FINAL WELL REPORT

WELL 36/7-2

PL 153

HYDRO

STATOIL

A/S Norske Shell

saga

DEMINEX

U&P-divisjonen

Gradering
Intern
Nedgradering
Oppbevaringstid
Erfaringsdok.

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NORSK HYDRO

FINAL WELL REPORT

WELL 36/7-2

March 1998

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INTRODUCTION:

PREFACE

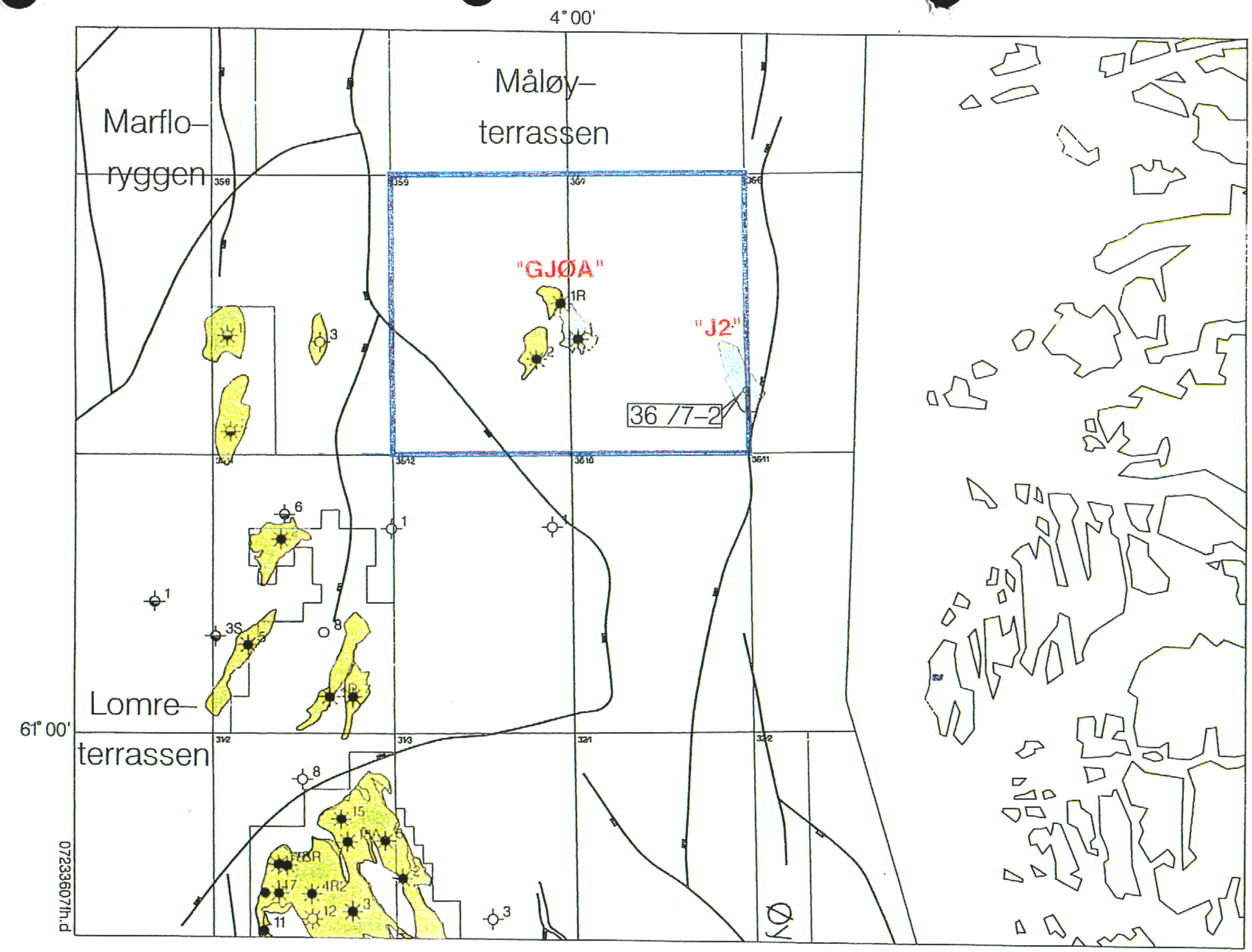
License PL 153 was awarded to the Norsk Hydro/Statoil/Saga/Norske Shell/ Deminex group in 1988 with Norsk Hydro as the operator.

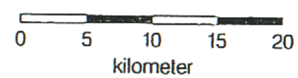
The licensees' percentage share of the block is as follows:

Den Norske Stats Oljeselskap a.s. (Statoil)	50%
Norsk Hydro a.s. (operator)	20%
Norske Shell	12%
Saga Petroleum	10%
Deminex	8%

The well was drilled by Norsk Hydro a.s.,on behalf of the group, during 1997 (see Location Map, page II).

All depths in this report are mMD RKB unless otherwise stated





Well location map 36/7–2

SUMMARY OF WELL DATA	
LOCATION:	61° 18' 23.50"N 04° 19' 47.50" E 6797817.6 mN 571232.6 mE ED 50, UTM Zone 31, CM 3°E
OPERATOR: RIG: CONTRACTOR:	Norsk Hydro a.s West Vanguard Smedvig Drilling
KB ELEVATION (to MSL): WATER DEPTH (MSL):	22 m 269 m
START OF OPERATIONS: WELL SPUDDED: REACHED TD ON: COMPLETED: STATUS: FORMATION AT TD:	30.08.97 01.09.97 14.09.97 22.09.97 Plugged and abandoned oil discovery Basement
TD DRILLER (mRKB): TD LOGGER (mRKB):	1435 1433
DRILLING DEPTHS:	36" to 355 m 17 1/2" to 591 m 12 1/4" to 925 m 8 1/2" to 1435 m
CASING DEPTHS:	30" to 340 m 13 3/8" to 587 m

SECTION A

GEOLOGY

LIST OF CONTENTS SECTION A

SECTION A: LIST OF FIGURES, TABLES AND APPENDICES

1 OBJECTIVES

The primary objective of well 36/7-2 was:
To prove oil and gas resources within the J2 structure before 50% relinquishment decision on the 8 July 1998.

The secondary objectives of the well were:
In case of no oil discovery, to gather geological information from the Cretaceous and Jurassic sequence by logging runs.
In case of discovery, to gather additional information from VSP and CST log runs.

2 RESULTS

The well 36/7-2 discovered heavily biodegraded oil in the Upper Jurassic deltaic sandstone reservoir of the Fensfjord Formation. The overlying Sognefjord Formation sands were tight and contained no hydrocarbons.

A 32,5 m oil column is proven from 909,5 to 942,0 m TVD MSL. As the oil-water contact is within a shale dominated zone, some uncertainty is attached to it.

The reservoir zone of the Fensfjord Formation is divided into two units, from which only the upper one has good reservoir properties.

The oil column correlates to a small structural closure with a similar structural hight. The spillpoint is to the Øygarden Fault to the east.

The STOOIP volumes are estimated to 4,4 mill. Sm^3, whereof 1,8 mill. Sm^3 are located within block 36/7 of PL153.

There were no cores taken and no production tests done. The discovery will be further evaluated and mapped in greater detail after having been covered with a forthcoming 3D seismic survey.

3 BIOSTRATIGRAPHY

Biostratigraphic analyses are available in the 36/7-2 routine biostratigraphy report by Robertson Research.

Chronostratigraphical boundaries/tops in the well are listed in Table 3.1. The tops are inferred tops based on biostratigraphy and log interpretation.

The youngest sediments are silty mudstones and glauconitic sandstones of Pliocene age. These rest unconformable upon truncated possibly Early Eocene sediments. The poorly age-constrained Early Eocene interval comprises sandy tuffs and glauconitic sandstones, probably attributed to the Balder Formation.

A significant unconformity separates the Balder Formation from late Aptian Sola Formation sediments.

The Cromer Knoll Group is fragmentarily developed consisting of early Aptian, early Barremian and early Valanginian-latest Ryazanian strata and rests conformably upon the Draupne Formation of late Ryazanian to late Volgian age.

It is considered possible that a minor intra-Late Jurassic hiatus separates the Draupne Formation from the Sognefjord Formation, with no positive evidence for middle Volgian strata.

The reservoir interval comprises two formations in well 36/7-2, the Sognefjord Fm. (916,5-931,5 mRKB) and the Fensfjord Fm (931,5-1363mRKB) The OWC is at 964 mRKB in beds of Late? Callovian age.

The upper part of the reservoir, the Sognefjord Formation, principally comprises glauconitic, bioclastic sandstones of an incomplete early Volgian age. The section is considered to represent a relatively condensed shelf unit which rests unconformable upon the Fensfjord Formation.

The Fensfjord Formation comprises a sand-rich, marginal marine sequence of Callovian age. The upper part of the formation, of questionable Late Callovian age, comprises a progradational sequence. Deposition is considered to have occurred under a variety of marginal marine, estuarine/coastal plain settings. Increases in numbers/diversity of marine microplankton at 1090 m(RKB)(SWC), 1267 m(RKB)(SWC) and 1300 m(RKB) (SWC) are interpreted to reflect minor, flooding events. Increased freshwater input is evident at 1155 m. It is uncertain whether coals are *in situ* or drifted in origin.

The biostratigraphic recovery of the material which the datings is based on, is poor with a progressive reduction downhole. Confident dating of the Late? Callovian and Callovian intervals is hampered by the paucity of age-diagnostic palynomorphs. No positive pre-Callovian indices have been recorded. Local correlation's suggest that the Callovian interval most likely is of late - middle Callovian age, although positive data are lacking.

The Fensfjord Formation rests unconformable upon the truncated Statfjord Formation of Sinemurian - Hettangian age.

Reference:

Robertson Research International Limited: Norsk Hydro 36/7-2 Norwegian North Sea Well. Biostratigraphy of the Interval 595m - 1435 mTD. (February 1998)

Biostratigraphic tops

Age	mMSL	mRKB
Pliocene (top not seen)	573.0	595.0
Early Eocene	626.0	648.0
Early Cretaceous, Late Aptian	655.5	677.5
Early Aptian	673.0	695.0
Early Barremian	752.0	774.0
Early Valanginian	811.0	833.0
Latest Ryazanian	845.0	867.0
Late Ryazanian	857.5	879.5
Early Ryazanian	878.0	900.0
Late Jurassic, Late Volgian	893.0	915.0
Early Volgian	894.5	916.5
Middle Jurassic, Late? Callovian	909.5	931.5
Callovian	1102.0	1124.0
Early Jurassic, Sinnemurian - Hettangian	1341.0	1363.0

Lithostratigraphic tops

Group	Formation	mMSL	mRKB
Nordland		573.0	595.0
Rogaland	Balder	626.0	648.0
Cromer Knoll	Sola	655.5	677.5
	Åsgard	752.0	774.0
Viking	Draupne	857.5	879.5
	Sognefjord	894.5	916.5
	Fensfjord	909.5	931.5
	Statfjord	1341.0	1363.0
Basement		1407.0	1429.0

Table 3.1: Chrono- and lithostratigraphy

4 LITHOSTRATIGRAPHY

All depths are in mMD RKB (RKB is 22m). At levels where the well is deviated the depths are also given in mTVD RKB.

This summary is compiled predominantly from ditch cuttings descriptions.
60 sidewall cores were shot in this well. No conventional cores were cut in the well. Wireline and MWD logs were used to aid lithological interpretation and the placement of formation boundaries.

The well was drilled with returns to seabed from the seafloor at291 m to 591 m before setting 13 3/8" casing at 587 m. Lithology interpretation through this interval is based on MWD logs and drilling parameters. The first drill cuttings samples were taken at 600m.

4.1 Tertiary / Quaternary

4.1.1 Nordland Group (291-648 m)

This interval comprises clay / claystone with some minor sandstone stringers.

(591 - 648 m)

CLAYSTONE: medium grey - dark grey, soft - firm, blocky, non calcareous, sandy - very sandy locally grading sandstone, aboundat glauconite, traces mica, traces shell fragments.

SANDSTONE: clear - milky quartz, very fine- fine, trace coarse, subangular - subrounded, moderate sorted, as loose grains, no visible cement.

Age: Undifferentiated Quaternary - Tertiary

4.1.2 Rogaland Group (648-677.5m)

Balder Formation (648 - 677.5 m)

This interval comprises sandstone, claystone and limestone stringers.

SANDSTONE: clear - milky white quartz grains, predominantly as loose grains, very fine - very coarse, predominantly very coarse, subrounded - subangular, occasional rounded, sperical, moderate - good sorted, hard, silica / calcareous cement, calcareous matrix, trace micropyritic, trace micropyritic nodes, no visible porosity.

LIMESTONE: white - pinkish grey, blocky, hard, very abundant glauconite, trace sandy, rare trace pyritic, rare pyrite nodes, microcrystalline - crystalline, chalky.

CLAYSTONE: dark green grey, soft - firm, blocky - subblocky, sandy, very calcareous, abundant Glauconite.

4.2 Cretaceous

4.2.1 Cromer Knoll Group (677.5-879.5 m)

The Cromer Knoll Group consists of the Sola Formation and Åsgard Formation.

Sola Formation (677.5-774.0 m)

This interval comprises claystone with minor sandstone stringers.

CLAYSTONE: brown black - olive black, soft, subblocky - blocky, slightly calcareous - calcareous, sticky, abundant glauconite, trace micromicaceous, rare - trace micropyrite.

SANDSTONE: clear - milky quarts, predominantly as loose grains, very fine - coarse, predominantly fine, subrounded - subangular, moderate sorted, abundant glauconite, trace pyritic.

Age: Late Aptian - Early Aptian

Åsgard Formation (774.0--879.5 m)

This interval comprises of claystone with minor sandstone stringers.

CLAYSTONE: olive black - olive grey, becoming olive grey, soft, subblocky - blocky, slightly calcareous, very sticky, slightly silty, locally very silty grading siltstone, trace glauconitic, trace mica, locally abundant pyrite nodes.

SANDSTONE: clear - milky quarts, predominantly as loose grains, very fine - coarse, predominantly fine, subrounded - subangular, moderate sorted, abundant glauconite, trace pyritic.

DOLOMITE: dark yellowish brown, angular, hard, microcrystalline - crystalline, rare pyrite.

Age: Early Barremian - Latest Ryazanian

4.3 Jurassic

4.3.1 Viking Group (879.5-1363 m)

The Viking Group consists of the Draupne Formation, Sognefjord Formation and Fensfjord Formation.

Age: Late Ryazanian - Callovian

Draupne Formation (879.5-916.5 m)

This interval comprises claystone and minor sandstone stringers.

CLAYSTONE:	olive black, becoming predominantly olive grey, subblocky - blocky, soft - firm, non calcareous, trace glauconite, locally abundant glauconite, silty, becoming very silty grading siltstone.
SANDSTONE:	clear - milky quartz, predominantly as loose grains, very fine - coarse, predominantly fine, subangular - angular, moderate sorted, no visible cement.
Age:	Late Ryazanian - Late Volgian

Sognefjord Formation (916.5-931.5 m)

This interval comprises of sandstone and claystone.

SANDSTONE:	clear -translucent quartz, predominantly as loose grains, very fine - medium, predominantly fine, occasionally coarse - very coarse, subangular - subrounded, moderate sorted, firm - moderate hard, trace dolomitic cement, argillaceous matrix, occasionally very argillaceous grading sandy claystone, abundant glauconite, trace micropyrite, no visible porosity.
CLAYSTONE:	medium dark grey - brown grey, subblocky, soft, very slightly calcareous, sandy, silty, trace glauconite, trace micropyritic nodules.
Age:	Early Volgian

Fensfjord Formation (931.5-1363 m)

This interval comprises sandstone, siltstone, claystones and minor coal stringers.

SANDSTONE:	clear - milky quartz, trace smoky and rose quartz, very fine - v coarse, predominantly fine, becoming predominantly medium, locally coarse - very coarse, trace pebbly - pebbly / conglomeratic, subrounded, poor - moderate sorted, spherical, generally as lose grains, silica cemented, trace calcitic cement, trace argillaceous matrix, trace glauconite, locally trace micropyrite, locally trace mica, locally trace coal fragments.
SILTSTONE:	dusky yellow brown, dark yellowish brown, blocky - platy, sandy grading fine coarse sandstone, soft - firm, non calcareous, trace glauconite, trace pyrite.
CLAYSTONE:	olive grey, brown black, subblocky - blocky, soft, silty, sandy, non calcareous, trace micropyrite, trace micromicaceous, rare - trace carbonaceous matter.
COAL:	black - brown black, blocky, hard, brittle.
Age:	Callovian

4.4 Statfjord (1363-1429 m)

This interval comprises pebbly sandstone, claystones and siltstones.

SANDSTONE:	clear - translucent quartz, milky quartz, very fine - pebbly /, as loose grains, predominantly m, subrounded - subangular, moderate sorted, trace calcitic cement, rare - trace carbonaceous matter, rare - trace mica, rare - trace micropyrite.
CLAYSTONE:	olive grey, subblocky, soft, very slightly calcareous - slightly calcareous, sandy, silty, trace micropyrite, trace micromicaceous, rare carbonaceous matter.
CLAYSTONE:	brown grey - brown black, brown black, blocky, becoming blocky - platy, soft, slightly silty, locally very silty grading siltstone, non calcareous, micropyritic, carbonaceous.
SILTSTONE:	medium grey, blocky, firm, calcareous, carbonaceous, micropyritic.
SILTSTONE:	brown black, platy, non calcareous, micropyritic, carbonaceous matter, micromicaceous.
Age:	Sinemurian - Hettangian

4.5 Basement (1429-1435 m)

ROCK FLOUR: light olive grey - light brown - light grey, subblocky, soft, v slightly silty / very fine sandy, non calcareous, green speckled, green banded, trace chlorite.

5 HYDROCARBON SHOWS

The evaluation of hydrocarbon shows at the wellsite was carried out in a conventional manner. A standard (Baker Hughes Inteq) hydrocarbon total gas detector system together with a gas chromatograph for automatic and continuous gas analysis, recorded as ppm by volume of C1 through nC4, were operational below 587 m down to the TD of the well.

Hydrocarbon shows on ditch cuttings and sidewall cores were evaluated according to procedures described in Norsk Hydro's "Wellsite Geologist's Manual".

5.1 Gas Record

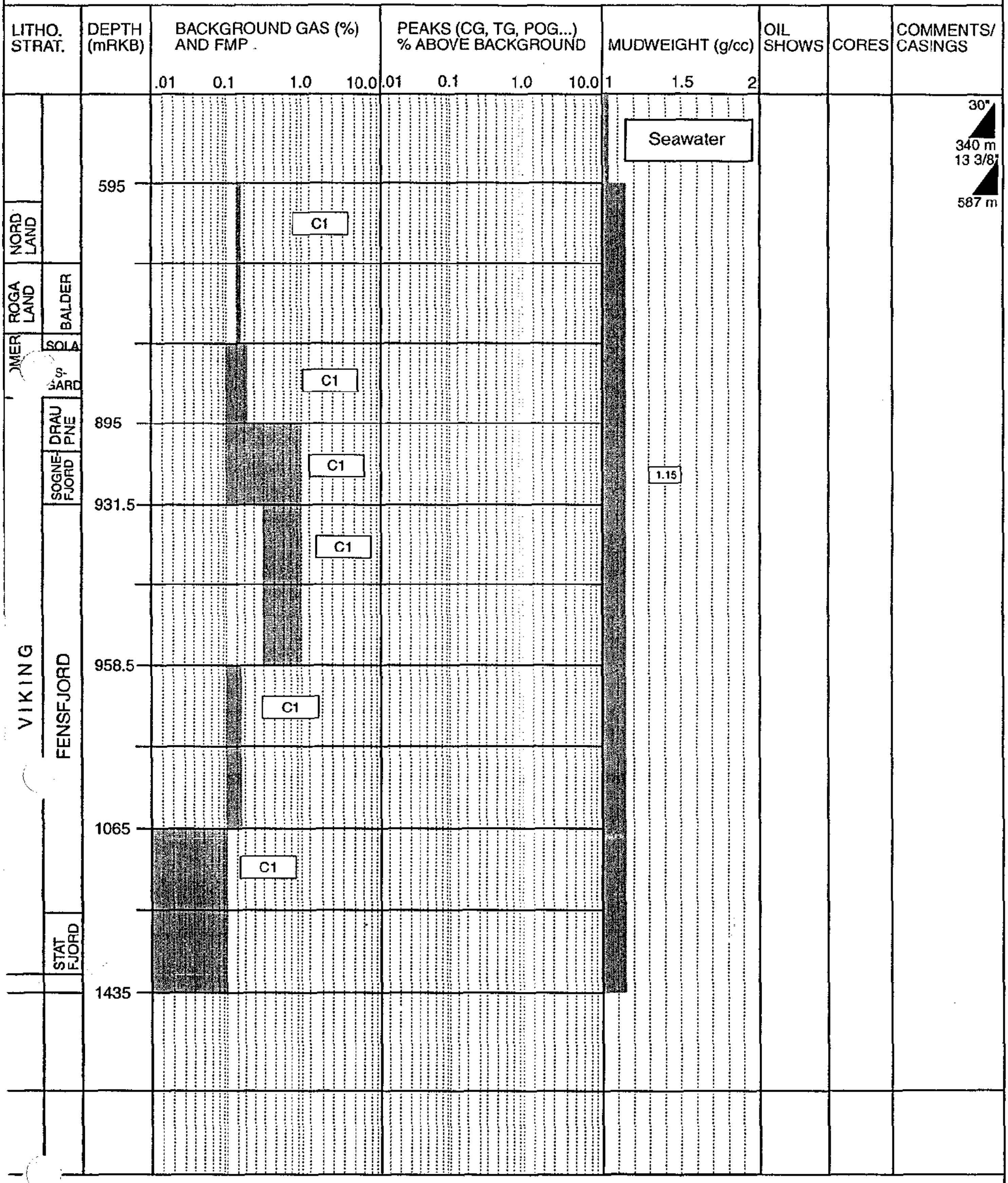
291 - 591 m:

This interval was drilled with returns to sea bed.

591 - 1435 m:

The gas summary for the well is presented in Figure 5.1 on the next page.

GAS SUMMARY WELL: 36/7-2



NOTE: NOT TO SCALE

CG=CONNECTION GAS, TG=TRIP GAS, WTG=WIPER TRIP GAS,
POG=PUMP OFF GAS, SWG=SWABBED GAS, FMP=FORMATION GAS PEAK

INTERVAL (mRKB)	SOURCE	LITHOLOGY	SHOWS DESCRIPTION
915-925	Cuttings	Sandstone	no petroliferous odour, no - wk brown oil stain, strong yellow direct fluorescence, slow streaming blue white fluorescent cut, weak brown visible cut, yellow white florescent residue, very weak brown visible residual
930-937	Cuttings	Sandstone	no petroliferous odour, no oil stain, wk yellow - yellow brown direct fluorescence, very slow streaming weak blue white fluorescent cut, no visible cut, blue white fluorescence residual, no visible residual.
942-970	Cuttings	Sandstone	no petroliferous odour, no oil stain, spotty yellow direct fluorescence, very slow streaming blue fluorescence cut, no visible cut, blue white fluorescence residual, no visible residual
970-1017	Cuttings	Sandstone	no petroliferous odour, no oil stain, very weak yellow direct fluorescence, very slow streaming blue fluorescence cut, no visible cut, blue white fluorescence residual, no visible residual
1017-1045	Cuttings	Sandstone	no petroliferous odour, no oil stain, spotty yellow direct fluorescence, very slow streaming blue fluorescence cut, no visible cut, blue white fluorescence residual, no visible residual

Table 5.1. Shows summary

6 CORING

6.1 Conventional cores

No cores was cut in this well.

6.2 Sidewall cores

Sidewall cores were taken from 1408 m to 603 m. Details of recovery are given in Table 6.1 below.

Descriptions of the sidewall cores can be found in Appendix I, and gross lithology is reported on the Completion Log.

Run	Requested	Misfired	Lost	Empty	Recovered	Rec.%
1A	60	2		2	56	93

Table 6.1: Sidewall cores

7 LOGGING

7.1 Wireline logs

The following table is a summary of wireline logs run in the well and shows log type, date run, logged intervals and run number for each log.

Logs	Date	Logged interval (mRKB)	Run
PEX/AMS	15.09.97	1433-586 (GR to seabed at 291m RKB)	1A
ARRAY SONIC/GR/AMS	15.09.97	1431-586	1A
VSP/GR	15-16.09.97	1430-586	1A
MDT/GR/AMS	16-17.12.97	918-1100	1A
MDT/GR/AMS	18-19.09.97	934.5-1375.1	1B
CST/GR/AMS	19.09.97	1408-603	1A

Table 7.1: Wireline logs

7.2 MWD logs

A MWD service (Baker Hughes Inteq) yielding gamma ray, resistivity and survey measurements was run in the following section:

291 - 1435m

Detailed MWD results can be found in the report "End of Well Report, MWD, for Norsk Hydro, Well 36/7-2."

7.3 Bottom hole temperatures from wireline logs

The table below gives a summary of the bottom hole temperatures measured from wireline logs.

Log suite	Run	Depth (mRKB)	Temp ° C	Time since circ.	Circ. time
PEX/AMS	1A	1433.2	34	7:45	5:30
ARRAY SONIC/GR/AMS	1A	1432.2	34	11:35	5:30

Table 7.2: Bottom hole temperatures from logs

8 PETROPHYSICAL RESULTS

Database and log quality

All digital data was input to the in-house Recall database. This applications different modules for data editing, calibration, log analysis etc. are used to perform the petrophysical evaluation. Mudlogs, MWD/LWD logs, and mud descriptions in addition to wireline logs and one fluid sample were input or used as corroborative data.

The log data is of good quality in most of the well. The MWD/LWD logs are of very good quality for the entire well. The calliper curve shows few washouts, the wireline logs are thus regarded as being of good quality as well. The density, neutron and resistivity curves are spiky in some intervals but this is regarded as being due to lithological variations (especially coal and calcite beds). Due to shortage of DSI tools during the time when the well was drilled, only an Array Sonic tool was available. The sonic data is thus not as comprehensive as that of a DSI run.

Pressure interpretation

All MDT formation pressure data obtained is plotted in Figure 8.1. 23 of the 42 attempted pre-tests were successful. In spite of the many (4) attempts to get pressures points from the top part of the reservoir (above 934mMD RKB), none were successful. The high percentage of dry tests is a result of the low permeability in parts of the formation.

The gradients defined are based on the pressures with best mobility, in addition to the sample. By using the formation water density, resistivity and temperature from the water analysis, the pressure gradients can be calculated:

Oil gradient:	γ_o= 0.0914bar/m	
Water gradient:	γ_w = 0.100bar/m	which is equivalent to,
Oil density:	ρ_o= 0.932g/cc	
Water density:	ρ_w = 1.020g/cc	at reservoir conditions.

The oil density is heavy, with a gradient close to the water gradient. Both gradients are forced through the highest mobility MDT points. The intersection between the oil and water gradient occurs at 964mMD RKB (942mTVD MSL), which is within a shaly silt. It is not possible to interpret this OWC from the logs (where only a transition zone can be identified). As there are no cores from this well the OWC has to be determined solely from the MDT pressure points. The OWC lies within the transition zone observed from logs.

A few of the MDT results from the first run were confirmed by the second run. In light of this the recorded data must be said to have a high degree of confidence.

The pore pressure is computed from MDT test #5:
formation pressure = 94.06 @ 912.0mTVD MSL (934.0mMD RKB),
which corresponds to an equivalent pore pressure of:
pp= 1.052 g/cc

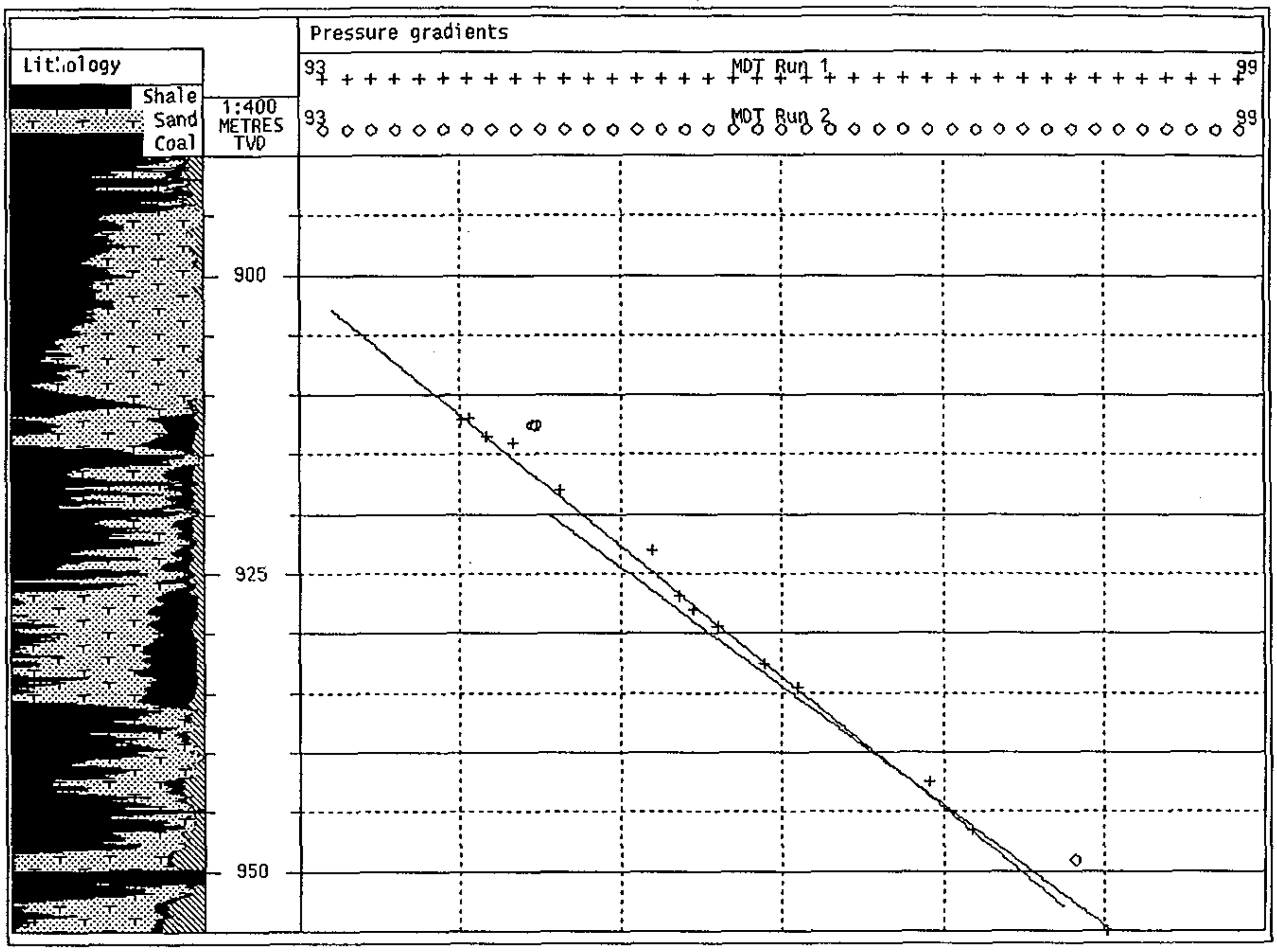


Figure 8.1: Pressure plot showing the reservoir zones within the upper part of the Sognefjord Formation. Depths in m MSL TVD.

Log interpretation

A Computer Processed Interpretation (CPI) is found in fig. 8.2. The cut off's used for the interpretation are:
phie<0.15 and Vsh>0.40

To distinguish net pay, a cut off for water saturation of 0.60 was chosen.
Based on the interpretation, the various reservoir parameters for the Sognefjord Formation are calculated (Table 8.1). Net pay is only found within reservoir zone 2, as reservoir zone 1 is calcite cemented and reservoir zone 3 is below the Oil Water Contact.

Zone	Gross	Net res	N/G	Por (%)	Sw(%)	Net pay
Tot: 916.5-964.0	47,5	15,2	0,32	0,25	0,17	15,2
1:916.5-931.5	15	0	0	0	1	0
2: 931.5-958.5	27	15,2	0,56	0,25	0,17	15,2
3: 958.5-964.0	5,5	0	0	0	1	0

Table 8.1: Reservoir parameters for the Sognefjord formation.
Porosity cut-off is set to 0.15, shale cut-off is set to 0.40 and Swe cut off to 0.60.

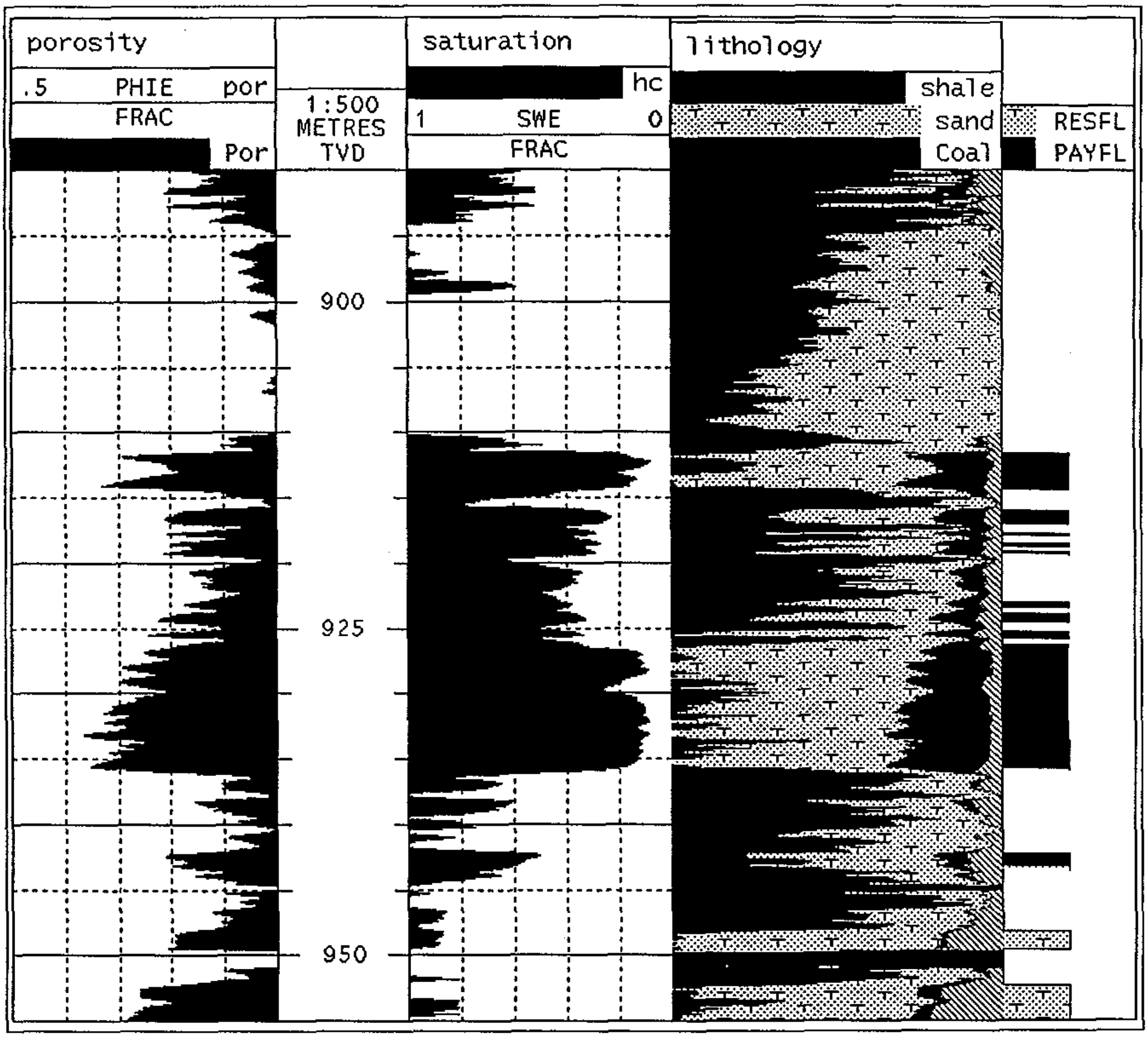


Figure 8.2: Computer Processed Interpretation of the upper part of the Sognefjord formation.
Depths in m MSL TVD.

Discussion/summary

The J2 prospect has proven to be oil bearing within the Sognefjord Formation. The upper 48m (916.5-964mMD RKB) have been interpreted with respect to saturation, porosity and net pay. 15 metres of net sand is interpreted for this interval, in which a Net/Gross ratio of 0.32 is established.

Presence of hydrocarbons was confirmed during sampling by the OFA (Optical Fluid Analyser, part of the MDT tool) and the hydrocarbon type is heavy oil. The oil-water contact is not clearly defined because of poor reservoir properties. The density and neutron curves do not show a typical sand separation. One of the reasons for this could be heavy minerals increasing the density slightly, as observed in nearby wells (e.g. 35/9-3T2).

The reservoir is divided into three reservoir zones; 1, 2 and 3.

Reservoir zone 1 (916.5-931.5mMD RKB) is extensively calcite cemented, thus the reservoir properties for this interval are poor. Low permeability where MDT sampling was impossible supports this interpretation. No net sand is interpreted. The average porosity and HC-saturation are presented as zero, due to the fact that only reservoir zones are evaluated.

15 metres of net sand is interpreted in reservoir zone 2 (931.5-958.5mMD RKB), in which a Net/Gross ratio of 0.56 is established. The sand quality is good, with an average porosity of 25 p.u. and mobility's up to 800mD/cp. Some tight spots are observed from the MDT sampling. All reservoir sand intervals are interpreted as net pay, thus giving a total of 15m net pay for this zone.

No net sand is interpreted in reservoir zone 3 (958.5-964.0mMD RKB), the zone consists of shaly silt.

The MDT pressure survey (pressure points and sample) gives an oil gradient of 0.0914bar/m and a water gradient of 0.100bar/m. This corresponds to an oil density of 0.932g/cc and a water density of 1.020g/cc. The gradients give an OWC at 964mMD RKB (942mTVD MSL), which is within a shaly silt. As the OWC is based on pressure gradients, the established contact is sensitive to small variations in either of the present fluids (similar gradients).

For more details regarding the petrophysical interpretations refer to this report's Appendix III "RFT Results", and to Norsk Hydro report "Formation Evaluation Report 36/7-2".

9 GEOPHYSICAL RESULTS

Table 9.1 shows the main formation tops in well 36/7-2 as prognosed and compares these with the results after drilling.

The prognosis was based on the interpretation of the seismic 2D line NH9205-113A in the well location at shotpoint 625. The seabed and the top Tertiary prognosis was confirmed by the site survey interpretation. The two-way-time results are derived from the zero offset VSP-report.

The interpretation concept has been shown to be incorrect at the Tertiary and basement levels. In Table 9.1, a correction for the misinterpretation is applied.

The Eocene interval (Balder Formation) between 626 and 655,5 mMSL was prognosed to represent an Upper Cretaceous sequence. The prognosis was uncertain because of a poor well tie and a thin sequence representation.

The top Statfjord Gp was wrongly picked as top basement and the top basement was not identified 62 m below. This is because top basement is not represented with a clear seismic anomaly.

Otherwise, the difference between prognosed and actual depth is relatively small and well within uncertainty limits at all levels. There is not observed a consistent shift trend in the prognosis.

WELL 36/7-2

SPUD UTM LOCATION: N 6797817.7 E 571232.6
SEISMIC LINE LOCATION: NH9202-113A SP 625

FORMATION TOPS	TWO-WAY-TIME (MS) (Prognosis from seismic rec.)				TRUE VERTICAL DEPTH (mMSL) (RKB = 22 m)				TOTAL ERROR IN DEPTH (mMSL)	
	TIME		ERROR		DEPTH		PROGN. ERROR			
	Progn.	Result	Progn.	Result	Progn.	Result	Seismic pick	Depth conv.	Progn.	Result
Seabed	364	364	+/-4	0	270	269	+/-1	+/-2	+/-3	-1
Top Tertiary	694	697	+/-4	-3	609	600	+/-4	+/-12	+/-16	9
Top Rogaland Gp*	704	719	+/-4	-15	619	626	+/-4	+/-12	+/-16	-7
Top L Cretaceous	745	738	+/-10	7	669	655,5	+/-12	+/-16	+/-28	13,5
Top Draupne Fm	910	913	+/-6	-3	867	857,5	+/-7	+/-28	+/-35	9,5
Top Sognefjord Gp	936	943	+/-6	-7	900	894,5	+/-7	+/-30	+/-37	5,5
Top Statfjord Gp**	1 255	1 242	+/-6	-13	1 339	1 341	+/-8	+/-62	+/-70	-2
Top Basement		1 283				1 407				

* interpreted as Top U Cretaceous in the prognosis
** interpreted as Top Basement in the prognosis

Table 9.1 Prognosis and results for well 36/7-1

nhofhj\i:\data\ami\pl153\360702\fer_tab2.sam

10 POST SITE SURVEY REPORT 36/7-2

WELL DATA:

1 Distance from rig floor to sea level: 22 m

2 Water depth (MSL): 291 m

3a Setting depth for conductor (m RKB): 340 m

3b Leak Off / Formation Integrity Test (g/cc):

4a Setting depth for casing on which BOP mounted: 587 m

4b Leak Off / Formation Integrity Test (g/cc):

5 Depth (m RKB & two way time to formation/section/layer tops:

Top Balder Fm.:	648 m/ 718 ms (VSP TWT)
Top Sola Fm.:	677,5 m/ 737 ms (VSP TWT)
Top Åsgard Fm.:	774 m/ 825 ms (VSP TWT)

6 Depth interval (m RKB & TWT) and age of sand bodies shallower than 1000 m under the seabed. Note which layers if any contain gas:

The logs in the upper part of Pleistocene are poor and sand layers are not resolved (36" hole).

Pleistocene layers:	No distinct sand layers observed.
Paleocene layers:	648-677.5 m (718-737 ms).

7 By what means is the presence of gas proven:

No gas was observed.

8 Composition and origin of gas: N/A

9 Describe all measurements taken in gas bearing layers:

SEISMIC DATA:

10 Given depth (m RKB & TWT) of unconformities at the well location:

Top Balder Fm.:	648 m/ 718 ms (VSP TWT)
Top Sola Fm.:	677,5 m/ 737 ms (VSP TWT)
Top Åsgard Fm.:	774 m/ 825 ms (VSP TWT)

11 Given depth and extent of sand layers (communication, continuity, truncation etc.):

Pleistocene layers:	No distinct sand layers observed.
Paleocene layers:	648-677.5 m (718-737 ms).

12 Given depth and extent of any gas blanking ("gass-skygging"), seismic anomalies etc.:

A high seismic amplitude anomaly were mapped at Base Pleistocene (622 m RKB).

13 Note any indication of gas originating from deeper levels. Give description in cases where gas comes from deeper layers:

14 How does the interpretation of the site survey correspond to the well data with respect to:

- **shallow gas:** A weak gas warning was given at Base Pleistocene. No gas was observed.
- **sand bodies:** In general the predicted sand layers of the Nordland Group is not observed in the logs. The sand in the Balder Fm. was predicted as siltstone with sandstone stringers..
- **unconformities:**

  The Base Pleistocene was prognosed at 632 m, but biostratigraphic analysis indicate Pliocene age at 595 m (Top Pliocene is not identified in the biostratigraphic report). Top Cretaceous was prognosed at 642 and is reported at 677,5 m in the biostratigraphic report. The seismic pick of Top Cretaceous corresponds to a Near Top Balder horizon.
- **correlation to nearby wells:**

  The interval above the Near Top Balder horizon at 633 m is absent or has a different seismic pattern in the tie well 35/9-2.

11 STANDARD AND SPECIAL STUDIES

- **Norsk Hydro, 1997:** Reservoir Geochemistry of well 36/7-2
- **Norsk Hydro, 1998:** Well 36/7-2, transfer, drainage and PVT analyses
- **Robertson Research, 1998:** 36/7-2, Biostratigraphy of the interval 595 - 1435 m.
- **Norsk Hydro, 1998:** Formation Evaluation Report 36/7-2
- **Baker Hughes Inteq, 1998:** End of Well Report, measurement while drilling, well 36/7-2
- **Read Well Services, 1998:** Final VSP Report, 36/7-2

APPENDIX I

SIDEWALL CORE DESCRIPTIONS

NORSK HYDRO	SIDE WALL CORE DESCRIPTION	WELL	36/7 - 2
		RIG	West Vanguard

1A	Date : 19.09.97	Logging co. SCHLUMBERGER	Page 1.00 of 6.00
t: 60.00	Misfired 2.00	Lost: 0.00 / Empty 2.00 / Recoverd 56.0	Geologist O.G / F-M.J / H.N.

No.	Depth m RKB	Recoverd cm	Lithology and shows description	Fluorescence Direct Tr	Direct M	Direct G	Cut Tr	Cut M	Cut G
1A/1	1408.00	2.00	Sst: lt gn gry,clr-mky Qtz,v f-f,Tr m,sbang-sbrndd,mod srt,frm,slily slty,Kao Mtrx,Tr Mic,Tr Glau,r carb,n.v.p.,n/s						
1A/2	1387.00	2.50	Sst: w/ C and Clst Len Sst: lt gry-m gry,f-crs,Kao Mtrx,mic,carb,n.v.p.,else a/a Clst: dk gry,frm,sbfis,slily slty,Micromic						
1A/3	1364.00	4.00	Sst: lt gry-grysh wh,clr-mky Qtz,v f-m,sbang-sbrndd, frm, mod srt,Kao Mtrx,Tr Micropyr,Tr carb,r Mic,n.v.p.,n/s						
1A/4	1352.00	2.50	Sst: some rose Qtz, else as 1364m						
1A/5	1343.00	4.00	Sst: lt gry-m gry,clr-mky Qtz,m-crs,Tr v crs,sbrndd-rndd,mod srt,fri-mod hd,Kao Mtrx,Tr Pyr,Tr Mic, Tr carb,pr-n.v.p.,n/s						
1A/6	1335.00	2.00	Clst: brn gry,frm,blky,non calc,slily slty,Micromic,carb						
1A/7	1316.00	2.00	Sst: m dk gry-lt gry,v f-f,sbang-sbrndd,ang,mod-gd srt, frm, Kao Mtrx,, Tr Pyr,Tr Mic, carb,n.v.p.,n/s						
1A/8	1300.00	4.50	Sst: as for 1316m						
1A/9	1283.00	1.50	Sst: v f-f,abd Kao Mtrx,else as for 1316m						
1A/10	1267.00	2.00	Sltst: m dk gry,frm,blky,slily-non calc,Micropyr,Tr Mic, slily v f sdy						

Tr:Trace M:Medium G:Good

mments:

NORSK	SIDE WALL CORE DESCRIPTION	WELL	36/7 - 2
HYDRO		RIG	West Vanguard

1A	Date 19.09.97	Logging co. SCHLUMBERGER	Page 2.00 of 6.00
..t: 60	Misfired 2.00	Lost: 0.00 / Empty 2.00 / Recoverd 56.0	Geologist O.G / F-M.J / H.N

No.	Depth m RKB	Recoverd cm	Lithology and shows description	Fluorescence Direct Tr	Direct M	Direct G	Cut Tr	Cut M	Cut G
1A/11	1245.50	2.00	Sst: m dk gry, clr-mky Qtz,vf,sbang-sbrndd,frm,Kao Mtrx,loc v slty grad Sltst,Tr carb,Tr Pyr,Tr Mica,n .v.p.,n/s.						
1A/12	1231.50	4.00	Sst: olv gry-m dk gry,clr-mky Qtz,vf-v crs,sbang- sbrndd,frm,Kao Mtrx,Tr Mica,pr v.p,n/s						
1A/13	1195.00	4.50	Cgl: lt gry-m lt gry,vf-pbl,dom crs-pbl,sbrndd-rndd, mod srt,fri-sft,Kao Mtrx,Tr Mic,Tr Pyr,Tr carb,r Glauc,n-pr v.p,n/s.						
1A/14	1177.50		Empty						
1A/15	1142.00	3.50	Clst: brn-brnsh blk,blky-sbfis,frm-m hd,non calc,C Len,v slty,loc grad Sltst,Tr micromic						
1A/16	1124.00	4.00	Sst: m lt gry-lt brnsh gry,vf-m,frm-fri,Tr Glauc,Tr carb,Tr Mica,Kao Mtrx, n.v.p.,n/s						
1A/17	1104.00	3.50	Sst: m lt gry, else as for 1124m						
1A/18	1090.00	1.00	Clst: brnsh gry-m dk gry,frm,blky,non calc,loc vf sdy Len,v slty grad Sltst,mic						
1A/19	1082.00	4.00	Sst: vf-crs,pr srt,Tr Kao Mtrx,r Mica,r Pyr,r carb,v gd v.p,n/s.						
1A/20	1052.50		Empty						

Tr:Trace M:Medium G:Good

..nments:

NORSK	SIDE WALL CORE DESCRIPTION	WELL	36/7 - 2
HYDRO		RIG	West Vanguard

1A	Date 19.09.97	Logging SCHLUMBERGER	Page 3.00 of 6.00
ɔt: 60.00	Misfired 2.00	Lost 0.00 / Empty 2.00 / Recoverd 56.0	Geologist O. G / F - M . J / H. N

No.	Depth m RKB	Recoverd cm	Lithology and shows description	Fluorescence Direct Tr	Direct M	Direct G	Cut Tr	Cut M	Cut G
1A/21	1037.00	3.00	Clst w/Sst Len Clst:brnsh gry-m dk gry,frm,blky,non calc,loc vf Sd,v slty grad Sltst,Tr Mica Sst: vf-f, Kao Mtrx,Tr Pyr,carb,n/s						
1A/22	1030.00	4.00	Sst:vf-crs,pr srt,Tr Kao Mtrx,r Mica,r Pyr,r carb,v gd v.p.,n/s.						
1A/23	1021.00	2.50	Cgl: olv gry,clr-mky Qtz,vf-pbl,frm,sbrnd,loc ang,Cl Mtrx,r Mica,n.v.p.,n/s.						
1A/24	1017.00	3.00	Cgl: as for 1021m						
1A/25	1013.00	4.00	Cgl: as for 1021m						
1A/26	1007.00	4.00	Cgl: as for 1021m						
1A/27	998.00	4.50	Sst: m dk gry,vf-m,fri,arg/Kao Mtrx,Tr Pyr,Tr Mica,n.v.p.,n/s						
1A/28	987.50	3.00	Sst: f-crs,carb Len,else as 998m						
1A/29	979.00	4.00	Sst: f-v crs,r Kao Mtrx,v gd v.p. Show: no Pet od,no O Stn,dull sptd yel dir Fluor,v slo strmg bl-bl wh Fluor cut,no vis cut,bl wh Fluor Res,no vis Res	X				X	
1A/30	970.50	3.00	Cgl:vf-pbl,Tr Rose Qtz,Tr Pyr,mod v.p. Show: wk Pet od,no O Stn,sptd dull yel dir Fluor,v slo strmg bl wh-wh Fluor cut,no vis cut,wk bl Fluor Res,no vis Res.	X				X	

Tr:Trace M:Medium G:Good

ɔmments:

NORSK HYDRO	SIDE WALL CORE DESCRIPTION	WELL	36/7 - 2
		RIG	West Vanguard

	1A	Date	19.09.97	Logging	SCHLUMBERGER	Page	4.00	of	6.00
t:	60.00	Misfired	2.00	Lost 0.00	Empty 2.00	Recoverd 56.0	Geologist	O.G / F-M.J / H.N	

No.	Depth m RKB	Recoverd cm	Lithology and shows description	Fluorescence Direct Tr	Direct M	Direct G	Cut Tr	Cut M	Cut G
1A/31	969.50	1.50	Clst w/Len of Sst Clst:brn gry,blky-sbfis,mod hd-frm,non calc,slty,micromic,vf sdy,loc Qtz pbl, Tr Shows in Sst	X			X		
1A/32	961.00	3.00	Sst: yelsh brn,clr-trans Qtz,vf,rndd-sbrndd,spher,gd srt,fri-lse,Tr sil Cmt,Tr Pyr,Tr Mica,Tr carb,mod vis por. Show: wk Petr od,yel wh-brt yel wh dir Fluor, mod strmg,mod wh Fluor cut,pl straw vis cut,brt crm Fluor res,lt yel vis Res			X			X
1A/33	955.00	6.50	Sst:dk yelsh brn,clr-trans Qtz,occ mky,vf-crs,pred f, mod srt,sbrndd-sbang,Tr sil Cmt,Tr Pyr,gd vis por.Show: mod Petr od,brt yel wh dir Fluor, mod strmg, mod wh Fluor cut,pl straw vis cut,m yel wh flu Res,lt yel vis Res			X			X
1A/34	950.00	2.50	Sst: yel brn,m brn,m-crs,pred m,tr Kao Mtrx,else as 950m. Show: yel brn-m brn O Stn,brt yel wh-wh dir Fluor, else as 955m			X			X
1A/35	947.00		Misfire						
1A/36	935.00	4.00	Sst:pred m-dk brn,f-m, loc pbl, else as 950m Show: as for 955m			X			X
1A/37	928.00	3.00	Glauc Sst/Cgl: gn-dk gn,gn-gnsh blk Glauc,pred f-m, loc clr-trans Qtz,pred pebl,rndd-sbrndd,spher,Kao Cmt,m v.p. Show: v wk Petr od,lt brn O Stn,fnt crm Fluor cut,no vis cut,m yel wh Fluor Res,no vis Res	X			X		
1A/38	923.00	3.50	Glauc Sst/Cgl: as 928m Show:no Petr od,tr dull ptchy yel dir Fluor,v slo strmg dull crm Fluor cut,no vis cut,no fluor Res,no vis Res	X			X		
1A/39	919.00	3.50	Glauc Sst/Cgl: as 928m Show: as 923m	X			X		
1A/40	915.00		Misfire						

Tr:Trace M:Medium G:Good

Comments:

NORSK HYDRO	SIDE WALL CORE DESCRIPTION	WELL	36/7 - 2
		RIG	West Vanguard

1A	Date 19.09.97	Logging co. SCHLUMBERGER	Page 5.00 of 6.00
ot: 60.00	Misfired 2.00	Lost: 0.00 / Empty 2.00 / Recoverd 2.00	Geologist O.G / F-M.J / H.N

No.	Depth m RKB	Recoverd cm	Lithology and shows description	Fluorescence Direct Tr	M	G	Cut Tr	M	G
1A/41	908.00	5.00	Clst w/Ls Lam: Clst: dk gry-olv gry,frm,slily calc,Tr micropyr,r Mica, Tr micromic Ls: yelsh gry,m hd,styl						
1A/42	900.00	5.50	Clst:dk gry-olv gry,loc v lt gry,sft-frm,non fiss,slily calc,Tr Slt,Tr vf Sd,Tr carb,r Mica						
1A/43	887.00	5.50	Clst: pred frm, else as 900m						
1A/44	867.00	5.00	Clst:frm-hd,v calc grad arg Ls, else as 900m.						
1A/45	859.00	5.00	Sst: lt brn,clr-trans Qtz,f-m,occ crs,sbang-sbrndd, spher,mod-pr srt,mod hd,Kao/Cl Mtrx,slily calc,gd Tr Glauc,n/s						
1A/46	847.00	5.00	Clst: m gnsh gry-m dk gry,frm-sft,plty,non-slily calc,mod fiss,Tr Slt,Tr Pyr,r Mica						
1A/47	834.00	6.00	Clst: pred lt olv gry-olv gry,crs Qtz gr,Tr micropyr,loc sdy,else as for 847m.						
1A/48	817.50	5.00	Clst: olv gry-dk gry,mod-v calc,Tr Mic,else as 847m.						
1A/49	798.00	4.50	Clst: dk gry,m calc,Tr Pyr Lam,Tr Ls,Tr Qtz pbl,else as for 847						
1A/50	768.00	4.00	Clst:md dk gry,frm,fiss,m-v calc,Tr Slt,Tr Pyr lam and Nod,r Sd,Tr micromic.						

Tr:Trace M:Medium G:Good

omments:

NORSK HYDRO	SIDE WALL CORE DESCRIPTION	WELL	36/7 - 2
		RIG	West Vanguard

1A	Date 19.09.97	Logging co. SCHLUMBERGER	Page 6.00 of 6.00
..t: 60.00	Misfired 2.00	Lost: 0.00 Empty 2.00 Recoverd 56.0	Geologist O.G / F-M.J / H.N

No.	Depth m RKB	Recoverd cm	Lithology and shows description	Fluorescence Direct Tr	Direct M	Direct G	Cut Tr	Cut M	Cut G
1A/51	744.00	5.00	Clst: dk gry-brnsh gry,frm-m hd,non stky,m fiss,m-slily calc,v slty grad Sltst,Tr Glauc,r Mica,r Pyr.						
1A/52	722.00	3.50	Clst: olv blk,frm,stky,non fiss,slily-m calc,v slty,grad Sltst,Tr Glauc						
1A/53	705.00	3.00	Clst: as for 722m						
1A/54	685.00	5.00	Clst: grysh blk-olv blk,sft,slily calc,else as for 722m						
1A/55	665.00	3.50	Glauc Sst/Cgl: grysh gn-yelsh gry,grysh gn-blk Glauc, m-f,trans-mky Qtz, pred crs-v crs,occ pbl,rndd-sbrndd, spher,fri-m hd,Kao Mtrx,Tr Ls, n/s						
1A/56	653.50	3.00	Sst: olv-gry,lt olv gry,occ lt gry,clr-trans Qtz,pred f,occ vf,occ m,sbrndd-sbang,spher,m srt,hd-m hd,Cl Mtrx,v arg,Tr Mica,n/s						
1A/57	639.00	2.50	Sst: wh,lt yelsh brn,mky Qtz,occ clr-trans,pred f,occ m-crs,sbrndd-sbang,spher,m srt,hd-m hd,v calc cmt,abd Glauc,n.v.p.,min Fluor						
1A/58	623.50	5.00	Clst: olv gry,sft-frm,mod stky,non fiss,mod calc,Tr Slt,Tr vf Sd						
1A/59	615.00	6.00	Clst: gd Tr m Sd,micromic,else as for 623.5m						
1A/60	603.00	5.00	Clst:calc,v gd Tr m Sd,Tr Glauc,else as for 623.5m.						
				Tr:Trace M:Medium G:Good					

..mments:

APPENDIX II

WELL SUMMARY

GEOLOGICAL WELL SUMMARY

MDT RESULTS

GEOLOGICAL WELL SUMMARY

HYDRO

Located on: 61° 18' 23.5" N, 04° 19' 47.5" E

Water depth: 269 m MSL

WELL **36/7-2**

DEPTH m MD RKB	LITHO SECTION	SYSTEM	SERIES/STAGE	GROUP	FORMATION	DESCRIPTION	SHOWS
						Seabed 291 m RKB	
291–587		QUATERNARY	PLIOCENE	NORDLAND		Returns to seabed 30" 340 m 13 3/8" 587 m	
587–648		TERTIARY				**Clst:** m dk gry, sdy, abdt Glauc	
648–677.5			EOCENE	ROGAL.	Balder	648 m **Ls:** wh-pk gry, hd, abd Glauc Tr sdy, Tr pyr, microxln-xln, chky **Sst:** clr-mky wh Qtc, vf-v crs, pred v crs, sbrndd-srt, hd, sil/calc cmt, calc mtx	
677.5–774			L. Ryazanian - Aptian	CROMER KNOLL	Sola	677.5 m **Clst:** brn blk-olv blk, bcm olv blk-olv gry, slily calc, stky, slily slty loc v slty grad **Sltst**, abd Glauc-Tr Glauc, Tr mic, Tr pyr loc abd Pyr nod	
774–879.5					Asgard	774 m	
879.5–916.5		JURASSIC	CALLOVIAN - L. RYAZANIAN	VIKING	D / S	879.5 m **Clst:** olv blk, bcm olv gry, non calc, loc abd Glauc	
916.5–					Fensfjord	916.5 m **Sst:** clr-trnsl Qtz, vf-m, pred f, occ crs-v crs, mod srt, Tr dol cmt, arg grad sdy Clyst, abd Glauc **Clst:** dk gn gry, slty, v slily calc, micromic **Sst:** clr-trnsl Qtc, f-crs, pred m, bcm f-pbly, mod-gd srt, loc Tr calc cmt, Tr Mic, Tr Pyr **Sltst:** dusky yel brn, dk yel brn, sdy grad f **sst**, non calc **Clst:** olv gry, brn blk, slty, sdy, non calc **Sst:** clr-trnsl Qtz, mky Qtz, vf-pbly, pred m Tr calc cmt	
–1363		JURASSIC		VIKING	Fensfjord	**Slst:** brn blk, non calc, micropyr, carb mat, micromic	
1363–1429				PLIENSB.	Statfiord	1363 m **Clst:** olv gry, v slily calc-clily calc, sdy, slty, Tr micropyr, Tr micromic, r carb.	
1429–1435					B	1429 m **Gnsch:** lt olv gry-lt brn-lt gry, sft, v slily slty/vf sdy, non calc, gn spk/bnd, Tr Chlor TD 1435 m	

Depth scale (m MD RKB): 50, 100, 150, 200, 250, 300, 350, 400, 450, 500, 550, 600, 650, 700, 750, 800, 850, 900, 950, 1000, 1050, 1100, 1150, 1200, 1250, 1300, 1350, 1400, 1450, 1500, 1550, 1600, 1650, 1700, 1750, 1800, 1850, 1900, 1950, 2000, 2050, 2100, 2150, 2200, 2250, 2300, 2350, 2400, 2450, 2500

WELL SUMMARY

HYDRO

Coord: 61° 18' 23.5"N 04° 19' 47.5"E
UTM: 6 797 817.6 mN 571 232.6 mE
Zone: ED50,UTM Zone 31, CM 3E
Line: NH9205-113A, sp625
Rig: West Vanguard
Waterdepth: 269 m MSL
Stopped in: Basement

On location: 30.08.97
Spudded: 01.09.97
At T.D.: 14.09.97
Completed: 22.09.97
T.D. Driller: 1435 m RKB
T.D. Logger: 1433 m RKB
Wireline Logging: Schlumberger
Mudlogging: Baker Huges Inteq

WELL: 36/7-2

COUNTRY Norway

OPERATOR Norsk Hydro **LICENCE**

OWNED BY:

TARGETS
Primary: Sognefjord Fm and Fensfjord Fm
Secondary:

RESULTS The J2 prospect has proven to be oil bearing within the Sognefjord Formation.
The well is permanently plugged and abandoned.

CASING

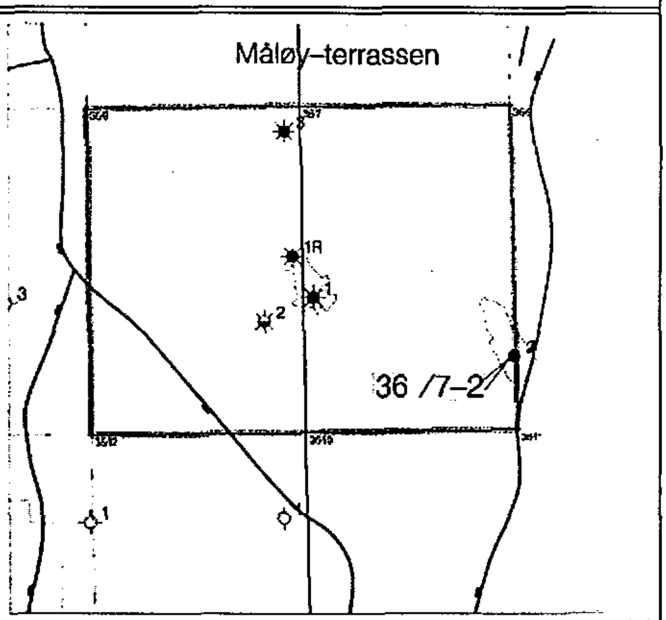
30" at 340 m

13 3/8" at 587 m

CORES

GAS RECORD

595 - 895 m
0.21 - 0.28% C1
895 - 916 m
0.17 - 0.52% C1
916 - 933 m
0.12 - 1.56% C1
933 - 958.5 m
0.5 - 1.56% C1
958.5 - 1065 m
0.10 - 0.25% C1
1065 - 1435 m
0.01 - 0.12% C1



LOGS

PEX-AMS 1433.2 - 586 m	1A	
Array Sonic-GR-AMS 1431 - 586 m	1A	
VSP - GR 1430 - 586 m	1A	
MDT - GR - AMS 918 - 1100 m	1A	
MDT-GR-AMS 934.5 - 1375.1 m	1B	
CST-GR-AMS 1408 - 603 m	1A	
MWD 291 - 1435 m		

OIL SHOWS

910-925 m Sandstone: no petroloferous odour, no-wk brown oil stain, strong yellow direct fluorecence, slow streaming blue white fluorecent cut, weak brown visible cut, yellow white fluorecent residue, very weak brown visible residule
930-937 m Sandstone: no petroloferous odour, no oil stain, wk yellow white fluorecent cut, no vis cut blue white fluorecence residual, no visible residual.
942-970 Sandstone: no petroliferous odoure, no oil stain, yellow-bright yellow direct fluorecence, slow streaming blue white fluorecence cut, no visible cut, blue white fluorecence residule, no visible residule
970-1017 m Sandstone: no petroliferous odoure, no oil stain, very weak yellow direct fluorecence, very slow streaming blue fluorecence cut, no visible cut, blue white fluorecence residule, no visible residule.
1017-1045 m Sandstone: no petroliferous odoure, no oil stain, spotty yellow direct flourecence, very slow streaming blue fluorecence cut, no visible cut, blue white fluorecence residule no visible residule

FORMATION PRESSURE WORKSHEET

Well Name : 36/7-2 | Rig : West Vanguard | Date : 16-19.09.97

Pressure Units : bar | RKB-MSL : 22 m. | MSL-SBed: 269 m. | Witnessed by : O.Wahl

Run No./ Test No.	Depth mMD RKB	Depth mTVD RKB	Initial Hydrostatic Pressure Strain	Initial Hydrostatic Pressure CQG	Formation Pressure Strain	Formation Pressure CQG	Final Hydrostatic Pressure Strain	Final Hydrostatic Pressure CQG	Time hh:mm Set	Time hh:mm Retract	Formation Pressure sg EMD	Test Temp degC	Good Data? Y/N	Sample Information Main Fluid Type	Sample Information HC Gravity g/cc	Sample Information Sample Vol, cc	Remarks
1	918,1	918,1	108,40	107,95	n/a	n/a	108,3	107,82	13:14	13:19	0,000	26,6	N				Tight
2	921,0	921,0	108,7	108,3	n/a	n/a	108,6	108,18	13:25	13:32	0,000	26,9	N				Tight
3	924,2	924,2	109,05	108,66	n/a	n/a	109,0	108,63	13:40	13:46	0,000	27,2	N				Seal failure
4	928,0	928,0	109,5	109,13	n/a	n/a	109,4	108,95	13:55	14:00	0,000	27,2	N				Tight
5	934,0	934,0	110,2	109,85	94,5	94,06	110,2	109,73	14:05	14:10	1,027	27,5	Y				838 mD/cp
6	936,0	936,0	110,4	110,03	94,7	94,33	110,4	109,97	14:17	14:35	1,027	27,7	Y				9.1 mD/cp
7	948,7	948,7	111,9	111,50	n/a	n/a	111,8	111,40	14:55	15:01	0,000	27,9	N				Tight
8	948,9	948,9	111,9	111,49	95,8	95,36	111,8	111,40	15:07	15:19	1,024	28,1	Y				117 mD/cp
9	950,0	950,0	112,0	111,60	95,9	95,45	112,0	111,51	15:27	15:40	1,024	28,2	Y				23.5 mD/cp
10	951,5	951,5	112,2	111,78	96,0	95,60	112,2	111,70	15:46	15:54	1,024	28,2	Y				405 mD/cp
11	954,5	954,5	112,5	112,11	n/a	n/a	112,5	112,11	16:03	16:05	0,000	28,3	N				Seal failure
12	954,6	954,6	112,5	112,14	96,3	95,89	112,5	112,07	16:10	16:30	1,024	28,6	Y				0.2 mD/cp
13	964,5	964,5	113,7	113,30	97,3	96,91	113,7	113,22	16:40	16:49	1,024	28,5	Y				3.6 mD/cp
14	977,0	977,0	115,2	114,84	98,4	98,02	115,2	114,70	16:56	17:04	1,023	28,5	Y				56 mD/cp
15	1000,0	1000,0	118,0	117,60	100,8	100,35	117,9	117,44	17:12	17:17	1,023	28,6	Y				178 mD/cp
16	934,1	934,1	110,1	109,64	94,4	94,01	110,1	109,63	17:56	18:03	1,026	28,3	Y				655 mD/cp, Repeat point.
17	940,0	940,0	110,8	110,40	95,1	94,62	110,8	110,31	18:08	18:16	1,026	28,4	Y				69 mD/cp
18	945,1	945,1	111,4	110,98	95,7	95,19	111,3	110,83	18:20	18:31	1,027	28,4	Y				20 mD/cp

NB: Fmtn Press sg calculated from RKB

HYDRO

FORMATION PRESSURE WORKSHEET

Well Name : 36/7-2 Rig : West Vanguard Date : 16-19.09.97

Pressure Units : bar RKB-MSL : 22 m. MSL-SBed: 269 m. Witnessed by : O.Wahl

Run No./ Test No.	Depth mMD RKB	Depth mTVD RKB	Initial Hydrostatic Pressure Strain	Initial Hydrostatic Pressure CQG	Formation Pressure Strain	Formation Pressure CQG	Final Hydrostatic Pressure Strain	Final Hydrostatic Pressure CQG	Time hh:mm Set	Time hh:mm Retract	Formation Pressure sg EMD	Test Temp degC	Good Data? Y/N	Sample Information Main Fluid Type	Sample Information HC Gravity g/cc	Sample Information Sample Vol, cc	Remarks
19	956,6	956,6	112,8	112,36	96,5	96,09	112,8	112,26	18:38	18:44	1,024	28,4	Y				308 mD/cp
20	968,6	968,6	114,1	113,78	97,6	97,17	114,1	113,65	18:55	19:02	1,023	28,5	Y				40 mD/cp
21	983,1	983,1	115,9	115,57	99,0	98,66	115,9	115,49	19:20	19:30	1,023	28,7	Y				21 mD/cp
22	935,5	935,5	110,3	109,87	94,6	94,17	110,3	109,80	19:45	19:52	1,026	28,3	Y				171 mD/cp
23	949,3	949,3	112,1	111,6	n/a	n/a	n/a	n/a	21:30		0,000		N				Instrumentation failure
24	949,3	949,3	112,0	111,7	n/a	n/a	111,9	111,6	21:40	21:43	0,000		N				Seal failure
25	950,6	950,6	112,1	111,85	95,9	95,59			21:48			26,7	Y	n/a	n/a	n/a	Attempted taking a sample
26	956,7	956,7	112,7	113,04	96,4	96,72	4,4		09:16	09:38	1,031	26,8	Y	n/a	n/a	n/a	261 mD/cp, Probe plugged
27	949,0	949,0	111,5	111,88													MDT Sampling. Aborted
28	934,5	934,5	110,2	n/a	94,45	n/a		n/a	13:47	17:07	1,030	27,6	Y				MDT Sampling, 8.6 mD/cp
29	934,6	934,6	110,0	n/a	94,47	n/a		n/a	18:32	21:25	1,030		Y				MDT sampling
30	971,1	971,1	114,5	n/a	97,82	n/a	114,4	n/a	21:50	22:00	1,027	28,5	Y				32 mD/cp
31	973,0	973,0	114,7	n/a	73,00	n/a	114,7	n/a	22:05	22:10	0,765	28,5	N				Tight
32	974,0	974,0	114,8	n/a	79,00	n/a	114,8	n/a	22:13	22:22	0,827		N				Tight
33	1000,0	1000,0	118,1	n/a	n/a	n/a	117,9	n/a	22:27	22:33	0,000		N				Seal failure
34	1000,0	1000,0	117,9	n/a	117,89	n/a	117,9	n/a	22:35	22:39	1,202		N				Seal failure
35	1001,0	1001,0	118,1	n/a	100,89	n/a	118,1	n/a	22:45	22:51	1,027	29,0	Y				34 mD/cp
36	1100,0	1100,0	129,8	n/a	110,96	n/a	129,8	n/a	23:18	23:27	1,028	30,0	Y				47 mD/cp

NB: Fmtn Press sg calculated from RKB

FORMATION PRESSURE WORKSHEET

HYDRO

Well Name : 36/7-2 Rig : West Vanguard Date : 16-19.09.97

Pressure Units : bar RKB-MSL : 22 m. MSL-SBed: 269 m. Witnessed by : O.Wahl

Run No./ Test No.	Depth mMD RKB	Depth mTVD RKB	itial Hydrostatic Pressure		Formation Pressure		Final Hydrostatic Pressure		Time hh:mm		Formation Pressure	Test Temp	Good Data?	Sample Information			Remarks
			Strain	CQG	Strain	CQG	Strain	CQG	Set	Retract	sg EMD	degC	Y/N	Main Fluid Type	HC Gravity g/cc	Sample Vol, cc	
37	1195,0	1195,0	141,0	n/a	120,61	n/a	140,9	n/a	23:35	23:49	1,029	31,6	Y				15 mD/cp
38	1314,1	1314,1	156,1	n/a	132,68	n/a	154,8	n/a	00:04	00:10	1,029	33,4	Y				34 mD/cp
39	1375,1	1375,1	162,4	n/a	n/a	n/a	161,9	n/a	00:20	00:30	0,000		N				Tight
40	1375,1	1375,1	162,4	n/a	121,07	n/a	161,8	n/a	00:30	00:43	0,897	35,7	N				Tight
41	1374,6	1374,6	161,9	n/a	138,79	n/a	161,8	n/a	00:50	00:55	1,029	36,0	Y				32 mD/cp
42	973,5	973,5	114,7	n/a	92,82	n/a	114,7	n/a	02:05	02:10	0,972	28,9	N				Tight

NB: Fmtn Press sg calculated from RKB

RFTWKS3.WK4

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GENERAL INFORMATION ON WELL 36/7-2 PO:1

Field : UNDEFINED Country: NORWAY
Licence : 153
UTM zone : 31 Central Meredian: 3' E Horiz. Datum: ED50

LOCATION coordinates:		Surface	Target
UTM	N [m]:	6797817.6	6797819.0
UTM	E [m]:	571232.6	571231.0
Geographical	N :	61 18'23.50"	
Geographical	E :	04 19'47.50"	

Water depth : 269 m Reference point height: 22 m
Formation at TD : No formation data found

Operator :	NORSK HYDRO PRODUKSJON A/S	Share: 20.00 %
Partners :	DEN NORSKE STATS OLJESELSKAP A/S	Share: 50.00 %
	A/S NORSKE SHELL	Share: 12.00 %
	PETROBRAS NORGE A/S	Share: 10.00 %
	DEMINEX NORGE A/S	Share: 8.00 %

RIG NAME : WEST VANGUARD

Total depth (RKB) : 1435 m MD 1435 m TVD

TIME SUMMARY
Start time : 30-aug-1997 21:30
Spudding date : 01-sep-1997
Abandonment date: 22-sep-1997

Main operation	Hours	Days	%
MOBILIZATION	38.5	1.6	7.1
DRILLING	208.5	8.7	38.5
FORMATION EVALUATION MWD	0.5	0.0	0.1
FORMATION EVALUATION LOGGING	54.0	2.2	10.0
PLUG AND ABANDONMENT	52.5	2.2	9.7
DOWNTIME MOBILIZATION	77.0	3.2	14.2
DOWNTIME DRILLING	58.5	2.4	10.8
DOWNTIME FORM. EVAL. LOGGING	43.5	1.8	8.0
DOWNTIME PLUG AND ABANDONMENT	5.0	0.2	0.9
Sum	538.0	22.6	

Hole and casing record

Hole	Depth [m MD]	Casing	Depth [m MD]
36"	355	30"	340
17 1/2"	591	13 3/8"	587
12 1/4"	925		
8 1/2"	1435		

Well status : PERMANENTLY ABANDONED

SECTION C

OPERATIONS

Prepared by: J. M. Hegreberg J. M. Hegreberg

Verified by: B. Syrstad Bam Syrstad

Approved by: T. Øvrebøe T. Øvrebøe

LIST OF CONTENT

1. GENERAL

All depths are referenced to RKB, 22 m above MSL. Seabed was tagged at 291 m RKB.

The semi submersible drilling rig "West Vanguard" drilled the vertical exploration well 36/7-2.
The well started at 21:30 hrs the 30th of August 1997 and was finished the 22nd of September at 07:30 hrs, a total of 22.4 days.

2. POSITIONING AND ANCHORING OF THE RIG

Rig Move and Anchor handling

Arrived location at 19:30 hrs the 31th of August and ran all 8 anchors.
Pre-tensioned the anchors to 1500 KN.

The rig was navigated to and positioned using the Differential Global Position System (DGPS) GEOREF and SeaStar.

The final position / co-ordinates of the wellhead (ED1950, UTM-ZONE 31 (CM 3° EAST)) was:

Geographical	**UTM**
Latitude: 61° 16' 23.50" N	6 797 817.7 mN
Longitude: 04° 19' 47.50" E	571 232.6 mE

The rig heading was 222°.
The well position was located 2.6 m on a bearing of 97.1 deg (UTM grid) from the intended location.

3. DRILLING SUMMARY AND EXPERIENCES

3.1 36" hole section / 30" conductor

Total depth of section: 355 m MD.

The well was spudded and 36" hole drilled with sea water from 291 m to 354 m, pumping high-viscous bentonite sweeps. Problems with boulders resultet in a inclination of 2.1 deg at 307 m and 1.8 deg at 317 m. Reamed the area and drilled to TD, achieved a max inclination of 0.9 deg at 337 m MD.
Lost two cutters from the 36" holeopener in the hole during drilling/reaming.
After drilling to TD the well was displaced to 1.25 sg mud and a wipertrip performed.

Prior to running the 30" conductor, the hole was displaced to 1.50 sg mud. Ran the 30" conductor, but was not able to pass a restriction at 336 m. Tried several times, whithout success. Pulled the conductor out of the hole. Made a new wipertrip and ran the 30" conductor again, could not pass 343 m. Pulled out and removed one joint, sat the 30" conductor at 340 m and cemented same. Held the string in tension while waiting for the cement to set up, max incl. on Bulls Eye: 1.25 deg.

3.2 17 1/2" hole section / 13 3/8" intermediate casing

Total depth of section; 592 m MD.

The 30" shoe was drilled out using a 24" bit, drilled two m new formation from 355 m to 357 m.
The Bulls Eye inclination varied between 1.25 - 2.5 deg, adjusted the guidewire tension and the inclination was reduced to 1.25 deg.
Tagged firm cement at 302 m in the first grouting funnel and boulders/cement at 292 m in the second. Grouted the conductor using 12.5 m3 1.95 sg cement. Observed return to seabed, Bulls Eyes showing 1.25 deg.

The 17 1/2" hole was drilled with sea water and high viscous pills from 357 m to 591 m with a rotary assembly.

The hole was displaced to 1.25 sg mud before a wipertrip was performed.
Prior to pulling out of the hole for running the 13 3/8" casing, the hole was displaced to 1.25 sg mud.

The casing was set with the shoe at 587 m, cemented same by pumping 69.9 m3 of 1.44 sg lead- and 11.5 m3 of 1.90 sg tail slurry.

Anchor no.2 and 3 failed the test to 180 ton, slipped at 170 ton. Set piggyback anchors on anchor no.2, lost main anchor no.3 while attempting to set piggy back. Had to wait 47.5 hrs on the weather before the fishing operation of the anchor chain could start. Retrieved the chain an ran a new anchor with two piggy backs.
Made an successful test of the anchors and ran the BOP, tested the BOP and casing to 100 bar.

3.3 12 1/4" hole section

Total depth of section: 925 m MD.

Drilled the shoetrack and cleaned out the rathole with seawater before pumping 3 viscous pills. Performed a leak-off test to 1.48 sg.
Displaced the hole to 1.15 sg Anco 2000.

Drilled 12 1/4" hole from 594 m to 725, where the MWD failed. Pulled out and changed the MWD before drilling to TD at 925 m, conditioned the mud and pulled out.

3.4 8 1/2" Hole section

Total depth of section: 1435 m MD.

Drilled 8 1/2" hole from 925 m to TD of the well at 1435 m, had several drilling breaks.
Pumped a high viscosity pill and circulated the hole clean, pulled out for logging.

A total of 7 wireline logs were run.

Log no.1:	PEX/NGT Logged from 1433.2 m to 291 m.
Log no.2:	Array Sonic Logged from 1431 m to 586 m.
Log no.3:	VSP Logged from 1430 m to 400 m.
Log no.4:	MDT/GR/AMS (not able to sample) Took 22 pressure points.
Log no.4 rr1:	MDT/GR/AMS Attempted to take a sample at 951.5 m, no seal. Tried again at 949.3 m, no success. Found sand inside the tolls piping.
Log no.4 rr2:	RFT/GR/AMS Failed to take sample.
Log no. 4 rr3:	MDT/GR/AMS Failure in the electrical system
Log no.4 rr4:	MDT/GR/AMS Took a fluid sample and 16 pressure points, 9 successful.
Log no.5:	CST/GR Shot 60 charges, recovered 56.

3.5 Permanent Plug & Abandonment

Set a cement plug from 1435 m to 437 m. Tagged the cement at 446 m, and pressure tested same to 100 bar.
Made up and set a 13 3/8" bridge plug at 400 m and pressure tested same to 100 bar.
Pulled the BOP and cut the 20" x 30" casing at 295 m.

For details, see the P&A fig.

The anchors were pulled and the rig left the location at 07:30 hrs the 22nd of September.

Daily report no: 1 Date : 30-aug-1997
Midnight depth : m MD Estimated PP: sg Mudweight: sg

Stop time	Description
21:30	No activity on well 36/7-2.
23:59	Rig in transit to 36/7-2.

Daily report no: 2 Date : 31-aug-1997
Midnight depth : m MD Estimated PP: sg Mudweight: sg

Stop time	Description
19:30	Rig in transit to 36/7-2.
23:59	Positioned the rig and set anchor no. 1, no. 8, no. 4 and no. 7.

Daily report no: 3 Date : 01-sep-1997
Midnight depth : 337 m MD Estimated PP: sg Mudweight: sg

Stop time	Description
02:00	Set anchor no. 3, no. 6 and no. 2.
04:00	Ballasted the rig to drilling draft. Pre-tensioned the anchors to 125 tons.
11:30	Made up elements in the 36" bottom hole assembly.
12:00	Made up the cement stand and the 30" conductor running tool.
15:00	Made up the 36" bottom hole assembly and ran in the hole. Tagged the seabed at 291 m.
23:59	Spudded the well and drilled 36" hole from 291 m to 337 m. Pumped high viscosity pills every 10 m.

Daily report no: 4 Date : 02-sep-1997
Midnight depth : 354 m MD Estimated PP: sg Mudweight: 1.05 sg

Stop time	Description
06:30	Drilled 36" hole from 337 m to 354 m.
08:30	Displaced the hole to 1.25 sg bentonite mud. Performed a wipertrip to 300 m. Ran in the hole to TD at 354 m.
09:00	Pumped a high viscosity pill and circulated the hole clean. Displaced the hole to 1.50 sg bentonite mud.
10:30	Pulled out to 300 m with the 36" bottomhole assembly. Placed two buoy markers and a transponder at the seabed.
12:30	Pulled out of the hole with the 36" bottomhole assembly.
17:30	Rigged up casing handling equipment. Made up the 30" conductor string and landed the conductor string in the Retrievable Guide base. Made up the cement stinger and installed the conductor running tool on the Retrievable Guide base.
19:30	Ran into the sea with the 30" conductor string to 290 m, positioned the rig and stabbed into the 36" hole.
23:59	Ran in hole with 30" conductor string to 297 m. Established circulation, moved the rig and worked the string through ledge at 297 m. Continued running in hole to 336 m. Attempted to work string through ledge at 336 m without success.

Daily report no: 5 Date : 03-sep-1997
Midnight depth : 355 m MD Estimated PP: sg Mudweight: 1.05 sg

Stop time	Description
03:00	Pulled out of the hole with the 30" conductor string and secured the Retrievable Guide base and conductor string on trolley in the moon pool.
09:30	Made up the 36" wipertrip assembly, positioned the rig and entered the hole. Ran in the hole to 298 m.
12:30	Washed and reamed from 298 m to 354m. Drilled 1 m new formation to 355 m (36" hole).
14:00	Pumped a high viscosity pill and performed a wipertrip to 295 m. Ran in the hole to TD. Pumped a high viscosity pill and displaced the hole to 1.50 sg bentonite mud.
14:30	Pulled out of the hole with the 36" wipertrip assembly to 298 m.
15:00	Serviced the top drive.
17:00	Pulled out of the hole with the 36" wipertrip assembly.
20:00	Ran into the sea with the 30" conductor string to 290 m. Positioned the rig and stabbed into the 36" hole.
23:00	Ran in the hole with the 30" conductor string to 336 m. Established circulation and worked the string through ledge at 336 m. Continued running in hole to 343 m. Moved the rig and made several attempts to pass restriction at 343 m.
23:59	Pulled out of the hole with the 30" conductor string to 90 m. Secured the conductor landing string in rotary due to severe weather.

Daily report no: 6 Date : 04-sep-1997
Midnight depth : 354 m MD Estimated PP: sg Mudweight: 1.25 sg

Stop time	Description
08:30	Waited on weather.
16:30	Pulled out of the hole with the 30" conductor string. Landed and secured the 30" conductor on trolley in moonpool. Released the 30" Wellhead Housing and laid down one conductor joint. Ran and landed the 30" conductor with the shoe at 340 m.
19:30	Cemented the 30" conductor string.
23:59	Waited on cement to set up.

Daily report no: 7 Date : 05-sep-1997
Midnight depth : 357 m MD Estimated PP: sg Mudweight: 1.05 sg

Stop time	Description
02:30	Waited on cement to set up.
04:00	Slacked off tension in the landing string and observed the bulls eye inclination on the Guide Base structure. Released the 30" Housing running tool and pulled out of the hole with the landing string and the cement stinger.
04:30	Laid down the 30" Housing running tool and the cement stinger.
08:00	Made up the 18 3/4" Wellhead Housing running tool to the 13 3/8" cement plug assembly. Made up the running tool to the 18 3/4" Wellhead Housing.
09:00	Made up the cement head.
11:30	Laid down the 36" hole opener. Made up a 24" bit and ran in

Daily report no: 7 Date : 05-sep-1997
Midnight depth : 357 m MD Estimated PP: sg Mudweight: 1.05 sg

Stop time	Description
	to 290 m.
13:00	Positioned the rig, entered the 30" Wellhead Housing and ran in the hole to 337 m.
15:30	Drilled out cement and the 30" conductor shoe . Cleaned out the rathole to 355 m. Drilled 2 m new formation from 355 m to 357 m.
17:00	Pumped a high viscosity bentonite pill and circulated the hole clean. Pulled out of the hole with the 24" bit.
18:00	Made up a 3 1/2" cement stinger.
18:30	Serviced the Top drive.
19:30	Installed internal BOP and torque wrench on the Top drive.
22:00	Installed the Guide Frame and ran in to the sea with the 3 1/2" cement stinger to 290 m.
23:00	Entered the grouting funnel between Guide Post no. 1 and 4. Tagged firm cement at 302 m. Pulled out and entered the grouting funnel between Guide Post no. 2 and 3. The stinger stopped at 292 m (cement or boulders).
23:30	Pulled out with the cement stinger and entered the grouting funnel between Guide Post no. 1 and 4. Ran in the hole to 301 m. Circulated to clean the hole.
23:59	Made up the cement stand and observed the bulls eye inclination at the Guide Base structure.

Daily report no: 8 Date : 06-sep-1997
Midnight depth : 591 m MD Estimated PP: sg Mudweight: 1.05 sg

Stop time	Description
00:30	Pumped 12.5 m3 1.95 sg cement slurry. Displaced the cement with seawater. Pulled out from 301 m to 295 m while pumping cement.
01:30	Pulled the cement stinger out of the grouting funnel and circulated two string volumes to clean the drill pipe.
02:30	Repaired hydraulic leakage on the torque wrench on Top drive.
03:30	Pulled out with the 3 1/2" cement stinger.
08:30	Made up the 17 1/2" rotary assembly. Entered the 30" Wellhead Housing and ran in the hole to 337 m.
09:00	Logged with the MWD from 337 m to TD at 357 m.
16:00	Drilled 17 1/2" hole from 357 m to 591 m (TD of section).
17:00	Circulated the hole clean and displaced the hole to 1.25 sg bentonite mud.
18:00	Performed a wipertrip to the 30" conductor shoe at 340 m. Ran in the hole with the 17 1/2" bit to 591 m.
18:30	Displaced the hole to 1.25 sg bentonite mud.
21:30	Pulled out of the hole with the 17 1/2" bit.
22:30	Rigged up the 13 3/8" casing running equipment.
23:59	Ran in the hole with the 13 3/8" casing to 50 m.

Norsk Hydro

DAILY REPORT ON WELL 36/7-2

Daily report no: 9 Date : 07-sep-1997
Midnight depth : 591 m MD Estimated PP: 1.03 sg Mudweight: 1.25 sg

Stop time	Description
02:00	Ran in the hole with the 13 3/8" casing from 50 m to 288 m.
05:30	Made up the 18 3/4" Wellhead Housing and Wellhead Housing running tool. Entered the 30" Wellhead Housing and ran in the hole with the 13 3/8" casing. Landed the 13 3/8" casing with the shoe at 587 m.
06:30	Established circulation and circulated one casing volume with seawater.
08:00	Cemented the 13 3/8" casing.
09:00	Displaced the cement. Bumped the plug and pressure tested the 13 3/8" casing to 100 bar.
09:30	Released the 18 3/4" Wellhead Running tool and washed the Wellhead and the Guide Base structure.
11:00	Retrieved and laid down the 18 3/4" Wellhead Running tool. Laid down the cement head.
14:00	Laid down the 17 1/2" rotary assembly.
17:00	Rigged up the riser spider and made up two marine riser joints while performing final tension test on the anchors to 180 tons. Anchor no. 2 and 3 slipped from the seabed at 170 tons tension. Rigged down the BOP running equipment.
23:59	Made up the 12 1/4" rotary assembly.

Daily report no: 10 Date : 08-sep-1997
Midnight depth : 591 m MD Estimated PP: 1.03 sg Mudweight: 1.25 sg

Stop time	Description
04:00	Picked up 5" and 5 1/2" Drill Pipe and set back in the derrick.
06:00	Delivered pennant wire on anchor no. 2. Retrieved main anchor no. 2. Reset main anchor no. 2 and set the piggy back anchors. Connected a surface buoy to the pennant wire.
09:30	Delivered pennant wire on anchor no. 3. Retrieved main anchor no. 3. Reset main anchor and attempted to set piggy back anchor no. 1. Lost tension in pennant wire.
10:00	Retrieved the piggy back anchor. Main anchor no. 3 lost on seabed due to broken anchor swivel or anchor chain. Suspended anchor handling operation due to severe weather condition.
23:59	Waited on weather.

Daily report no: 11 Date : 09-sep-1997
Midnight depth : 591 m MD Estimated PP: 1.03 sg Mudweight: 1.25 sg

Stop time	Description
23:59	Waited on weather - anchorhandling.

Daily report no: 12 Date : 10-sep-1997
Midnight depth : 591 m MD Estimated PP: 1.03 sg Mudweight: 1.25 sg

Stop time	Description
09:30	Waited on weather for anchor handling.
12:00	Fished anchor chain number 3.

Daily report no: 12 Date : 10-sep-1997
Midnight depth : 591 m MD Estimated PP: 1.03 sg Mudweight: 1.25 sg

Stop time	Description
15:00	Prepared to run a new anchor and two piggy backs. Ran the BOP into the sea.
21:30	Anchors in position on the seabed.
23:59	Successful test of anchor number 3.

Daily report no: 13 Date : 11-sep-1997
Midnight depth : 591 m MD Estimated PP: 1.03 sg Mudweight: 1.25 sg

Stop time	Description
04:00	Mechanical problems in the riser support ring.
08:00	Landed the BOP and performed an overpull test. Closed the shear ram with the acoustic system . Tested the casing to 100 bar.
09:30	Laid down the BOP landing joint and installed the diverter.
10:30	Rigged down the BOP handling equipment.
16:00	Tested the BOP.
17:30	Installed the wear bushing.
20:00	Made up the 12.25 bottom hole assembly and ran into the hole.
20:30	Held a choke drill.
23:00	Drilled the shoe track and 3 m. new formation.
23:59	Cleaned the hole.

Daily report no: 14 Date : 12-sep-1997
Midnight depth : 884 m MD Estimated PP: 1.03 sg Mudweight: 1.16 sg

Stop time	Description
01:30	Performed a leak off test. 1.48 sg.
08:30	Displaced the hole to 1.15 sg mud and drilled 12.25" hole from 594 to 725m.
09:30	MWD failed. Circulated the hole clean.
16:30	Pulled out of the hole and changed out the MWD and bit. Ran into the hole. Tested the MWD.
17:00	Logged the hole from 680 to 725m with the MWD.
23:59	Drilled from 725 to 884m.

Daily report no: 15 Date : 13-sep-1997
Midnight depth : 1200 m MD Estimated PP: sg Mudweight: 1.17 sg

Stop time	Description
01:30	Drilling break at 918m. Flow checked . No inflow . Drilled to 925m.
03:00	Circulated bottoms up. Checked for flow, negative.
04:30	Pulled out to the shoe and checked for flow, negative.
05:30	Continued pulling out of the hole.
06:00	
07:30	Pulled the bottom hole assembly and laid down the MWD , monel and bit.
11:00	Made up the 8.5" bottom hole assembly and ran into the hole to the casing shoe.
12:00	Tested the BOP pipe rams on acoustic control.

Daily report no: 15 Date : 13-sep-1997
Midnight depth : 1200 m MD Estimated PP: sg Mudweight: 1.17 sg

Stop time	Description
13:00	Tested the MWD and ran into the hole to 925m.
23:59	Drilled 8.5" hole from 925m to 1200m. Drilling breaks at 932m, 1075m, 1090m, 1145m, and 1183m. Flow checked each drilling break. No inflow.

Daily report no: 16 Date : 14-sep-1997
Midnight depth : 1435 m MD Estimated PP: sg Mudweight: 1.17 sg

Stop time	Description
19:00	Drilled 8.5" hole from1200m to 1425m. Flow checked drilling breaks at 1239m, 1295m and 1306m. No inflow.
21:30	Pumped a 10m3 high viscosity pill and circulated the hole clean.
22:30	Pulled out of the 8.5" hole . Tight sections from 1218 to 1250m.
23:30	Ran back into the hole to 1435m.
23:59	Pumped a 10m3 high viscosity pill and circulated the hole clean.

Daily report no: 17 Date : 15-sep-1997
Midnight depth : 1435 m MD Estimated PP: sg Mudweight: 1.17 sg

Stop time	Description
00:30	Circulated the hole.
02:30	Flow checked . No inflow. Pulled out of the hole.
04:30	Pulled the bottom hole assembly out of the hole and laid down the MWD, monel and bit.
06:30	Preparing to run the first wireline log.
10:00	Ran log nr.1 PEX. from 1433.2m to 291m.
11:00	Prepared to run log nr.2
14:30	Ran log nr. 2 - Array Sonic from 1431m to 586m.
16:30	Waited on weather.
17:30	Prepared to run log nr.3.
23:59	Ran log nr.3 - VSP from 1430m to 400m.

Daily report no: 18 Date : 16-sep-1997
Midnight depth : 1435 m MD Estimated PP: 1.03 sg Mudweight: 1.17 sg

Stop time	Description
01:00	Ran log nr.3 - VSP.
04:00	Waiting on weather.
05:00	Prepared to run log nr.4
12:00	Trouble shooting the MDT tool.
20:00	Ran the MDT tool. Took 22 pressure measurements.
21:00	Pulled out of the hole with the MDT tool to check the sampling system. Ran back into the hole.
22:00	Correlated depth with Gamma Ray. Attempted to take a sample at 951.5m. No seal. Changed depth to 949.3m . Pretested the tool successfully. Attempted to take a sample without success.
23:59	Trouble shooted the tool in the hole.

Norsk Hydro

DAILY REPORT ON WELL 36/7-2

Daily report no: 18 Date : 16-sep-1997
Midnight depth : 1435 m MD Estimated PP: 1.03 sg Mudweight: 1.17 sg

Stop time	Description

Daily report no: 19 Date : 17-sep-1997
Midnight depth : 1435 m MD Estimated PP: 1.03 sg Mudweight: 1.17 sg

Stop time	Description
03:30	Pulled the MDT out of the hole. Checked the tool. Found sand inside the tools piping. Cleaned the tool and performed a function test. The MDT tools pump failed.
07:30	Rigged up to run log nr 5. - RFT.
11:30	Ran the RFT. Failed to take a sample. Pulled out of the hole. Laid down the RFT tools.
12:00	Rigged down wireline equipment.
14:30	Picked up 3 1/2" drillpipe needed to set cement plugs during abandonment.
17:30	Laid down excess 6 1/2" drill collars in the derrick.
18:00	Service the top drive.
18:30	Rigged up to run wireline.
23:00	Made up new MDT tool string . Checked the equipment. Ran into the hole for run nr 6.
23:59	Pulled out of the hole. Troubleshooted the MDT tool.

Daily report no: 20 Date : 18-sep-1997
Midnight depth : 1435 m MD Estimated PP: 1.03 sg Mudweight: 1.17 sg

Stop time	Description
01:30	Troubleshooted the MDT electrical system.
06:30	Ran into the hole . Attempted to set the inflatable packers without success. Pulled out of the hole.
10:30	Changed out the MDT pump section. Fabricated and installed a filter screen to prevent sand entering the MDT pump system. Checked the tool string. Ran into the hole for run nr 7 -MDT.
23:59	Took a sample of the formation fluid and 16 pressure measurements of which 9 were successful.

Daily report no: 21 Date : 19-sep-1997
Midnight depth : 1435 m MD Estimated PP: 1.03 sg Mudweight: 1.17 sg

Stop time	Description
03:00	Completed the MDT run and pulled out of the hole.
05:00	Laid down the MDT tool string , and retrieved the sample.
05:30	Held a safety meeting .Prepared to run log nr 8 CST.
10:00	Ran the CST into the hole. Shot 60 charges and recovered 56 samples 93% recovery) . Pulled out of the hole.
11:00	Laid down the CST string and recovered the samples.
12:00	Rigged down the wireline equipement.
15:30	Ran into the hole with the cementing string.
16:30	Circulate bottoms up.
17:30	Placed 1.9 sg cement from 1435m to 1102m.
19:00	Pulled out of the hole to 1102m. Attempted to reverse circulate without success.

Norsk Hydro

DAILY REPORT ON WELL 36/7-2

Daily report no: 21   Date   : 19-sep-1997
Midnight depth : 1435 m MD   Estimated PP: 1.03 sg   Mudweight: 1.17 sg

Stop time	Description
20:00	Circulated the cement out of the hole at 1093m.
21:30	Placed 1.9 sg cement from 1093m to 764m
22:30	Pulled out of the hole to 764m.
23:30	Dropped a drillpipe dart and circulated cement out of the hole.
23:59	Started placement of 1.92 sg. cement from 764m to 437m.

Daily report no: 22   Date   : 20-sep-1997
Midnight depth : 1435 m MD   Estimated PP: 1.03 sg   Mudweight: 1.17 sg

Stop time	Description
00:30	Finished placing cement from 764m to 437m
01:30	Pulled out of the hole to 437m.
02:30	Circulated excess cement out of the hole.
04:00	Pulled out of the hole with the cementing string.
06:30	Waited on cement . Maintained the top drive.
07:30	Made up a 12 1/4" bit onto drillpipe and ran into the hole to tag cement at 446m. Soft cement.
10:00	Waited on cement.
11:00	Tagged cement at 446m with 10 Tonnes weight on the bit. Pressure tested the cement plug with 100 bar. Pulled out of the hole.
14:00	Ran into the hole with a 13 3/8" bridge plug and set it at 400m. Tested the plug to 100 bar Pulled out of the hole.
15:30	Made up the wear bushing running tool and ran into the hole. Failed to retrieve the wear bushing . Pulled out of the hole.
16:30	Made up a jetting tool and ran into the hole. Jetted the BOP and wellhead with seawater. Pulled out of the hole.
17:30	Retrieved and laid down the wear bushing.
19:00	Rigged up to retrieve the BOP.
21:00	Held a safety meeting. Installed the diverter handling tool. Laid down the diverter. Installed the riser landing joint. Disconnected the BOP .
23:59	Pulled the BOP.

Daily report no: 23   Date   : 21-sep-1997
Midnight depth : 1435 m MD   Estimated PP: sg   Mudweight: 1.17 sg

Stop time	Description
00:30	Prepared to lay down the slip joint.
05:00	Pulled the BOP and riser.
07:00	Secured , undressed and skidded the BOP out from the well center.
08:30	Laid down two riser joints and rigged down the riser handling equipment.
12:00	Made up the casing cutting equipment and ran into the hole. Stabbed into the wellhead.
16:00	Cut the 20" and 30" casing at 295m. Pulled loose with 200 Tonnes overpull.
18:00	Pulled out of the hole with the temporary guide base and cut casings. Landed the temporary guide base on the work skid .
19:30	Released the casings from the guide base and laid down the

Daily report no: 23 Date : 21-sep-1997
Midnight depth : 1435 m MD Estimated PP: sg Mudweight: 1.17 sg

Stop time	Description
	casings.
21:30	Skidded the temporary guide base from the well center. Laid down the casing cutting tools.
23:30	Picked up the riser slip joint . Lowered the support ring onto the work skid. Secured and repaired the support ring.
23:59	Handled anchors. Debalasted the rig.

Daily report no: 24 Date : 22-sep-1997
Midnight depth : m MD Estimated PP: sg Mudweight: 1.17 sg

Stop time	Description
02:45	Finished debalasting.
07:30	Anchor handling. Last anchor on bolster.
23:59	Rig in transit to 35/9-3.

Norsk Hydro

T I M E   D I S T R I B U T I O N

Well: 36/7-2   Rig: WEST VANGUARD   Depth: 1435.0 m MD
All sections

Operations		Hours	%	Hours	%	Acc. total
MOBILIZATION						
MOVING	:	22.0	4.06			
MOORING; RUNNING ANCHORS	:	8.5	1.57			
MOORING; PULLING ANCHORS	:	8.0	1.48			
Sum				38.5	7.10	38.5
DRILLING						
BHA HANDLING/TESTING	:	35.5	6.55			
TRIPPING IN CASED HOLE	:	1.0	0.18			
TRIPPING IN OPEN HOLE	:	17.0	3.14			
DRILLING	:	70.5	13.01			
OTHER	:	16.0	2.95			
CIRC. AND COND. MUD/HOLE	:	8.0	1.48			
WIPER TRIP	:	3.0	0.55			
CASING HANDLING/TESTING	:	6.5	1.20			
RUNNING CASING IN OPEN HOLE	:	15.0	2.77			
DRILLING OUT OF CASING	:	8.0	1.48			
PRIMARY CEMENTING	:	7.0	1.29			
TRIPPING FOR CEMENT JOB	:	3.0	0.55			
FORMATION STRENGTH TESTING	:	1.5	0.28			
BOP HANDLING	:	5.0	0.92			
BOP RUNNING/RETRIEVING	:	1.5	0.28			
BOP TESTING	:	6.5	1.20			
WELLHEAD EQUIPMENT HANDLING	:	3.5	0.65			
Sum				208.5	38.47	247.0
FORMATION EVALUATION MWD						
LOGGING WITH MWD	:	0.5	0.09			
Sum				0.5	0.09	247.5
FORMATION EVALUATION LOGGING						
LOGGING EQUIPMENT HANDLING/TES	:	9.5	1.75			
LOGGING	:	14.5	2.68			
FORMATION TESTER	:	25.5	4.70			
SIDEWALL CORING	:	4.5	0.83			
Sum				54.0	9.96	301.5
PLUG AND ABANDONMENT						
OTHER	:	1.0	0.18			
WELLHEAD EQUIPMENT INSTALLATIO	:	3.5	0.65			
TRIPPING FOR CEMENT JOB	:	6.0	1.11			
BOP HANDLING	:	7.0	1.29			
BOP RUNNING/RETRIEVING	:	10.0	1.85			
SET CEMENT PLUG	:	11.0	2.03			
SET MECHANICAL PLUG	:	3.0	0.55			
TRIPPING OF CASING CUTTING EQU	:	7.0	1.29			
CUT CASING/WELLHEAD	:	4.0	0.74			
Sum				52.5	9.69	354.0
DOWNTIME MOBILIZATION						
EQUIPMENT FAILURE AND REPAIR	:	6.0	1.11			
WAITING	:	47.5	8.76			
OTHER	:	23.5	4.34			
Sum				77.0	14.21	431.0

Norsk Hydro

T I M E   D I S T R I B U T I O N

Well: 36/7-2 Rig: WEST VANGUARD Depth: 1435.0 m MD
All sections

Operations		Hours	%	Hours	%	Acc. total
DOWNTIME DRILLING						
EQUIPMENT FAILURE AND REPAIR	:	10.5	1.94			
WAITING	:	8.5	1.57			
CEMENTING	:	8.0	1.48			
WIPER TRIP	:	31.5	5.81			
Sum.......................................				58.5	10.79	489.5
DOWNTIME FORM. EVAL. LOGGING						
EQUIPMENT FAILURE AND REPAIR	:	14.5	2.68			
WAITING	:	5.0	0.92			
OTHER	:	24.0	4.43			
Sum.......................................				43.5	8.03	533.0
DOWNTIME PLUG AND ABANDONMENT						
WAITING	:	5.0	0.92			
Sum.......................................				5.0	0.92	538.0

Reported time (99.3 % of well total 542.0 hours) : 538.0

HYDRO

Downtimereport - Well 36/7-2

DDR no.	Hole size	Rep #	Subrep #	MIN Date	Hours Used	Responsible Contractor	Downtime Type	Short Description	Service Type
4	36.00	1		1997-09-02	31.50	NORSK HYDRO A/S	Other	Not able to pass ledge at 336 m with 30" conductor string.	
6	36.00	2		1997-09-04	8.50		Waiting on weather		
7	36.00	3		1997-09-05	8.00	NORSK HYDRO A/S	Other	Remedial cementing of 30" conductor.	
7	17.50	4		1997-09-05	1.00	SMEDVIG OFFSHOR	Equipment failure	Installed Internal BOP and torque wrench on Top drive.	DRILLING CONTRACTO
7	17.50	5		1997-09-05	1.00	SMEDVIG OFFSHOR	Equipment failure	Repaired hydraulic leakage on torque wrench on the Top drive.	DRILLING CONTRACTO
9		6		1997-09-07	23.50	NORSK HYDRO A/S	Other	Anchor no. 2 and 3 slipped from seabed during final tension test.	
10		7		1997-09-08	47.50		Waiting on weather		
12		8		1997-09-10	6.00	SMEDVIG OFFSHOR	Equipment failure	Dog failed to function in riser support ring	DRILLING CONTRACTO
14	12.25	9		1997-09-12	8.50	BAKER HUGHES INT	Equipment failure	mwd failure, resistivity failure.	MWD/LWD
17	8.50	10		1997-09-15	5.00		Waiting on weather		
18	8.50	11		1997-09-16	7.00	SCHLUMBERGER N	Equipment failure	Trouble shooting the MDT tool. Poor electric connections.	ELECTRIC LOGGING
18	8.50	12		1997-09-16	1.00	SCHLUMBERGER N	Equipment failure	MDT tool sampling problem. Manual valve in wrong position.	ELECTRIC LOGGING
18	8.50	13		1997-09-16	24.00	SCHLUMBERGER N	Other	MDT lines plugged with sand. Pump failed to operate.	
19	8.50	14		1997-09-17	4.00	SCHLUMBERGER N	Equipment failure	MDT pump failed. Possible cause - sand in pump - need verify	ELECTRIC LOGGING
19	8.50	15		1997-09-17	2.50	SCHLUMBERGER N	Equipment failure	Electrical failure in the MDT tool.	ELECTRIC LOGGING
22		16		1997-09-20	5.00		Waiting for cement to		
					184.00				

rsk Hydro

HOLE DEVIATION

Well : 36/7-2 Reference Point : RKB , 22.0 m above MSL
Waterdepth: 269.0 m Vertical to 290.9 m
UTM zone : 31 Central Meredian: 3' E Horizontal Datum: ED50
Template Centre Coordinates, UTM: North: 0.0 m, East: 0.0 m
Wellhead Coordinates, UTM: North: 6797817.6 m, East: 571232.6 m
Official surveys : Y Track :
Coordinates are measured from the wellhead centre.

Depth MD [m]	Incli-nation [Deg]	Direc-tion [Deg]	Tool Type	#	Depth TVD [m]	Coordinates North [m]	Coordinates East [m]	Vert. Sect. [m]	Dogleg D/30m	Build D/30m	Turn D/30m
291.0	0.00	0.00	MWD		291.0	0.00	0.00	0.0	0.00	0.00	0.00
298.0	0.70	194.90	MWD		298.0	-0.04	-0.01	0.0	3.00	3.00	-707.6
307.0	0.90	89.10	MWD		307.0	-0.09	0.05	0.1	4.27	0.67	-352.7
317.0	0.10	67.30	MWD		317.0	-0.09	0.13	0.2	2.42	-2.40	-65.40
327.0	0.20	338.70	MWD		327.0	-0.07	0.13	0.2	0.66	0.30	-265.8
337.0	0.90	321.80	MWD		337.0	0.01	0.08	0.1	2.13	2.10	-50.70
347.0	0.90	337.70	MWD		347.0	0.14	0.00	0.1	0.75	0.00	47.70
387.0	0.20	26.10	MWD		387.0	0.50	-0.09	0.5	0.59	-0.52	36.30
416.0	0.20	51.30	MWD		416.0	0.57	-0.03	0.6	0.09	0.00	26.07
446.0	0.10	322.50	MWD		446.0	0.63	-0.00	0.6	0.22	-0.10	-88.80
475.0	0.40	346.80	MWD		475.0	0.75	-0.04	0.7	0.32	0.31	25.14
504.0	0.30	23.70	MWD		504.0	0.91	-0.03	0.9	0.25	-0.10	38.17
533.0	0.30	10.90	MWD		533.0	1.06	0.01	1.1	0.07	0.00	-13.24
562.0	0.20	357.20	MWD		562.0	1.18	0.02	1.2	0.12	-0.10	-14.17
583.0	0.50	7.30	MWD		583.0	1.31	0.03	1.3	0.44	0.43	14.43
643.0	0.40	47.30	MWD		643.0	1.71	0.22	1.7	0.16	-0.05	20.00
701.0	0.40	257.80	MWD		701.0	1.81	0.17	1.8	0.40	0.00	-77.33
760.0	0.20	270.60	MWD		760.0	1.76	-0.13	1.8	0.11	-0.10	6.51
818.0	0.40	230.60	MWD		818.0	1.64	-0.39	1.7	0.14	0.10	-20.69
876.0	0.70	244.20	MWD		876.0	1.35	-0.87	1.6	0.17	0.16	7.03
951.0	0.80	335.80	MWD		951.0	1.63	-1.49	2.2	0.43	0.04	36.64
1009.0	1.10	286.90	MWD		1009.0	2.16	-2.19	3.1	0.43	0.16	-25.29
1067.0	1.10	322.10	MWD		1067.0	2.76	-3.07	4.1	0.34	0.00	18.21
1126.0	1.80	302.20	MWD		1125.9	3.71	-4.20	5.6	0.43	0.36	-10.12
1182.0	1.70	300.50	MWD		1181.9	4.60	-5.66	7.3	0.06	-0.05	-0.91
1240.0	1.70	296.20	MWD		1239.9	5.41	-7.17	9.0	0.07	0.00	-2.22
1300.0	1.20	301.00	MWD		1299.9	6.13	-8.51	10.5	0.26	-0.25	2.40
1358.0	1.10	318.80	MWD		1357.9	6.86	-9.40	11.6	0.19	-0.05	9.21
1416.0	0.80	347.50	MWD		1415.9	7.67	-9.85	12.5	0.29	-0.16	14.84
1435.0	0.80	347.50	DUMM	1	1434.9	7.93	-9.91	12.7	0.00	0.00	0.00

MAIN CONSUMPTION OF CASING/TUBING ON WELL 36/7-2

Size	Casing string	Grade	Weight [kg/m]	Weight [lb/ft]	Threads type	Length [m]	No. of joints	Cost of str. in hole	Total cost of string
30"	CONDUCTOR	X-52	460.86	309.70	SL-60	50.6	4		
13 3/8"	SURFACE	N-80	101.19	68.00	BUTTRESS	298.9	23		

TOTAL CONSUMPTION OF CEMENT ADDITIVES
ON WELL 36/7-2

Section	Cement/ Additive	Unit	Total Amount Used	Cost [kNOK]
36"	API CLASS G	MT	78.5	
	CaCl2C	l	2185.0	
	ECONO	l	504.0	
	NF-5	l	34.0	
17 1/2"	API CLASS G	MT	55.8	
	ECONO	l	2030.0	
	NF-5	l	40.0	
8 1/2"	API CLASS G	MT	88.0	
	CFR-3L	l	1501.0	
	GASCON	l	3760.0	
	HAL600	l	3311.0	
	HR-4L	l	565.0	
	NF-5	l	29.0	

Norsk Hydro

B I T R E C O R D   F O R   W E L L   36/7-2

Bit No	Bit RR	Bit Type	Size (in)	Manufacturer	Tradename	Serial no.	IADC code			Nozzles diameter (../32in)				Flow area (in2)	BHA no.	Depth out (m MD)	Bit meter (m)	Rot. hours (hrs)	ROP (m/hr)	Rotation min/max (rpm)	Total bit revol.	Weight min/max (kN)	Flow min/max (l/min)	Pump min/max (bar)	Bit grading: Cutting structur I	O	DC	L	B	Gauge 1/16 (in)	Remarks oth	pul
1		MITO	17.500	SDBS	SS33GJ4	682632	115			16	18	18	18	0.942	1	355	64	11.00	5.8	71/94	56000	1/21	2000/4000	110/135	6	8	ER	A	E	1	WT	TD
1		HO	36.000	GRNT	6980	SNJ8132				20	20	22	22	1.356	1	355	64		0.0	71/94		1/21	2000/4000	110/135	8	8	LC	C	8	16	LC	
2	2	MITO	24.000	SDBS	S33SG	693813	115			20	20	20	24	1.362	2	354	63	4.00	15.8	70/100	9600	0/60	4300/4500	129/144	1	1	NO	A	E	I	NO	TD
2	3	MITO	24.000	SDBS	S33SG	693813	115			20	20	20	24	1.362	3	357	2	0.30	6.7	50/70	6200	10/70	3000/4100	70/135	1	1	NO	A	E	I	NO	TD
3		MITO	17.500	SDBS	MM44NG	499531	215M			18	18	18	18	0.994	4	591	234	4.90	47.8	60/116	24500	10/130	3500/4630	95/223	1	1	NO	A	E	I	NO	TD
4		ISRT	12.250	HTC	MAX-GTCP09	F35CT	435			18	18	18	18	0.994	5	725	138	4.90	28.2	50/150	38300	20/180	2810/4100	100/220	1	4	BT	H	1	2	NO	DTF
5		ISRT	12.250	HTC	MAX-GTCP09	J68CG	435			18	18	18	18	0.994	6	925	200	5.90	33.9	110/150	50060	30/180	3100/4500	135/220	1	1	NO	A	E	I	NO	BHA
6		ISRT	8.500	HTC	ATMGTP18DD	M56CW	447				15	15	15	0.518	7	1435	510	24.60	20.7	60/130	138900	10/160	1775/2550	110/215	3	3	BT	A	E	1	LT	TD

Norsk Hydro

BOTTOM HOLE ASSEMBLIES USED ON WELL 36/7-2

BHA no. 1: No./Element/OD(in)/Length(m) Depth In: 291 m MD Out: 355 m MD

1	SS33GJ4	17.500	0.42	7	DRILL COLLAR STEEL	8.000	45.40
2	6980	36.000	1.84	8	JAR	8.000	9.70
3	BIT SUB	9.500	1.68	9	DRILL COLLAR STEEL	8.000	18.17
4	MWD	9.500	13.90	10	X-OVER	6.500	1.59
5	DRILL COLLAR STEEL	9.500	36.99	11	HWDP	5.000	136.85
6	X-OVER	8.000	1.52	12	X-OVER	6.625	0.81

Reason Pulled: TOTAL DEPTH/CASING DEPTH Sum: 268.87

BHA no. 2: No./Element/OD(in)/Length(m) Depth In: 291 m MD Out: 354 m MD

1	S33SG	24.000	0.56	7	DRILL COLLAR STEEL	8.000	45.40
2	IPE DRS	36.000	2.56	8	JAR	8.000	9.70
3	BIT SUB	9.500	1.68	9	DRILL COLLAR STEEL	8.000	18.17
4	MWD	9.500	13.90	10	X-OVER	6.500	1.59
5	DRILL COLLAR STEEL	9.500	36.99	11	HWDP	5.000	136.85
6	X-OVER	8.000	1.52	12	X-OVER	6.625	0.81

Reason Pulled: TOTAL DEPTH/CASING DEPTH Sum: 269.73

BHA no. 3: No./Element/OD(in)/Length(m) Depth In: 355 m MD Out: 357 m MD

1	S33SG	24.000	0.56	7	JAR	8.000	9.70
2	BIT SUB	9.500	1.68	8	DRILL COLLAR STEEL	8.000	18.17
3	MWD	9.500	13.90	9	X-OVER	6.500	1.59
4	DRILL COLLAR STEEL	9.500	36.99	10	HWDP	5.000	136.85
5	X-OVER	8.000	1.52	11	X-OVER	6.625	0.81
6	DRILL COLLAR STEEL	8.000	45.40				

Reason Pulled: TOTAL DEPTH/CASING DEPTH Sum: 267.17

BHA no. 4: No./Element/OD(in)/Length(m) Depth In: 357 m MD Out: 591 m MD

1	MM44NG	17.500	0.54	8	DRILL COLLAR STEEL	8.000	36.40
2	BIT SUB	9.500	1.68	9	JAR	8.000	9.70
3	MWD	9.500	13.90	10	DRILL COLLAR STEEL	8.000	18.17
4	NON MAG. COLLAR	9.500	8.95	11	X-OVER	6.500	1.59
5	NON MAG. STAB	17.500	2.13	12	HWDP	5.000	136.85
6	DRILL COLLAR STEEL	9.500	46.11	13	X-OVER	6.625	0.81
7	X-OVER	9.500	1.52				

Reason Pulled: TOTAL DEPTH/CASING DEPTH Sum: 278.35

BHA no. 5: No./Element/OD(in)/Length(m) Depth In: 587 m MD Out: 725 m MD

1	MAX-GTCP09	12.250	0.30	7	JAR	8.000	9.70
2	BIT SUB	8.000	1.75	8	DRILL COLLAR STEEL	8.000	18.22
3	MWD	8.250	18.57	9	X-OVER	7.625	1.56
4	NON MAG. COLLAR	8.000	7.99	10	HWDP	5.000	136.85
5	NON MAG. STAB	12.250	1.84	11	X-OVER	6.625	0.81
6	DRILL COLLAR STEEL	8.000	109.38				

Reason Pulled: DOWNHOLE TOOL FAILURE Sum: 306.97

Norsk Hydro

BOTTOM HOLE ASSEMBLIES USED ON WELL 36/7-2

BHA no. 6: No./Element/OD(in)/Length(m) Depth In: 725 m MD Out: 925 m MD

No.	Element	OD(in)	Length(m)	No.	Element	OD(in)	Length(m)
1	MAX-GTCP09	12.250	0.30	7	JAR	8.000	9.70
2	BIT SUB	8.000	1.75	8	DRILL COLLAR STEEL	8.000	18.22
3	MWD	8.250	14.29	9	X-OVER	7.625	1.56
4	NON MAG. COLLAR	8.000	7.99	10	HWDP	5.000	136.85
5	NON MAG. STAB	12.250	1.84	11	X-OVER	6.625	0.81
6	DRILL COLLAR STEEL	8.000	109.38				

Reason Pulled: CHANGE BOTTOMHOLE ASSEMBLY Sum: 302.69

BHA no. 7: No./Element/OD(in)/Length(m) Depth In: 925 m MD Out: 1435 m MD

No.	Element	OD(in)	Length(m)	No.	Element	OD(in)	Length(m)
1	ATMGTP18DD	8.500	0.24	9	X-OVER	6.880	0.49
2	BIT SUB	6.375	0.85	10	JAR	6.500	9.78
3	MWD	6.500	13.13	11	X-OVER	6.500	0.83
4	NON MAG. COLLAR	6.500	8.94	12	DRILL COLLAR STEEL	6.500	18.41
5	NON MAG. STAB	8.500	1.63	13	X-OVER	6.750	1.70
6	X-OVER	6.375	0.56	14	HWDP	5.000	137.10
7	DRILL COLLAR STEEL	6.500	92.21	15	DRILL PIPE	5.000	782.71
8	DRILL COLLAR STEEL	6.500	92.58	16	X-OVER	7.250	0.81

Reason Pulled: TOTAL DEPTH/CASING DEPTH Sum:1161.97

Norsk Hydro

DAILY MUD PROPERTIES : RHEOLOGY PARAMETERS FOR WELL 36/7-2

Hole section: 36" — WATER BASED SYSTEM

Date	Depth [m] MD	Depth [m] TVD	Mud Type	Funnel Visc [sec]	Dens [sg]	Mudtmp Out [DegC]	Fann Readings 600	300	200	100	60	30	6	3	Rheo Test [DegC]	PV [mPas]	YP [Pa]	Gel0 [Pa]	Gel10 [Pa]
02-sep-1997 23:59	337	337	SPUD MUD	0.0	1.05	0.0									0.0	0.0	0.0	0.0	0.0
03-sep-1997 23:59	337	337	SPUD MUD	0.0	1.05	0.0									0.0	0.0	0.0	0.0	0.0
04-sep-1997 23:59	337	337	SPUD MUD	0.0	1.25	0.0									0.0	0.0	0.0	0.0	0.0

Hole section: 17 1/2" — WATER BASED SYSTEM

Date	Depth [m] MD	Depth [m] TVD	Mud Type	Funnel Visc [sec]	Dens [sg]	Mudtmp Out [DegC]	Fann Readings 600	300	200	100	60	30	6	3	Rheo Test [DegC]	PV [mPas]	YP [Pa]	Gel0 [Pa]	Gel10 [Pa]
05-sep-1997 23:59	340	340	SPUD MUD	0.0	1.05	0.0									0.0	0.0	0.0	0.0	0.0
06-sep-1997 23:59	592	592	SPUD MUD	0.0	1.05	0.0									0.0	0.0	0.0	0.0	0.0
07-sep-1997 23:59	592	592	SPUD MUD	0.0	1.25	0.0									0.0	0.0	0.0	0.0	0.0
08-sep-1997 23:59	592	592	SPUD MUD	0.0	1.25	0.0									0.0	0.0	0.0	0.0	0.0
09-sep-1997 12:00	592	592	SPUD MUD	0.0	1.25	0.0									0.0	0.0	0.0	0.0	0.0
10-sep-1997 12:00	592	592	SPUD MUD	0.0	1.25	0.0									0.0	0.0	0.0	0.0	0.0
11-sep-1997 12:00	592	592	SPUD MUD	0.0	1.25	0.0									0.0	0.0	0.0	0.0	0.0

Hole section: 12 1/4" — WATER BASED SYSTEM

Date	Depth [m] MD	Depth [m] TVD	Mud Type	Funnel Visc [sec]	Dens [sg]	Mudtmp Out [DegC]	Fann Readings 600	300	200	100	60	30	6	3	Rheo Test [DegC]	PV [mPas]	YP [Pa]	Gel0 [Pa]	Gel10 [Pa]
12-sep-1997 20:15	884	884	ANCO 2000	78.0	1.16	0.0	68	48	39	29			10	7	50.0	20.0	14.0	5.0	10.0

See also the report 'DAILY MUD PROPERTIES : OTHER PARAMETERS'

DAILY MUD PROPERTIES : RHEOLOGY PARAMETERS FOR WELL 36/7-2

Hole section: 8 1/2"

WATER BASED SYSTEM

Date	Depth [m] MD	Depth [m] TVD	Mud Type	Funnel Visc [sec]	Dens [sg]	Mudtmp Out [DegC]	Fann Readings 600	300	200	100	60	30	6	3	Rheo Test [DegC]	PV [mPas]	YP [Pa]	Gel0 [Pa]	Gel10 [Pa]
13-sep-1997 20:30	1200	1200	ANCO 2000	84.0	1.17	0.0	68	48	39	29			10	8	50.0	20.0	14.0	5.0	12.0
14-sep-1997 19:45	1435	1435	ANCO 2000	82.0	1.17	0.0	62	44	36	27			8	6	50.0	18.0	13.0	5.0	11.0
15-sep-1997 21:00	1435	1435	ANCO 2000	83.0	1.17	0.0	63	45	37	28			9	7	50.0	18.0	13.5	5.0	11.0
16-sep-1997 23:00	1435	1435	ANCO 2000	83.0	1.17	0.0	63	45	37	28			9	7	50.0	18.0	13.5	5.0	11.0
17-sep-1997 23:00	1435	1435	ANCO 2000	83.0	1.17	0.0	63	45	37	28			9	7	50.0	18.0	13.5	5.0	11.0
18-sep-1997 23:00	1435	1435	ANCO 2000	86.0	1.17	0.0	65	47	38	29			9	7	50.0	18.0	14.5	5.0	12.0
19-sep-1997 23:00	1435	1435	ANCO 2000	86.0	1.17	0.0	65	47	38	29			9	7	50.0	18.0	14.5	5.0	12.0
20-sep-1997 23:00	0		ANCO 2000	0.0	1.17	0.0									50.0	0.0	0.0	0.0	0.0

See also the report 'DAILY MUD PROPERTIES : OTHER PARAMETERS'

Norsk Hydro

DAILY MUD PROPERTIES : OTHER PARAMETERS FOR WELL 36/7-2

Hole section: 36" — WATER BASED SYSTEM

Date	Depth [m] MD	Depth [m] TVD	Mud Type	Dens [sg]	Filtrate API [ml]	Filtrate HPHT [ml]	Filt.cake API [mm]	Filt.cake HPHT [mm]	HPHT Press/Temp [psi/DegC]	pH	Alcalinity Pm [ml]	Alcalinity Pf [ml]	Alcalinity Mf [ml]	Inhib Chem [Kg/m3]	K+ [mg/l]	CL- [mg/l]	Ca++ [mg/l]	Mg++ [mg/l]	Tot hard [mg]	Percentage Solid [%]	Percentage Oil [%]	Percentage Sand [%]	CEC [Kg/m3]	ASG [sg]	LGS [Kg/m3]
02-sep-1997 23:59	337	337	SPUD MUD	1.05	0.0	0.0	0	0	0/0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0.0	0.0	0.0	0	0.0	0
03-sep-1997 23:59	337	337	SPUD MUD	1.05	0.0	0.0	0	0	0/0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0.0	0.0	0.0	0	0.0	0
04-sep-1997 23:59	337	337	SPUD MUD	1.25	0.0	0.0	0	0	0/0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0.0	0.0	0.0	0	0.0	0

Hole section: 17 1/2" — WATER BASED SYSTEM

Date	Depth [m] MD	Depth [m] TVD	Mud Type	Dens [sg]	Filtrate API [ml]	Filtrate HPHT [ml]	Filt.cake API [mm]	Filt.cake HPHT [mm]	HPHT Press/Temp [psi/DegC]	pH	Alcalinity Pm [ml]	Alcalinity Pf [ml]	Alcalinity Mf [ml]	Inhib Chem [Kg/m3]	K+ [mg/l]	CL- [mg/l]	Ca++ [mg/l]	Mg++ [mg/l]	Tot hard [mg]	Percentage Solid [%]	Percentage Oil [%]	Percentage Sand [%]	CEC [Kg/m3]	ASG [sg]	LGS [Kg/m3]
05-sep-1997 23:59	340	340	SPUD MUD	1.05	0.0	0.0	0	0	0/0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0.0	0.0	0.0	0	0.0	0
06-sep-1997 23:59	592	592	SPUD MUD	1.05	0.0	0.0	0	0	0/0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0.0	0.0	0.0	0	0.0	0
07-sep-1997 23:59	592	592	SPUD MUD	1.25	0.0	0.0	0	0	0/0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0.0	0.0	0.0	0	0.0	0
08-sep-1997 23:59	592	592	SPUD MUD	1.25	0.0	0.0	0	0	0/0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0.0	0.0	0.0	0	0.0	0
09-sep-1997 12:00	592	592	SPUD MUD	1.25	0.0	0.0	0	0	0/0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0.0	0.0	0.0	0	0.0	0
10-sep-1997 12:00	592	592	SPUD MUD	1.25	0.0	0.0	0	0	0/0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0.0	0.0	0.0	0	0.0	0
11-sep-1997 12:00	592	592	SPUD MUD	1.25	0.0	0.0	0	0	0/0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0.0	0.0	0.0	0	0.0	0

Hole section: 12 1/4" — WATER BASED SYSTEM

Date	Depth [m] MD	Depth [m] TVD	Mud Type	Dens [sg]	Filtrate API [ml]	Filtrate HPHT [ml]	Filt.cake API [mm]	Filt.cake HPHT [mm]	HPHT Press/Temp [psi/DegC]	pH	Alcalinity Pm [ml]	Alcalinity Pf [ml]	Alcalinity Mf [ml]	Inhib Chem [Kg/m3]	K+ [mg/l]	CL- [mg/l]	Ca++ [mg/l]	Mg++ [mg/l]	Tot hard [mg]	Percentage Solid [%]	Percentage Oil [%]	Percentage Sand [%]	CEC [Kg/m3]	ASG [sg]	LGS [Kg/m3]
12-sep-1997 20:15	884	884	ANCO 2000	1.16	3.1	0.0	1	0	0/0	8.2	0.0	0.0	0.6	90	47200	61000	200	0	300	9.0	0.0	0.1	8	0.0	46

Hole section: 8 1/2" — WATER BASED SYSTEM

Date	Depth [m] MD	Depth [m] TVD	Mud Type	Dens [sg]	Filtrate API [ml]	Filtrate HPHT [ml]	Filt.cake API [mm]	Filt.cake HPHT [mm]	HPHT Press/Temp [psi/DegC]	pH	Alcalinity Pm [ml]	Alcalinity Pf [ml]	Alcalinity Mf [ml]	Inhib Chem [Kg/m3]	K+ [mg/l]	CL- [mg/l]	Ca++ [mg/l]	Mg++ [mg/l]	Tot hard [mg]	Percentage Solid [%]	Percentage Oil [%]	Percentage Sand [%]	CEC [Kg/m3]	ASG [sg]	LGS [Kg/m3]
13-sep-1997 20:30	1200	1200	ANCO 2000	1.17	3.0	0.0	1	0	0/0	8.1	0.0	0.0	0.6	110	57700	63000	260	0	280	9.3	0.0	0.5	10	0.0	41
14-sep-1997 19:45	1435	1435	ANCO 2000	1.17	2.9	0.0	1	0	0/0	8.3	0.0	0.0	0.6	112	58700	66000	280	0	300	9.1	0.0	0.4	10	0.0	39
15-sep-1997 21:00	1435	1435	ANCO 2000	1.17	3.0	0.0	1	0	0/0	8.3	0.0	0.0	0.6	110	57700	66000	280	0	300	9.1	0.0	0.3	10	0.0	39
16-sep-1997 23:00	1435	1435	ANCO 2000	1.17	3.0	0.0	1	0	0/0	8.3	0.0	0.0	0.6	110	57700	66000	280	0	300	9.1	0.0	0.3	10	0.0	39
17-sep-1997 23:00	1435	1435	ANCO 2000	1.17	3.0	0.0	1	0	0/0	8.3	0.0	0.0	0.6	110	57700	66000	280	0	300	9.1	0.0	0.3	10	0.0	39
18-sep-1997 23:00	1435	1435	ANCO 2000	1.17	3.0	0.0	1	0	0/0	8.1	0.0	0.0	0.6	110	57700	66000	280	0	300	9.1	0.0	0.3	10	0.0	39
19-sep-1997 23:00	1435	1435	ANCO 2000	1.17	3.0	0.0	1	0	0/0	8.1	0.0	0.0	0.6	110	57700	66000	280	0	300	9.1	0.0	0.3	10	0.0	39
20-sep-1997 23:00	0		ANCO 2000	1.17	0.0	0.0	0	0	0/0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0.0	0.0	0.0	0	0.0	0

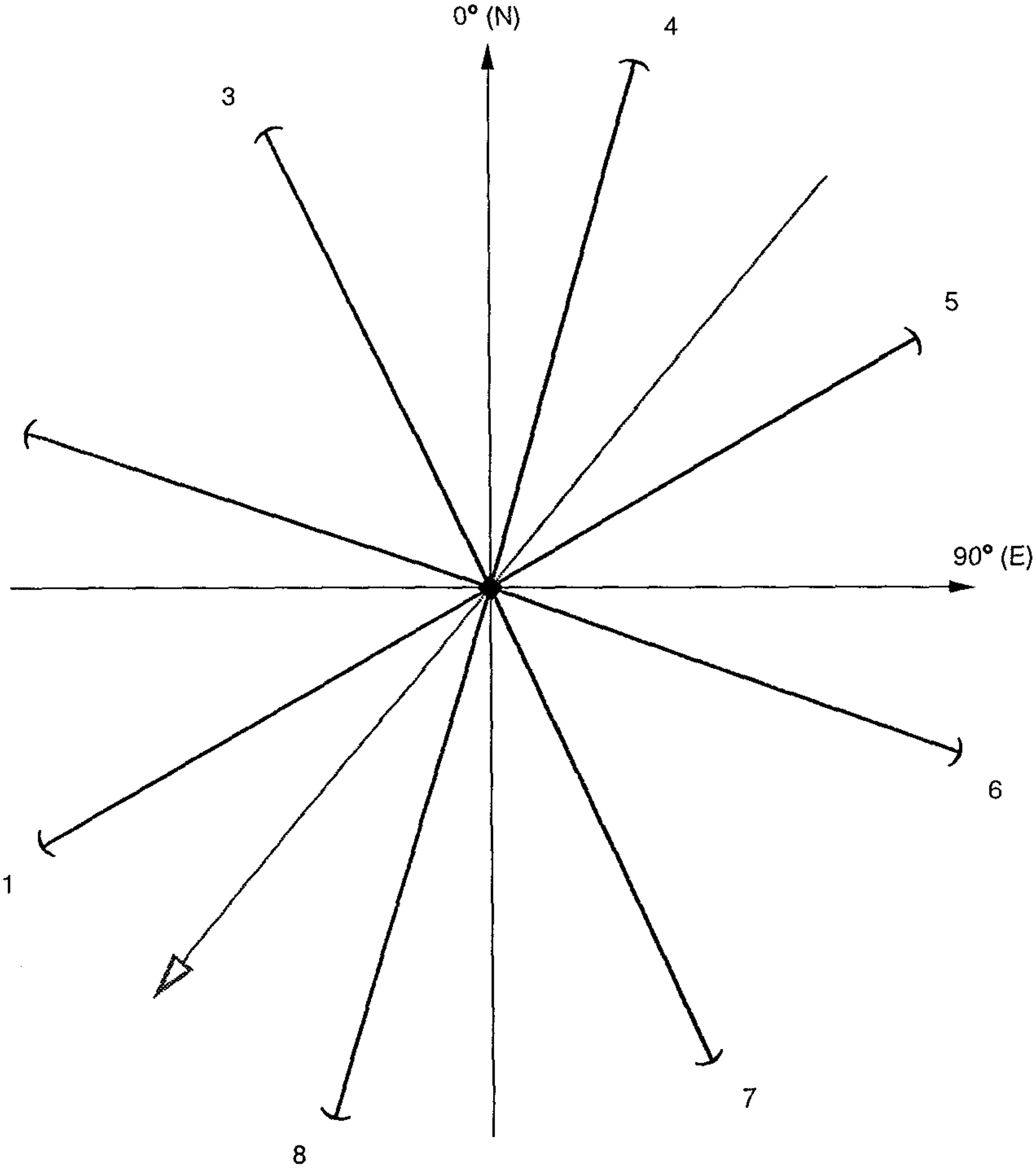
See also the report 'DAILY MUD PROPERTIES : RHEOLOGY PARAMETERS'

Norsk Hydro

18-jan-1998

TOTAL CONSUMPTION OF MUD ADDITIVES ON WELL 36/7-2

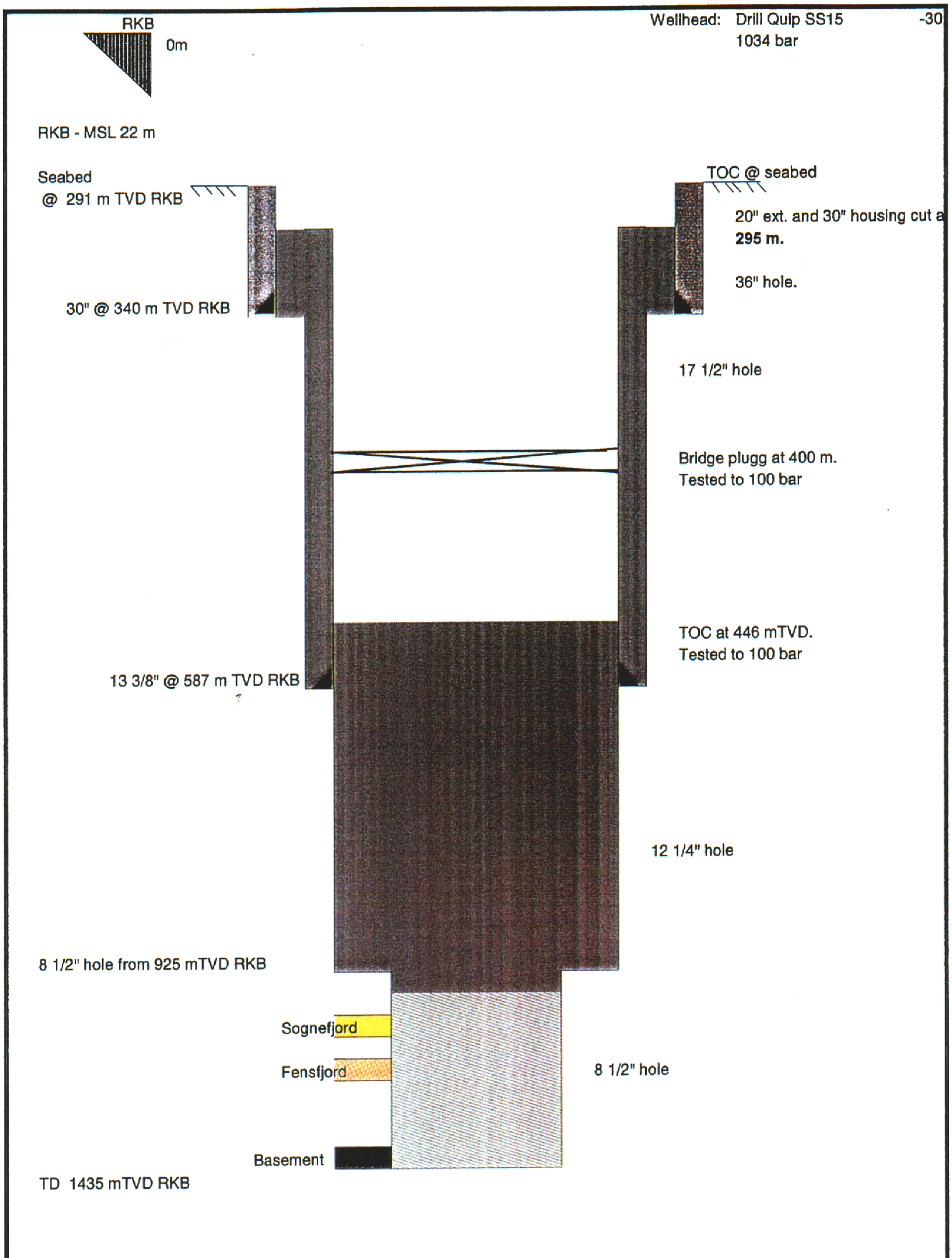
Section Size	Product/Additive	Total Amount Planned	Total Amount Used	Unit	Difference		Difference in cost	
					Amount	%	%	[kNOK]
36"	BARITE		162000.0	kg				
	BENTONITE		48000.0	kg				
	SODA ASH		175.0	kg				
17 1/2"	BENTONITE		13000.0	kg				
	MICA COARSE		150.0	kg				
12 1/4"	ANCO 208		13000.0	l				
	ANCO ZAN D		1850.0	kg				
	ANTISOL FL10		5200.0	kg				
	BARITE		29000.0	kg				
	BENTONITE		3000.0	kg				
	KCL BRINE		180000.0	l				
	KCL POWDER		2000.0	kg				
8 1/2"	ANCO 208		2000.0	l				
	ANCO ZAN D		425.0	kg				
	ANTISOL FL10		800.0	kg				
	KCL BRINE		49000.0	l				
	MICA COARSE		400.0	kg				
	MICA FINE		175.0	kg				
	SODA ASH		300.0	kg				
0.0	BICARBONATE		325.0	kg				
	CITRIC ACID		550.0	kg				
	KCL POWDER		2000.0	kg				



RIG HEADING 222 DEG.

ANCHOR NO	DIRECTION (DEG.)	LENGTH (m)
1	242	1400
2	287	1336
3	332	1304
4	17	1393
5	62	1336
6	108	1358
7	153	1341
8	198	1406

Figure 1		Mooring Line Pattern WEST VANGUARD 36/7-2	HYDRO



WELL SCHEMATIC

PLUGGED AND PERMANENT ABANDONED

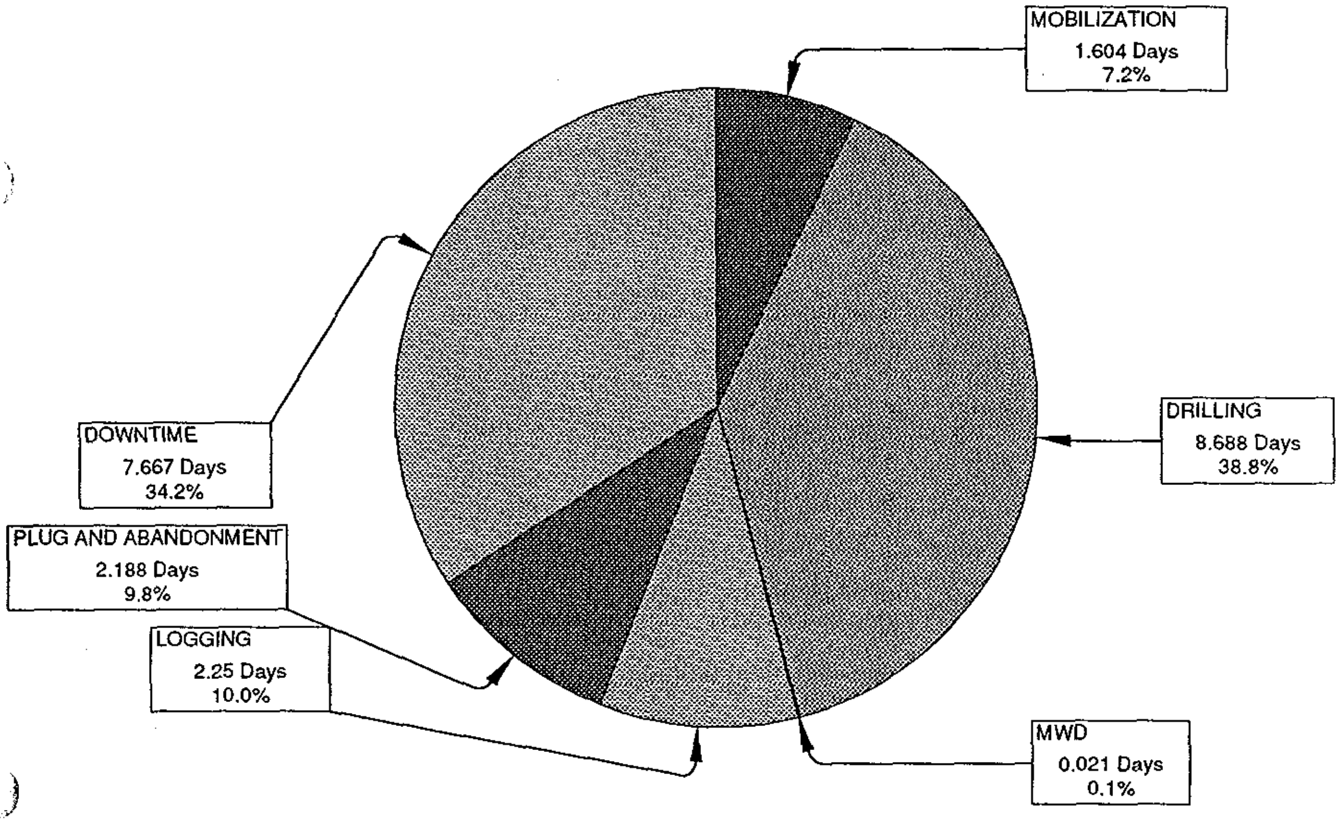
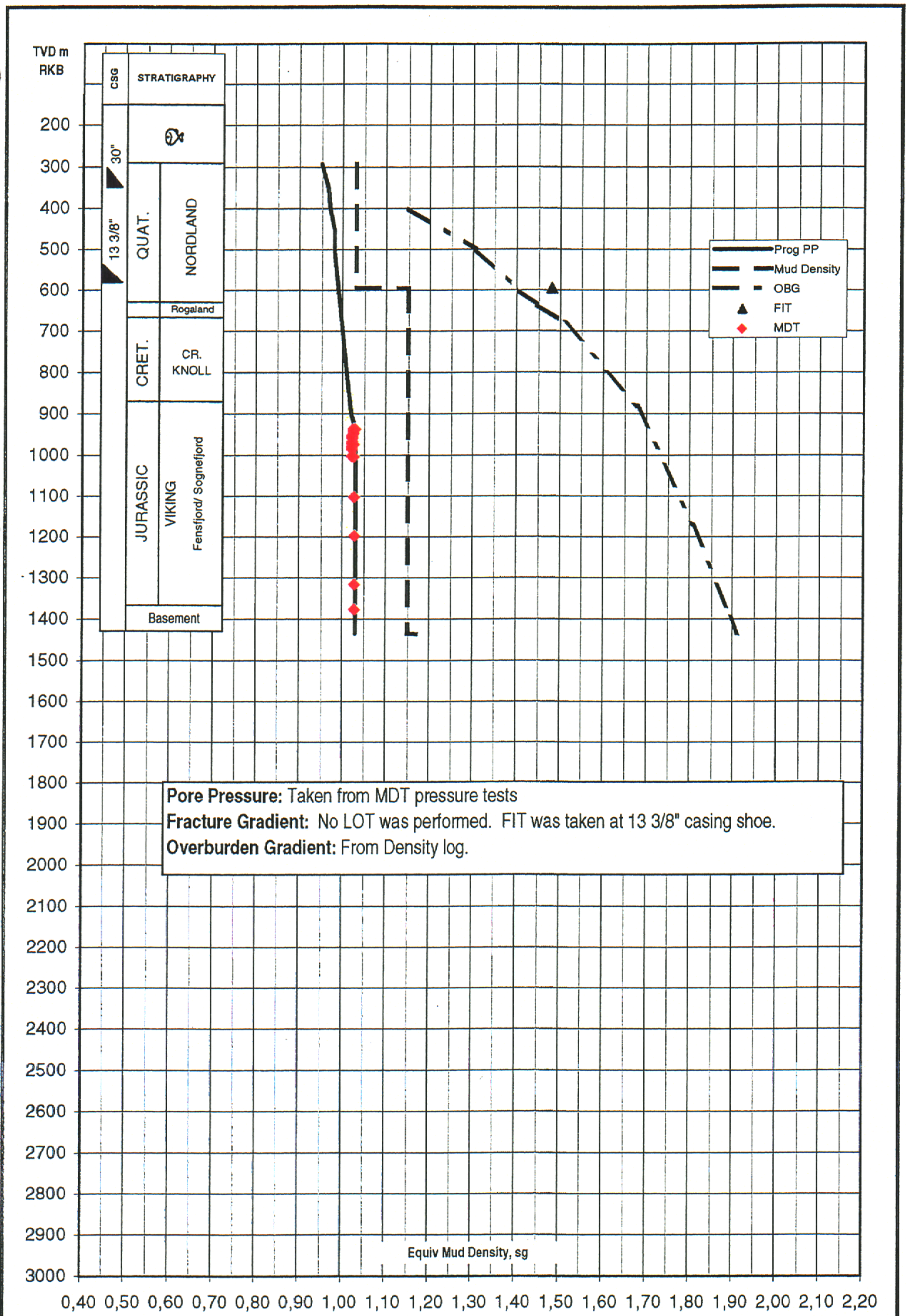
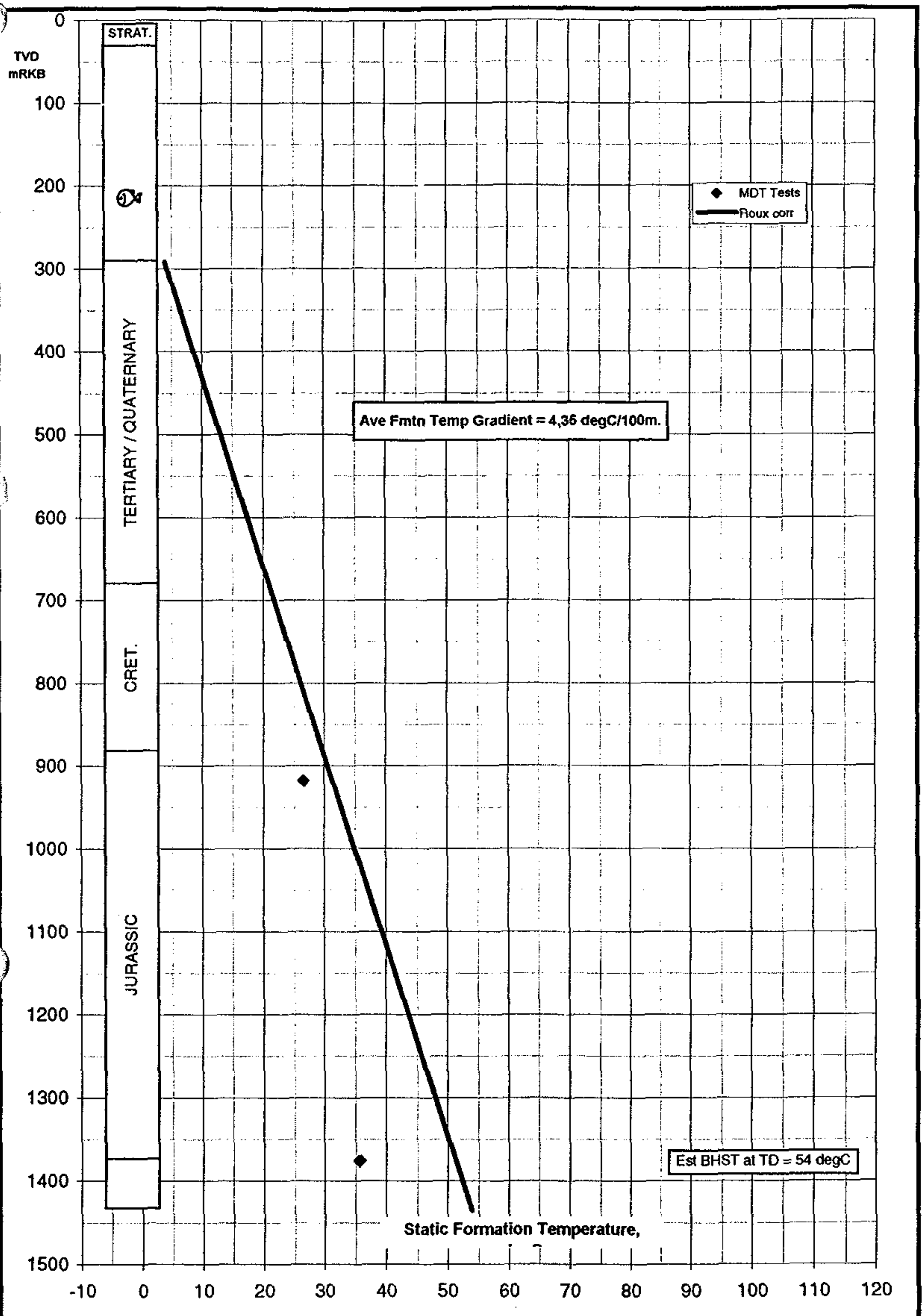


Figure 1		Time Distribution Well: 36/7-2	HYDRO

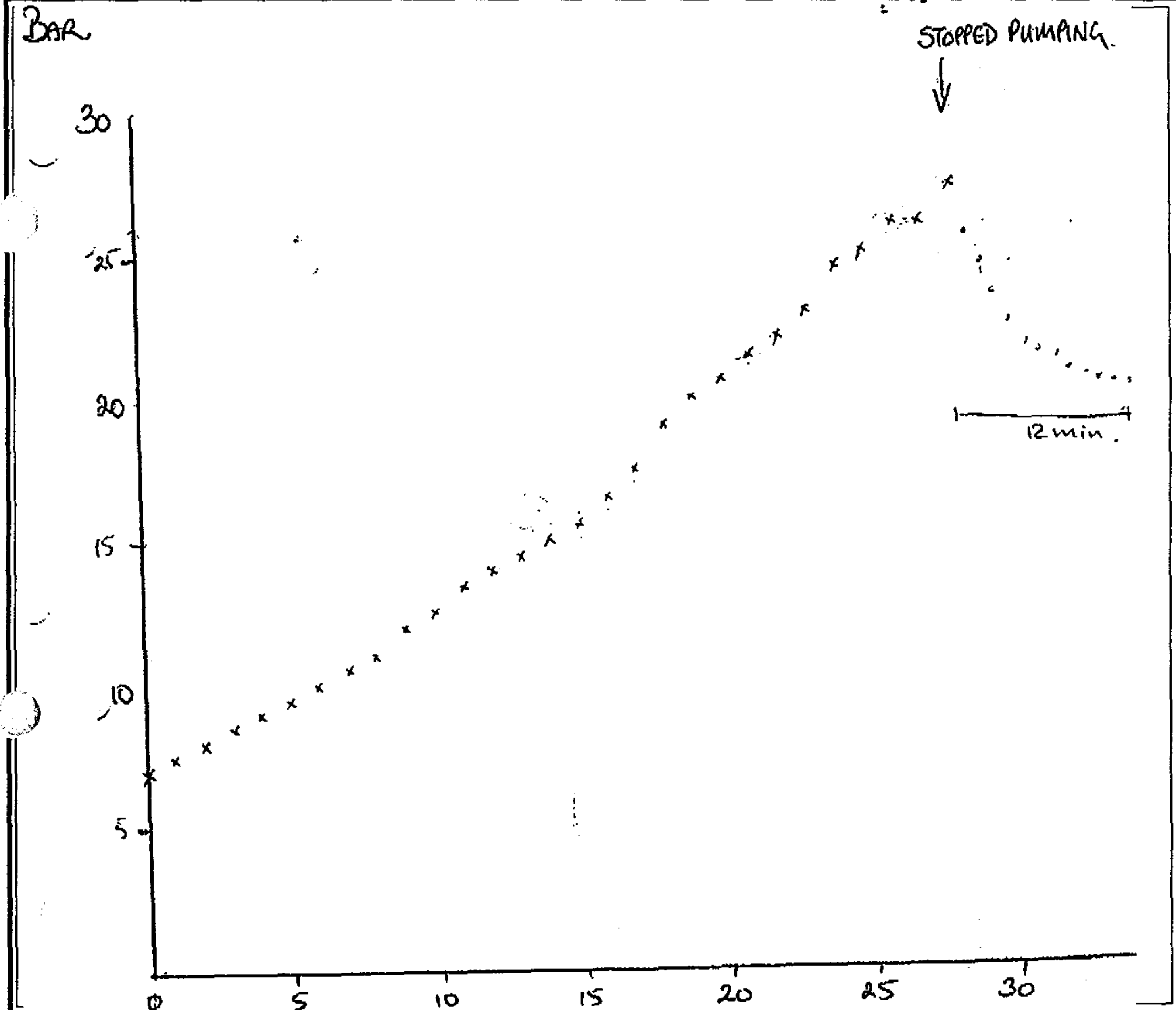


Final Well Report 36/7-2	Figure: Revision: 0 Date: 05-mar-98	Final pore pressure, mud density, fracture- and overburden gradients	HYDRO



Well Programme 36/7-2	Figure:	FormationTemperature Gradient

Well	36/7-2		Test type - ELOT/LOT/FIT	FIT		Test date	12/9/97	
Rig	West Vanguard	Airgap(m) 22	Water depth (m)	358	Csg OD" 13 3/8"	Hole angle (deg)	0	
Csg Shoe (mMD/mTVD)	587	587	OH depth, (mMD/mTVD)	0	0	Lithology	Claystone	
Mud Properties	Dens (sg)	1,03	API WL(ml/30min)	PV (cp)	0	YP (Pa) 0	Gels (Pa)	0
Pump Rate (l/min)	v. low		Vol pumped (l.)	28 Stro		Vol bled back (l.)	0	
Leakoff Pressure (bar)	26		Max pressure (bar)	26		Propagation press. (bar)		
Test result (sg EMD)	**1,48**		Comments	Used seawater as fracturing fluid. No pressure/time data available				



Final Well Report 36/7-2	Fig. a	Formation Strength Test Report

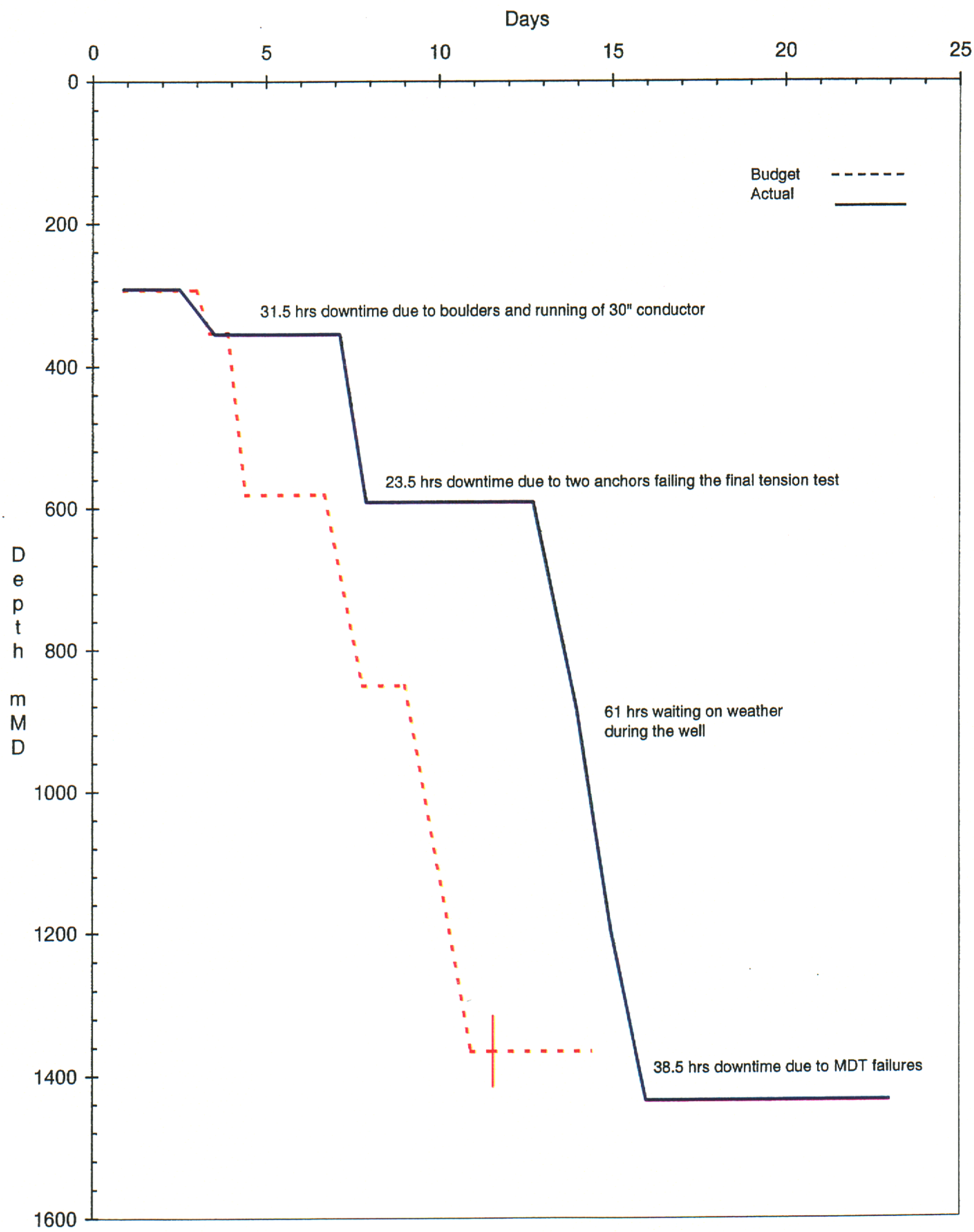


Fig. C-5	Drilling Curves Well 36/7-2	HYDRO

Completion log
Scale: 1:500
Well: 36/7-2

NORSK HYDRO — SIDE WALL CORE DESCRIPTION

WELL: 36/7 - 2 — RIG: West Vanguard

Run: 1A — Date: 19.09.97 — Logging co.: SCHLUMBERGER — Page 1.00 of 6.00
Shot: 60.00 — Misfired: 2.00 — Lost: 0.00 — Empty: 2.00 — Recovered: 56.0 — Geologist: O.G / F-M.J / H.N.

No.	Depth m RKB	Recovered cm	Lithology and shows description	Direct Tr	Direct M	Direct G	Cut Tr	Cut M	Cut G
1A/1	1408.00	2.00	Sst: lt gn gry,clr-mky Qtz,v f-f,Tr m,sbang-sbrndd,mod srt,frm,slily slty,Kao Mtrx,Tr Mic,Tr Glau,r carb,n.v.p.,n/s						
1A/2	1387.00	2.50	Sst: w/ C and Clst Len Sst: lt gry-m gry,f-crs,Kao Mtrx,mic,carb,n.v.p.,else a/a Clst: dk gry,frm,sbfis,silty slty,Micromic						
1A/3	1364.00	4.00	Sst: lt gry-grysh wh,clr-mky Qtz,v f-m,sbang-sbrndd, frm, mod srt,Kao Mtrx,Tr Micropyr,Tr carb,r Mic,n.v.p.,n/s						
1A/4	1352.00	2.50	Sst: some rose Qtz, else as 1364m						
1A/5	1343.00	4.00	Sst: lt gry-m gry,clr-mky Qtz,m-crs,Tr v crs,sbrndd-rndd,mod srt,fri-mod hd,Kao Mtrx,Tr Pyr,Tr Mic, Tr carb,pr-n.v.p.,n/s						
1A/6	1335.00	2.00	Clst: brn gry,frm,blky,non calc,slily slty,Micromic,carb						
1A/7	1316.00	2.00	Sst: m dk gry-lt gry,v f-f,sbang-sbrndd,ang,mod-gd srt, frm, Kao Mtrx,, Tr Pyr,Tr Mic, carb,n.v.p.,n/s						
1A/8	1300.00	4.50	Sst: as for 1316m						
1A/9	1283.00	1.50	Sst: v f-f,abd Kao Mtrx,else as for 1316m						
1A/10	1267.00	2.00	Sltst: m dk gry,frm,blky,slily-non calc,Micropyr,Tr Mic, slily v f sdy						

Tr:Trace M:Medium G:Good

Comments:

NORSK HYDRO — SIDE WALL CORE DESCRIPTION

WELL: 36/7 - 2 — RIG: West Vanguard

Run: 1A — Date: 19.09.97 — Logging co.: SCHLUMBERGER — Page 2.00 of 6.00
Shot: 60 — Misfired: 2.00 — Lost: 0.00 — Empty: 2.00 — Recovered: 56.0 — Geologist: O.G / F-M.J / H.N.

No.	Depth m RKB	Recovered cm	Lithology and shows description	Direct Tr	Direct M	Direct G	Cut Tr	Cut M	Cut G
1A/11	1245.50	2.00	Sst: m dk gry, clr-mky Qtz,vf,sbang-sbrndd,frm,Kao Mtrx,loc v slty grad Sltst,Tr carb,Tr Pyr,Tr Mica,n .v.p.,n/s.						
1A/12	1231.50	4.00	Sst: olv gry-m dk gry,clr-mky Qtz,v-f-v crs,sbang- sbrndd,frm,Kao Mtrx,Tr Mica,pr v.p,n/s						
1A/13	1195.00	4.50	Cgl: lt gry-m lt gry,vf-pbl,dom crs-pbl,sbrndd-rndd, mod srt,fri-sft,Kao Mtrx,Tr Mic,Tr Pyr,Tr carb,r Glauc,n-pr v.p,n/s.						
1A/14	1177.50		Empty						
1A/15	1142.00	3.50	Clst: brn-brnsh blk,blky-sbfis,frm-m hd,non calc,C Len,v slty,loc grad Sltst,Tr micromic						
1A/16	1124.00	4.00	Sst: m lt gry-lt brnsh gry,vf-m,frm-fri,Tr Glauc,Tr carb,Tr Mica,Kao Mtrx, n.v.p.,n/s						
1A/17	1104.00	3.50	Sst: m lt gry, else as for 1124m						
1A/18	1090.00	1.00	Clst: brnsh gry-m dk gry,frm,blky,non calc,loc vf sdy Len,v slty grad Sltst,mic						
1A/19	1082.00	4.00	Sst: vf-crs,pr srt,Tr Kao Mtrx,r Mica,r Pyr,r carb,v gd v.p,n/s.						
1A/20	1052.50		Empty						

Tr:Trace M:Medium G:Good

Comments:

NORSK HYDRO — SIDE WALL CORE DESCRIPTION

WELL: 36/7 - 2 — RIG: West Vanguard

Run: 1A — Date: 19.09.97 — Logging: SCHLUMBERGER — Page 3.00 of 6.00
Shot: 60.00 — Misfired: 2.00 — Lost: 0.00 — Empty: 2.00 — Recovered: 56.0 — Geologist: O.G / F-M.J / H.N.

No.	Depth m RKB	Recovered cm	Lithology and shows description	Direct Tr	Direct M	Direct G	Cut Tr	Cut M	Cut G
1A/21	1037.00	3.00	Clst w/Sst Len Clst:brnsh gry-m dk gry,frm,blky,non calc,loc vf Sd,v slty grad Sltst,Tr Mica Sst: vf-f, Kao Mtrx,Tr Pyr,carb,n/s						
1A/22	1030.00	4.00	Sst:vf-crs,pr srt,Tr Kao Mtrx,r Mica,r Pyr,r carb,v gd v.p.,n/s.						
1A/23	1021.00	2.50	Cgl: olv gry,clr-mky Qtz,vf-pbl,frm,sbrnd,loc ang,Cl Mtrx,r Mica,n.v.p.,n/s.						
1A/24	1017.00	3.00	Cgl: as for 1021m						
1A/25	1013.00	4.00	Cgl: as for 1021m						
1A/26	1007.00	4.00	Cgl: as for 1021m						
1A/27	998.00	4.50	Sst: m dk gry,vf-m,fri,arg/Kao Mtrx,Tr Pyr,Tr Mica,n.v.p.,n/s						
1A/28	987.50	3.00	Sst: f-crs,carb Len,else as 998m						
1A/29	979.00	4.00	Sst: f-v crs,r Kao Mtrx,v gd v.p. Show: no Pet od,no O Stn,dull sptd yel dir Fluor,v slo strmg bl-bl wh Fluor cut,no vis cut,bl wh Fluor Res,no vis Res	X				X	
1A/30	970.50	3.00	Cgl:vf-pbl,Tr Rose Qtz,Tr Pyr,mod v.p. Show: wk Pet od,no O Stn,sptd dull yel dir Fluor,v slo strmg bl wh-wh Fluor cut,no vis cut,wk bl Fluor Res,no vis Res.	X				X	

Tr:Trace M:Medium G:Good

Comments:

NORSK HYDRO — SIDE WALL CORE DESCRIPTION

WELL: 36/7 - 2 — RIG: West Vanguard

Run: 1A — Date: 19.09.97 — Logging: SCHLUMBERGER — Page 4.00 of 6.00
Shot: 60.00 — Misfired: 2.00 — Lost: 0.00 — Empty: 2.00 — Recovered: 56.0 — Geologist: O.G / F-M.J / H.N

No.	Depth m RKB	Recovered cm	Lithology and shows description	Direct Tr	Direct M	Direct G	Cut Tr	Cut M	Cut G
1A/31	969.50	1.50	Clst w/Len of Sst Clst:brn gry,blky-sbfis,mod hd-frm,non calc,slty,micromic,vf sdy,loc Qtz pbl, Tr Shows in Sst	X			X		
1A/32	961.00	3.00	Sst: yelsh brn,clr-trans Qtz,vf,rndd-sbrndd,spher,gd srt,fri-lse,Tr sil Cmt,Tr Pyr,Tr Mica,Tr carb,mod vis por. Show: wk Petr od,yel wh-brt yel wh dir Fluor, mod strmg,mod wh Fluor cut,pl straw vis cut,brt crm Fluor res,lt yel vis Res			X			X
1A/33	955.00	6.50	Sst:dk yelsh brn,clr-trans Qtz,occ mky,vf-crs,pred f, mod srt,sbrndd-sbang,Tr sil Cmt,Tr Pyr,gd vis por.Show: mod Petr od,brt yel wh dir Fluor, mod strmg, mod wh Fluor cut,pl straw vis cut,m yel wh flu Res,lt yel vis Res			X			X
1A/34	950.00	2.50	Sst: yel brn,m brn,m-crs,pred m,tr Kao Mtrx,else as 950m. Show: yel brn-m brn O Stn,brt yel wh-wh dir Fluor, else as 955m			X			X
1A/35	947.00		Misfire						
1A/36	935.00	4.00	Sst:pred m-dk brn,f-m, loc pbl, else as 950m Show: as for 955m			X			X
1A/37	928.00	3.00	Glauc Sst/Cgl: gn-dk gn,gn-gnsh blk Glauc,pred f-m, loc clr-trans Qtz,pred pebl,rndd-sbrndd,spher,Kao Cmt,m v.p. Show: v wk Petr od,lt brn O Stn,fnt crm Fluor cut,no vis cut,m yel wh Fluor Res,no vis Res	X			X		
1A/38	923.00	3.50	Glauc Sst/Cgl: as 928m Show:no Petr od,tr dull ptchy yel dir Fluor,v slo strmg dull crm Fluor cut,no vis cut,no fluor Res,no vis Res	X			X		
1A/39	919.00	3.50	Glauc Sst/Cgl: as 928m Show: as 923m	X			X		
1A/40	915.00		Misfire						

Tr:Trace M:Medium G:Good

Comments:

NORSK HYDRO — SIDE WALL CORE DESCRIPTION

WELL: 36/7 - 2 — RIG: West Vanguard

Run: 1A — Date: 19.09.97 — Logging co.: SCHLUMBERGER — Page 5.00 of 6.00
Shot: 60.00 — Misfired: 2.00 — Lost: 0.00 — Empty: 2.00 — Recovered: 2.00 — Geologist: O.G / F-M.J / H.N

No.	Depth m RKB	Recovered cm	Lithology and shows description	Direct Tr	Direct M	Direct G	Cut Tr	Cut M	Cut G
1A/41	908.00	5.00	Clst w/Ls Lam: Clst: dk gry-olv gry,frm,blky,slily calc,Tr micropyr,r Mica, Tr micromic Ls: yelsh gry,m hd,styl						
1A/42	900.00	5.50	Clst: dk gry-olv gry,loc v lt gry,sft-frm,non fiss,slily calc,Tr Slt,Tr vf Sd,Tr carb,r Mica						
1A/43	887.00	5.50	Clst: pred frm, else as 900m						
1A/44	867.00	5.00	Clst:frm-hd,v calc grad arg Ls, else as 900m.						
1A/45	859.00	5.00	Sst: lt brn,clr-trans Qtz,f-m,occ crs,sbang-sbrndd, spher,mod-pr srt,mod hd,Kao/Cl Mtrx,slily calc,gd Tr Glauc,n/s						
1A/46	847.00	5.00	Clst: m gnsh gry-m dk gry,frm-sft,plty,non-slily calc,mod fiss,Tr Slt,Tr Pyr,r Mica						
1A/47	834.00	6.00	Clst: pred lt olv gry-olv gry,grs Qtz gr,Tr micropyr,loc sdy,else as for 847m.						
1A/48	817.50	5.00	Clst: olv gry-dk gry,mod-v calc,Tr Mic,else as 847m.						
1A/49	798.00	4.50	Clst: dk gry,m calc,Tr Pyr Lam,Tr Ls,Tr Glz pbl,else as for 847						
1A/50	768.00	4.00	Clst: md dk gry,frm,fiss,m-v calc,Tr Slt,Tr Pyr lam and Nod,r Sd,Tr micromic.						

Tr:Trace M:Medium G:Good

Comments:

NORSK HYDRO — SIDE WALL CORE DESCRIPTION

WELL: 36/7 - 2 — RIG: West Vanguard

Run: 1A — Date: 19.09.97 — Logging co.: SCHLUMBERGER — Page 6.00 of 6.00
Shot: 60.00 — Misfired: 2.00 — Lost: 0.00 — Empty: 2.00 — Recovered: 2.00 — Geologist: O.G / F-M.J / H.N

No.	Depth m RKB	Recovered cm	Lithology and shows description	Direct Tr	Direct M	Direct G	Cut Tr	Cut M	Cut G
1A/51	744.00	5.00	Clst: dk gry-brnsh gry,frm-m hd,non stky,m fiss,m-slily calc,v slty grad Sltst,Tr Glauc,r Pyr.						
1A/52	722.00	3.50	Clst: olv blk,frm,stky,non fiss,slily-m calc,v slty,grad Sltst,Tr Glauc						
1A/53	705.00	3.00	Clst: as for 722m						
1A/54	685.00	5.00	Clst: grysh blk-olv blk,sft,slily calc,else as for 722m						
1A/55	665.00	3.50	Glauc Sst/Cgl: grysh gn-yelsh gry,grysh gn-blk Glauc, m-f,trans-mky Qtz, pred crs-v crs,occ pbl,rndd-sbrndd, spher,fri-m hd,Kao Mtrx, n/s						
1A/56	653.50	3.00	Sst: olv gry,lt olv gry,occ lt gry,clr-trans Qtz,pred f,occ vf,occ m,sbrndd-sbang,spher,m srt,hd-m hd,Cl Mtrx,v arg,Tr Mica,n/s						
1A/57	639.00	2.50	Sst: wh,lt yelsh brn,mky Qtz,occ clr-trans Qtz,pred f,occ m-crs,sbrndd-sbang,spher,m srt,hd-m hd,v calc cmt,abd Glauc,n.v.p.,min Fluor						
1A/58	623.50	5.00	Clst: olv gry,sft-frm,mod stky,non fiss,mod calc,Tr Slt,Tr vf Sd						
1A/59	615.00	6.00	Clst: gd Tr m Sd,micromic,else as for 623.5m						
1A/60	603.00	5.00	Clst:calc,v gd Tr m Sd,Tr Glauc,else as for 623.5m.						

Tr:Trace M:Medium G:Good

Comments:

FORMATION PRESSURE WORKSHEET

Well Name: 36/7-2 — Rig: West Vanguard — Date: 16-19.09.97
Pressure Units: bar — RKB-MSL: 22 m — MSL-SBed: 269 m — Witnessed by: O.Wahl

Run No./Test No.	Depth mMD RKB	Depth mTVD RKB	Initial Hydrostatic Pressure Strain	Initial Hydrostatic Pressure CQG	Formation Pressure Strain	Formation Pressure CQG	Final Hydrostatic Pressure Strain	Final Hydrostatic Pressure CQG	Time hh:mm Set	Time hh:mm Retract	Formation Pressure sg EMD	Test Temp degC	Good Data? Y/N	Sample Main Fluid Type	HC Gravity g/cc	Sample Vol, cc	Remarks
1	918.1	918.1	108.40	107.95	n/a	n/a	108.3	107.92	13:14	13:19	0.000	26.6	N				Tight
2	921.0	921.0	108.7	108.3	n/a	n/a	108.6	108.18	13:25	13:32	0.000	26.9	N				Tight
3	924.2	924.2	109.05	108.66	n/a	n/a	109.0	108.63	13:40	13:45	0.000	27.2	N				Seal failure
4	929.0	929.0	109.5	109.13	n/a	n/a	109.4	109.09	13:55	14:00	0.000	27.2	N				Tight
5	934.0	934.0	110.2	109.65	94.5	94.06	110.2	109.73	14:05	14:10	1.027	27.8	Y				838 mD/cp
6	936.0	936.0	110.4	110.03	94.7	94.33	110.4	109.97	14:17	14:20	1.027	27.7	Y				9.1 mD/cp
7	948.7	948.7	111.9	111.50	n/a	n/a	111.8	111.40	14:55	15:01	0.000	27.9	N				Tight
8	948.9	948.9	111.9	111.49	95.6	95.36	111.8	111.49	15:07	15:19	1.024	28.1	Y				117 mD/cp
9	950.0	950.0	112.0	111.60	95.5	95.45	112.0	111.51	15:27	15:40	1.024	28.2	Y				22.5 mD/cp
10	951.5	951.5	112.2	111.78	96.0	95.60	112.2	111.73	15:46	15:54	1.024	28.2	Y				405 mD/cp
11	954.5	954.5	112.5	112.11	n/a	n/a	112.5	112.11	16:02	16:08	0.000	28.3	N				Seal failure
12	954.6	954.6	112.5	112.14	96.3	95.89	112.5	112.07	16:10	16:30	1.024	28.6	Y				0.2 mD/cp
13	964.5	964.5	113.7	113.30	97.3	96.91	113.7	113.22	16:40	16:49	1.024	28.5	Y				3.9 mD/cp
14	977.0	977.0	115.2	114.84	98.4	98.02	115.2	114.70	16:56	17:04	1.023	28.6	Y				56 mD/cp
15	1000.0	1000.0	118.0	117.53	100.8	100.35	117.9	117.44	17:12	17:17	1.023	28.9	Y				178 mD/cp
16	934.1	934.1	110.3	109.84	94.4	94.01	110.3	109.83	17:56	18:03	1.026	29.3	Y				655 mD/cp, Repeat point.
17	940.0	940.0	110.9	110.40	95.1	94.62	110.9	110.46	18:08	18:16	1.026	29.4	Y				69 mD/cp
18	945.1	945.1	111.4	110.98	95.7	95.19	111.2	110.83	18:20	18:31	1.027	29.4	Y				20 mD/cp

NB: Fmtn Press sg calculated from RKB — Page: 1 of: 3

Well Name: 36/7-2 — Rig: West Vanguard — Date: 16-19.09.97
Pressure Units: bar — RKB-MSL: 22 m — MSL-SBed: 269 m — Witnessed by: O.Wahl

Run No./Test No.	Depth mMD RKB	Depth mTVD RKB	Initial Hydrostatic Pressure Strain	Initial Hydrostatic Pressure CQG	Formation Pressure Strain	Formation Pressure CQG	Final Hydrostatic Pressure Strain	Final Hydrostatic Pressure CQG	Time hh:mm Set	Time hh:mm Retract	Formation Pressure sg EMD	Test Temp degC	Good Data? Y/N	Sample Main Fluid Type	HC Gravity g/cc	Sample Vol, cc	Remarks
19	956.8	956.8	112.8	112.36	96.5	96.09	112.8	112.28	18:36	18:44	1.024	28.4	Y				328 mD/cp
20	968.5	968.5	114.1	113.78	97.6	97.17	114.1	113.69	18:55	19:02	1.023	28.5	Y				40 mD/cp
21	983.1	983.1	115.9	115.47	99.0	98.66	115.8	115.49	19:20	19:20	1.023	28.7	Y				21 mD/cp
22	935.5	935.5	110.4	109.97	94.6	94.17	110.3	109.90	19:40	19:52	1.026	28.3	Y				171 mD/cp
23	949.3	949.3	112.1	111.6	n/a	n/a	n/a	n/a	21:20		0.000		N				Instrumentation failure
24	949.3	949.3	112.0	111.7	n/a	n/a	111.9	111.6	21:40	21:43	0.000		N				Seal failure
25	950.6	950.6	112.1	111.65	95.9	95.59			21:48			28.7	Y	n/a	n/a	n/a	Attempted taking a sample
26	956.7	956.7	112.7	112.35	96.4	95.72	4.4		09:18	09:38	1.031	28.5	Y				261 mD/cp, Probe plugged
27	949.0	949.0	111.9	111.66									N				MDT Sampling. Aborted
28	934.5	934.5	110.2	n/a	94.45		n/a	n/a	13:47	17:07	1.030	27.9	Y				MDT Sampling, 8.6 mD/cp
29	934.8	934.8	110.2	n/a	94.47		n/a	n/a	18:32	21:25	1.030		Y				MDT sampling
30	971.1	971.1	114.5	n/a	97.82	n/a	114.4	n/a	21:30	22:00	1.027	28.5	Y				32 mD/cp
31	973.0	973.0	114.7	n/a	73.00	n/a	114.7	n/a	22:05	22:10	0.765	28.5	N				Tight
32	974.0	974.0	114.9	n/a	79.00	n/a	114.5	n/a	22:15	22:22	0.827		N				Tight
33	1000.0	1000.0	118.1	n/a	n/a	n/a	117.9	n/a	22:27	22:33	0.000		N				Seal failure
34	1000.0	1000.0	117.9	n/a	117.89	n/a	117.9	n/a	22:35	22:39	1.202		N				Seal failure
35	1001.0	1001.0	118.1	n/a	100.89	n/a	118.1	n/a	22:45	22:51	1.027	29.0	Y				34 mD/cp
36	1100.0	1100.0	129.8	n/a	110.96	n/a	129.8	n/a	23:18	23:27	1.028	30.0	Y				47 mD/cp

NB: Fmtn Press sg calculated from RKB — Page: 2 of: 3

Well Name: 36/7-2 — Rig: West Vanguard — Date: 16-19.09.97
Pressure Units: bar — RKB-MSL: 22 m — MSL-SBed: 269 m — Witnessed by: O.Wahl

Run No./Test No.	Depth mMD RKB	Depth mTVD RKB	Initial Hydrostatic Pressure Strain	Initial Hydrostatic Pressure CQG	Formation Pressure Strain	Formation Pressure CQG	Final Hydrostatic Pressure Strain	Final Hydrostatic Pressure CQG	Time hh:mm Set	Time hh:mm Retract	Formation Pressure sg EMD	Test Temp degC	Good Data? Y/N	Sample Main Fluid Type	HC Gravity g/cc	Sample Vol, cc	Remarks
37	1195.0	1195.0	141.0	n/a	120.61	n/a	140.8	n/a	23:35	23:40	1.029	31.6	Y				16 mD/cp
38	1314.1	1314.1	156.1	n/a	132.68	n/a	154.8	n/a	00:04	00:10	1.029	33.4	Y				34 mD/cp
39	1376.1	1376.1	162.4	n/a	n/a	n/a	161.9	n/a	00:20	00:30	0.000		N				Tight
40	1375.1	1375.1	162.4	n/a	121.07	n/a	161.8	n/a	00:35	00:43	0.897	35.7	N				Tight
41	1374.6	1374.6	161.9	n/a	138.79	n/a	161.8	n/a	00:50	00:55	1.029	36.9	Y				32 mD/cp
42	973.5	973.5	114.7	n/a	92.82	n/a	114.7	n/a	02:05	02:10	0.872	28.9	N				Tight

NB: Fmtn Press sg calculated from RKB — Page: 3 of: 3

RFTWKS3.WK4

INTERPRETATION RESULTS

DRILLING RESULTS

36/7-2

COORDINATES:
Geographic:
61 °18' 23.50" N – 4 °19' 47.50" E

UTM:
6797 817.7 mN – 571 232.6 mE
ED50, Zone 31 (CM 3° E).

RIG: WEST VANGUARD — RKB: 22 m

SPUD DATE: 01.09.97
COMPLETION DATE: 22.09.97

LEGEND:

- ——► Correlation of seismic event with log event (Seismic pick in site survey report)
- ◄- - - - Revised seismic pick (Based on log results)

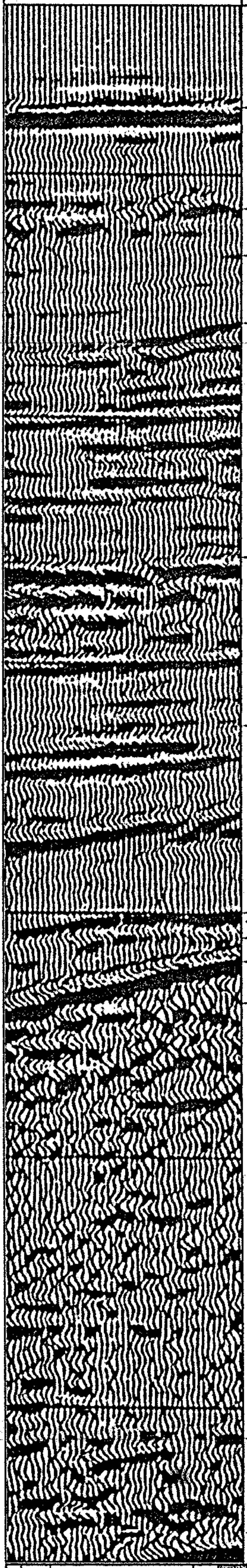
LEGEND:

- Clay/claystone
- Silt/Siltstone
- Sand/sandstone
- Limestone
- Cement plug

Seismic

Seismic source: 4x40 cu.in sleeve airgun
Sample rate: 1.0 ms
Streamer: 1200 m96 ch12.5 m/11.25 m
Shot point Interval:: 6.25 m
Line: NH9652-122

Well location 36/7-2



Prognosis

Reflectors	TWT (ms)	Int. vel	Depth (m RKB)
	365		292
		1787	
R2.5	412		334
		1739	
R2.7	435		354
R3	465		383
		2098	
R4	630		554
R5	700		632
TCREA	710	2000	642
		1950	

Anomaly: Weak Gas Warning

Correlation

Stratigraphy (System / Series / Group / Formation / Informal Unit)

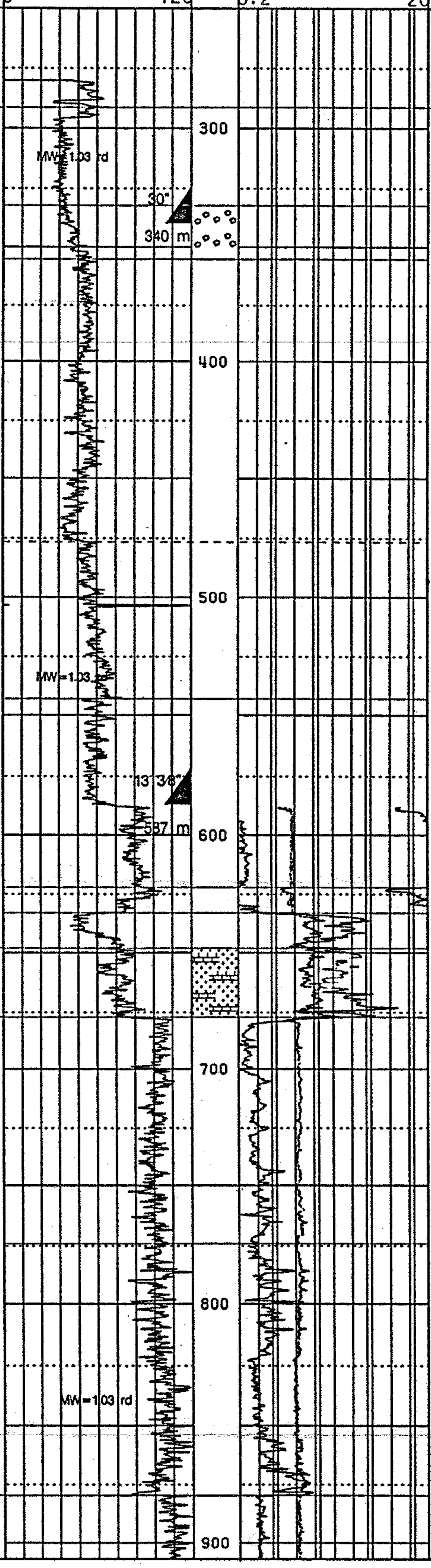
QUATERNARY – PLEISTOCENE – NORDLAND
TERTIARY – PLIOCENE
EOC./PAL. – ROGAL. – BALDER
CRETACEOUS – CROMER KNOLL – SOLA
ASGARD

Gamma — Gamma, GR 0–120

Sonic Resistivity — RACM 0.2–20, RPCM 0.2–20

TVD

Shallow Gas

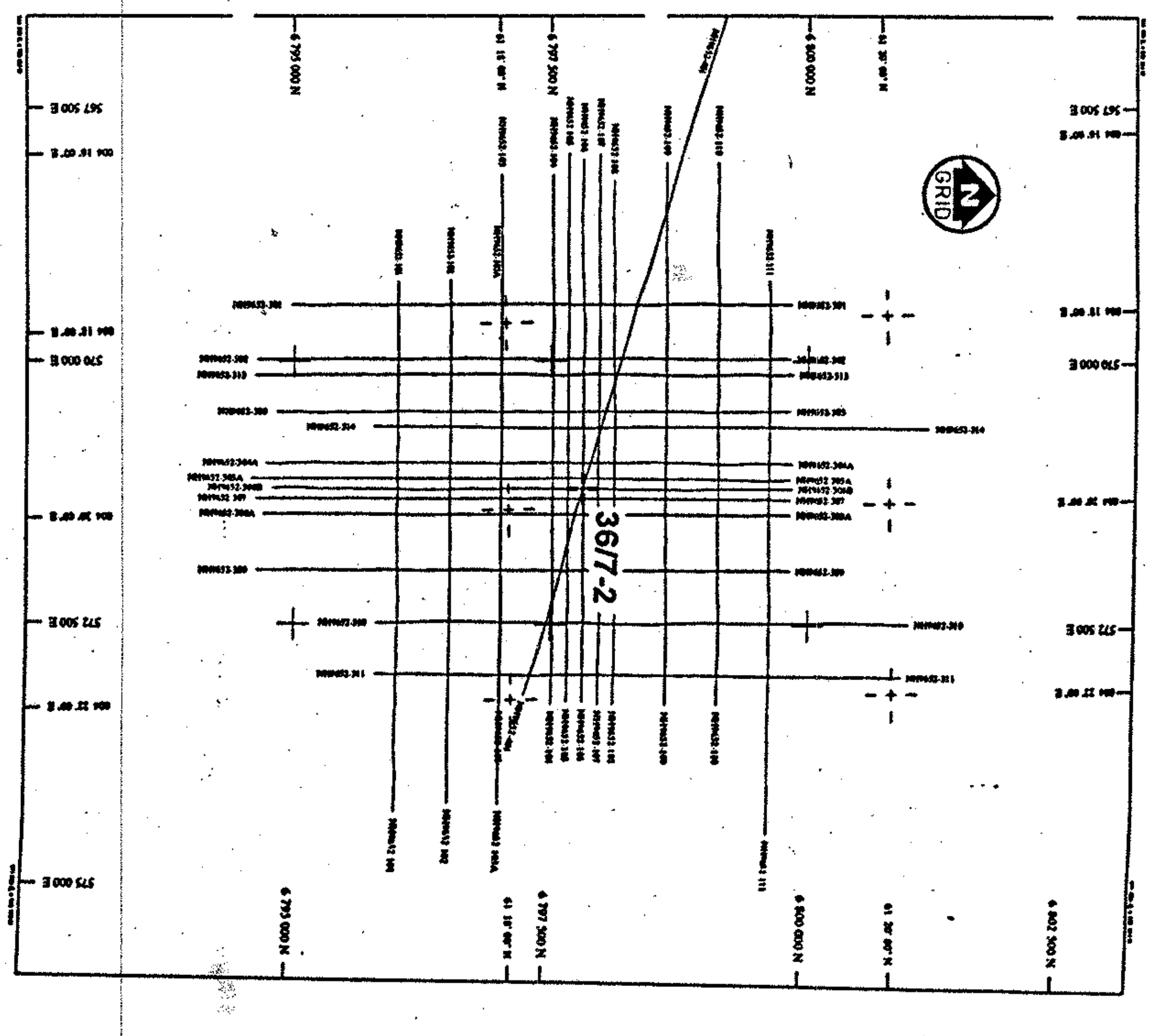


Results

Drilled with returns to seabed to 587 m.
TWT from seismic above Top Åsgard
TWT from VSP below Top Åsgard

Results	Int.vel.
Gamma log started above seabed	
291 m (365 ms)	
	1745
332 m (412 ms)	
Boulders	2000
355 m (435 ms)	
	2038
476 m (554 ms)	
542 m (619 ms)	
622 m (697 ms)	
633 m (709 ms)	
648 m (718 ms)	
677,5 m (737 ms)	
	2395
774 m (825 ms)	
879,5 m (912 ms)	

NOTES:
The given Pleistocene stratigraphy is based on seismic correlation to other wells as no datings or cuttings are available from the investigated interval in well 36/7-2. A sample from 594 m RKB is reported to be of Pliocene age in the biostratigraphic report.



HYDRO

Marine Survey Section — Exploration and Production Division

Drawing title:
Post site survey for well 36/7-2
Comparison between predicted lithology, stratigraphy, shallow gas and obtained drilling results

Scale 1:2000

Interpreted by	Drawn by	Checked by	Date	File no.	Rev.
KB	KB	FSS	27.02.1998		0