of Glauconite, no visible porosity.

Claystone; dusky yellowish brown - dusky brown, trace olive grey, firm, blocky, non calcareous, trace Pyrite, micromicaceous, silty to very fine sandy.

Limestone; pale yellowish brown, firm, blocky, argillaceous, microcrystalline.

1455-1611 m: Claystone, traces of Limestone,

traces of Sand/Sandstones

Claystones; dusky yellowish brown to olive black and brownish black, firm to moderately hard, blocky to subfissile, non calcareous, trace Pyrite, in part slight micromicaceous, slightly silty.

Limestones; pale yellowish brown, firm to moderately hard, blocky, very argillaceous, microcrystalline.

Sand/

Sandstone; olive grey, clear to milky Quartz, very fine to coarse, subangular to subrounded, poorly sorted, locally clay matrix, trace Glauconite.

1611-1697 m: Claystone, trace Limestone

Claystone; dusky yellowish brown to brownish black trace olive grey, firm to moderately hard, blocky to subfissile, non calcareous, trace Pyrite rare micromicaceous, locally silty. Also traces of Claystone dark greenish grey to greenish black.

Limestone; moderately to dark yellowish brown, firm to moderately hard, blocky, argillaceous, locally dolomitic, microcrystalline.

1697-1827 m: Claystone, trace Limestone, rarely Sand

Claystone; olive grey to dark greenish grey, soft to firm, blocky, non calcareous, slightly micromicaceous, rarely micropyrrite.

Claystone; brownish black to greyish black, firm to (minor) moderately hard, blocky to occasionally subfissile, non calcareous, trace Pyrite, rarely micromicaceous.

Limestone; greyish white to dark yellowish brown, firm to moderately hard, blocky, locally argillaceous, locally dolomitic, microcrystalline.

Sand; clear to smoky Quartz, coarse, loose, subangular to angular.

1827-1953 m: Claystone, trace Limestone and Dolomite,

rarely Sandstone

Claystone; dark grey to greyish black, medium grey, greenish black, firm to moderately hard, blocky to subfissile, non to moderately calcareous, trace micropyrrite, rarely micromicaceous.

Limestone; dark to pale yellowish brown, moderately hard, blocky, locally argillaceous, microcrystalline.

Dolomite; moderately brown to dark yellowish brown,  
hard to very hard, microcrystalline.

Sandstone; clear Quartz, very fine to fine, subangular,  
well sorted, hard, silica cemented, locally  
argillaceous matrix, micropyrritic.

1953-1993 m: Claystone, trace Limestone

Claystone; brownish grey to moderately brown, soft to  
firm, blocky, non calcareous.

Claystone; medium blue grey to greenish grey to dark  
greenish grey, soft to firm, amorphous to  
blocky, non calcareous, abundant  
micropyrrite, rarely micromicaceous.  
Trace Pyrite nodules.

Limestone; dark to pale yellowish brown, moderately  
hard, locally argillaceous,  
microcrystalline.

ROGALAND GROUP: 1993-2265 m

There is a sharp distinction in Claystone lithology on  
the transition between the Hordaland and Rogaland Groups.  
This difference is easily detected when going from the  
moderately brown (brick red) Claystones in the Hordaland  
Group into the olive black, greenish black, greyish black  
Claystones with traces of tuffaceous material of the  
Rogaland Group.

The Rogaland Group is divided in three formations:  
Balder, Sele and Lista. Each formation has its own  
wireline log characteristics and lithological  
descriptions.

Balder Formation: 1993-2075 m

1993-2075 m: Claystone, trace tuffaceous Claystones  
and Limestones

Claystone; greyish black, greenish black, olive black, dark grey, firm to soft, blocky to locally subfissile, non calcareous to locally moderately calcareous, trace micropyrrite, rarely micromicaceous, locally silty.

Tuffaceous

Claystone; medium light grey to medium blue grey, soft to firm, blocky, non calcareous, sucrosic, black specs.

Limestone; pale yellowish brown, light olive grey, moderately brown, hard to firm, locally argillaceous, locally dolomitic, microcrystalline to crystalline.

Sele Formation: 2075-2154 m

2075-2154 m: Claystone, trace Limestone and  
tuffaceous Claystone

Claystone; greyish black to brownish black, olive grey, firm to blocky, occasionally subfissile, non calcareous, micromicaceous, micropyrrite, trace Pyrite nodules, locally slightly silty.

Claystone; (seen at base of this interval)  
greyish red to very dusty red, rarely carbonaceous, else a/a.



Limestone,  
tuffaceous

Claystone; similar in description to those of the Balder  
Formation above.

Lista Formation: 2154-2265 m

2154-2265 m: Claystone, trace Limestone, rarely Sand

Claystone; olive black to greyish black, firm to  
occasionally soft and moderately hard, blocky  
to subfissile, non calcareous, trace Pyrite  
nodules, micromicaceous, rarely carbonaceous,  
locally silty.

Limestone; greyish white, pale to moderately brown, firm  
to hard, blocky, locally argillaceous,  
microcrystalline.

Sand; clear Quartz, medium to coarse, subangular to  
subrounded, loose.

MONTROSE GROUP: 2265-2279 m

Maureen Formation Equivalent: 2265-2279 m

The Montrose Formation is represented by the Maureen  
Formation Eq. The interval is defined by log breaks as  
well as by lithological characteristics.

2265-2279 m: Claystone

Claystone; olive grey to medium grey, soft, sticky, very  
calcareous, rarely carbonaceous, silty in  
laminae. At base also Claystone greyish  
brown to very dusky red.

SHETLAND GROUP: 2279-2575 m

The Shetland Group can be subdivided in two major sections. Claystones is the predominant lithology except at the upper part of the two sections where Limestones dominate. Traces of sand associated with abundances of fecal pellets was seen at the base of the Shetland Group.

2279-2446 m: Claystone and Limestone

Claystone; greenish black to dark greenish grey, becoming predominantly medium grey to medium dark grey, moderately hard, occasionally soft, blocky to subfissile, calcareous to very calcareous, slightly micaceous, rarely carbonaceous, locally silty.

Limestone; pale to dark yellowish brown, moderately hard to locally firm, slightly argillaceous, locally micropyrritic, crypto- to microcrystalline.

2446-2575 m: Claystone and Limestone

Claystone; greyish black, dark grey, medium grey, moderately hard, occasionally soft, blocky, non calcareous to locally calcareous, occasionally pyritic, slightly silty.

Limestone; medium grey, light olive grey, light grey, moderately hard to firm, blocky, locally argillaceous, microcrystalline.

BRENT GROUP: 2575-2670.5 m

The Brent Group comprises the Ness, Etive, Rannoch and the Oseberg Formations. The Oseberg Formation makes up the lower massive Sandstone interval of the Brent Group and was previously referred to as the Etive Formation.

Ness Formation; 2575-2615 m

2575-2615 m: Sandstone, Claystone, minor Coal

Sandstone; transparant to translucent, occasionally smoky Quartz, very fine to fine, subangular to subrounded, moderately sorted, moderately hard to friable, silica cemented, locally kaolinitic matrix, carbonaceous, micaceous, poor visible porosity.

Claystone; olive black, greyish black, hard, subfissile to locally blocky, non calcareous, carbonaceous, micromicaceous, locally silty, very fine sandy in lenses.

Coal; black, brownish black, hard, shiny, locally grading to Coaly shale.

Etive/Rannoch/Oseberg Formations: 2615-2670.5 m

2615-2670.5 m: Sandstone

Sandstone; clear, milky, frosty, smoky Quartz, very fine to very coarse, locally pebbly, predominantly medium, subangular to subrounded, moderately to poorly sorted, moderately hard to friable, silica locally calcareous cemented, locally

abundant kaolinitic matrix, locally  
glaucinitic, locally micaceous, rarely  
carbonaceous, fair to good visible porosity.

DUNLIN GROUP: 2670.5-3052.5 m

The Dunlin Group consists of the Drake, the Cook and the Amundsen Formations. Both top and base of this interval is clearly marked by sharp log breaks as well as a change of lithology.

Drake Formation: 2670.5-2854 m

2670.5-2854 m: Claystone, trace Limestone/Dolomite,

Limestone, rarely Siltstone

Claystone; olive grey to olive black, soft to moderately hard, blocky to fissile, non calcareous, pyritic, micaceous, carbonaceous, locally glauconitic, silty.

Limestone/

Dolomite; greyish white to yellowish white, soft, very argillaceous, locally very silty.

Limestone; moderately to dark yellowish brown, firm to moderately hard, blocky, slightly argillaceous, slightly micromicaceous.

Siltstone; (seen at the very top of the interval) brownish black to olive black, hard to moderately hard, blocky to subfissile non calcareous, micromicaceous, pyritic, carbonaceous, argillaceous laminae, locally very fine sandy, locally grading to shale.

Cook Formation: 2854-2922 m

2854-2922 m: Sandstone, trace Claystone and Limestone

Sandstone; medium light grey, clear to milky Quartz, fine to medium, subangular to subrounded, well to moderately sorted, friable to loose, locally silica cemented, in part very argillaceous, traces of carbonaceous material, poor visible porosity.

Claystone; dusky yellowish brown, firm to moderately hard, blocky to occasionally subfissile, non to slightly calcareous, micromicaceous, trace carbonaceous, rarely micropyrritic, silty to locally grading to Siltstone.

Limestone; white-pale yellowish brown, firm, very argillaceous.

Amundsen Formation: 2922-3052.5 m

2922-3052.5 m: Claystone, trace Limestone

Claystone; olive grey to olive black, dusky yellowish brown, firm to moderately hard, slightly to locally very calcareous, rarely micromicaceous, carbonaceous, trace micropyrrite, silty to locally very silty.

Limestone; pale yellowish brown to dusky brown, firm, brittle, locally very argillaceous, cryptocrystalline.

Statfjord Formation: 3052.5-3107 m TD

3052.5-3107 m: Sandstone, minor Claystone, trace

Limestone and Coaly shale

Sandstone; light grey, clear to milky Quartz, fine to medium, locally coarse, subangular to subrounded, moderately to locally well sorted, loose, locally abundant white argillaceous matrix.

Claystone; olive grey to olive black, dusky yellowish brown, firm to moderately hard, carbonaceous, micropyrritic, silty to very silty.

Limestone; pale yellowish white, firm to moderately hard, cryptocrystalline.

Coaly shale; black to olive black, hard, shiny, brittle, silty, occasionally pyritic.

The well was drilled to a total depth at 3100 m RKB driller's depth, 3107 m RKB logger's depth in the Statfjord Formation.

### 3.2 Biostratigraphy

The biostratigraphic evaluation of the well has been performed by Stratlab A/S at Skjetten, Oslo. The results are contained in the report: Well 30/6-21, Biostratigraphy, Kerogen Analysis.

The basic material for the analysis were ditch cuttings. Sidewall cores and chips from conventional cores were used when available. Electrical logs were not made available for the final biostratigraphic breakdown.

It should also be noted that the logger's depth generally are 5-7 meters deep as compared to the driller's depths.

The diagram in Figure 3.2-1 summarizes the bio-lithostratigraphy for this well.

# WELL 30/6-21

DEPTH NOT TO SCALE

BIOSTRATIGRAPHY		DEPTH m/RKB	LITHOSTRATIGRAPHY		DEPTH m/RKB	
SERIES/STAGE			GROUP	FORMATION		
SEABED						
TERTIARY	QUAT.		NORDLAND GROUP			
	DRILLED WITH RETURNS TO SEABED					
	-----	665				
	EARLY PLIOCENE				706	
	MIOCENE	720		UTSIRA		
	EARLY MIOCENE	890			895.5	
	LATE OLIGOCENE	1100	HORDALAND GROUP			
	EARLY OLIGOCENE	1400				
	LATE-MIDDLE EOCENE	1590				
	EARLY EOCENE	1790				
		1990			1993	
	LATE PALEOCENE		ROGALAND GROUP	BALDER		2075
				SELE		2154
				LISTA		
EARLY PALEOCENE	2240			2265		
	2280	MONTROSE GROUP	MAUREEN FM. EQ.		2279	
CRET.	MAASTRICHTIAN		SHETLAND GROUP			
	EARLY MAASTRICHTIAN	2340				
	LATE CAMPANIAN	2460				
	MIDDLE CAMPANIAN (CAMP II)	2490				
	EARLY CAMPANIAN (CAMP III)	2550				2575
	2573					
JURASSIC	BAJOCIAN	2608	BRENT GROUP	NESS	2615	
				ETIVE/RANNOCH	2626	
	LATE TOARCIAN-AALENIAN	2663		OSEBERG	2670.5	
	TOARCIAN	2770	DUNLIN GROUP	DRAKE		
	EARLY TOARCIAN	2841		COOK	2854	
	PLIENSBACHIAN			AMUNDSEN	2922	
		3040				3052.5
	UNDATED			STATFJORD FORMATION		
		TOTAL DEPTH:				
		DRILLER:3100m LOGGER:3107m				

30/6-21  
FINAL WELL  
REPORT

Fig.  
3.2-1

BIO- AND  
LITHOSTRATIGRAPHY





4 HYDROCARBON SHOWS

The evaluation of hydrocarbon shows at the wellsite was carried out in a conventional manner. Below 665 m a total gas detector and a gas chromatograph were operational for automatic and continuous gas analysis. chromatograph values were recorded as ppm by volume of C1 through C5.

4.1 Gas Records

The gas record together with the mud weight and estimated pore pressure are summarized on the diagram at the back of this section:

665-1720 m (17 1/2" section)

This section was drilled with a mud weight of 1.35 rd. The pore pressure was normal hydrostatic, 1.03 rd. The background gas read between 0.03-0.21%, all C1.

1720-2075 m (12 1/4" section)

The mud weight was raised to 1.50 and kept constant for the 12 1/4" section. The pore pressure increased gradually and reached approximately 1.2 rd at the base of this interval. The total gas varied between 0.03-0.35%, C1.

2075-2235 m (12 1/4" section)

The pore pressure slightly increased down the section, and the amount of back ground gas generally read higher, varying between 0.2-1% mostly C1, locally also C2 and C3 were recorded.

2235-2575 m (12 1/4" section)

This interval covers the basal part of the Tertiary and the Cretaceous strata. The pore pressure still increased and reached 1.31 rd at the lower part. The total gas was recorded between 0.3-1.2% C1 and C2, occasionally C3. The mud weight was kept at 1.50 rd.

2575-2670 m(8 1/2" section)

This interval is the Brent Group. The pore pressure was measured by RFT to approximately 1.13 rd at the top of the reservoir. The mud weight was lowered to 1.36 rd and kept at that level for this section. The total gas read from 0.4% up to 2.6% with all components from C1 through IC4, NC4 being present.

2670-3100 m TD (8 1/2" section)

This interval comprises the Dunlin Group and the Statfjord Formation. The pore pressure was recorded at approximately 1.18 rd in the Cook Formation and slightly lower in the Statfjord Formation. The amount of background gas dropped significantly and read between 0.03-0.5% C1 with C2 and C3 only occasionally being present.

4.2 Oil Stain and Fluorescence

Hydrocarbon shows on cuttings and core chips were evaluated according to Norsk Hydro's Wellsite Geologists Manual.

Due to contamination caused by the oil based drilling fluid only oil shows seen on core chips are described here.

2575-2615\_m\_Ness\_Formation

Shows on Sandstones: brownish to dark yellowish oil stain, petroliferous odour, 100% moderately strong to strong yellowish to bright yellow direct fluorescence, generally strong instant to fast streaming, locally slow streaming, yellowish white to milky white fluorescence cut, dark straw to amber visible cut, strong yellowish white fluorescence residual, non to locally straw visible residual.

2615-2670.5\_m\_Etive/Rannoch/Oseberg\_Formations

Shows on Sandstones: yellowish brown to dark yellowish brown oil stain, petroliferous odour, 100% bright yellowish direct fluorescence, strong instant milky white to yellow white fluorescence cut, straw to locally dark amber visible cut, strong yellowish white to milky white fluorescence residual, straw visible residual.

# WELL 30/6-21

m	Group	Fm	Lith.	Gas	Mw	EPP	CSG
	NORDLAND GROUP			Drilled with returns to seabed			30" 221
			UTSIRA			1.03	20" 665
1000	HORDALAND GROUP		M	0.03-0.21% all C1	1.35		
			M				
			H	0.01-0.35% all C1			13 3/8" 1698
			H			1.05-1.1	
2000	ROGA-LAND GP	BALDER	V			1.1-1.2	
		SELE	H	0.2-1% C1 occ C2, C3	1.50		
		LISTA	H			1.2-1.31	
	SHETLAND GP		H	0.3-1.2% C1, C2 occ C3			9 5/8" 2544
	BRENT GP	NESS/ ETIVE/ OSEB.	C	0.4-2.6% C1-C4		1.13	
	DUNLIN GP	DRAKE	H				7" 2856
		COOK	C	0.03-0.5% C1 occ C2, C3	1.36		
		AMUNDSEN	H				
3000		STATFJORD FM	/ / / /	3100m T.D.			

5 CORING

5.1 Conventional Cores

The coring operations were carried out with a 180 feet core barrel with fiberglass innerbarrels. A total of four cores were cut in the well covering the whole of the Brent Group.

Cored interval: 2563-2669 m (driller's depths)  
 Brent Group : 2575-2670.5 m (logger's depths)

Core no	Cut interv. m	Rec. interv. m	Recovery m	%	Lithology/ shows
1	2563-2581	2563-2580.3	17.3	96	Claystones, interbeds of Sandstones and occasionally Coaly Shale and Siltstone.
2	2581-2597	2581-2596.67	15.67	98	a/a.
3	2597-2652	2597-2651.9	54.9	100	a/a down to appr. 2609 m. Sandstones below.
4	2652-2669	2652-2668.84	16.84	99	Sandstones down to appr. 2665 m. Siltstones below. Good oil shows on Sandstones in all cores.

The wellsite core descriptions and wellsite core log can be found in Appendix I.

5.2 Sidewall Cores

Sidewall cores were taken in the Dunling Group and the Ståtfjord Formation over the interval 2672-3094.5 m.

A total of 30 sidewall cores were recovered out of 30 asked for (100%). The average size of the cores were approximately 2 cm.

The sidewall core descriptions can be found in Appendix II.

6 WIRELINE LOGGING

The following list is a summary of the wireline logs run in the well 30/6-21 and shows the date, logged intervals and number for each log.

LOG TYPE	DATE	LOGGED INTERVAL		RUN NO
DIL/LSS/GR/CAL (GR to seabed)	06.03.87	650-1720	m	1A
DIL/LSS/GR/CAL	12.03.87	1701-2564	m	2B
DIT-E/SDT/GR	17.03.87	2543-2671	m	3A
DIL/LSS/GR	20.03.87	2600-3105	m	4C
LDL/CNL/GR	12.03.87	2234-2566	m	2A
LDL/CNL/GR	17.03.87	2543-2673	m	3B
LDL/CNL/NGT/GR/CAL	20.03.87	2540-3106	m	4C
CBL/VDL/GR	12/13.03.87	1275-1701	m	2A
CBL/VDL/GR	21.03.87	2135-2543	m	4B
CBL/VDL/CET/GR (GR to 2515 m)	25/26.03.87	2393-2770	m	4C
EPT	20.03.87	2545-2950	m	4A
RFT (pressure tests)	17/18.03.87	2578-2660	m	3A
RFT (sample)	17/18.03.87	2660	m	3B
RFT (sample)	17/18.03.87	2619	m	3C
RFT (sample)	21.03.87	2590	m	4D
RFT (pressure tests)	21.03.87	2590-2665	m	4D
RFT (pressure tests)	21.03.87	2617-3093	m	4E
CST	22.03.87	2672-3094.5	m	4A
VSP	24.03.87	1230-2760	m	4A
MWD RES/GR (Exlog)		137-1720	m	

APPENDIX I  
Core descriptions (Core 1-4)  
Wellsite core log





Well no.		Core report			Core no.s
30/6-21					1
Interval		Area	Cut	Date	
2563-2573 m		Oseberg	2563-2581 m	15.03.87	
Scale		Well R.K.B.	Recovery	Geologist	
1:50		25 m	2563-2580.3 m, 96%	Midtkandal/ Giskeødegaard	
Depth scale	Recovery	Lithological column	Depths	Lithological descriptions	Shows
2563m		" C " M		<b>Clyst:</b> gy blk, v hd, blk, non calc, micromic, carb, loc streaks of micropyr, loc sity.	
2564		" C " * □			
2565		" " M " " M C		a/a sity lenses	
2566		" " M C			
2567		" C " * □		<b>Clyst</b> a/a micropyr, poss Glau.	
2568		" " M " " M " " □			
2569		" " M " " M " " C " " C		<b>Clyst:</b> olv blk, hd, subfis, non calc, carb, sity in lenses, loc gy blk - blk and v carb in lam. Smooth slickenside surfaces.	
2570		C M " " C			
2571		. . . . C . . . M		<b>Set:</b> brn - dk yel stn, transp - transl, occ smky Qtz, f - vf, pred f, subang - subrnd, fair srted, mod hd - fri, silic cmt, loc arg "dirty", tr carb, mica, pr vis por.	Petr Odour, 100% mod strong yel - yel orng dir flu, strong fast strng yel wh flu cut, dk amber vis cut, strong yel flu resd, dk brn vis resd.
2572		" C M		<b>Clyst:</b> olv gy - m gy, hd, blk, non calc, micromic tr carb, sl sity.	
2573	. . . .				
Well 30/6-21		Core report 1 of 2			Core no.s 1



Well no.		Core report			Core no's	
30/6-21					1	
Interval 2573-2581 m		Area Oseberg		Cut 2563-2581 m	Date 15.03.87	
Scale 1:50		Well R.K.B. 25 m		Recovery 2563-2580.3 m, 96%	Geologist Midtkandal/ Giskeødegaard	
Depth scale	Recovery	Lithological column	Depths	Lithological descriptions	Shows	
2573m				<b>Sst:</b> yel brn stn, trnsp - trnsl Qtz, vf - f, subang - subrnd, mod srtd, mod hd - fri, silic cmt, occ cly mtx, loc arg, carb, mica, poor vis por.	Petr odour, 100% strong yel wh dir flu, strng inst mlky wh flu cut, dk straw vis cut, amber vis resd, strng yel wh flu resd.	
2574				<b>Sst:</b> a/a f - vf, pred f.		
2575				<b>Clyst:</b> olv gy, hd, blk, non calc, sl micromic, microcarb, smooth surfaces.		
2576				<b>Clyst:</b> olv blk, hd, blk - subfis, non calc, sl micromic, carb - coal frags.		
2577				<b>Clyst:</b> a/a coal frags in lam, micropyr		
2578				<b>Clyst:</b> olv gy, hd, subfis, non calc, coal frags, micromic, smooth surfaces.		
2579				<b>Clyst/Coaly sh:</b> olv blk - blk, hd, fri, fis, micromic, v carb - coal lam.		
2580				<b>Sst:</b> lt olv gy Qtz, vf, ang - subrnd, w srtd, hd, silic and micropyr cmt, carb, micromic, no vis por, root structures. <b>Sst:</b> yel brn stn, f - vf, pred f. mod hd - fri, fair srtd, pt silica cmt, pt kao mtx, fair vis por, bcm vf with arg lam.		
2580.3 m						
2581			Not recovered	2581,0 m		
Well 30/6-21		Core report 2 of 2			Core nos 1	



Well no		Core report			Core nos
30/6-21					2
Interval		Area	Cut	Date	
2581-2591 m		Oseberg	2581-2597 m	16.03.87	
Scale		Well R.K.B.	Recovery	Geologist	
1:50		25 m	2581-2596.67 m, 98%	Giskeødegaard / Midtkandal	
Depth scale	Recovery	Lithological column	Depths	Lithological descriptions	Shows
2581m		 · · C		<b>Sst:</b> olv gy - dusky yel brn, hd - mod hd, blk, non calc, sl micromic, tr carb, loc vf sdy.	No shows.
2582		M C Λ		<b>Clyst:</b> lt olv gy - olv gy, hd, subfis - fis, non calc, tr carb, loc plnt frag, sl micromic.	
2583		 M □		<b>Clyst:</b> dv gy, hd, blk, non calc, tr carb, tr pyr, sl stty, tr micromic.	
2584		 M C		<b>Clyst:</b> a/a	
2585		· · · · M C		<b>Sst:</b> yel brn, clr - milky Qtz, f - m, subang - subrnd, fair - mod srted, mod hd - frm, occ silic cmt, occ cly mbx, tr mica, loc arg, fair vis por.	<b>Shows:</b> strong, petr odour, yel brn strn, 100% bri yel dir flu, strng inst - fast strng wh yel flu cut, dk straw vis cut, yel wh flu resd, straw vis resd.
2586		· · · · M		<b>Sst:</b> vf - f, occ in else a/a.	<b>Shows</b> a/a.
2587		<del>· · · ·</del> C Λ		<b>Coal:</b> blk - brn blk, hd, shiny, blk, occ brit, loc grdg <b>Coaly sh,</b> subfis - fis.	
2588		M Λ Λ C		<b>Clyst:</b> olv gy, mod hd, subfis - fis, non calc, tr carb, occ plnt frag, tr micromic.	
2589		C M		<b>Clyst:</b> a/a also loc tr stty.	
2590		M Λ		<b>Clyst:</b> brn gy - dusky yel brn, subfis - fis, occ slick, non calc, tr carb frag.	
2591		C			
Well 30/6-21		Core report 1 of 2			Core nos 2



Well no.		Core report			Core no s	
30/6-21					2	
Interval 2591-2597 m		Area Oseberg	Cut 2581-2597 m		Date 16.03.87	
Scale 1:50		Well R.K.B. 25 m	Recovery 2581-2596,67 m, 98%		Geologist Giskeødegaard/ Midtkandal	
Depth scale	Recovery	Lithological column	Depths	Lithological descriptions	Shows	
2591m		C ~		<b>Clyst:</b> brn gy - dusky yel brn, subfis - fis, occ slick, non calc, tr carb frag.	No shows.	
2592		" " " "		<b>Sst:</b> m gy - olv gy, mod hd, blk, micromic, tr carb, loc arg grdg. <b>Clyst,</b> occ vf sdy.		
2593		" " " "		<b>Clyst:</b> olv gy-brn gy, hd - mod hd, subfis - blk, occ sl slick, non calc, tr carb, tr pint frag, tr micromic, tr slty.		
2594		" " " "		<b>Clyst</b> a/a		
2595		" " " "		<b>Clyst:</b> lt gy - olv gy, hd, blk, occ subfis, tr carb, v micromic, v mica, occ slty.		
2596		" " " "		<b>Sst:</b> lt gy - mod brn, clr - miky Qtz, vf, subang - submd, gd srted, frm - occ mod hd, occ silic cmt, pred cly mbx, loc arg, mica in lam, tr carb, pr vis por.		<b>Shows:</b> petr odour, spty str, spty w yel dir flu, slo strng bl wh flu cut, lt amber vis cut, bl wh flu resd, no vis resd.
2596.67 m		Not recovered		<b>Sst:</b> olv gy, hd, blk, non calc, micromic, occ lam of vf <b>Sst</b> a/a		No shows.
2597						
Well 30/6-21		Core report 2 of 2			Core no s 2	



Well no.		Core report			Core no's
30/6-21					3
Interval 2597-2607 m		Area Oseberg	Cut 2597-2652 m		Date 16.03.87
Scale 1:50		Well R.K.B. 25 m	Recovery 2597-2651.9, 100%		Geologist Midtkandal/ Giskeødegaard
Depth scale	Recovery	Lithological column	Depths	Lithological descriptions	Shows
2597m		"		<b>Clyst:</b> olv blk, hd, blk, non calc, rr carb, sl micromic.	
2598				<b>Sh:</b> dk gy - olv blk, hd, brit, fis, non calc, carb, micromic. int lam <b>Sst</b> , v <b>ast</b> , carb.	
2599		"		<b>Clyst:</b> dusky yel brn w/irr lam of coal.	
2600				Lam <b>Sst</b> /v <b>Sst</b> : dk gy - gy, hd, fis, non calc, v micro - mic, carb.	
2601				<b>Coal sh:</b> gy blk - blk, hd, fis, brit, non calc, sl micromic.	
2602				<b>Clyst sh:</b> olv blk, sfty.	
2603				<b>Clyst:</b> olv blk m/coal frags.	
2604		"			
2605				<b>Clyst</b> a/a, irr lam, coal frags.	
2606				<b>Sst:</b> dk yel brn stn, cir, miky, smoky Qtz f, subang - subrnd, w srted, silic cmt, occ kao mtx, carb, mica, pr vis por.	100% strong yel dir flu, strong inst - fast strmg milky wh flu cut, straw vis cut, strong yel flu resd, straw vis resd.
2607					
Well 30/6-21		Core report 1 of 6			Core nos 3



Well no.		Core report			Core nos
30/6-21					3
Interval		Area	Cut	Date	
2607-2617 m		Oseberg	2597-2652 m	16.03.87	
Scale		Well R.K.B.	Recovery	Geologist	
1:50		25 m	2597-2651.9 m 100%	Midtkandal/ Giskeødegaard	
Depth scale	Recovery	Lithological column	Depths	Lithological descriptions	Shows
2607m				<b>Clyst:</b> olv blk, hd, fis - subfis, non calc, carb, micromic, pyr, plant frags, sity.	
2608				<b>Clyst</b> a/a, blk.	
2609			2609 m	<b>Sst:</b> dk yel brn stn, clr, milky, fro, smky Qtz, m - f, pred m, subang - subrnd, fair srted, hd - fri, w silic cmt, loc arg mtb, rr glau, occ carb, mod - fair vis por.	on <b>sst:</b>
2610				<b>Sst:</b> Qtz a/a bimodal vf and m - crs pred m, <b>Clyst</b> lam; olv blk hd.	
2611				<b>Sst:</b> lt olv gy, Qtz a/a f - m, pred m, abn kao mtb.	
2612			2612 m	<b>Sst:</b> yel brn stn, Qtz a/a, m - crs, pred m, subang - subrnd, pr - fair srtg, mod hd fri, silic cmt, loc kao mtb, rr glau, tr mica, fair vis por.	oil stn, petr odour, 100% bri yel dir flu, strong inst milky wh flu cut, dk straw - amber vis cut, strong yel wh flu resd, straw vis resd.
2613				a/a m, w srted	
2614				a/a f - vcrs, pred m - crs.	
2615				a/a crs - vcrs, occ pbls.	
2616				a/a f - crs, pred m, tr mica.	
2617			a/a vf - pbls		
Well		Core report			Core nos
30/6-21		2 of 6			3



Well no		Core report			Core no s
30/6-21					3
Interval 2617-2627 m		Area Oseberg	Cut 2597-2652 m	Date 16.03.87	
Scale 1:50		Well R.K.B. 25 m	Recovery 2597-2651.9 m 100%	Geologist Midtkandal/ Giskeødegaard	
Depth scale	Re- covery	Lithological column	Depths	Lithological descriptions	Shows
2617m				<b>Set:</b> yel brn stn, cl, milky, smky, fros. Qtz, vf - crs, pbls, subang - subrnd, pr srt'd, mod hd - fri, silic cmt, tr kao mtx, loc glau, gd vis por.	Oil stn, petr odour, 100% strong yel - yel wh dir flu, strong inst milky wh flu cut, dk straw vis cut, strong yel wh flu resd, straw vis resd.
2618					
2619				a/a f-m, crs, mod vis por.	
2620				a/a m-f, pred m.	
2621				a/a	
2622				a/a f - vcrs pred m - crs.	
2623				a/a pred m - crs.	
2624				a/a m - crs, arg lam	
2625				a/a f - pbly, pred crs.	
2626				a/a m - crs.	
2627			a/a m - vcrs, tr glau, com kao.		
Well 30/6-21	Core report 3 of 6			Core no s 3	



Well no.		Core report			Core nos
30/6-21					3
Interval		Area	Cut	Date	
2627-2637 m		Oseberg	2597-2652 m	16.03.87	
Scale		Well R.K.B.	Recovery	Geologist	
1:50		25 m	2597-2651.9 m 100%	Midtkandal/ Giskeødegaard	
Depth scale	Re- covery	Lithological column	Depths	Lithological descriptions	Shows
2627m					
2628				Set: yel brn str, clr, milky, fros, smky Qtz, f - crs, pred m, subang - subrnd, pr srted, mod hd - fri, silic cmt, tr kao mbx, rr glau, occ tr mica, rr carb, fair - gd vis por, loc arg lam.	Oil str, ptr odour 100% gen strong, bri yel - yel dir flu, strong inst yel wh - milky wh flu cut, straw - loc amber vis cut, strong yel wh - milky wh flu resd, straw vis resd.
2629					
2630				a/a m - crs, tr v crs.	
2631				a/a f - vcrs, pred m - crs.	
2632				a/a f - crs, pred m - crs.	
2633				a/a pred m	
2634				a/a f - vcrs, pred m - crs.	
2635				a/a	
2636				a/a f - pbis, pred m - crs.	
2637				a/a pred m - crs.	
Well 30/6-21		Core report 4 of 6			Core nos 3





Well no.		Core report			Core nos
30/6-21					3
Interval		Area	Cut	Date	
2637-2647 m		Oseberg	2597-2652 m	16.03.87	
Scale		Well R.K.B.	Recovery	Geologist	
1:50		25 m	2597-2651.9 m 100%	Midtkandal/ Giskeødegaard	
Depth scale	Recovery	Lithological column	Depths	Lithological descriptions	Shows
2637m		• • • M		<p>Sst: yel brn str, clr mlky smky, fros Qtz, f - v crs, loc pbly, subang - subrnd, pr - loc mod srted, mod nd - loc hd, fri, silic cmt, kao mxb in pt, rr glau, occ rr carb, loc tr mica, fair - gd vis por.</p> <p>a/a f - pbly.</p> <p>a/a f - crs, pred m - crs.</p> <p>a/a</p> <p>a/a</p> <p>a/a tr v crs</p> <p>a/a pbly pred crs</p> <p>a/a pred m - crs</p> <p>a/a</p>	<p>Oil str, petr odour, 100% strong bri yel yel dir flu, inst strong mlky wh - yel wh flu cut, straw - occ amber vis cut, strong yel wh, mlky wh flu resd, straw vis resd.</p>
2638		• • • C			
2639		• • • *			
2640		• • •			
2641		• • •			
2642		• • • *			
2643		• • • C			
2644		• • • M			
2645		• • •			
2646		• • •			
2647		• • •		a/a	
Well 30/6-21		Core report 5 of 6			Core nos 3



Well no. <b>30/6-21</b>		Core report			Core nos <b>3</b>	
Interval <b>2647-2652 m</b>		Area <b>Oseberg</b>	Cut <b>2597-2652 m</b>		Date <b>16.03.87</b>	
Scale <b>1:50</b>		Well R.K.B. <b>25 m</b>	Recovery <b>2597-2651.9 m 100%</b>		Geologist <b>Midtkandal/ Giskeødegaard</b>	
Depth scale	Recovery	Lithological column	Depths	Lithological descriptions	Shows	
2647m		C		<b>Set:</b> yel brn stn, cl; mlky, smky, fros Qtz, f - pbly, subang - subrnd, pr - loc fair srtg, mod hd, hd, fri, silic cmt, loc kao mtz, rr glau, occ rr carb, occ tr mica, fair - gd vis por.	Oil stn, petr odour, bri yel - yel dir flu, strong inst mlky wh - occ yel wh flu cut, straw amber vis cut, strong mlky wh - occ yel wh flu resd, straw vis resd.	
2648		.				
2649		.	M		a/a f - vcrs, pred m - crs	
2650		*			a/a pred m	
2651			.		a/a	
2652			.	2651.9 m 2652.0 m	a/a lt yel stn	
		Not rec.				
Well <b>30/6-21</b>		Core report <b>6 of 6</b>			Core nos <b>3</b>	



Well no.		Core report			Core no's
30/6-21					4
Interval		Area	Cut	Date	
2652-2662 m		Oseberg	2652-2669 m	17.03.87	
Scale		Well R.K.B.	Recovery	Geologist	
1:50		25 m	2652-2668.84 m 99%	Giskeødegaard/ Midtkandal	
Depth scale	Recovery	Lithological column	Depths	Lithological descriptions	Shows
2652 m				<b>Sst:</b> pl yel brn, clr, milky, smky Qtz, f - pbly, pred m, subang - subrnd, pr - loc mod srted, mod hd - frm, occ fri, silic cmted, loc kao mt x, rr glau, tr carb, tr mica, fair - gd vis por	<b>Shows:</b> yel brn oil stu, petr odour, bri yel dir flu, strong inst - fast strong milky - yel wh flu cut, ft amber vis cut, milky - yel wh flu resd, straw vis resd.
2653					
2654				<b>Sst a/a</b>	<b>Shows a/a</b>
2655				<b>Sst a/a</b> vf - m, occ crs	<b>Shows a/a</b>
2656				<b>Sst a/a</b> f - pbly, pred m	<b>Shows a/a</b>
2657				<b>Sst:</b> a/a pl yel brn - ltgy	<b>Shows a/a</b>
2658				<b>Sst:</b> ltgy, occ yel brn, clr, milky, smky Qtz, vf - pbly, subang - subrnd, pr - mod srted, mod hd - occ fri, silic cmted, loc kao mt x, occ calc cmt, tr mica, rr glau, no vis por.	<b>Shows:</b> spty eise a/a
2659				<b>Sst:</b> yel brn, clr - milky Qtz, vf - pbly, subang - subrnd, pr - mod srted, mod hd - occ fri, silic cmted, loc kao mt x, rr glau, tr carb, tr mica, fair - gd vis por.	<b>Shows:</b> yel brn oil str, petr odour, bri yel dir flu a/a.
2660					
2661				<b>Sst:</b> a/a	<b>Shows a/a</b>
2662					
Well 30/6-21		Core report 1 of 2			Core nos 4



Well no.		Core report			Core no's
30/6-21					4
Interval		Area	Cut	Date	
2662-2669 m		Oseberg	2652-2669 m	17.03.87	
Scale		Well R.K.B.	Recovery	Geologist	
1:50		25 m	2652-2668.84 99%	Giskeødegaard/ Midtkandal	
Depth scale	Recovery	Lithological column	Depths	Lithological descriptions	Shows
2662		• • • *		<b>Sst:</b> pl yel brn, clt, mlky, smky Qtz, vf - crs, occ pbly, subang - subrnd, pr - loc mod srted, mod hd - frm, occ fri, silic cmted, occ kao mxb, rr glau, rr carb, tr mica, fair - pred gd vis por.	<b>Shows:</b> yel brn oil str, petr odour, bri yel dir flu, strong inst - fast strng mlky - wh yel flu cut, lt amber vis cut, mlky - yel wh flu resd, straw vis resd.
2663		• • • C			
2664		• • • M		<b>f - pbly Sd g in clay mbc:</b> lt gy - olv gy, v hd - hd, blk, non calc, v mica, tr glau.	<b>No shows.</b>
2665		• • • M		a/a	<b>No shows.</b>
2666		• • • M		<b>Sst:</b> brn blk - olv blk, hd - mod hd, blk - subfis, non calc, micromic, pyr, tr carb, arg in lam grdg Sh, occ tr vf Sd.	<b>No shows.</b>
2667		• • • C			
2668		• • • M		<b>Sst a/a</b>	<b>No shows.</b>
2669		Not rec.	2668.84 m 2669.00 m		

SECTION B  
OPERATIONS

0010b  
sn, LTS

## LIST OF CONTENT

### SECTION B

	PAGE
1. LOCATION SURVEY	1
2. POSITIONING AND ANCHORING OF THE RIG	3
Fig. B-1: Mooring line pattern	4
3. OPERATION RESUME	
3.1 Summary Drilling	5
3.2 Production test summary	7
3.3 Daily report	10
3.4 Time distribution	29
Table B-1: Time distribution	30
Fig. B-2: Time distribution	32
Table B-2: Deviation report	33
4. TEMPORARY ABANDONMENT OF THE WELL	35
Fig. B-3: Temporary abandonment	36
5. PORE PRESSURE, AND FORMATION INTEGRITY AND TEMPERATURE GRADIENT PROGNOSIS	
5.1 Pore pressure	37
Fig. B-4: Pore pressure, Mud density and formation integrity results	39
Fig. B-5: Temperature profile	40
Table B-3: Pore pressure	41
Table B-4: Formation integrity tests	43

	<u>PAGE</u>
6. MATERIALS REPORT	44
Table B-5: Main consumption casing and wellhead	45
Table B-6: Main consumption cement and additives	46
Table B-7: Bit record	48
Table B-8: Bottom hole assembly	49
6.1 Mud reports	51
Table B-9: Daily mud properties	53
Table B-10: Mud material consumption	55
Table B-11: Cement reports	57
7. TOTAL COST REPORT	59
8. DRILLING EQUIPMENT FAILURES AND PROBLEMS	61
9. DRILLING PROGRESS CURVES	
Fig. B-6: Prognosed and actual drilling curves	63
Fig. B-7: Progress curve	

1. LOCATION SURVEY

The site survey for the 30/6-21 was performed between 16th January and 30th January 1987, by A/S GEOTEAM using the survey vessel M/V "GEO Surveyor"

The coordinates for the well were given as:

Latitude: 60° 38' 35,7" N

Longitude: 02° 43' 46.8" E

The purpose of the survey was to obtain bathymetric in formations and to detect any seabed obstructions or sub-seabed hazards to drilling operations.

Echo-sounder and side scan sonar equipment were used to map bathymetry and seabed features.

A deep tow sparker and an analog sparker were used to investigate the shallow strata. A digital recorded airgun was used to investigate the deeper strata.

A survey area of 4 km x 2.3 km was covered.

The results of the site survey was summarized as follows:

- Depth at well location was 112 m.
- The seabed was composed by featureless fine sand.
- The seabed slope was negligible.
- None seabed hazards were observed.



- The shallow geology was subdivided into the following intervals:

112	-	123 m :	Sand
123	-	133 m :	Clay
133	-	139 m :	Sand-silt
139	-	300 m :	Clay
300	-	309 m :	Clay
309	-	332 m :	Clay with thin sand layer on top.
332	-	374 m :	Clay with thin sand layer on top.
374	-	674 m :	Soft claystone
674	-	840 m :	Sand

POSITIONING AND ANCHORING OF THE RIG.

The target of the well 30/6-21 was defined as column 379 on the seismic line NH 82-321. The well was to be spudded within an area of a radius of 50 m. Planned position of the well at surface:

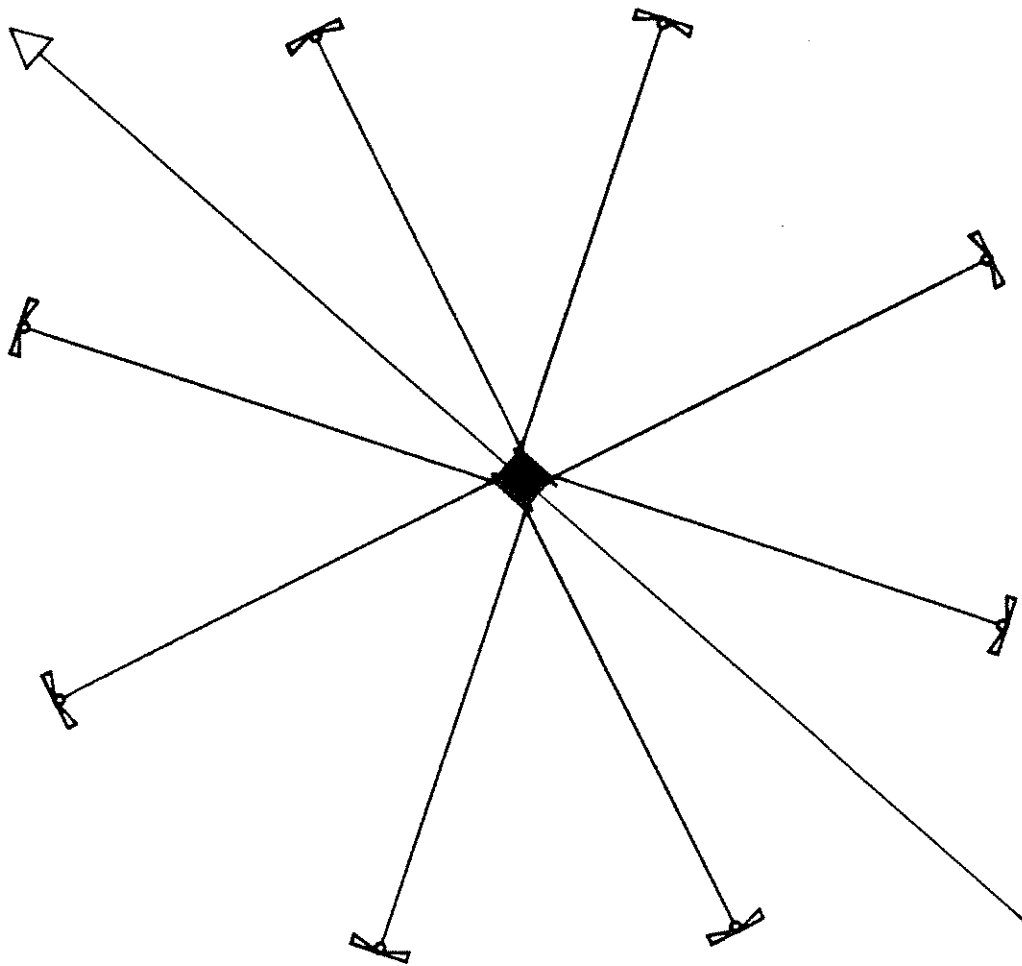
Geogr.	UTM
Lat: 60° 38' 35.70" N	6.723.241.3 m N
Long: 02° 43' 46.80" E	485.214.4 m E

The equipment onboard the rig for navigation and position were Syledis and Navstar. The satellite MX1502 navigation system was used to determine the final coordinates to be:

Geogr.	UTM
Lat: 60 38' 34.90" N	6.723.215.60 m N
Long: 02 43' 47.60" E	485.226.50 m E

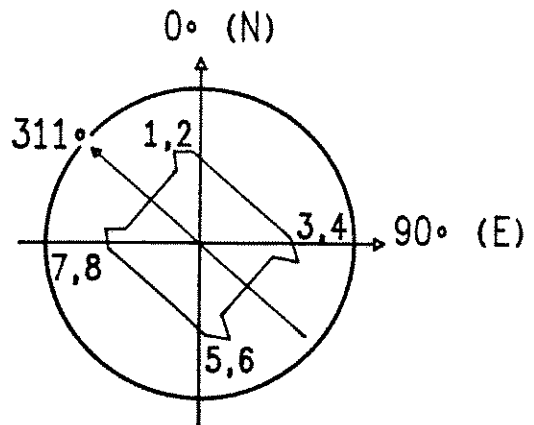
The rig heading was 311°.

Prior to drilling out of the 30" casing all the anchors were tension tested to 1557 kN. The mooring line pattern is shown in fig. B-1.



0 200 400 M

ANCHOR NO	DIRECTION DEGREES	LENGTH METERS
1	333	1062
2	18	1031
3	63	1116
4	108	1086
5	153	1071
6	198	1057
7	243	1114
8	288	1139



Norsk Hydro  
Drilling Department

Date:19870812

MOORING LINE PATTERN

VILDKAT

30/6-21

Fig.:  
B - 1

3. OPERATION RESUME

3.1 Drilling Summary  
-----

Vildkat arrived the location at 14:15 hrs , 21.02.87.

All depths referred to are measured depth, RKB.

36" Hole section  
-----

Ran the temporary guidebase and spudded the well at 14:35 hrs, 22.02.87. Drilled the 36" hole from 137 m to 225 m. The temporary guidebase tilted approximately 25-30° over. Pulled the temporary guidebase. Ran the 30" casing and cemented it back to the seabed, with the shoe at 221 m.

26" Hole section  
-----

Drilled a 12 1/4" pilot hole from 225 m to 665 m. Opened the pilot hole to 26" from 225 m to 664 m. Displaced the hole with 1.17 rd mud. Ran and cemented the 20" casing, with the shoe at 650 m.

Ran the riser and the BOP. Tested the casing and the BOP. Displaced the hole to oilbased mud.

17 1/2" Hole section  
-----

Drilled 3 m with 17 1/2" hole and performed a formation integrity test to 1.41 rd equivalent mud weight.

Drilled the 17 1/2" hole from 668 m to 1342 m. Fished for a lost part of the bottom hole assembly. Drilled the 17 1/2" hole from 1342 m to 1720 m. Ran the DIL/LSS/GR log. Performed a wipertrip. Ran and cemented the 13 3/8" casing with the shoe at 1704 m. Set a cement plug and tested the casing against this plug.

12 1/4" Hole section  
-----

Drilled the 12 1/4" hole from 1720 m to 1723 m, and performed a formation integrity test to 1.59 rd equivalent mud weight. Drilled the 12 1/4" hole from 1723 m to 2560 m. Ran the DIL/LSS/GR, LDL/CNL/CAL/GR and CBL/VBL log. Ran the 9 5/8" x 10 3/4" casing with the shoe at 2543 m. Displaced the hole to 1.35 rd mud.

8 1/2" Hole section  
-----

Drilled 3 m with 8 1/2" hole and performed a formation integrity test to 1.60 rd equivalent mud weight. Cut 4 cores from 2563 m to 2669 m. Ran the DIT-E/SDT/GR, LDT/CNT/NGT/CAL and 4 RFT logs.

Drilled the 8 1/2" hole from 2669 m to 3100 m. Ran the DIL/LSS/GR, LDT/CNT/NGT, EPT, CBL/VDL, 2 RFT logs and the CST log.

Set a balanced cement plug from 3100 m to 2860 m.

Ran and cemented the 7" liner with the shoe at 2856 m and the top of the PBR at 2388 m.

Cut the mudweight to 1.25 rd.

Ran the VSP and the CBL/VDL/CET/GR log.

3. PRODUCTION TEST SUMMARY

Ran 5" modified drillpipe Crossed over to the fluted hanger. Had a painted joint on top to verify the position of the rams related to the hang off point. Pulled out and racked the 5" modified drill pipe back in the derrick. Performed an extensive VSP logging programme and a CBL/VDL/CET/GR-logging run. Tested the BOP before the junkbasket and gaugering was run.

DST No. 1

Ran the test-string with 2 Flopetrol SDP gauges and 2 Matre MURR-1 gauges in bundle carriers. Performed pressure and function tests. The OMNI-RS circulating valve was cycled and pressure tested. During pressure testing of the surface equipment, leaks were experienced on the fail safe valve, chiksan and BJ unit.

Waited on weather. Rigged up Schlumberger and ran GR-tool for correlating. Had to pull out due to the flat ended bullnose was hung up in the slip joints. Replaced the same and ran in the hole again. Turned the tubing by using tubing tong, and set packer 0,2 m high (heave 2,0 m). Opened the tester valve and pressured up the tubing to 370 bar. Perforated from 2645,3 m to 2657,3 m. Opened the well and increased the choke to 52/64" fixed. Switched the flow through the separator. Got carry over at the separator. Reduced the choke size to 40/64" choke. Performed a build-up. The pump for the control hose to the Subsea test tree started to compensate for pressure drop on the ball opening line. No defaults were observed at the surface. Bullheaded the string volume to the tester-valve. Closed the testervalve and observed the well for 30 min. Opened the OMNI-RS circulating valve and reverse circulated 2 x tubing volume. Made several attempts to hydraulically unlatch the Subsea test tree. Rotated the tubing 12 turns and mechanically unlatched the Subsea test tree.

Pulled out the landing string and installed the back-up latch mechanism. Latched on the Subsea test tree again, but were unable to operate the ball-valves. Bullheaded the volume from the tester-valve to the perforations. Had to increase the pumping pressure to 200 bar, which was above the fracture pressure, to inject sufficient volume of mud to stabilize the well. Cycled the circulating valve to open position, pulled the packer loose and reverse circulated. Pulled the string until the Subsea test tree was above the rotary. The o-rings in the latch-mechanism were badly damaged. Installed new o-rings in the latch mechanism and the bottom part of the Subsea test tree. Ran the string again. Set the packer by using slips and rotary. Pressure tested the surface equipment. Opened the well and performed a short clean-up flow. Prepared for running gauges. Damaged the seal surface on the BOP's connection while stabbing this onto the Surface test tree. Tried to sort out the problems, including fishing gauges which dropped down to the lub. valve when the lub. section bent over. Prepared to perform the clean-up flow while waiting for a new BOP, but were unable to light the pilot flare. Spent several hours sorting out problems on the ignition system, leak in propane hose and at the sparkplug. Performed the clean-up flow. Worked on the new BOP, but were unable to work up in the derrick due to the wind. Waited on the weather. Rigged up the wire line equipment, but bent the jar while lowering the lub-section onto the BOP. Ran in the hole with 2 x Flopetrol gauges and 1 x Matre gauge. Got stuck at 3879 m (on indicator). The wire line operator now realized that his depth indicator was in meters and his measuring wheel in feet. Jarred upwards and the wire-line came loose as normal. Changed the depth indicator to read feet and pulled out. The tools got stuck at 235 m indicated by the depth indicator. The wire-line operator hand jarred on the wire-line and reported that it was more likely the tool was stuck downhole rather than being in the lub. section.

Flowed the well to verify if there were any obstructions downhole. No obstruction was confirmed. The lub. valve was then closed and the wire line tools were found in the lub. section. The data recording from the gauges showed that the gauges were pulled upwards together with the running tool and lost when the tools were in the stuffing box. The gauges dropped and were found in the F-nipple when pulling the string.

Installed the surface read out gauge and performed the main flow and build-up.

Killed the well and pulled the tubing .



((( (ooo)	Daily report						Date
	System : Boredata Sandnes						28/9-1987
Norsk Hydro	Well: 30/6-21						
	Casing Size (in):	30	20	13 3/8	9 5/8	7	
	Setting depth m,MD:	221	650	1704	2543	2856	2

Report number	Mid. depth m,MD	Est. Pore Pressure (SG)	Mud dens. (SG)	Stop time	Short Summary
1	0	.00	1.05	08:00 14:30 20:00 24:00	Start of well 30/6-21. In transit to the new location. Dropped the anchors. Reran anchor no.2. Started to deballast the rig.
2	225	1.03	1.05	02:00 04:00  05:00 06:00 08:00 10:30 11:00 13:30 14:30 15:00 22:00 23:00 23:30 24:00	Continued to deballast the rig. Made up the J-slot tool to the temporary guide base. Made up guidelines no. 1 and 3. Ran the temporary guide base. Pulled out of the hole. Made up the 30'' casing running tool and set it back in the derrick. Made up a new bottom hole assembly and ran in the hole. Tested the MWD tool, ok. Continued to make up and run the bottom hole assembly. Worked on the top drive wrench assembly. Continued to stab into the temporary guide base. Took a survey, negative. Drilled the 36'' hole from 137 m to 225 m. Pumped 8 m3 high viscous pill every 10 m. Circulated 20 m3 high viscous mud around. Filled the hole with 60 m3 1.2 rd mud. Dropped a single shot survey. Pulled out of the hole to 10 m below the temporary guide base. Retrieved the single shot survey, misrun.
3	225	1.03	1.05	00:30 01:00 01:30 03:00 04:00 07:30	Ran in the hole to TD. Pumped 10 m3 high-viscous mud around. Filled the hole with 60 m3 1.5 rd mud. Dropped a single shot survey and retrieved the same. Pulled out of the hole with the bit to the sea level. The bit caught in guideline no 1. Rotated the bit free. Observed the temporary guide base with the ROV. The temporary guide base tilted approximately 25-30 degrees over. Made up the running tool for the temporary guide base. Ran in the hole and attempted to "J" into the temporary guide base, negative. Pulled out of the

((( (ooo)	D a i l y   r e p o r t					Date
	System : Boredata Sandnes					28/9-1987
Norsk Hydro	Well: 30/6-21					
	Casing Size (in):	30	20	13 3/8	9 5/8	7
	Setting depth m,MD:	221	650	1704	2543	2856

Report number	Mid. depth m,MD	Est.Pore Pressure (SG)	Mud dens. (SG)	Stop time	Short Summary
				08:30	hole. Lifted the temporary guide base with the guide lines. Moved the rig and set the temporary guide base on the seabed.
				11:00	Retrieved the temporary guidebase with the "J"-tool.
				14:30	Cleared the cellar deck and prepared the guidebase and the gimbal assembly.
				22:00	Rigged up and ran the 30'' casing.
				22:30	Pumped 30 m3 seawater. Pressure tested the cement line, ok.
				24:00	Mixed and pumped the cement. Displaced with seawater.
4	453	1.03	1.06	05:00	Waited on the cement. Reinstalled guidepost no.1.
				06:00	Released the running tool and pulled out of the hole.
				07:30	Laid down the 36'' bottom hole assembly.
				09:30	Made up the 12 1/4'' bottom hole assembly and ran in the hole.
				10:30	The wire broke on the two arm guide. Pulled out of the hole and installed a new line.
				13:30	Ran back in to the hole and stabbed into the 30'' housing. Continued to run in the hole. Drilled cement and cleaned out the rat hole to 225 m.
				14:00	Pumped 5 m3 high viscous mud and circulated out.
				15:30	Pulled out of the hole and laid down the hole opener.
				17:00	Ran in the hole to 225 m.
				24:00	Drilled the 12 1/4'' pilot hole from 225 m to 453 m.
5	665	1.03	1.17	06:30	Drilled the 12 1/4'' pilote hole from 453 m to 665 m.
				07:00	Pumped 20 m3 high viscous mud around.
				09:30	Pulled out of the hole.
				11:00	Made up a new bottom hole assembly and ran in the hole to 225 m.
				24:00	Opened the 12 1/4'' hole to 26'' from 225 m to 615 m.
6	664	1.03	.00	03:00	Opened the 12 1/4'' hole to 26'' from 615 m to 664 m.
				04:30	Pumped 20 m3 high viscous mud around.

((( (000)	Daily report					Date
	System : Boredata Sandnes					28/9-1987
Norsk Hydro	Well: 30/6-21	Casing Size (in):	30	20	13 3/8	9 5/8   7
	Setting depth m,MD:		221	650	1704	2543   2856
						2

Report number	Mid. depth m,MD	Est.Pore Pressure (SG)	Mud dens. (SG)	Stop time	Short Summary
				06:30	Displaced the hole with 195 m3 high viscous mud, 1.15 rd.
				07:00	Pulled out of the hole. Washed the well-head on the way out.
				09:00	Made up the cement head x-over on one stand HWDP and set the same back in the derrick.
				19:30	Made up the running tool to the 18 3/4'' housing and set the same back in the derrick. Function tested the hydraulic latch on the running tool.
				20:30	Rigged up and ran the 20'' casing .
				23:00	Circulated 100 m3 seawater around. Pressure tested the cementline.
				24:00	Cemented the 20'' casing. Dropped the dart. Pumped 2 m3 seawater. Sheared the plug. Displaced the cement.
7	664	1.03	1.35	00:30	Continued displacing the cement with seawater. Bumped the plug.
				01:30	Attempted to pressure test the casing, negative. Checked the surface equipment.
				07:30	Waited on the cement while observing the weather for running the BOP.
				08:30	Unlatched the 18 3/4'' wellhead running tool. Laid down the cement head. Pulled out of the hole and laid down the running tool.
				10:00	Laid down the 26'' bottom hole assembly.
				20:00	Rigged up and ran the BOP. Pressure tested the kill and choke line. Installed the diverter-housing and rigged down the BOP equipment.
				23:30	Made up a test plug and ran in the hole. Attempted to set the plug, negative.
				24:00	Pulled out of the hole. Removed the J-in bolts in the test plug.
8	727	1.04	1.35	01:00	Removed the test sub in the test string. Ran in the hole with open pipe. Attempted to set the plug, negative.
				02:30	Pulled out of the hole. Changed seal on the test tool. Closed the shear ram and pressure tested to 1.41 rd equivalent mud weight. Ran in the hole with the test plug and set the same.
				08:30	Ran the BOP and tested the accoustic control system.

((( (ooo) ----- Norsk Hydro	D a i l y   r e p o r t						Date 28/9-1987
	System : Boredata Sandnes						
	Well: 30/6-21	Casing Size (in):	30	20	13 3/8	9 5/8	7
	Setting depth m,MD:	221	650	1704	2543	2856	2

Report number	Mid. depth m,MD	Est.Pore Pressure (SG)	Mud dens. (SG)	Stop time	Short Summary
				09:30	Pull tested the plug. Broke and laid down the same.
				10:30	Installed the nominal bore protector.
				11:30	Made up the hang off tool and set it back in the derrick.
				12:00	Tested the topdrive valve and the hose.
				15:30	Made up the 17 1/2" bottom hole assembly and ran in the hole.
				17:00	Drilled the shoe track from 632 m to 650 m.
				18:30	Displaced the hole to oilbased mud.
				19:00	Cleaned the rat hole and drilled 3 m new formation.
				19:30	Circulated and conditioned the mud.
				20:30	Performed a formation integrity test to 1.41 rd equivalent mud weight.
				24:00	Took slow circulating rate and drilled the 17 1/2" hole from 668 m to 727 m.
9	1115	1.04	1.36	19:00	Drilled the 17 1/2" hole from 727 m to 1115 m.
				20:00	Prepared for hang off. Circulated bottoms up.
				22:00	Slugged the pipe and pulled out of the hole to 6 stands above the shoe.
				24:00	Made up the kelly valve, inside BOP, screen and hang off stand. Ran in the hole and hung off the string on the middle pipe ram. Pulled out of the hole. Installed the guide on the hang off stand and racked back in the derrick.
10	1115	1.04	1.35	23:30	Took the rig to survival draft. Prepared for disconnecting. The wire on riser tensioner no.1 broke. Disconnected.
				24:00	Waited on the weather. Ran the lower marin riser package on the stack and latched on.
11	1288	1.04	1.36	02:30	Landed the diverter and latched on the same. Displaced the riser to mud. Ran in the hole, retrieved the hang off tool with string and pulled out of the hole. Started to run in the hole. Function tested the BOP.
				04:30	Continued running in the hole to TD.
				16:30	Continued drilling the 17 1/2" hole from 1115 m to 1288 m.

D a i l y   r e p o r t

Date  
28/9-1987

System : Boredata Sandnes

((  
(ooo)

Norsk  
Hydro

Well: 30/6-21

Casing Size (in): | 30 | 20 | 13 3/8 | 9 5/8 | 7 |  
Setting depth m,MD: | 221 | 650 | 1704 | 2543 | 2856 |

2

Report number	Mid. depth m,MD	Est.Pore Pressure (SG)	Mud dens. (SG)	Stop time	Short Summary
				17:00	Circulated to clean the hole. Slugged the pipe.
				19:30	Pulled out of the hole.
				20:00	The shearpins on the upper racking arm on the pipe handling system was broken. Repaired the same.
				20:30	Continued pulling out of the hole.
				21:00	Attempted to recover the log from the MWD tool, negative.
				24:00	Laid down the MWD tool. Picked up a new MWD tool and ran in the hole. Tested the MWD tool and continued to run in the hole.
12	1351	1.04	1.35	01:30	Continued to run in the hole to TD.
				06:30	Drilled 17 1/2" hole to 1342 m. Took a survey at 1288 m. MWD failure occurred at 1309 m. Sudden loss of weight on the weight indicator.
				08:00	Circulated to clean the hole.
				10:00	Slugged the pipe. Pulled out of the hole. Found the up-jar parted due to stress in the relieve groove.
				13:00	Made up the fishing assembly. Ran in the hole to 1200 m.
				14:00	Established circulation and engaged the fish at 1210 m.
				19:00	Pulled out of the hole with the fish.
				23:30	Ran in the hole. Tested the MWD tool. Continued to run in the hole to TD.
				24:00	Drilled the 17 1/2" hole from 1342 m to 1351 m.
13	1720	1.04	1.36	21:30	Drilled the 17 1/2" hole from 1351 m to 1720 m.
				23:30	Circulated the hole clean.
				24:00	Dropped the multishot, slugged the pipe and pulled out of the hole.
14	1720	1.04	1.36	05:00	Continued to pull out of the hole. Retrieved the multishot.
				06:00	Rigged up Schlumberger.
				11:30	Run Schlumberger, (GR, Resistivity, Sonic and Caliper log)
				12:00	Rigged down Schlumberger.
				13:30	Ran in the hole and retrieved the wearbushing.
				14:00	Washed the wellhead and pulled out of

((( (ooo) ----- Norsk Hydro	D a i l y   r e p o r t					Date 28/9-1987
	System : Boredata Sandnes					
Well: 30/6-21						
Casing Size (in):   30   20   13 3/8   9 5/8   7						
Setting depth m,MD:   221   650   1704   2543   2856						

Report number	Mid. depth m,MD	Est. Pore Pressure (SG)	Mud dens. (SG)	Stop time	Short Summary
				16:00	the hole. Made up the hanger and set it back in the derrick.
				24:00	Waited on the weather. Ran the wear bushing.
15	1720	1.04	1.36	03:00	Waited on the weather.
				04:00	Picked up the cement kelly and dressed the same. Laid down the cement kelly on deck.
				07:30	Ran in the hole for a wipertrip.
				09:00	Circulated bottoms up. Slugged the pipe.
				12:00	Pulled out of the hole.
				14:00	Made up a jet sub and ran in the hole with 5 stands. Made up the wearbushing running tool. Ran in and retrieved the same. Washed the wellhead and pulled out of the hole with the string.
				24:00	Rigged up and ran the casing.
16	1720	1.04	1.50	03:30	Continued to run the 13 3/8" casing.
				05:00	Broke the circulation and pumped the casing volume.
				06:30	Attempted to pressure test the cement lines. Observed a leak on the chicsan elbow on the cement hose. Changed the same.
				07:30	Pumped the spacer. Mixed and pumped the cement.
				09:00	Displaced the cement. The plug did not bump. Checked for backflow.
				09:30	Set and tested the seal assembly.
				12:00	Tested the BOP.
				13:30	Retorqued the seal assembly. Laid down the cement kelly. Pulled the landing string.
				14:30	Ran and set the wearbushing. Pulled out of the hole.
				15:00	Tested the lower kelly cock and the stand pipe.
				17:30	Made up a new bottom hole assembly and ran in the hole.
				18:00	Attempted to test the casing against the shear ram.
				19:00	Pulled out of the hole with the bottom hole assembly.
				21:30	Ran in the hole with open ended drill

((( (ooo)	D a i l y   r e p o r t					Date
	System : Boredata Sandnes					28/9-1987
Norsk	Well: 30/6-21					
Hydro	Casing Size (in):	30	20	13 3/8	9 5/8	7
	Setting depth m,MD:	221	650	1704	2543	2856
						2

Report number	Mid. depth m,MD	Est. Pore Pressure (SG)	Mud dens. (SG)	Stop time	Short Summary
				23:00	pipe. Broke the circulation. Tested the cement lines to 300 bar. Closed the middle pipe ram. Attempted to pressure test the 13 3/8" casing.
				24:00	Set a balanced cement plug from 1668 m to 1613 m.
17	1723	1.04	1.50	00:30	Pulled 5 stands and reversed out.
				01:30	Cut and slipped the drilling line.
				03:00	Pulled out of the hole.
				07:00	Waited on the cement. Tested the casing.
				08:30	Made up the bottom hole assembly and ran in the hole.
				09:30	Tested the lower pipe ram. Tested the MWD tool.
				11:00	Continued to run in the hole.
				14:00	Drilled firm cement from 1625 m to 1673 m.
				17:00	Drilled plugs and float from 1673 to 1674 m.
				21:30	Washed from 1674 m to 1697 m. Tagged the shoe at 1697 m. Drilled the shoe. Drilled cement in the rathole to TD.
				22:00	Drilled 3 m of the new formation to 1723 m.
				23:00	Circulated and conditioned the mud.
				24:00	Performed a formation integrity test to 1.59 rd equivalent mud weight.
18	2009	1.19	1.49	24:00	Drilled the 12 1/4" hole to 2009 m.
19	2347	1.31	1.49	03:30	Continued to drill the 12 1/4" hole to 2025 m.
				04:00	Circulated the hole clean.
				06:00	Pulled out of the hole.
				08:30	Replaced the bit. Tested the MWD.
				10:30	Ran in the hole.
				24:00	Drilled the 12 1/4" hole to 2347 m.
20	2560	1.30	1.50	09:00	Continued to drill the 12 1/4" hole to 2560 m.
				11:00	Circulated the hole clean.
				14:30	Pulled out of the hole.
				15:00	Rigged up the wireline logging equipment.
				24:00	Ran log no. 1: DIL/LSS/GR and log no.2: LDL/CNL/CAL/GR.

((( (ooo)	D a i l y   r e p o r t					Date
	System : Boredata Sandnes					28/9-1987
Norsk Hydro	Well: 30/6-21					
	Casing Size (in):	30	20	13 3/8	9 5/8	7
	Setting depth m,MD:	221	650	1704	2543	2856
						2

Report number	Mid. depth m,MD	Est. Pore Pressure (SG)	Mud dens. (SG)	Stop time	Short Summary
21	2560	1.30	1.50	02:00	Ran CBL/VDL log in the 13 3/8" casing. (17 1/2" hole)
				02:30	Rigged down the wireline logging equipment.
				03:30	Made up the 10 3/4" casing hanger to the seal assembly and running tool.
				04:30	Loaded the cement kelly with ball and dart.
				05:30	Ran in the hole with the wear bushing retrieving tool and wash tool. Picked up the wear bushing.
				06:00	Washed the wellhead area.
				20:30	Rigged up and ran the 9 5/8" x 10 3/4" casing. Landed the casing with the shoe at 2543 m.
				22:00	Circulated one casing volume.
				23:00	Pumped a low viscosity mud pill at 1.40 r.d.
				24:00	Pumped a spacer and pressure tested the cement lines. Mixed and pumped the cement slurry.
				22	2560
02:30	Pressure tested the casing. Made up the seal assembly, and tested it.				
07:30	Pressure tested the BOP. Had a leak in the choke line flex hose. Retorqued the seal assembly.				
08:30	Pulled out of the hole with the casing running tool.				
09:30	Set the wear bushing.				
14:30	Laid down the 12 1/4" bottom hole assembly.				
17:30	Made up the 8 1/2" bottom hole assembly.				
20:00	Ran in the hole to 1600 m.				
20:30	Pressure tested the upper and the lower kelly valves.				
21:00	Disconnected the tilt cylinder on the top drive.				
21:30	Attempted to test the lower pipe ram. The standpipe hose leaked.				
22:00	Replaced the standpipe hose with chicksan lines. Tested the lower pipe ram.				
24:00	Continued to run in the hole.				



(( (ooo)		Daily report					Date
Norsk Hydro		System : Boredata Sandnes					28/9-1987
Well: 30/6-21							
Casing Size (in):		30	20	13 3/8	9 5/8	7	
Setting depth m,MD:		221	650	1704	2543	2856	
							2

Report number	Mid. depth m,MD	Est. Pore Pressure (SG)	Mud dens. (SG)	Stop time	Short Summary
23	2581	1.19	1.35	00:30	Tagged the cement at 2505 m.
				03:30	Drilled the float, the shoe track, and the shoe while displacing the hole to 1.35 r.d. mud.
				04:00	Cleaned the rat hole and drilled 8 1/2" hole to 2563 m.
				05:30	Circulated and conditioned the mud.
				06:00	Performed a formation integrity test equivalent to 1.60 r.d. mud weight.
				09:30	Pulled out of the hole.
				10:00	Made up the hang off tool and set it back in the derrick.
				13:00	Made up the core barrel.
				16:00	Ran in the hole with the core barrel and tagged the bottom at 2563 m.
				17:00	Circulated and dropped the ball.
				19:00	Cut core no. 1 from 2563 m to 2581 m. The core jammed off.
				22:00	Pulled out of the hole with core no. 1.
				22:30	Recovered core no. 1.
				23:30	Serviced the core barrel and changed the core head.
				24:00	Ran in the hole to cut core no. 2.
24	2652	1.13	1.36	01:30	Continued to run in the hole to cut core no. 2.
				02:00	Circulated and conditioned the mud. Dropped the ball.
				04:30	Cut core no. 2 from 2581 m to 2597 m.
				07:00	Pulled out of the hole.
				08:30	Recovered the core. Serviced the core barrel.
				10:30	Ran in the hole to cut core no.3.
				11:00	Circulated and dropped the ball.
				16:00	Cut core no. 3 from 2597 m to 2652 m.
				17:30	Circulated bottoms up.
				20:30	Pulled out of the hole.
				22:30	Recovered core no. 3. Serviced the core barrel.
				24:00	Ran in the hole to cut core no. 4.
25	2669	1.13	1.37	00:30	Continued to run in the hole to cut core no. 4.
				01:00	Circulated and conditioned the mud. Dropped the ball.
				03:00	Cut core no. 4 from 2652 m to 2669 m.
				04:30	Circulated bottoms up.

D a i l y   r e p o r t

Date  
28/9-1987

((  
(ooo)

System : Boredata Sandnes

Norsk Well: 30/6-21  
Hydro

Casing Size (in): |30 |20 |13 3/8|9 5/8 |7 |  
Setting depth m,MD: | 221| 650| 1704| 2543| 2856|

2

Report number	Mid. depth m,MD	Est.Pore Pressure (SG)	Mud dens. (SG)	Stop time	Short Summary
				06:30 07:00 07:30 08:00 17:30 24:00	Pulled out of the hole. Recovered core no. 4. Broke off the core head and set the core barrel back in the derrick. Rigged up the wireline logging equipment. Ran log no. 1:DIT-E/SDT/GR. Ran log no. 2:LDT/CNT/NGT/CAL. Ran log no. 3:RFT.
26	2734	1.13	1.36	05:00 09:00 12:00 15:30 16:00 18:30 20:00 24:00	Continued to run log no.3. Run log no.4:RFT. Run log no.5:RFT. Ran log no.6:RFT. Rigged down Schlumberger. Made up the 8 1/2" bottom hole assembly. Tested the MWD tool. Ran in the hole. Broke the circulation at the 9 5/8" shoe. Washed and reamed to TD. Drilled the 8 1/2" hole from 2669 m to 2734 m.
27	3025	1.13	1.37	08:30 09:30 10:00 11:00 24:00	Drilled the 8 1/2" hole from 2734 to 2858 m. Circulated bottoms up for samples. Drilled the 8 1/2" hole from 2858 to 2863 m. Circulated bottoms up for samples. Drilled the 8 1/2" hole from 2863 m to 3025 m.
28	3100	1.13	1.37	02:00 03:00 06:00 07:30 11:00 11:30 15:00 19:00 24:00	Drilled the 8 1/2" hole from 3025 m to 3058 m. Circulated bottoms up for samples. Drilled the 8 1/2" hole from 3058 m to 3100 m. Circulated bottoms up. Pulled out of the hole. Rigged up Schlumberger. Ran log no.1: DIL/LSS/GR. Ran log no.2: LDT/CNT/NGT. Ran log no.3: EPT.
29	3100	1.13	1.37	03:00 10:00 22:00 24:00	Ran log no.4: CBL/VDL. Ran log no.5: RFT. Ran log no.6: RFT. Ran log no.7: CST.

((( (ooo)	Daily report					Date
	System : Boredata Sandnes					28/9-1987
Norsk Hydro	Well: 30/6-21	Casing Size (in):	30	20	13 3/8	9 5/8   7
	Setting depth m,MD:		221	650	1704	2543   2856   2

Report number	Mid. depth m,MD	Est. Pore Pressure (SG)	Mud dens. (SG)	Stop time	Short Summary
30	2838	1.13	1.37	03:30 04:00 08:00 08:30 09:30 10:00 10:30 11:30 12:00 12:30 15:30 17:00 18:00 22:00 22:30 24:00	Continued to run log no.7: CST. Rigged down Schlumberger. Ran in the hole open ended. Circulated and conditioned the mud. Pressure tested the cement lines. Set a balanced cement plug from 3100 m to 2940 m. Pulled out of the hole to 2940 m. Reverse circulated out cement. Set a balanced cement plug from 2940 m to 2800 m. Pulled out of the hole to 2800 m. Reverse circulated out cement. Slugged the pipe. Pulled out of the hole Broke and laid down the core barrel. Picked up the cement kelly, drifted and loaded the same. Made up the 8 1/2" bottom hole assembly and ran in the hole to 2780 m. Washed down from 2780 m to 2838 m. Circulated bottoms up. Contaminated cement came over the shakers.
31	2860	1.13	1.37	00:30 01:30 02:30 03:30 07:30 17:00 23:00 24:00	Washed the cement from 2838 m to 2860 m. Circulated to clean the hole. Slugged the pipe. Pulled into the 9 5/8" casing shoe. Slipped and cut the drill-line. Tested the crown saver system and crown-o-matic. Pulled out of the hole. Rigged up and ran the 7" liner. Ran in the hole with the 7" liner on 5" DP. Circulated and tagged the bottom at 2860 m. Pulled out the cement kelly and circulated while reciprocating the liner.
32	2765	1.13	1.25	00:30 01:00 01:30	Dropped the ball. Pressured up to 110 bar and set the hanger. Continued to pressure up to 200 bar. Sheared the ball and seat. Checked for returns. Released the running tool and checked that it was free. Set down 178 kN weight on the liner hanger. Broke the circulation. Rotated the liner

((( (ooo)	Daily report					Date
	System : Boredata Sandnes					28/9-1987
Norsk Hydro	Well: 30/6-21					
	Casing Size (in):	30	20	13 3/8	9 5/8	7
	Setting depth m,MD:	221	650	1704	2543	2856
						2

Report number	Mid. depth m,MD	Est.Pore Pressure (SG)	Mud dens. (SG)	Stop time	Short Summary
					Continued to circulate till the pressure was stabilized.
				02:00	Pumped 10 m3 low viscous mud and 5 m3 S-O spacer.
				03:00	Pressure tested the cement lines. Mixed and pumped 5 m3 scavenger slurry and 11.8 m3 main slurry. Displaced the dart.
				04:00	Displaced the cement with S-O spacer and mud. Bumped the plug and tested the liner.
				05:00	Set the packer with 222 kN. Pulled out the PBR with stinger and reversed out the cement.
				05:30	Closed the middle pipe ram and pressure tested the liner.
				08:30	Pulled out of the hole.
				13:30	Made up the 6" clean out assembly and ran in the hole to 2760 m.
				14:00	Washed and reamed from 2760 m to 2765 m.
				15:00	Pressure tested the liner packer.
				15:30	Dressed off the top of the PBR at 2388 m.
				19:00	Circulated and conditioned the mud. Cut the mud weight from 1.37 sg to 1.25 sg.
				24:00	Pulled out of the hole with the clean out assembly.
33	2765	1.13	1.25	01:00	Continued to pull out of the hole and laid down the bottom hole assembly.
				01:30	Rigged up the wireline logging equipment.
				23:00	Ran log run no. 1 : VSP.
				24:00	Ran log run no. 2 : CBL/VDL/CET/GR.
34	2765	1.13	1.25	04:30	Continued logging with Schlumberger. Ran no. 2: CBL.
				05:00	Rigged down Schlumberger.
				13:30	Picked up the 5" DP test tubing and ran in the hole open ended.
				16:00	Picked up fluted hanger, 1 joint white painted drillpipe and the landing string.
				19:30	Slugged the pipe and pulled out of the hole. Laid down the fluted hanger. Continued to pull out of the hole with the test tubing and racked it in the

((( (ooo)	D a i l y   r e p o r t					Date
	----- System : Boredata Sandnes					28/9-1987
Norsk	Well: 30/6-21					
Hydro	Casing Size (in):	30	20	13 3/8	9 5/8	7
	Setting depth m,MD:	221	650	1704	2543	2856
						2

Report number	Mid. depth m,MD	Est. Pore Pressure (SG)	Mud dens. (SG)	Stop time	Short Summary
				24:00	and the test string. Waited on the weather.
37	2765	1.13	1.25	18:00 20:00 21:30 22:30 23:00 24:00	Continued to wait on the weather. Rigged up the wireline logging equipment. Ran in the hole with the GR/CCL tool. Made a depth correlatin run with the GR/CCL tool. Pulled out of the hole with the wireline logging tool. Tested the SOS choke to 380 bar. Opened the downhole tester valve. Fired the perforating guns. Opened the well to flow on 52/64'' choke.
38	2765	1.13	1.25	07:00 14:00 15:30 17:00 18:30 20:00 20:30 22:00 22:30 24:00	Continued to flow the well on a 48/64'' choke. Change to 40/64'' choke. Shut the well in for a build up. Bullheaded the string volume of oil back into the formation. Observed the well for 30 mins. Reverse circulated through the choke manifold and gas separator. Pressure tested against the downhole tester valve. Attempted to disconnect at the SSTT. No success. Function tested the SSTT ball valve. Unlatched mechanically. Laid down the SSTT, changed the bails and pulled out of the hole. Pressure tested the control lines. Replaced the SSTT latch.
39	2765	1.13	1.25	01:00 02:30 03:30 08:00 10:00 11:00 12:30	Function tested the back up SSTT latch. Ran in the hole with the back up SSTT latch. Hooked up the long bails and the STT, and latched the SSTT. Pressure tested the lines and string, and attempted to close the SSTT. No success. Worked the SSTT valves. Opened the LPR-N, and bullheaded the string volume back into the formation. Unseated the packer and flowchecked the well for 30 minutes. Reverse circulated and checked for gas.

D a i l y   r e p o r t

Date  
28/9-1987

System : Boredata Sandnes

((  
(ooo)

Norsk  
Hydro

Well: 30/6-21

Casing Size (in): | 30 | 20 | 13 3/8 | 9 5/8 | 7  
Setting depth m,MD: | 221 | 650 | 1704 | 2543 | 2856 |

2

Report number	Mid. depth m,MD	Est.Pore Pressure (SG)	Mud dens. (SG)	Stop time	Short Summary
				22:00	derrick. Picked up the lubricator valve and made up 1 joint of tubing. Laid down the same. Picked up the sub sea test tree, made up 1 joint of tubing. Serviced checked and laid down the same.
				22:30	Picked up 6 joints of 4 3/4" DC and sat the same back in the derrick.
				23:30	Ran in the hole with 5 stands heavy weight drill pipe.
				24:00	Pressure test the BOP.
35	2765	1.13	1.25	02:30	Continued to pressure test the BOP.
				03:00	Pulled out of the hole with the BOP test tool.
				03:30	Rigged up the wireline logging equipment.
				05:30	Ran a junk basket and gauge ring on wireline.
				06:00	Rigged down the wireline logging equipment.
				19:30	Made up the drill stem test bottom hole assembly and ran in the hole. Pressure tested it to 440 bar. Ran in the hole with the test tubing.
				23:00	Picked up the sub sea test tree, function and pressure tested it. Pressure tested the surface lines and the tubing.
				24:00	Ran in the hole with the landing string.
36	2765	1.13	1.25	01:00	Picked up the lubricator valve and continued to run in the hole with the landing string.
				01:30	Broke off the spline sub and the lower kelly cock.
				02:00	Rigged up the wireline logging equipment.
				04:30	Made a depth correlation run with a slim hole gamma ray tool. No success. Pulled out of the hole.
				06:30	Reran the slim hole gamma ray tool for a depth correlation run.
				07:00	Rigged down the wireline logging equipment.
				11:00	Picked up and hooked up the surface test tree.
				20:00	Pressure tested the surface equipment

((( (ooo)	D a i l y   r e p o r t					Date
	----- System : Boredata Sandnes					28/9-1987
Norsk Hydro	Well: 30/6-21					
	Casing Size (in):	30	20	13 3/8	9 5/8	7
	Setting depth m,MD:	221	650	1704	2543	2856
						2

Report number	Mid. depth m,MD	Est.Pore Pressure (SG)	Mud dens. (SG)	Stop time	Short Summary
				14:30	Broke and laid down the STT. Pulled out of the hole with the SSTT.
				19:00	Displaced the string with diesel while servicing the SSTT.
				21:30	Pressure tested the SSTT, and ran in the hole.
				22:30	Picked up the STT and landed the SSTT in the wellhead. Set the packer.
				24:00	Pressure tested the string to 345 bar.
40	2765	1.13	1.25	00:30	Nippled up the wireline BOP.
				01:00	Pressured up the annulus to open the lower pipe ram.
				02:00	Flowed the well for cleanup. Shut the well in. Closed the lower pipe ram and stabilized the pressure.
				03:00	Rigged up the lubricator and the memory gauges.
				05:00	Worked on the damaged threads on the wireline BOP.
				09:00	Filled the lubricator, the wireline BOP and the surface test tree with diesel. Attempted to pressure test the wire line BOP and the lubricator, negative. Rigged down the lubricator. Changed the o-rings. Pulled out with the wireline.
				12:00	Fished for the gauges left in the lubricator valve while preparing the lubricator. Rigged up the lubricator and tested the same to 170 bar. Found a leak on the wireline BOP. Rigged down the same.
				15:30	Continued to rig up the wireline BOP and serviced the same.
				20:30	Flowed the well for clean up. Shut in the well due to helicopter arrival. Opened the well and continued to flow the well. Shut in the well.
				23:30	Changed out the wireline BOP. Dressed the same to fit the slick line. Function tested the same.
				24:00	Attempted to nipple up the BOP, impossible due to bad weather. Waited on the weather.
41	2765	1.13	1.26	08:30	Waited on the weather.
				14:30	Rigged up the wire line BOP, the gauges and the lubricator. Pressure tested the

((( (ooo)	D a i l y   r e p o r t						Date
	System : Boredata Sandnes						28/9-1987
Norsk Hydro	Well: 30/6-21						
	Casing Size (in):	30	20	13 3/8	9 5/8	7	
	Setting depth m,MD:	221	650	1704	2543	2856	2

Report number	Mid. depth m,MD	Est. Pore Pressure (SG)	Mud dens. (SG)	Stop time	Short Summary
					<p>same to 180 bar, ok. Bled off the pressure to 120 bar. Opened the lubricator valve.</p> <p>18:00 Ran the gauges on wireline. Opened the LPR-valve. Landed the gauges in the F-nipple and pulled out of the hole. Closed the LPR-valve.</p> <p>18:30 The wireline running tool was stuck in the tubing.</p> <p>20:00 Opened the LPR and flowed the well to check for possible obstruction in the tubing. The flow parameter indicated no obstruction.</p> <p>21:30 Closed the wireline BOP and verified that the wireline running tool was inside. Closed the lubricator valve and bled off the pressure above. Checked for pressure build up.</p> <p>23:30 Rigged down the lubricator and the wireline BOP. Redressed the same to fit the 3/16" electric wireline.</p> <p>24:00 Pressure tested the wireline BOP.</p>
42	2765	1.13	1.25	03:00	<p>Nippled up the wireline BOP, lubricator, wireline samplers, pressure and temperature gauges and the CCL. Calibrated the depth recorder in the wireline unit.</p> <p>04:30 Flushed the line from the cement unit to the SST with diesel. Closed the packoff and pressure tested to 170 bar for 10 minutes. Bled off the pressure to 110 bar. Closed the kill valve. No signals from the gauges and CCL, repaired same.</p> <p>07:00 Opened the lubricator valve. Ran in the hole with wireline tools. Opened the LPR and continued to run in the hole.</p> <p>11:00 Flowed the well on 24/64" choke. Shut in the well.</p> <p>13:00 Pulled out of the hole. Made three gradient stops. Closed the LPR-N. Pulled out of the hole with the bottom hole samplers. Closed the lubricator valve, bled off and checked for pressure build up, ok.</p> <p>15:30 Rigged up for bottom hole samplers run no.2. Pressure tested. Equilized across the lubricator valve.</p>



((( (ooo)	Daily report					Date
	System : Boredata Sandnes					28/9-1987
Norsk Hydro	Well: 30/6-21					
	Casing Size (in):	30	20	13 3/8	9 5/8	7
	Setting depth m,MD:	221	650	1704	2543	2856
						2

Report number	Mid. depth m,MD	Est. Pore Pressure (SG)	Mud dens. (SG)	Stop time	Short Summary
				17:00	Opened the lubricator valve and ran in the hole with the bottom hole samplers. Opened the LPR-N and continued to run in the hole. Prepared to open the well.
				21:30	Flowed the well for sampling.
				23:30	Shut in the well. Burned off the tank. Pulled out of the hole and took three gradients. Closed the LPR-N. Pulled out of the hole with the bottom hole samplers. Closed the lubricator valve. Bled off and checked for pressure build up.
				24:00	Rigged down Schlumberger.
43	2765	1.13	1.25	00:30	Laid down the samplers.
				02:00	Made up the tool string to run the MUST operator.
				03:00	Had a failure on Florpetrol pressure gauge. Rigged down and changed the same.
				05:30	Tested the lubricator section to 170 bar. Ran in the hole. Latched on the MUST operator. Opened the LPR-N and flowed the well on 40/64" choke.
				24:00	Flowed the well on 40/64" choke.
44	2765	1.13	1.25	14:00	Opened the MUST for main build up. Burned off the stock tank.
				16:30	Closed the LPR-N. Equilized and opened the MUST. Released the MUST operator. Pulled out of the hole. Closed the lubricator valve, bled off and checked. Rigged down the wireline.
				18:00	Flushed the surface lines. Equilized and opened the lubricator valve. Opened the LPR-N.
				20:00	Killed the well.
				20:30	Observed the well for 30 minutes.
				22:00	Pressured up the annulus to 220 bar. Opened the APR-N valve. Reversed out through the choke manifold and the mud gas separator.
				22:30	Observed the well for 30 minutes.
				24:00	Circulated the long way through the choke manifold and mud gas separator. After bottoms up, circulated over the shaker until the gas level was below 1.0 0/0.
45	2765	1.13	1.25	00:30	Continued to circulate until the gas was

((( (000)	Daily report						Date
	System : Boredata Sandnes						28/9-1987
Norsk Hydro	Well: 30/6-21						
	Casing Size (in):	30	20	13 3/8	9 5/8	7	
	Setting depth m,MD:	221	650	1704	2543	2856	2

Report number	Mid. depth m,MD	Est.Pore Pressure (SG)	Mud dens. (SG)	Stop time	Short Summary
					below 1.0 0/0.
				02:00	Started to pull out of the hole. Laid down thw SST.
				04:00	Pulled out of the hole with the landing string.
				10:30	Pulled out of the hole with the testing string.
				17:00	Continued to pull out of the hole.
				17:30	Rigged up Schlumberger.
				20:30	Ran in the hole with Schlumberger. Set a bridge plug at 2641 m. Rigged down Schlumberger. Pressure tested the bridge plug to 230 bar in 10 minutes.
				23:00	Ran in the hole with open ended pipe.
				23:30	The shearpins was broken on the upper racking arm, repaired the same.
				24:00	Continued to run in the hole.
46	300	1.00	1.00	01:00	Ran in the hole with pipe. Tagged the plug at 2637 m.
				04:00	Pumped 8 m3 Lanpo, 50 m3 seawater, 45 m3 Dirt Magnet followed by 138 m3 seawater.
				06:00	Observed the well for 2 hrs.
				07:00	Pumped seawater to clean the hole. Flushed the choke manifold, the kill, the choke and the booster line.
				07:30	Pumped 40 m3 fresh water.
				12:00	The brine pump was down. Lined up to pump the brine with the sea pump ballast pump to the B.J. unit.
				14:00	Displaced the hole to brine.
				17:30	Pulled out of the hole.
				18:30	Ran in the hole to 500 m.
				19:00	Set a 100 m high viscous pill. Displaced the same with 3.9 m3 brine.
				19:30	Pulled out of the hole to 400 m. Retrieved the inside BOP.
				20:00	Pumped 1 m3 drillwater. Set a 100 m balanced cement plug, 1.9 rd. Displaced the cement plug with 2.2 m3 brine.
				20:30	Pulled out of the hole to 200 m. Reverced out with 3 m3 brine.
				24:00	Pulled out of the hole while laying down drill pipe.
47	300	1.00	1.00	06:30	Continued laying down drill pipe.
				07:30	Retrieved the wearbushing.
				15:30	Pulled the BOP and the riser.

D a i l y   r e p o r t

Date  
28/9-1987

((  
(ooo)

System : Boredata Sandnes

Well: 30/6-21

Norsk      Casing Size (in): | 30      | 20      | 13 3/8 | 9 5/8 | 7  
Hydro      Setting depth m,MD: | 221    | 650    | 1704   | 2543   | 2856   |

2

Report number	Mid. depth m,MD	Est.Pore Pressure (SG)	Mud dens. (SG)	Stop time	Short Summary
				17:30	Picked up and function tested the R.G.S retrieving tool.
				19:00	Ran in the hole with the running tool. Latched on and retrieved the R.G.S.
				22:00	Disconnected the running tool. Laid down the guideposts and the guidebase.
				24:00	Rigged up and ran the two armed guide frame on drillpipe.
48	0	1.00	1.00	01:00	Installed the guidelines no 2 and 4 on the gimbal.
				03:30	Ran the corrosion cap. Started deballasting the rig. Retrived the running tool and the two armed guide frame. Cut and retrieved the guidelines.
				14:00	Continued deballasting the rig. Pulled the anchors. Last anchor on the bolster at 1400 hrs. Started the transit to 30/9-B19 at 1400 hrs.

3.4 Time distribution

The total time used for moving the rig to the location, drill the well, production test and temporary plug and abandon the well 30/6-21 was 47.25 days.

The well was considered as completed when the last anchor was on the bolster.

The time distribution is shown in table B-1 and fig. B-2.

The operation can be broken down into the following main groups:

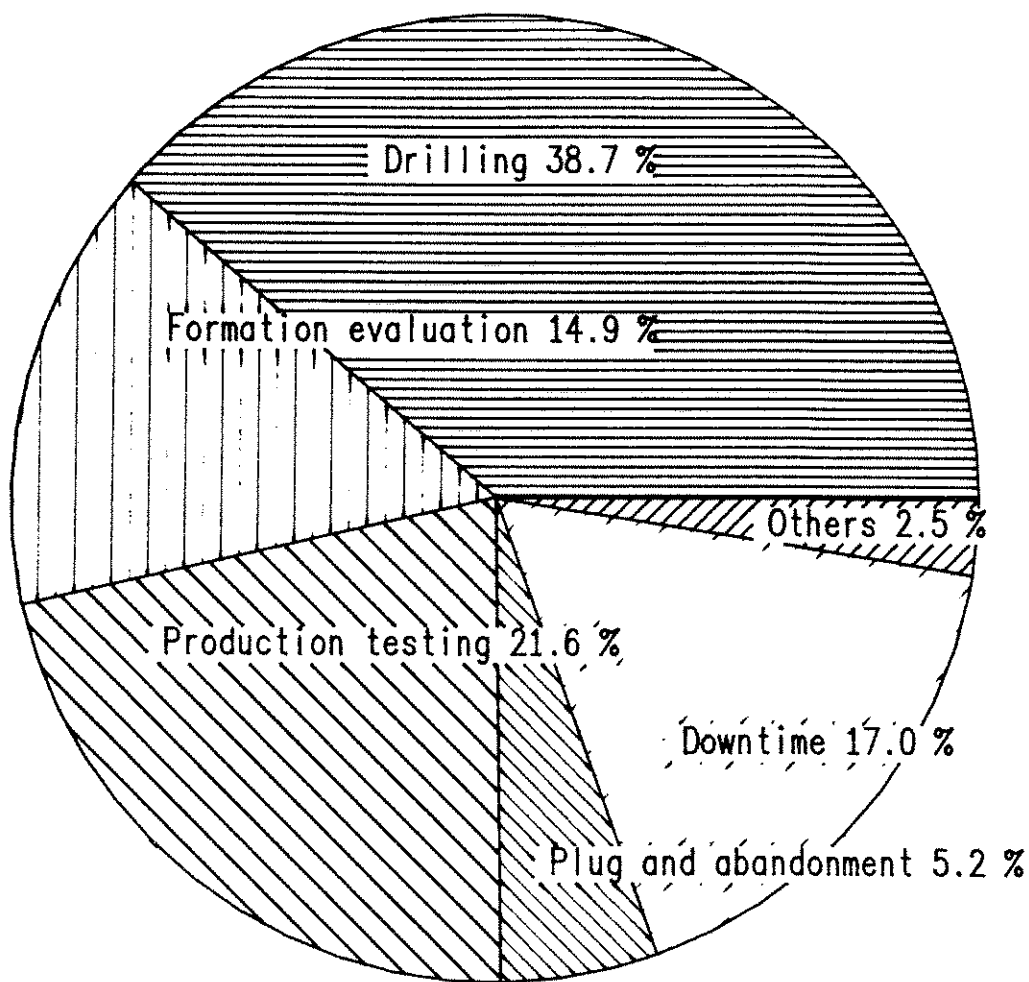
- Moving and anchorhandling:	1.19 days
- Drilling the well to TD:	18.29 days
- Formation evaluation:	7.04 days
- Production testing:	10.23 days
- Downtime:	8.02 days
- Plug and abandonment:	<u>2.48 days</u>
Total	<u>47.25 days</u>

		Time distribution		Date	
((( (ooo)		System : Boredata Sandnes		10/8-1987	
Norsk	Well : 30/6-21				
Hydro	Rig name: VILDKAT				
	Phase : All phases				

6

Operations	Hrs	%	Hrs	%	Subtotal
Rig moving.....					
Rig moving	: 6.5	.57			
Mooring	: 22.0	1.94			
Sum .....			28.50	2.51	28.50
Drilling.....					
Drilling	: 168.0	14.81			
Opening hole	: 16.0	1.41			
Tripping	: 77.0	6.79			
Circ. and cond. hole and mud	: 14.5	1.28			
Formation leak off test	: 5.0	.44			
Surveying	: 1.5	.13			
Sub sea equipment handling	: 12.0	1.06			
BOP testing/activities	: 32.5	2.87			
Other equipment testing	: 2.0	.18			
Running casing	: 81.5	7.19			
Primary cementing	: 27.0	2.38			
Slip and cut drilling line	: 1.0	.09			
Other	: 1.0	.09			
Sum .....			439.00	38.71	467.50
Formation evaluation.....					
Tripping	: 23.5	2.07			
Circ and cond mud/hole	: 5.5	.49			
Circulating for samples	: 3.0	.26			
Coring	: 21.5	1.90			
Logging	: 72.5	6.39			
RFT/FMT	: 43.0	3.79			
Sum .....			169.00	14.90	636.50
Production testing.....					
Circulating	: 13.0	1.15			
Wire line operations	: 30.0	2.65			
Tripping workstring	: 53.5	4.72			
Tripping other	: 16.0	1.41			
Rigging up/down	: 24.5	2.16			
Equipment testing	: 19.5	1.72			
Flowing/injection	: 34.0	3.00			
Pressure build up/fall off	: 21.0	1.85			
Plugging and squeezing	: 5.5	.49			
Slip and cut drilling line	: 1.0	.09			
Other	: 27.5	2.43			
Sum .....			245.50	21.65	882.00
Plug and abandonment.....					
Tripping	: 27.5	2.43			
Circ and cond mud/hole	: 8.0	.71			
Cement plug	: 3.0	.26			
Equipment recovery	: 21.0	1.85			
Sum .....			59.50	5.25	941.50
Downtime.....					
Reaming	: 1.5	.13			
Fishing> due to hole equipment:	17.0	1.50			
Waiting on weather	: 45.0	3.97			
Waiting on weather,prod test	: 30.5	2.69			

		Time distribution				Date
((( (ooo)		System : Boredata Sandnes				10/8-1987
-----						
Norsk	Well	: 30/6-21				
Hydro	Rig name:	VILDKAT				
	Phase	: All phases				6
		Hrs	%	Hrs	%	Subtotal
Operations						
Drilling equipment repair		: 10.5	.93			
Drilling wait		: 11.5	1.01			
Production test equip repair		: 60.0	5.29			
Downtime equipment repair		: 4.5	.40			
Downtime wait		: .5	.04			
Other		: 11.5	1.01			
Sum .....				192.50	16.98	1134.00
Completion.....						
Sum .....				.00	.00	1134.00
-----						
Reported time (100.00 % of well total 1134.00 hours) :						1134.00
-----						



TIME REPORTED (HRS): 1134 OF TOTAL 1134

Others:

Rig moving : 2.5 %



Norsk Hydro  
Drilling Department

Date:19870811

TIME DISTRIBUTION

WELL: 30/6-21

Fig.:

B - 2

((( (ooo)	H o l e   d e v i a t i o n		Date
	----- System : Boredata Sandnes		10/8-1987
Norsk Hydro	Well: 30/6-21 Proposed direction (deg): 0 (referensed to grid north) Data from table 19		11

Meas. Depth (m)	Incli- nation (deg)	Direc- tion (deg)	Tool type	Vert. Depth (m)	Coordinates		Vert. Sect. (m)	Dogleg d/30m	Build d/30m	Turn d/30m
					North (m)	East (m)				
138	0	0	MS	138.0	.00	.00	.0	.00	.00	.00
148	0.3	251	MWD	148.0	.01	.02	.0	.90	.90	*
157	0.3	207	MWD	157.0	.04	.06	.0	.75	.00	*
163	0.2	260	MWD	163.0	.05	.08	.1	1.20	.50	*
180	0.7	230	MWD	180.0	.12	.18	.1	.95	.88	*
206	0.4	277	MWD	206.0	.22	.40	.2	.60	.35	*
288	0.6	300	MWD	288.0	.03	1.05	.0	.10	.07	8.41
374	0.4	214	MWD	374.0	.01	1.61	.0	.24	.07	30.00
458	0.4	283	MWD	458.0	.17	2.06	.2	.16	.00	24.64
543	0.1	179	MWD	543.0	.17	2.35	.2	.15	.11	36.71
626	0.2	144	MWD	626.0	.36	2.26	.4	.05	.04	12.65
658	0.4	198	MWD	658.0	.52	2.26	.5	.31	.19	*
682	0.25	187.6	MS	682.0	.65	2.30	.6	.20	.19	13.00
710	0.28	205.5	MS	710.0	.77	2.33	.8	.09	.03	19.18
739	0.33	240.9	MS	739.0	.87	2.44	.9	.20	.05	36.62
767	0.53	244.6	MS	767.0	.97	2.62	1.0	.22	.21	3.96
795	0.74	245.1	MS	795.0	1.10	2.90	1.1	.23	.23	.54
823	0.88	244.1	MS	823.0	1.27	3.26	1.3	.15	.15	1.07
852	0.83	235.7	MS	852.0	1.49	3.64	1.5	.14	.05	8.69
880	0.81	236.4	MS	880.0	1.71	3.97	1.7	.02	.02	.75
908	0.7	246.5	MS	908.0	1.89	4.29	1.9	.18	.12	10.82
936	0.58	240	MS	936.0	2.03	4.57	2.0	.15	.13	6.96
965	0.43	239.3	MS	965.0	2.16	4.79	2.2	.16	.16	.72
993	0.43	242.2	MS	993.0	2.26	4.97	2.3	.02	.00	3.11
1021	0.37	246.6	MS	1021.0	2.34	5.15	2.3	.07	.06	4.71
1049	0.37	240.5	MS	1049.0	2.42	5.31	2.4	.04	.00	6.54
1078	0.43	246.2	MS	1078.0	2.51	5.49	2.5	.07	.06	5.90
1106	0.43	237.2	MS	1106.0	2.61	5.68	2.6	.07	.00	9.64
1134	0.43	241.4	MS	1134.0	2.72	5.86	2.7	.03	.00	4.50
1163	0.42	218.8	MS	1163.0	2.86	6.02	2.9	.17	.01	23.38
1191	0.18	174.6	MS	1191.0	2.98	6.08	3.0	.34	.26	47.36
1219	0.19	285.9	MS	1219.0	3.01	6.12	3.0	.33	.01	*
1247	0.7	331	MS	1247.0	2.85	6.25	2.8	.62	.55	48.32
1276	1.39	326.8	MS	1276.0	2.40	6.53	2.4	.72	.71	4.34
1304	1.91	301.3	MS	1303.9	1.87	7.11	1.9	.95	.56	27.32
1332	1.48	104.8	MS	1331.9	1.72	7.16	1.7	3.60	.46	*
1360	2.89	122.4	MS	1359.9	2.19	6.21	2.2	1.66	1.51	18.86
1389	2.59	166.4	MS	1388.9	3.22	5.44	3.2	2.14	.31	45.52
1417	2.26	95.1	MS	1416.9	3.89	4.74	3.9	3.04	.35	*
1445	3.59	113.7	MS	1444.8	4.29	3.39	4.3	1.73	1.43	19.93



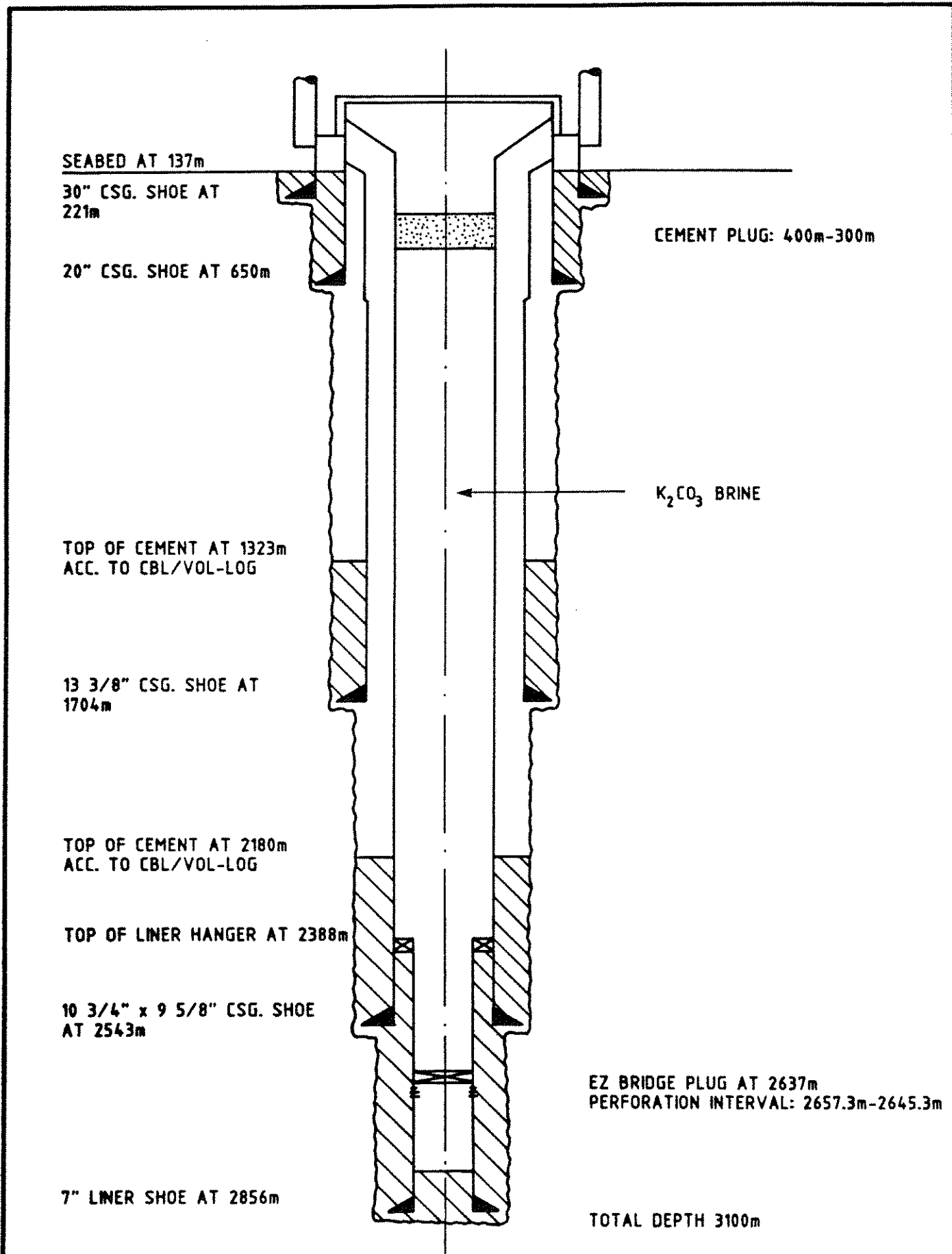
((( (ooo) Norsk Hydro	H o l e   d e v i a t i o n		Date
	----- System : Boredata Sandnes		10/8-1987
	Well: 30/6-21 Proposed direction (deg): 0 (referensed to grid north) Data from table 19		11


Meas. Depth (m)	Incli- nation (deg)	Direc- tion (deg)	Tool type	Vert. Depth (m)	Coordinates		Vert. Sect. (m)	Dogleg d/30m	Build d/30m	Turn d/30m
					North (m)	East (m)				
1473	3.7	120.9	MS	1472.8	5.10	1.81	5.1	.50	.12	7.71
1502	3.39	123.7	MS	1501.7	6.06	.30	6.1	.37	.32	2.90
1530	3.06	122.7	MS	1529.7	6.92	1.02	6.9	.36	.35	1.07
1558	2.78	121.5	MS	1557.6	7.68	2.23	7.7	.31	.30	1.29
1586	2.15	124.3	MS	1585.6	8.33	3.24	8.3	.69	.68	3.00
1615	1.57	126.2	MS	1614.6	8.87	4.01	8.9	.60	.60	1.97
1643	0.74	109.5	MS	1642.6	9.16	4.49	9.2	.95	.89	17.89
1671	0.4	50.1	MS	1670.6	9.16	4.74	9.2	.68	.36	*
1699	0.57	146.2	MS	1698.6	9.21	4.89	9.2	.78	.18	*
1717	1.2	57.8	MWD	1716.6	9.18	5.10	9.2	2.19	1.05	*
1778	0.5	52.5	MWD	1777.6	8.68	5.85	8.7	.35	.34	2.61
1805	0.4	83.4	MWD	1804.6	8.60	6.04	8.6	.29	.11	34.33
1890	2.1	79.2	MWD	1889.6	8.27	7.86	8.3	.60	.60	1.48
1975	3.9	64.8	MWD	1974.4	6.75	12.01	6.8	.68	.64	5.08
1995	3.5	48.1	MWD	1994.4	6.05	13.08	6.1	1.72	.60	25.05
2003	3.5	44.8	MWD	2002.4	5.72	13.43	5.7	.76	.00	12.38
2019	2.7	18.1	MWD	2018.4	5.01	13.89	5.0	3.05	1.50	*
2033	2.7	24	MWD	2032.3	4.40	14.13	4.4	.60	.00	12.64
2672	1.3	319.5	MWD	2671.0	14.87	15.54	14.9	.11	.07	13.87
2729	1.1	212.1	MWD	2728.0	14.89	14.83	14.9	1.02	.11	*
2813	1.6	52.9	MWD	2812.0	14.92	15.34	14.9	.95	.18	*
2853	2.3	25.6	MWD	2852.0	15.98	16.13	16.0	.86	.53	20.48
2898	1.8	94.3	MWD	2896.9	16.74	17.23	16.7	1.57	.33	45.80
2982	4.6	109.4	MWD	2980.8	15.52	21.72	15.5	1.04	1.00	5.39
3010	4.8	197.4	MWD	3008.7	14.03	22.43	14.0	6.99	.21	*
3066	5.6	201.2	MWD	3064.5	9.25	20.74	9.2	.47	.43	2.04

4. ABANDONMENT OF THE WELL

The temporary abandonment is shown in fig. B-3 and was carried out as described below:

- Set a bridge plug at 2637 m.
- Displaced the hole to  $K_2CO_3$  brine.
- Set a cement plug in the 10 3/4" casing from 400 m to 300 m.
- Ran the corrosion cap onto the wellhead.



 **Norsk Hydro**  
Drilling Department

**PLUG AND ABANDONMENT  
WELL 30/6-21**

Gr. no.: **3**  
Date: **28.08.87**  
Sign: **LTS/AHJ**

Fig.: **B-3**  
Dwg. no.: **46**

5. PORE PRESSURE, FORMATION INTEGRITY AND TEMPERATURE GRADIENT PROGNOSIS.

5.1 Pore Pressure

The pore pressure in well 30/6-21 is estimated, taking into consideration the Dc-exponent, the Sonic-log, the background gas and the R.F.T.-logs. However, the Dc-exponent and back ground is not considered to be reliable due to large overbalance in most of the pressure build up interval. Therefore main emphasis has been put on the sonic-log and the RFT-log. The pore pressure has been calculated using the equivalent - depth - method, and all depths are in m TVD with reference to RKB. The pore pressure gradient for well 30/6-21 is shown in fig. B-4.

Seabed (137) to 1350 m

All pressure indicators indicates normal compaction, i.e. a normal pore pressure gradient of 1.03 sg down to 1350 m.

1350 m to 2000 m

The Sonic-log shows a divergence from the normal trend, indicating that the pore pressure starts to increase from approx. 1350 m. The pore pressure is increasing gradually through the Hordaland group and is calculated to 1,34 sg at approx. 1800 m. From 1800 m to 2000 m the pore pressure gradient stays constant at 1,34 sg.

2000 to Top Brent Group (2575 m)

The sonic-log indicates a fairly constant pressure gradient decrease from 2000 m and down to Top Brent Group.

12 1/4" hole.  
-----

Before drilling out of the 13 3/8" shoe the hole was displaced to 1,50 rd oil mud. At 2025m the bit was pulled. No hole problems were seen during this trip.

The next bit drilled to the shoe with no mud or hole problems. Logs and casing were run troublefree although 3m<sup>3</sup> of mud was lost when circulating the casing. Another 3m<sup>3</sup> was lost during the cement job.

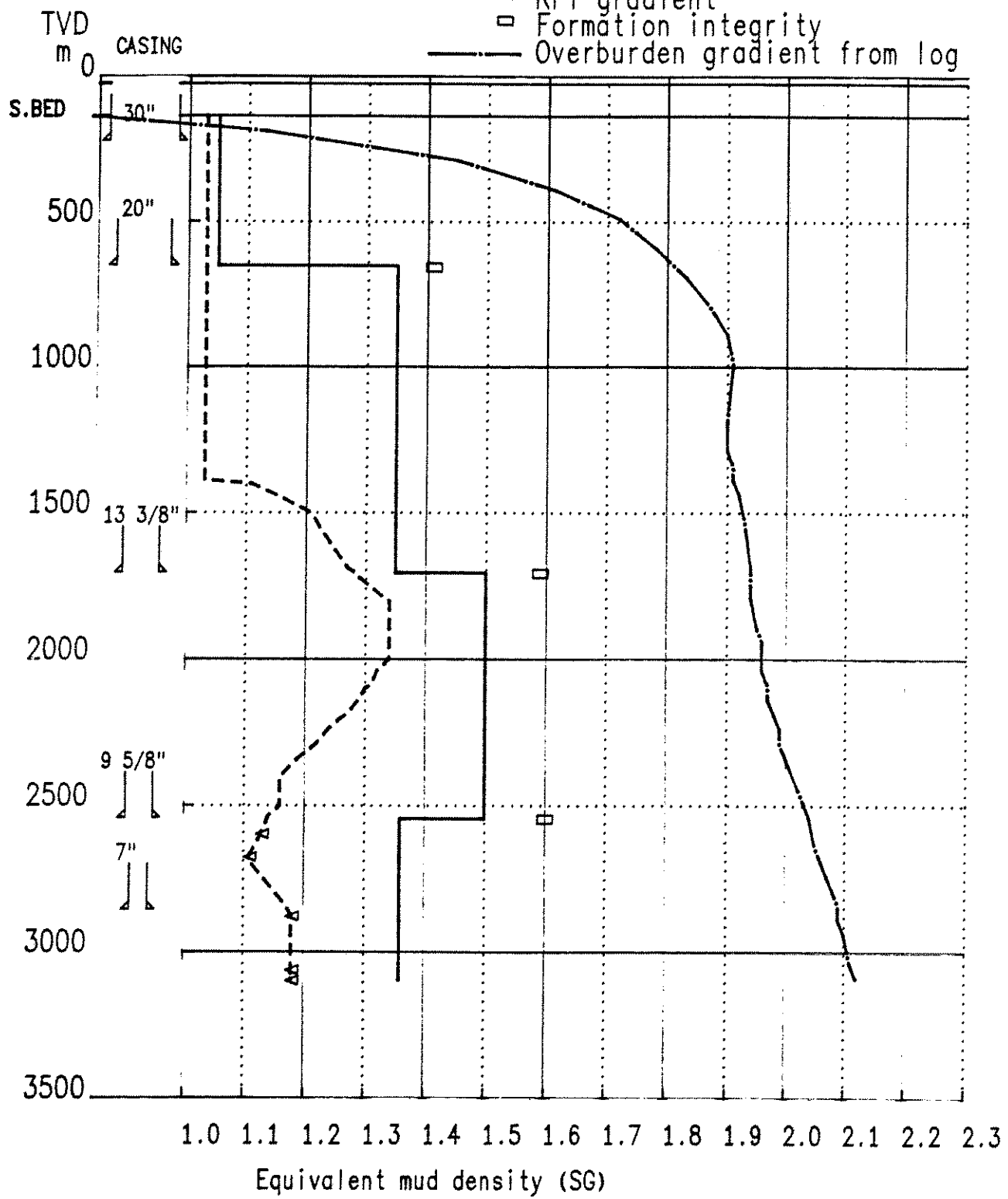
8 1/2" hole.  
-----

The hole was displaced to 1,35 rd mud whilst the shoe was drilled. 4 cores were taken from 2563m to 2669m. The well was then drilled to its final TD.

The hole was logged and cementplugs were set from 3100m to 2810m. The 7" liner was then run and cemented.

OPERATOR: HYDRO

- Final Pore Pressure
- Mud density
- ▲ RFT gradient
- Formation integrity
- Overburden gradient from log



Norsk Hydro  
Drilling Department

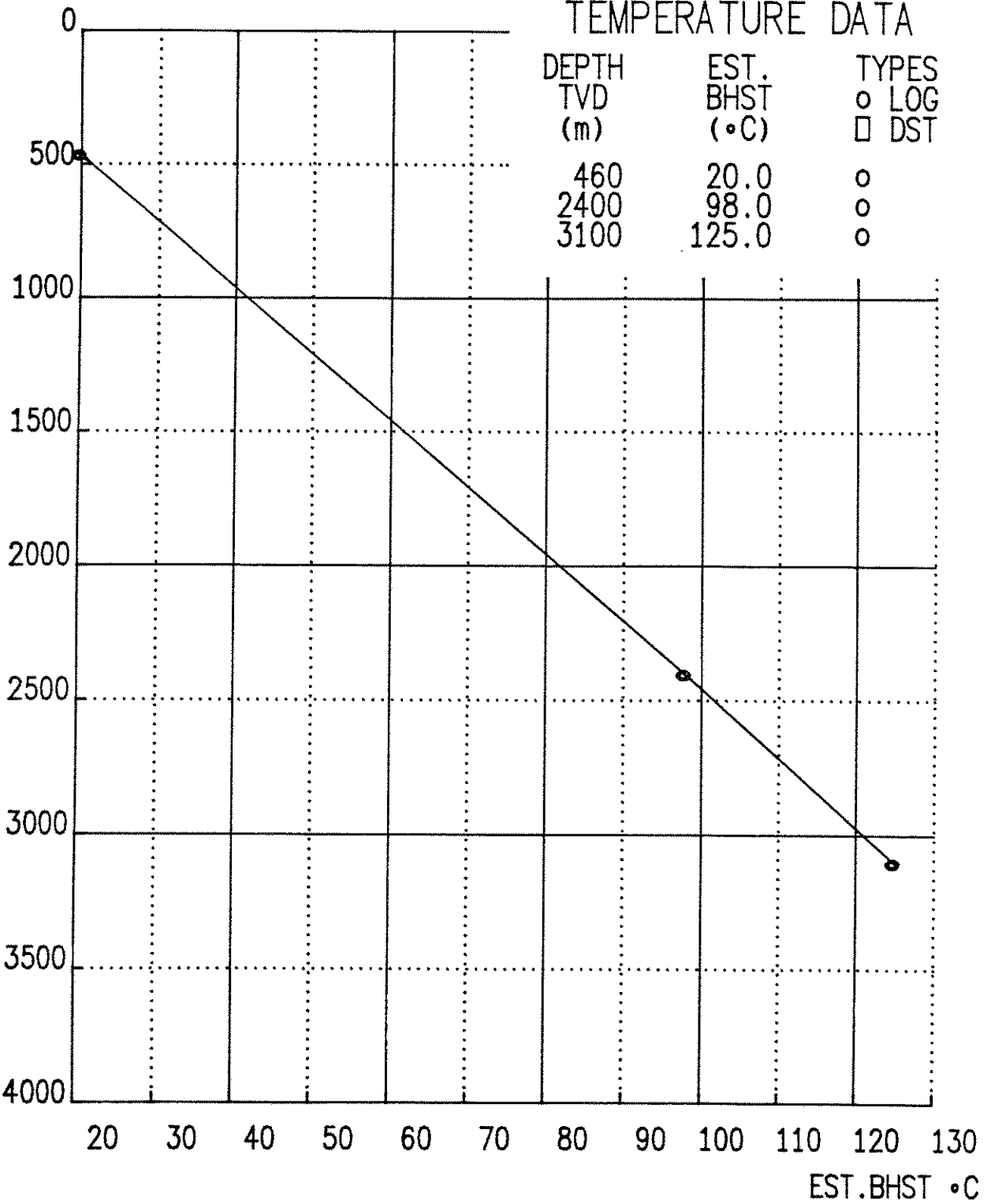
Date: 19870903

FINAL PORE PRESSURE  
MUD DENSITY,  
RFT AND OVERBURDEN GRAD.  
FORMATION INTEGRITY.  
WELL: 30/6-21

Fig.:  
B-4

DEPTH (m)  
(TVD)

TEMPERATURE DATA



Norsk Hydro  
Drilling Department

Date: 19870910

TEMPERATURE  
PROFILE  
WELL: 30/6-21

Fig.:  
B-5

((( (ooo)	P o r e   p r e s s u r e		Date
	System : Boredata Sandnes		3/9-1987
Norsk Hydro	Well: 30/6-21 Seabed at : 137 m RKB Total depth: 3100 m,MD,RKB		8

Vertical depth (m)	Pore pressure from soniclog (SG)	Pore pressure from DC-exp. (SG)	RFT/FMT (SG)	Most probable pore pressure (SG)	Actual mud density used (SG)
137	1.03			1.03	1.05
187	1.03			1.03	1.05
220	1.03			1.03	1.05
221	1.03			1.03	1.05
287	1.03			1.03	1.05
387	1.03			1.03	1.05
487	1.03			1.03	1.05
587	1.03			1.03	1.05
649	1.03			1.03	1.05
650	1.03			1.03	1.35
687	1.03			1.03	1.35
787	1.03			1.03	1.35
887	1.03			1.03	1.35
987	1.03			1.03	1.35
1187	1.03			1.03	1.35
1287	1.03			1.03	1.35
1337	1.03			1.03	1.35
1387	1.03			1.03	1.35
1400	1.11			1.11	1.35
1437	1.15			1.15	1.35
1500	1.21			1.21	1.35
1537	1.22			1.22	1.35
1600	1.24			1.24	1.35
1687	1.27			1.27	1.35
1700	1.28			1.28	1.35
1703	1.28			1.28	1.35
1704	1.28			1.28	1.50
1787	1.33			1.33	1.50
1800	1.34			1.34	1.50
1887	1.34			1.34	1.50
1900	1.34			1.34	1.50
1937	1.34			1.34	1.50
2000	1.34			1.34	1.50
2037	1.32			1.32	1.50
2087	1.31			1.31	1.50
2100	1.30			1.30	1.50
2137	1.29			1.29	1.50
2187	1.27			1.27	1.50
2200	1.26			1.26	1.50
2237	1.24			1.24	1.50
2287	1.22			1.22	1.50
2337	1.19			1.19	1.50
2400	1.16			1.16	1.50
2437	1.16			1.16	1.50
2487	1.16			1.16	1.50
2500	1.16			1.16	1.50
2537	1.14			1.14	1.50
2542	1.14			1.14	1.50



((( (ooo)	<u>P o r e p r e s s u r e</u>		Date
	System : Boredata Sandnes		3/9-1987
Norsk Hydro	Well: 30/6-21 Seabed at : 137 m RKB Total depth: 3100 m,MD,RKB		8

Vertical depth (m)	Pore pressure from soniclog (SG)	Pore pressure from DC-exp. (SG)	RFT/FMT (SG)	Most probable pore pressure (SG)	Actual mud density used (SG)
2543	1.14			1.14	1.36
2590			1.13	1.13	1.36
2637	1.12			1.12	1.36
2669			1.11	1.11	1.36
2687	1.11			1.11	1.36
2737	1.13			1.13	1.36
2787	1.15			1.15	1.36
2837	1.17			1.17	1.36
2872	1.18		1.18	1.18	1.36
2887	1.18			1.18	1.36
2937	1.18			1.18	1.36
3037	1.18			1.18	1.36
3057	1.18		1.18	1.18	1.36
3087	1.18			1.18	1.36
3093	1.18		1.18	1.18	1.36

((( (ooo)	F o r m a t i o n   i n t e g r i t y	Date
	----- System : Boredata Sandnes	3/9-1987
Norsk Hydro	Well: 30/6-21 Seabed at : 137 m RKB Total depth: 3100 m,MD,RKB	9

Casing shoe depth (m,MD)	Open hole depth (m,MD)	Form int strenght (SG)
650	668	1.41
1704	1723	1.59
2543	2563	1.60

6. MATERIAL REPORT

6.1 Main consumption casing and wellhead

6.2 Bit record

6.3 Bottom hole assembly

6.4 Mud report

6.5 Cement report

((( (ooo)	<u>M a i n c o n s u m p t i o n s</u>		Date
	System : Boredata Sandnes		4/8-1987
Norsk Hydro	Well: 30/6-21 Wellhead: MC EVOY Z-1 Data from table 8		5

C A S I N G				
size (in)	grade	weight (kg/m)	threads type	length (m)
30	B		LYNX 14S	84
20	X-56		LS	515
13 3/8	N-80	101.2	BUTT	1569
9 5/8	L-80	69.9	VAM	1709
10 3/4	C-75	90.3	VAM	711
7	L-80	38.2	New vam	184
7	L-80	38.2	Vam ace	267
7	L-80	38.2	New vam	7

((( (ooo)	M a i n   c o n s u m p t i o n s		Date
	----- System : Boredata Sandnes		10/8-1987
Norsk Hydro	Well: 30/6-21 Cement contractor: BJ HUGHES Data from table 9		5

Casing size (in)	Additive name	Total used (l)
30 Spacer		
Lead-	Cement	8254
	Seawater	24349
	A-3L	1037
Tail-	Cement	7841
	Seawater	10117
	A-7L	877
Flush	Seawater	4300
20 Spacer		
Lead-	Cement	30794
	Seawater	126100
	A-3L	5170
Tail-	Cement	3238
	Seawater	4488
Flush		
13 3/8 Spacer		
Lead-	Cement	
Tail-	Cement	11492
	Freshwater	16000
	D-19LN	543
	R-12L	199
Flush		
9 5/8 Spacer	E-6	8000
Lead-	Cement	
Tail-	Cement	5365
	Freshwater	7123
	D-19LN	254
	R-12L	105

((( (ooo) ----- Norsk Hydro	M a i n c o n s u m p t i o n s		Date
	----- System : Boredata Sandnes		11/8-1987
	Well: 30/6-21 Cement contractor: BJ HUGHES Data from table 9		5

Casing size (in)	Additive name	Total used (l)
-----	-----	-----
Flush	FRESHWATER	1600
-----	-----	-----
7	-----	-----
Spacer	SO	5000
-----	-----	-----
Lead-	Cement	5683
	Freshwater	7738
	D-31LN	206
	D-19	143
-----	-----	-----
Tail-	Cement	
-----	-----	-----
Flush		
-----	-----	-----

Bit record  
Date  
3/8-1987

Well: 30/6-21  
System : Boredata Sandnes

Data from table 4

BIT NUMBER	SIZE (in)	Manu- fact- urer	Trade Name	Serial number	IADC Code	Nozzles diameter (././32")	BHA no.	Depth out m, MD	Bit meter (m)	Drill time (hrs)	Rot. time (hrs)	ROP (m/h)	Rotation min/max (rpm)	Total Weight bit min/max (KN)	Flow min/max (m <sup>3</sup> /h)	Wear			Remarks					
																T	B	G		Other				
1	17 1/2	HTC	X3AC	352EK	114	24 24 24	18	225	88	8.42	2.83	31.1	50/50	7168	228/228									
1	36							225	88	8.42	2.83	31.1	50/50	7168	228/228									
2P	12 1/4	SMITH	SDTC	XF2513	124	20 20 20	16	225																
2	26	TRIST						225																
2P	12 1/4	SMITH	SDTC	XF2513	124	20 20 20	16	665	440	14.37	10.60	41.5	80/80	56270	228/228									
2	RR1																							
2	RR2																							
2	HO							664	439	16.50	13.65	32.2	100/100	83400	255/274									
3	26	TRIST						664	439	11.50	13.65	32.2	100/100	83400	255/274									
3	17 1/2	HUGHE	X3A	79918	114	24 24 24	18	1288	624	35.00	29.10	21.4	150/150	266952	150/180									
4	17 1/2	HICAL	SX23A	7190		22 22 22	28	1720	432	25.00	21.50	20.1	190/190	237000	110/130									
4	RR1																							
5	12 1/4	D.B.	LX 222	7860116																				
6	12 1/4	HICAL	DS26H	7200		18 18 18		2025	305	39.20	21.80	14.0	190/240	302000	110/156									
7	8 1/2	SMITH	SDGH	XF0205	135	16 16 16		2560	535	23.42	18.70	28.6	130/190	195000	58/100									
1C	8 1/2	D.B.	CD502	7860354				2563	54	2.25	2.20	270.0	120/120	1600	88/88									
2C	8 1/2	D.B.	CD502	7870099				2581	18	2.79	1.98	9.1	120/120	14000	40/80									
								2597	16	2.80	2.22	7.2	66/114	14000	30/111									
2C	RR1																							
3C	RR2							2652	55	6.82	4.61	11.9	100/130	33000	50/90									
8	8 1/2	D.B.	CD502	7870099				2669	17	3.55	1.81	9.4	80/120	12000	25/75									
7	RR1					16 16 16		3100	431	35.16	27.61	15.6	120/175	269000	67/111									
9	8 1/2	SMITH	SDGH	XF0205	135																			
	6	HUGHE	J2	XF126																				

Wipertrip  
Drig.cmt.  
Drig.cmt.  
Drig.cmt.  
20% worn  
45% worn  
Dress cmt.  
Clean lin.

(((  
(ooo)  
Norsk  
Hydro

4

((( (ooo) ----- Norsk Hydro	Bottom hole assembly		Date
	System : Boredata Sandnes		3/8-1987
	Well: 30/6-21		
Data from table 7 and table 10 ("Depth interval")			7

BHA no.:1 Item no./Name/OD,in/Length,m Depth interval md: 137-225

1 Bit	17 1/2	0.43	:	7 X-over	8	0.93
2 Hole Opener	36	2.09		8 Nonmag collar	8	8.43
3 Bit Sub		1.2		9 DC Steel	8	103.33
4 Short DC Steel	8	4.07		10 X-over		1.17
5 X-over	8	0.93		11 HWDP	5	159.05
6 MWD	8	9.6				

BHA no.:2 Item no./Name/OD,in/Length,m Depth interval md: 225-665

1 Bit	12 1/4	0.31	:	7 Nonmag collar	8	8.43
2 X-over		0.8		8 Steel stab	8	2.2
3 Bit Sub		1.2		9 DC Steel	8	103.33
4 X-over	8	0.93		10 X-over		1.17
5 MWD	8	9.6		11 HWDP	5	81.96
6 X-over	8	0.93				

BHA no.:3 Item no./Name/OD,in/Length,m Depth interval md: 665-1288

1 Bit	17 1/2	0.42	:	7 Steel stab	8	1.55
2 Bit Sub		1.2		8 DC Steel	8	103.33
3 X-over	8	0.93		9 Jar	8	11.65
4 MWD	8	9.6		10 X-over		1.17
5 Float Sub	8	0.93		11 HWDP	5	82.65
6 Nonmag collar	8	8.43				

BHA no.:4 Item no./Name/OD,in/Length,m Depth interval md: 1288-1720

1 Bit	17 1/2	0.42	:	7 Steel stab	17 1/2	1.58
2 Bit Sub	9 1/2	1.2		8 DC Steel	8	103.3
3 X-over	8	0.93		9 Jar	8	11.35
4 MWD	8	9.6		10 X-over	8	1.17
5 Float Sub	8	0.93		11 HWDP	5	82.65
6 Nonmag collar	8	8.43				

BHA no.:5 Item no./Name/OD,in/Length,m Depth interval md: 1720-2025

1 Bit	12 1/4	0.47	:	7 DC Steel	8	56.37
2 Bit Sub	8	1.2		8 Jar	8	11.35
3 X-over	8 1/4	0.66		9 DC Steel	8	28.19
4 MWD	8 1/4	9.6		10 X-over	6 1/2	1.17
5 Nonmag collar	8	8.43		11 HWDP	5	137.08





36" hole.  
-----

This section was drilled using seawater with returns to seabed and high viscosity pills on each connection. Prior to the wiper trip the hole was displaced to 1.20 rd bentonite mud. No problems were experienced during the wipertrip with regards to hole problems.

26" hole.  
-----

This section was drilled using seawater and viscous slugs. A 5m<sup>3</sup> viscous pill was pumped on each connection. After drilling a 12 1/4" pilot hole a 20m<sup>3</sup> high viscosity pill was pumped around and a 40m<sup>3</sup> pill was spotted down the hole.

When opening up to 26" hole, a 5m<sup>3</sup> viscous pill was pumped on each connection and the hole was displaced with 195m<sup>3</sup> 1,15 rd high viscous mud.

No significant problems were experienced when pulling out of hole or when running and cementing the casing.

17 1/2" hole.  
-----

After drilling out the casing shoe with bentonite and seawater, the hole was displaced to low toxic oilbased mud at a density of 1.35 rd.

The first problem occurred at 1342m where the string twisted off due to excessive torque in the sand sections. Further drilling proved no hole problems, and the 13 3/8" casing was run and cemented with full returns.

The mud weight was maintained at 1,35 - 1,36 rd throughout the hole section. Despite higher mud weight compared to previous wells (1,35 versus 1,25 rd) no significant mud losses were observed.

RFT-logs shows a pore pressure of 1.13 sg at 2590 m which is at the top of the reservoir, decreasing to 1,11 sg at 2670 m. The Drake Fm. (2670,5 m - 2854 m) acts as a pressure barrier between two different pressure regimes of the Brent Group and the Cook/Statfjord Formations.

RFT-measurements shows a pore pressure gradient of 1,18 sg at the top of the Cook Fm (2854 m) and the same gradient at the top of the Statfjord Fm (3052,7 m). The pore pressure gradient at TD is also 1.18 sg.

Formation integrity

A total of 3 Formation-Integrity-Tests (F.I.T) were performed in well 30/6-21 with the following results. All depths are in m TVD with reference to RKB.

<u>Depth</u> <u>(m TVD)</u>	<u>F.I.T</u> <u>(sg)</u>
668	1,41
1723	1,59
<u>2563</u>	<u>1,60</u>

Overburden gradient

Density-log on well 30/6-21 was only run over the reservoir interval, so in order to get a complete overburden curve, the Density-log on well 30/6-16 has been used for overburden calculations. The calculated overburden curve is shown on Fig. B-4.

Formation temperature

The formation temperature profile for well 30/6-21 has been found using temperature measurements obtained during logging and during the DST. The temperatures obtained during logging are corrected to BHST using the Horner-plot method. The temperature profile is shown in fig. B-5.

**Daily mud properties**

System : Boredata Sandnes

Well: 30/6-21  
Mud Contractor: NPS  
Data: "Mid depth" from table 3, otherwise from table 14

Date  
24/8-1987

Date	Mid. depth m, MD	Mud dens. (SG)	PV cps	YF mPa	GEL 0 mPa	GEL 10 mPa	GEL 100 psi	HP/HT (cc)	Cl- inn/out mg/l	Alkalinity Pf Pm Mf	Ca++ inn/out mg/l	Oil Sol H2O %	V.G. meter at 115 gr. 6 rpm	F 3 rpm	Mud type	
																FV
870221	0	1.05	0	0	0	0	0	0	0	0	0	0	0	0	0	0
870222	225	1.05	0	0	0	0	0	0	0	0	0	0	0	0	0	0
870223	225	1.05	0	0	0	0	0	0	0	0	0	0	0	0	0	0
870224	453	1.06	0	0	0	0	0	0	0	0	0	0	0	0	0	0
870225	665	1.17	0	0	0	0	0	0	0	0	0	0	0	0	0	0
870226	664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
870227	664	1.35	34	16	15	16	4.9	151000/151000	2.4	0	0	66	18	102	39	19
870228	727	1.35	34	16	15	16	4.1	153000/153000	2.5	0	0	66	18	101	38	19
870301	1115	1.36	35	14	15	16	4	162000/162000	3.6	0	0	66	16	91	29	11
870302	1115	1.35	32	13	11	13	4	165000/165000	3.5	0	0	66	16	59	46	11
870303	1288	1.36	37	13	10	12	4.1	153000/153000	4	0	0	65	17	60	47	12
870304	1351	1.35	34	12	10	12	4.8	132000/132000	5.5	0	0	63	17	93	59	14
870305	1720	1.36	32	12	9	12	5.2	136000/150000	4.4	0	0	66	17	89	57	11
870306	1720	1.36	28	9	9	10	5.2	152000/152000	3.4	0	0	66	17	74	46	11
870307	1720	1.36	28	9	9	10	4.8	145000/145000	3.3	0	0	66	16	74	46	11
870308	1720	1.5	28	9	9	13	5.6	151000/152000	3.6	0	0	65	20	73	45	11
870309	1723	1.5	34	11	12	18	6.8	152000/160000	3.2	0	0	64	21	90	56	14
870310	2009	1.49	33	11	12	18	5.4	153000/158000	3.2	0	0	64	21	55	44	14
870311	2347	1.49	34	12	12	17	5.3	150000/150000	4	0	0	65	22	88	56	13
870312	2560	1.5	35	11	11	17	5.4	159000/159000	3.5	0	0	65	21	93	58	14
870313	2560	1.5	35	11	12	18	5.4	157000/157000	3.5	0	0	65	21	93	58	15
870314	2560	1.35	23	8	7	9	4.5	165000/165000	3.6	0	0	68	17	63	40	8
870315	2581	1.35	23	8	7	9	4.5	167000/167000	3.6	0	0	68	17	65	41	9
870316	2652	1.36	20	7	6	7	4.6	168000/168000	3.1	0	0	69	17	60	35	7
870317	2669	1.37	21	7	7	8	4.8	169000/169000	4	0	0	69	17	57	36	7
870318	2734	1.36	20	6	6	8	5	167000/155000	4.4	0	0	69	18	53	33	7
870319	3025	1.37	20	7	7	10	4.7	159000/165000	4.5	0	0	70	19	55	35	7
870320	3100	1.37	21	7	7	9	4.7	166000/166000	4.5	0	0	70	19	57	36	7
870321	3100	1.37	21	7	7	9	4.8	164000/164000	4.5	0	0	70	19	57	36	7
870322	2838	1.37	20	6	7	9	4.9	168000/168000	4.5	0	0	70	19	53	33	7
870323	2860	1.37	21	6	7	9	4.9	165000/165000	4.5	0	0	70	19	55	34	7
870324	2765	1.25	19	5	6	8	5.1	146000/146000	4.8	0	0	71	19	49	30	6
870325	2765	1.25	19	5	6	8	5.2	146000/146000	4.8	0	0	71	13	49	30	6
870326	2765	1.25	20	5	6	8	5.2	148000/148000	4.7	0	0	71	13	50	30	5
870327	2765	1.25	19	6	5	8	5	148000/148000	4.7	0	0	71	13	50	31	4
870328	2765	1.25	19	6	5	8	5	148000/148000	4.7	0	0	71	13	50	31	4
870329	2765	1.25	19	6	5	8	5	149000/149000	4.5	0	0	71	13	50	31	5
870330	2765	1.25	23	6	4	8	5	152000/152000	4	0	0	68	13	60	36	5
870331	2765	1.25	21	6	4	6	5.2	155000/155000	4	0	0	68	12	60	35	4
870401	2765	1.25	21	5	4	6	5.2	142000/142000	3.8	0	0	68	11	55	34	4

**Daily mud properties**

System : Boredata Sandnes

Well: 30/6-21  
Mud Contractor: NPS  
Data: "Mid depth" from table 3, otherwise from table 14

Date  
24/8-1987

Date	Mid. depth m, MD	Mud dens. (SG)	FV cps	YF mPa	GEL			100 psi	HP/HT (cc)	Cl- inn/out mg/l	Alkalinity		Ca++ inn/out mg/l	Oil Sol H2O		V.G. meter at 115 gr. F			Mud type			
					0 mPa	10 mPa	10 mPa				Pf Pm	%		%	600 rpm	300 rpm	200 rpm	100 rpm		6 rpm	3 rpm	
870402	2765	1.26	22	5	2	5	5.2	136000/136000			2.6		68	10	22	49	27	22	14	5	5	ENVIROMUL
870403	2765	1.25	22	6	3	7	5	120000/120000			3		69	10	21	57	35	26	18	7	6	ENVIROMUL
870404	2765	1.25	22	6	3	7	5	120000/120000			3		69	10	21	57	35	26	18	7	6	ENVIROMUL
870405	2765	1.25	22	8	5	8	5.2	115000/115000			2.6		69	10	21	61	39	29	20	8	6	ENVIROMUL
870406	2765	1.25	23	6	3	6	5.6	115000/115000			2.5		67	10	23	59	36	27	18	8	7	ENVIROMUL
870407	300	1	0	0	0																	ENVIROMUL
870408	300	1	0	0	0																	ENVIROMUL
870409	0	1	0	0	0																	SEAWATER

((( (000)	M u d   c o n s u m p t i o n	Date
	----- System : Boredata Sandnes	10/8-1987
Norsk Hydro	Well: 30/6-21 Mud company: NPS	13

Hole size: 36  
-----

BARITE	(Mt)	97
BENTONITE	(Mt)	18
CAUSTIC SODA	(Kg)	694
SODA ASH	(Kg)	347

Hole size: 26  
-----

BARITE	(Mt)	25
BENTONITE	(Mt)	12
CAUSTIC SODA	(Kg)	285
SODA ASH	(Kg)	143
HPHT FLUID LOSS AGENT	(Kg)	940
ORGANOPHILIC CLAY	(Kg)	1980
OIL USED	(m3)	8
Others:		
SAFEMUL OW	(l)	180

Hole size: 17.5  
-----

BARITE	(Mt)	221
CALSIUM CHLORIDE	(Kg)	5600
LIME	(Kg)	6798
HPHT FLUID LOSS AGENT	(Kg)	4935
ORGANOPHILIC CLAY	(Kg)	5865
OIL USED	(m3)	219
Others:		
SAFEMUL OW	(l)	1250
INVERMUL NT	(l)	4582
EZ-MUL NT	(l)	2541

Hole size: 12.25  
-----

BARITE	(Mt)	73
CALSIUM CHLORIDE	(Kg)	2150
LIME	(Kg)	378
HPHT FLUID LOSS AGENT	(Kg)	1150
ORGANOPHILIC CLAY	(Kg)	671
OIL USED	(m3)	65
Others:		
SAFEMUL OW	(l)	0
EZ-MUL NT	(l)	90
OMC	(l)	200

Hole size: 8.5  
-----

BARITE	(Mt)	42
CALSIUM CHLORIDE	(Kg)	2250
LIME	(Kg)	3285
HPHT FLUID LOSS AGENT	(Kg)	1906
ORGANOPHILIC CLAY	(Kg)	2268

((( (ooo)	M u d c o n s u m p t i o n	Date
Norsk Hydro	Well: 30/6-21 Mud company: NPS System : Boredata Sandnes	10/8-1987
		13

OIL USED	(m3)	98
Others:		
EZ-MUL NT	(1)	760
SAFEMUL PE	(1)	800
INVERMUL NT	(1)	316
SAFEMUL OW	(1)	250

((( (ooo)	C e m e n t   r e p o r t s		Date
	System : Boredata Sandnes		10/8-1987
Norsk Hydro	Well: 30/6-21 Cement contractor: BJ HUGHES Data from table 9		10

Casing Size (in)	SLURRY VOLUME (m3)	SLURRY DENSITY (SG)	Thickening Time (hrs)	BHST (deg.C)	Additive name	Compo-sition (l/100kg)	Total used (l)
Lead-30	34	1.56		7	Seawater A-3L	93.65 3.99	24349 1037
Tail-30	19	1.92		7	Seawater A-7L	40.96 3.55	10117 877
Lead-20	161	1.44	6	29	Seawater A-3L	130.00 5.33	126100 5170
Tail-20	10	1.92	3.75	29	Seawater	44.00	4488
Tail-13 3/8	28	1.9	3.23	69	Freshwater D-19LN R-12L	44.20 1.50 .55	16000 543 199
Tail-9 5/8	13	1.9	4.25	85	Freshwater D-19LN R-12L	42.15 1.50 .62	7123 254 105
Lead-7	14	1.9	4.5	118	Freshwater D-31LN D-19	43.23 1.15 .80	7738 206 143



((( (ooo)	C e m e n t   r e p o r t s		Date
	----- System : Boredata Sandnes		10/8-1987
Norsk Hydro	Well: 30/6-21 Cement contractor: BJ HUGHES Data from table 16		10

Type of Job	Depth bot. m, MD	Slurry Volume (m3)	Slurry Density (SG)	Compress. strenght (bar/hrs)	Thickening time (hrs)	Additive name	Compo- sition l/100kg	Total used (l)
PLUG	1675	4	1.9			Freshwater	41.72	2186
						D-19LN	1.78	93
						D-31LN	.89	47
						R-12L	.36	19
PLUG	3100	5.5	1.9			Freshwater	43.08	3059
						D-31LN	1.15	82
						R-12L	.18	13
						D-19	.80	57
PLUG	2940	5.1	1.9			Freshwater	43.08	2878
						D-31LN	1.15	77
						R-12L	.18	12
						D-19	.80	53
PLUG	400	4.7	1.9		4	Seawater	41.20	2472
						A-7L	4.50	270

7. TOTAL COST REPORT

ESTIMATED COSTS

(in 000 NOK)

Survey personell cost	1.324
Position cost	<u>1.679</u>
* Site Survey/Rig positioning	<u>3.003</u>
Rig costs	16.449
Drilling bits & services	1.798
Wellheads	5.424
Casing & casing services	4.117
Cement & Cementing services	800
Mud & mud services	2.253
Wire line logging	3.275
Testing tools and service	1
Norsk Hydro offshore personnel	-94
Other costs	<u>593</u>
* Rig controllable costs	<u>34.616</u>
Supply boats	2.222
Stand by boats	1.021
Helicopter	418
Other transp./dir.freight	<u>103</u>
* Transportation costs	<u>3.764</u>
Drilling department adm.	<u>2.593</u>
* Warehouse costs	<u>2.593</u>
NH geolog. cost	3
Reservoir cost	460
Onshore drilling superv.	<u>3.104</u>
* Laboratory studies	<u>3.567</u>
Grand total	<u>47.489</u>

7. COST REPORTS

ESTIMATED COSTS  
(in 000 NOK)

Rig costs	7.931
Drilling bits & services	520
Casing & casing services	486
Cement & Cementing services	100
Mud & mud services	193
Wire line logging	975
Testing tools and service	3.788
Norsk Hydro offshore personnel	450
Other costs	<u>217</u>
* Rig controllable costs	<u>14.660</u>
Supply boats	1.035
Stand by boats	1.042
Helicopter	316
Other transp/dir.freight	<u>66</u>
* Transportation costs	<u>2.459</u>
Drilling department adm.	200
Warehouse costs	<u>800</u>
* Warehouse costs	<u>1.000</u>
Reservoir cost	9
Onshore drilling superv.	<u>463</u>
* Laboratory studies	<u>472</u>
Grand total	<u>18.591</u>

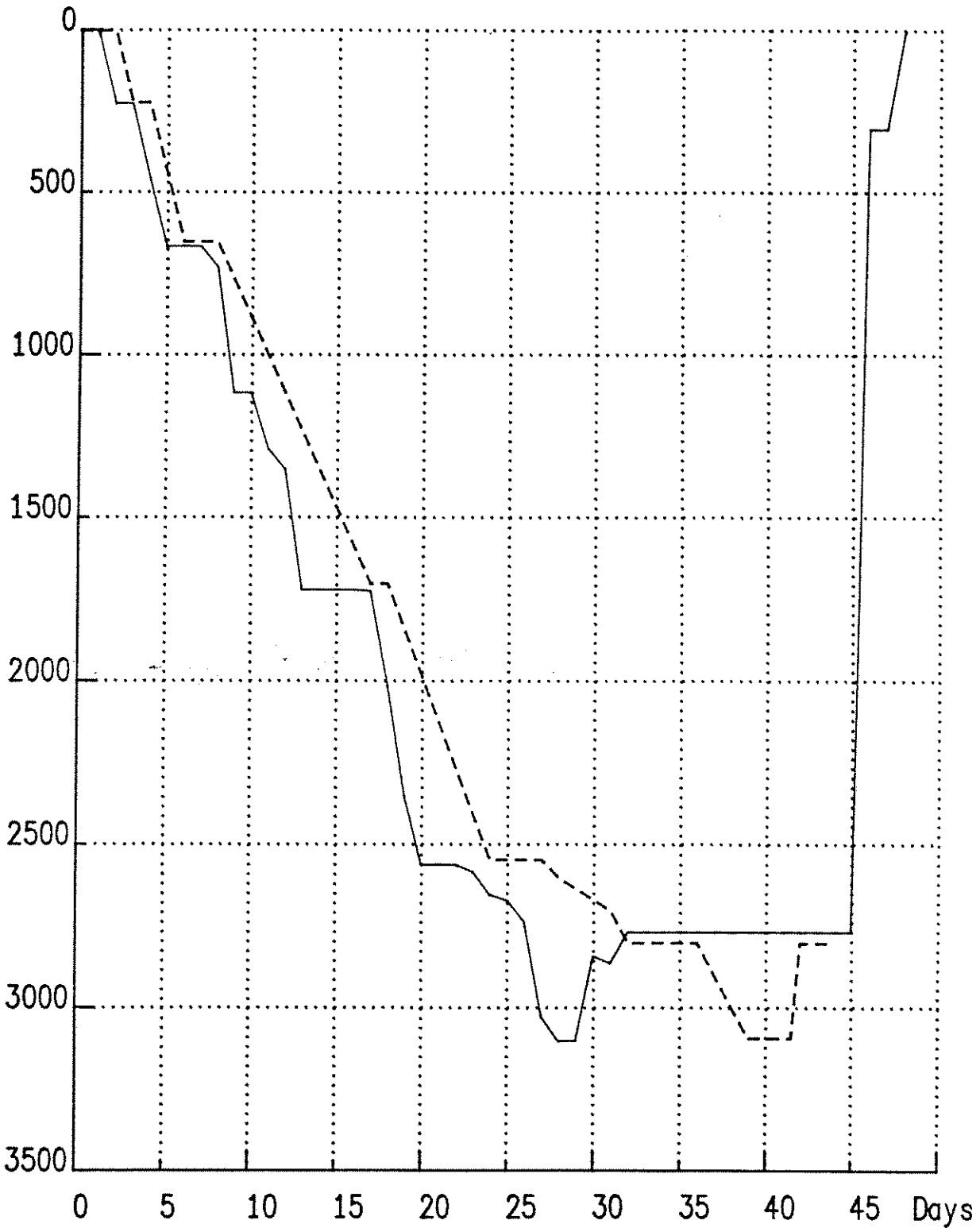
8. EQUIPMENT FAILURES AND PROBLEMS

Date	Equipment	Failure
22.02.87- 05.03.87	MWD-tool	The tool did not transmit data to the surface, or it did not store the data.
27.02.87	Universal BOP tester	Not able to set the tester.
04.03.87	Bowen 8" Up-Jar	The jar twisted off in a stress relief groove.
07.03.87	13 3/8" side door elevator.	The elevator opened by itself because of a shock created to it.
08.03.87	Chicksan elbow between cmt. head and low torque valve.	During testing of cement line, a leak was observed on the chicksan elbow.
13.03.87	Choke hose.	Small hole in the hose because of normal wear.
24.03.87	Compressor	The compressor (air) was down because the valve blew up.
25.03.87	HP Think Job printer.	The printer stopped, it was empty of paper.
30.03.87	SSTT	Had a leak on the ball valve control line of the SSTT.

Date	Equipment	Failure
30.03.87	SSTT	The ball valve in the SSTT failed to close for diff. test below the tree.
01.04.87	Lubricator section	Had problems when stabbing the lub. reactor section onto wireline BOP.
02.04.87	1 1/2" Spang jars 2" RB Running tool skirt.	Just before stabbing on the lubriactor, it tilted over and bended the jars and the running tool skirt.
02.04.87	Veeder loot counter	The depth counter wheel was not compatable to the depth counter.
07.04.87	Brine/Drill water pump	Was unable to transfer brine from pontoon tank to BJ unit.

True Vertical  
Depth (m)

— Actual    - - - Proposed



Norsk Hydro  
Drilling Department

Date:19870811

PROGNOSED AND ACTUAL  
DRILLING CURVES

WELL: 30/6-21

Fig.:  
B - 6

**APPENDIX II**  
**Sidewall core descriptions**

SIDE WALL CORES DESCRIPTION		SERVICE COMPANY Schlumberger	
		ASKED: 30	
		SHOT: 30	
		LOST: 0	
		EMPTY: 0	
WELL: 30/6 - 21	RUN NO: 4 A	SAMPLES RECOVERED: 30	
LICENCE: PL 053	PAGE NO: 1 of 2		
	DATE: 22.03.87	GEOLOGIST: D. Tønseth	

tr : trace M: medium G: good

NO	DEPTHS m	REC cm	LITHOLOGY	Fluorescence	
					CUT
1	3049,5	1.5	<p><b>Sst:</b> clr-lt gy, milky Qtz, f-crs, ang - subrnd, pr - mod srt'd, fri, cly mtb, pyr, coal lams, mod vis por.</p> <p><b>Shows:</b> no petr odour, lt brn oil stn, yel wh flu, slo - v slo strmg lt blish wh flu cut, straw vis resd, lt yel brn flu resd.</p>	trMG	
2	3086	2	<p><b>Sst:</b> lt gy-dk, gy clr-milky Qtz, v f-f, ang - subrnd, mod srt'd fri, abdt cly mtb, tr pyr, tr mica, pr vis por.</p>		
3	3062	2.5	<p><b>Sst:</b> lt gy dk gy, rr clr Qtz, f-crs, ang-subrnd, pr srt'd fri, cly mtb, coal frags, pr vis por.</p>		
4	3060	3	<p><b>Sst:</b> lt gy, occ dk gy, rr clr-milky Qtz, f - pbly, ang - md, pr srt'd, fri cly mtb, tr pyr, pr vis por.</p>		
5	3057	1.5	<p><b>Sst:</b> lt gy-lt brn, occ clr Qtz, f-v crs, ang - subrnd, pr srt'd fri, cly mtb, pyr, coal frags, mod - gd vis por.</p>		
6	3061	1.5	<p><b>Clyst:</b> w/intbd <b>Sst:</b> dusky yel brn, mod hd, subfis - blk, carb, sl calc, sl slty, tr micropyr, tr micromic.</p> <p><b>Sst:</b> lt gy - dk gy, clr - milky Qtz, f - crs, ang - md, pr srt'd, mod hd, cly mtb, silic cmt, no vis por.</p>		
7	3015	2	<p><b>Sh:</b> olv blk, mod hd, fis, calc, sl carb, tr micromic, tr micropyr, slty-vf sdy.</p>		
8	2992	1.5	<p><b>Clyst:</b> brn, blk, mod hd-hd, blk-subfis, sl calc carb, v slty.</p>		
9	2985	1.5	<p><b>Clyst:</b> brn, blk, mod hd-hd, subfis, tr carb, tr pyr sl micromic, slty.</p>		
10	2972	2	<p><b>Clyst:</b> dusky yel brn, mod hd-hd, blk non calc, tr micropyr.</p>		
11	2956	1.5	<p><b>Clyst:</b> brn blk, mod hd, blk - subfis, mod calc, sl carb, micromic, sl slty.</p>		
12	2925	1.5	<p><b>Clyst:</b> brn, blk, mod hd, subfis, calc, mod carb, v mic, slty.</p>		
13	2903,5	1	<p><b>Sst:</b> brn blk, mod hd, subfis - fis, sl calc, tr carb, micromic, tr vf sd.</p>		
14	2872	4	<p><b>Sst:</b> lt gy-dk gy Qtz, f - m, ang-subrnd, mod - w srt'd, mod hd, tr mica, cly mtb, mod vis por.</p> <p><b>Shows:</b> no petr odour, no oil stn, spt'd dk yel flu v slo strmg gyish wh flu cut, nd vis resd, yeis wh flu resd.</p>		



## SIDE WALL CORES DESCRIPTION

SERVICE COMPANY Schlumberger

ASKED: 30

SHOT: 30

LOST: 0

EMPTY: 0

SAMPLES RECOVERED: 30

WELL: 30/6 - 21

RUN NO: 4 A

LICENCE: PL 053

PAGE NO: 2 of 2

DATE: 22.03.87

GEOLOGIST:

D. Tønseth

tr : trace M: medium G: good

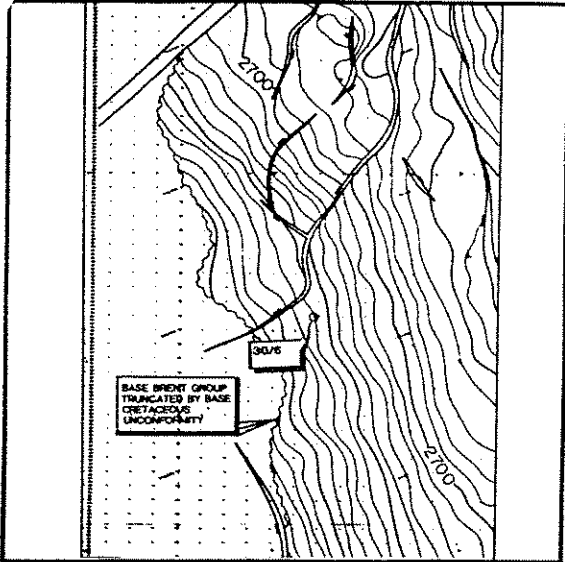
NO	DEPTHS m	REC cm	LITHOLOGY	Fluorescence	
				tr	CUT
15	2862	4	Sst: lt gy - dk gy, miky Qtz, f-m, ang, subrnd, mod srted, frm, mica, cly mtb, mod - fair vis por.		
16	2860	3.5	Sst: lt gy - dk gy, clr - miky Qtz, f-m, ang - subrnd, mod - w srted, frm, mica, cly mtb, fair vis por.		
	2857	2.5	Sst: dk gy - lt gy Qtz, f-crs prud m, ang - subrnd, mod srted, hd, mica, cly mtb, silic cmt, no vis por.		
18	2841	1.5	Sst: lt gy - dk gy, mod hd-hd, bkly-subfis, no calc, tr carb, mic tr vf sd.		
19	2827	1.5	Clyst: olv blk, mod hd - hd, bkly - subfis, no calc, mic.v slty, tr vf sd.		
20	2818	2	Clyst: olv blk, mod hd, subfis-fis, calc in pr, tr carb, mic slty.		
21	2796	2	Clyst: olv blk, mod hd, bkly - subfis, no calc, tr carb, sl slty.		
22	2787	2	Sst: olv gy - olv blk, mod hd - hd, bkly-fis mod calc, carb in lams, micromic, in pt vf sdy.		
23	2780	2	Sst: olv gy - olv blk, mod hd, fis - subfis, mod calc, in pt v calc, tr carb, micromic, micropyr, vf sdy.		
24	2770	1.5	Clyst: brn blk, mod hd, subfis, sl calc, tr carb, micromic, mod slty.		
25	2759	1.5	Clyst: gy blk, mod hd, bkly - subfis, in pt sl calc, tr carb, micromic, tr micropyr, slty.		
26	2737	2	Sst: olv gy - olv blk, mod hd, in pt fri, bkly - subfis, mod calc, tr carb, mica.		
27	2716	1.5	Clyst: olv blk, mod hd, bkly - subfis, in pt sl calc, tr carb, mic, in pt v slty.		
28	2697	2	Clyst: olv, gy- olv blk, mod hd, bkly - subfis, mod calc, tr carb, mic, pyr in lams, v slty.		
29	2679	1.5	Sst: olv blk - gy blk, mod hd, bkly, mod calc, tr carb, mic.		
30	2672	2	Sst: olv blk - brn blk, mod hd bkly, no - sl calc, tr carb, tr mic, tr pyr, burrows, tr vf sd.		

**APPENDIX III**  
**Well summary Geological well summary**

# WELL SUMMARY: 30/6-21



## Locations map (base Brent level)



Well Class: Appraisal  
 Target: BRENT GR. COOK FM.  
 STATFJORD FM.

Elevation KB: 25m  
 Water depth: 112m MSL  
 Total depth(Driller): 3100 mRKB  
 Total depth(Logger): 3107 mRKB

On location: 21.02.87  
 Spudded: 22.02.87  
 Reaced total depth: 20.03.87  
 Temporary abandoned: 09.04.87

Rig: VILDKAT  
 Contractor: SDS  
 Mudlogging Company: ANADRILL  
 Logging Company: SCHLUMBERGER

## Coordinates (UTM)

WELLHEAD: 6723215.6 mN  
 485226.5 mE

## Cores

## Logs

Core no.	Cut interval m	Recovered interval m	Recovery		Log type	Logged interval	Run no.
			m	%			
1	2563-2581	2563-2580.3	17.3	96	Exlog MWD GR/Res	137 - 1720	
2	2581-2597	2581-2596.67	15.67	98	DIL/LSS/GR/CAL	650-1720	1A
3	2597-2652	2597-2651.9	54.9	100	(GR to seabed)		
4	2652-2669	2652-2668.84	16.84	99	DIL/LSS/GR/CAL	1701-2564	2B
					LDL/CNL/GR	2234-2566	2A
					CBL/VDL	1275-1701	2A
					DIT-E/SDT/GR	2543-2671	3A
					LDL/CNL/GR	2543-2673	3B
					RFT	2578-2660	3A-C
					DIL/LSS/GR	2600-3105	4C
					LDL/CNL/NGT	2540-3106	4C
					EPT	2545-2950	4A
					RFT	2590-3093	4D-E
					CST	2672-3094.5	4A
					CBL/VDL	2135-2543	4B
					VSP	1230 - 2760	4A
					CBL/VDL/CET	2393-2770	4C

## Casing Records

## Comments

30" Csg shoe at: 221m  
 20" Csg shoe at: 650m  
 13 3/8" Csg shoe at: 1702m  
 9 5/8" Csg shoe at: 2544m  
 7" Csg shoe at: 2856m

# GEOLOGICAL WELL SUMMARY: 30/6-21



DEPTH m MD RKB	GEOLOGICAL RESULTS				GEOLOGICAL PROGNOSIS				DEPTH m	GEOLOGICAL RESULTS				GEOLOGICAL PROGNOSIS								
	CASING PROGRAM	GROUP	FORMATION	LITHOLOGY	DEPTH m	CASING PROGRAM	GROUP	FORMATION		LITHOLOGY	DEPTH m	CASING PROGRAM	GROUP	FORMATION	LITHOLOGY	DEPTH m	CASING PROGRAM	GROUP	FORMATION	LITHOLOGY	DEPTH m	
				MSL 25					MSL 25m													
100				Seabed 137m					Seabed 138m													
200	30"			Drilled with return to seabed	30"																	
	221m			225	222m																	
				286																		
400																						
				534																		
600	20"				20"																	
	650m				650m																	
700				706					707±20													
800																						
				895.5					905±20													
900																						
1000																						

### Lithology Description:

225-286m: Cly: olv gy-m lt gy, calc, tr Sd: m-v crs.  
 286-534m: Cly: olv gy-m lt gy, sl-non calc, tr Sd: vf-crs, pred f-m  
 534-706m: Cly: m dk gy-mgy, sl-non calc, tr Sd: f-crs, pred f.  
 706-895.5m: Sd: f-crs, pred m, subang-submd, mod srtid.  
 895.5-1697m: Clyst: dusky yel brn, mnr olv gy, non calc-calc, mnr Sd: vf-crs, pred f-m, subrnd-md, mod-pr srtid. tr Sst: vf-m, subang-rnd, mod srtid, silic cmt.

### Lithology Description:

1697-1953m: Clyst: grn gy-dk gm gy, non calc  
 1953-1993m: Clyst: mod brn, non-occ sl calc, tr Dot: dk yel brn, v hd, blk, crptoxln.  
 1993-2075m: Clyst: olv gy - m dk gy, non-occ sl calc, tr Lat, tr tuff Clyst.  
 2075-2154 m: Clyst: dk gy-olv blk, non-occ mod calc, tr Lst.  
 2154-2265m: Clyst: grn blk-gy blk, non-calc, sl silty, in pt v silty grdg Sst, tr, Lst.

# GEOLOGICAL WELL SUMMARY: 30/6-21



GEOLOGICAL RESULTS					GEOLOGICAL PROGNOSIS					GEOLOGICAL RESULTS					GEOLOGICAL PROGNOSIS								
DEPTH m	MD RKB	CASING PROGRAM	GROUP	FORMATION	LITHOLOGY	DEPTH m	CASING PROGRAM	GROUP	FORMATION	LITHOLOGY	DEPTH m	MD RKB	CASING PROGRAM	GROUP	FORMATION	LITHOLOGY	DEPTH m	CASING PROGRAM	GROUP	FORMATION	LITHOLOGY	DEPTH m	
2300			SHETLAND GROUP	Lista Fm	C D	2265		SHETLAND GROUP		M	2262±20	3400											
				MGR			2279																
2400			SHETLAND GROUP		M			SHETLAND GROUP		M		3500											
2500			SHETLAND GROUP		M			SHETLAND GROUP		M		3600											
2543			BRENT GR		M	2575		BRENT GR		M		3700											
							2615																
2600			BRENT GR	Osob. Ness Fm	M	2615		BRENT GR	Ness Fm	M	2598+15/-35												
							2626						2616±25										
2670.5			DUNLIN GROUP	Osob. Ness Fm	M	2670.5		DUNLIN GROUP	Osob. Ness Fm	M	2674±20												
2700			DUNLIN GROUP	Drake Formation	M			DUNLIN GROUP	Drake Formation	M		3800											
2800			DUNLIN GROUP	Drake Formation	M			DUNLIN GROUP	Drake Formation	M		3900											
2854.7			DUNLIN GROUP	Cook Fm	M	2854.7		DUNLIN GROUP	Cook Fm	M	2863±25												
							2922						2913±25										
3000			DUNLIN GROUP	Amundsen Fm	M			DUNLIN GROUP	Amundsen/Burton Fm	M		4100											
3052.5			DUNLIN GROUP	Statfjord Fm	M	3052.5		DUNLIN GROUP	Statfjord Fm	M	3041±25												
							3107 T.D. (Logger)						3091 T.D.										
4200												4300											

**Lithology Description:**

2265-2279m: Clyst: olv gy, calc-v calc grdg Mrl,

2279-2568m: Clyst: dk gy-olv gy, bec olv gy-olv blk, calc-v calc grdg Mrl, bec sl calc, intbd Lst: wh-v lt gy, occ pl yel brn

2568-2615m: Clyst: dusky yel brn, non calc, mnr Sst: lt gy-m gy, v f-m, pred f subang-subrnd, mod artd, mod-gd vis por, in pt pr vis por,

2615-2670.5m Sst: pl yel brn, f-crs, pred crs, tr pbla, subang-subrnd, mod-pr srtd gd vis por.

**Lithology Description:**

2670.5-2854: Clyst olv gy-olv blk, sl-mod calc, loc v silty grdg Sst strgs of Lst/Dol: gy wh, mod-dk yel brn.

2854-2922: Sst: m lt gy Qtz, f-m, subang-subrnd, w-mod srtd, fri-lse, silic cmt, loc v arg, pr vis por.

2922-3052.5: Clyst: olv gy-olv blk, dusky yel brn, calc, loc grd, Sst.

3052.5-T.D.: Sd: lt gy Clr, mky Qtz, f-crs, subang-subrnd, lse mod-loc w srtd. Minor Clyst; olv gy-olv blk, dusky yel brn frm-hd carb, silty. Tr Coaly Sh; blk-olv blk, hd, pyr, silty

APPENDIX IV  
CPI-log