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R-004067

NORSK HYDRO A.S

FINAL WELL REPORT

WELL 15/5-3

LICENCE 048

REGISTRERT

NORSK HYDRO BØRESEKTØREN
INFORMASJONSTJENESTEN

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PREFACE

Licence 048 was awarded the Statoil/Petronord group February 18, 1977 with Norsk Hydro Produksjon a.s as operator. The licence includes the blocks 15/2 and 15/5 on the Norwegian continental shelf.

The group consists of the following companies:

Den norske stats oljeselskap	50%
Elf Aquitaine Norge a.s	21.8%
Norsk Hydro Produksjon a.s	17.3%
Total Marine Norsk a.s	10.9%

The well 15/5-3 was drilled by Norsk Hydro Produksjon a.s on behalf of the Statoil/Petronord Group.

SUMMARY OF WELL DATA

Location: 58° 43' 47.93" N
 01° 38' 12.05" E
Operator: Norsk Hydro Produksjon a.s
Rig: S/S Nortrym
Contractor: Golar Nor
RKB elevation (to MSL): 25 m
Water depth: 110 m
Start of operation: August 16th, 1980
Well Spudded: August 19th, 1980
Well permanently abandoned: December 7th, 1980
TD (Driller): 5042 m
Formation at TD: Sandstones and shale
Status: Permanently abandoned

Well Program

Drilling depths	36"	to 198 m
	26"	to 615 m
	17-1/2"	to 2029 m
	12-1/4"	to 3542 m
	8-3/8"	to 4863 m
	5-7/8"	to 5042 m
Casing depths	30"	set at 198 m
	20"	set at 605 m
	13-3/8"	set at 2002 m
	9-5/8"	set at 3525 m
	7"	liner set at 4863 m, top of liner sleeve at 3375 m

All depths are given with reference to RKB.

5148A

SECTION A
GEOLOGY

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1.

OBJECTIVES

The primary objective of this well was to test possible sandstone reservoirs of Triassic age. In well 15/5-2 an interbedded sandstone shale sequence of Triassic age was encountered hydrocarbon bearing over the top 17 m. A similar Triassic facies was expected in this well.

A secondary objective was to test the Middle Triassic "Sleipner Formation". This formation is found throughout the area, developed as a deltaic sequence of sandstones, shales and interbedded coals. The formation was hydrocarbon bearing in well 15/5-2 and a similar reservoir development was expected in 15/5-3.

The well was planned to penetrate approximately 400 m into the Triassic and had a projected total depth of 4200 m.

2.

RESULTS

None of the objective sandstone reservoirs were found in the well.

After penetrating 134 m of Upper Jurassic Kimmeridge Clay Formation, the well encountered 1050 m of Zechstein evaporites. Below these, shales and thin sandstones of probable Devonian age were found.

The well was drilled to a total depth of 5050 m (logger's depth) after it has been decided to deepen the well to explore the pre-salt rocks.

While cutting the 9 5/8" casing prior to the completion of the well, small amounts of oil were found floating on the drilling mud. The oil is assumed to originate from two 2 m thick sandstone stringers at 1474 m and 1479 m at the top of the Frigg Formation. From wireline log interpretation these show high porosities and high hydrocarbon saturations.

3.

STRATIGRAPHY

The biostratigraphic evaluation of well 15/5-3 has been performed by the laboratories of Robertson Research International Ltd., of Llanrhos, North Wales, U.K., over the interval 225-5050 (T.D.).

The basic material for the analyses was ditch cuttings, but chips from conventional cores and sidewall cores have also been studied.

A well site micropalaeontologist examined cuttings at the well site over the interval 3200 m to 3543 m which included strata of Coniacian to Albian age. This service was utilised to provide continuous control while drilling the Cretaceous section of the well in order to ensure that the 9 5/8" casing would be set in the Lower Cretaceous. Since the Upper Jurassic shales are known to have contained over-pressured sandstones in the area, it was of prime importance to set the 9 5/8" casing prior to penetrating these shales. The information obtained on the well site was later incorporated in the laboratory study of the well.

The chrono- and lithostratigraphy of the well is shown on page 4 and 5. The lithostratigraphic terminology applied has been taken from Deegan and Scull: "A standard lithostratigraphic nomenclature for the Central and Northern North Sea" 1977.



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WELL : 15 / 5 - 3

DEPTH REF.: K.B.

ELEVATION K.B.: 25 m

ALL DEPTH IN METERS (m)

CHRONOSTRATIGRAPHY				LITHOSTRATIGRAPHY	
SYSTEM	SERIES / STAGE	DEPTH	THICKNESS	GROUP	FORMATION / MEMBER
QUATERNARY	SEA BED	135			195
	RECENT - PLEISTOCENE	225	90	NORDLAND GROUP	
	PLIOCENE	430	205		
	LATE MIocene	690	260		720
	MIDDLE MIocene	910	120		UTSIRA FM
	EARLY MIocene	1010	200	HORDALAND GROUP	882
	OLIGOCENE	1170	130		
	OLIGOCENE-EOCENE	1440	270		
	MIDDLE EOCENE	1600	160		1474
	EARLY EOCENE	1840	240		FRIGG FM.
TERTIARY	PALEOCENE	2045	205	ROGALAND GROUP	2055
			525		2100
					SELE FM
					LISTA FM
				MONTROSE GROUP	2180
					HEIMDAL FM



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WELL: 15/5 - 3

NOT TO SCALE

DEPTH REF.: K.B.

ELEVATION K.B.: 25 m.

ALL DEPTH IN METERS (m)

CHRONOSTRATIGRAPHY				LITHOSTRATIGRAPHY	
SYSTEM	SERIES / STAGE	DEPTH	THICKNESS	GROUP	FORMATION / MEMBER
CRETACEOUS	PALEOCENE	2570		MONTROSE GROUP	HEIMDAL FM.
		2595	105		2595
	DANIAN	2675	13		EKOISK FM.
	LATE MAASTRICHTIAN	2688	202		2688
	MAASTRICHTIAN	2890	70		TOR FM.
	EARLY MAASTRICHTIAN	2960	365		2877
	CAMPAÑIAN - CONIACIAN	3325			FLOUNDER FM.
	TURONIAN	3425	100		3324
	CENOMANIAN	3510	85		HERRING FM
	ALBIAN	3580	70		3381
JUR.	EARLY ALBIAN - APTIAN	3620	10	CROMER KNOLL GROUP	3419
	EARLY APTIAN	3630	31		VALHALL FM.
	BARREMIAN - LATE HAUT	3661	4		3666
	EARLY VALANG - LATEST RAZ	3665	73		3666
	RYAZANIAN - VOLGIAN	3738	13.5	HUMBER GROUP	KIMMERIDGE CLAY FM.
	KIMMERIDGIAN	3751.5	50.5		3800
	EARLY KIMM. - LATE OXF.	3802	1048		3800
	ZECHSTEIN			ZECHSTEIN GROUP	
	/				
	INDETERMINATE	4850	196		4850
DEVONIAN ?		5050 (TD)			4850

4.

LITHOSTRATIGRAPHY

This summary is compiled predominantly from ditch cuttings descriptions. Wireline logs have been used to assist lithological interpretation and to locate formation boundaries. Side wall core samples are available from the Paleocene (2555 m), through Upper and Lower Cretaceous, Upper Jurassic, Upper Permian and into the ? Devonian with the last core recovered at 5046 m. Conventional cores are available from the Upper Permian and from the ? Devonian at the T.D. of the well.

4.1

QUATERNARY (135 - 430 m)

NORDLAND GROUP (135 - 430 m)

This interval consists of clays with occasional interbeds of sand.

The clay is greenish grey to dark grey, soft, sticky, calcareous and silty. The sand is composed of clear, occasionally milky, fine to coarse, rounded to angular quartz and occasionally lithic clasts. There are local traces of shell fragments, lignite, limestone, pyrite and glauconite.

This interval is of Pleistocene age.

4.2

TERTIARY (430 - 2668 m)

NORDLAND GROUP (430 - 822 m)

430 - 720 m

This interval is a continuation of the overlying Pleistocene and consists of clays, as described above, and local thin hard, dark grey siltstone beds. It is of Pliocene age down to 690 m, below which it is dated as Late Miocene.

Utsira Formation (720 - 822 m)

The formation in this interval consists of sands with minor interbeds of clay.

The sands consist predominantly of clear and minor milky quartz, of very fine to occasionally coarse and subangular to subrounded grain size and shape. They contain occasional traces of mica and glauconite. The clay is dark grey, soft, moderately calcareous and silty. There are local traces of shell fragments and pyrite.

The interval is of Late Miocene (to 810 m) to Middle Miocene age.

HORDALAND GROUP (822 - 2055 m)

822 - 1474 m

This upper part of the Hordaland group consists of clay with locally developed beds of sandstone and siltstone.

The clay is dark greenish to olive grey, soft, sticky, calcareous, silty and locally glauconitic and micro micaceous. With depth it becomes medium brown to yellowish brown and towards the base of this interval it is locally indurated to claystone. Locally the clay grades to a grey to yellow brown, firm to hard, calcareous siltstone.

Occasional stringers of sand occur throughout the section but these only develop into thicker beds in the interval 1131 to 1180 m. Here are found loose sandstones composed of clear, very fine to medium, subangular to subrounded quartz. Traces of glauconite, pyrite, shell fragments, and mica are found throughout the section and towards its base there are occasional stringers of olive grey, hard, glauconitic limestone.

This section is of Middle Miocene (to 1010 m), Early Miocene (1010 - 1170 m), Oligocene (1170 - 1440 m) and Eocene ? - ? Oligocene age.

Frigg Formation (1474 - 2055 m)

1474 - 1766 m

This upper section consists of sands, sandstones and siltstones with minor interbeds of claystone. Towards the base, the claystone units become thicker than the sands.

The sandstone/sands are composed of clear and occasionally milky quartz which is predominantly very fine grained, with minor medium and coarse, subangular to rounded clast shape and locally calcareous. They grade in part to dark grey calcareous siltstones which are locally laminated and micaceous. The claystone is light to dark grey and greenish grey, firm to hard, laminated, locally platy, silty and locally calcareous. There are also traces of yellowish grey, hard, argillaceous limestone, glauconite and pyrite.

This interval ranges in age from Eocene? - ?Oligocene (to 1600 m) to Middle Eocene..

1766 - 1925 m

This middle part of the Frigg Formation consists of firm to hard, subfissile, silty, micro micaceous, non calcareous dark grey shales with occasional stringers of white to yellowish brown limestone and dolomite. There are traces of glauconitic siltstone and pyrite.

This interval is dated as Middle Eocene (to 1840 m) and Early Eocene.

1925 - 2055 m

This lower part of the Frigg Formation consists of shales with traces of tuff and occasional stringers of limestone/dolomite.

The shales are firm to hard, blocky to subfissile, non to slightly calcareous, locally silty and have variously colours including greys, greens, blues, yellows and browns. The tuff

is brownish black with black and white speckles and the limestone/dolomite is moderate yellowish brown. There are traces of very fine to medium grained light grey sandstone, glauconite and pyrite.

The age of this interval is Early Eocene (to 2045 m) and Paleocene.

ROGALAND GROUP (2055 - 2180 m)

Balder Formation (2055 - 2100 m)

The Balder Formation is defined by its bell shaped log character. It is composed of shale with stringers of limestone and traces of tuff.

The shale is medium to dark grey, platy and locally silty. The limestone is white to yellow and dolomitic. There are traces of tuff described as above, pyrite and a clear, fine to coarse, subangular, calcareous sandstone.

The formation is of Paleocene age.

Sele Formation (2100 - 2153 m)

The shale, limestone and tuff described above continue into this interval with the limestones becoming less frequent.

This interval is dated as Paleocene.

Lista Formation (2153 - 2180 m)

This formation is similar in character to the Sele Formation consisting as it does of grey/green, subfissile, non tuffaceous shale and limestone stringers.

Again the age is Paleocene.

MONTROSE GROUP (2180 - 2595 m)

Heimdal Formation (2180 - 2595 m)

This formation consists of sandstone with minor interbeds of shale and occasional stringers of limestone and dolomite.

The sandstone is composed of clear and milky quartz of very fine to very coarse size. It is generally subangular to angular but occasionally subrounded to rounded and locally has a calcareous cement. The shales are greys and greens in colour and blocky to subfissile, non calcareous, locally silty, and locally pyritic. The limestone is white to light grey, locally chalky or fibrous or crystalline and the dolomite is yellow to red brown.

The interval is of Paleocene age, the bottom 25 m from 2570 m is dated Danian.

CHALK GROUP (2595 - 2668 m)

Ekofisk Formation (2595 - 2668 m)

This formation consists of limestones grading to marl and minor shale.

The limestone is light grey to dusky red in colour, chalky and locally argillaceous grading to a medium grey, soft, very silty, occasionally glauconitic marl. The shale is dark grey to black, subfissile, calcareous and occasionally glauconitic.

This formation is of Danian (Paleocene) age.

4.3

CRETACEOUS (2668 - 3666/3738 m)

UPPER CRETACEOUS (2668 - 3510 m)

CHALK GROUP (2668 - 3522 m)

Tor Formation (2668 - 2877 m)

This formation consists of interbedded limestone and marl. The limestone is light grey, micro to crypto-crystalline, locally silty and locally very argillaceous grading to light to dark grey marl. Towards the base of this formation there are stringers of limestone with greyish orange mottling. There are also occasional traces of pyrite and grey calcareous shale.

This formation is dated as Danian (to 2675 m), Late Maastrichtian (2675 - 2688 m), and Maastrichtian.

Flounder Formation (2877 - 3324 m)

2877 - 3165 m

The upper part of the Flounder Formation consists of marl with stringers of limestone.

The marl which is soft and silty throughout this section, is originally a mixture of reds and greys. With depth, however, the greys predominate and eventually replace the reds. The formation also becomes firmer and harder with depth, grading to marlstone. The limestones are light grey to greybrown, moderately to very hard, locally argillaceous and locally crypto-crystalline. There are local traces of grey/black calcareous shale, silty marl grading to siltstone and, at about 3100 m, very fine, angular to subrounded clear quartz sand.

The interval is dated Maastrichtian (to 2890 m), ? Early Maastrichtian (2860 - 2960 m) and Campanian - Coniacian.

3165 - 3324 m

This lower part of the Flounder Formation consists of marlstone interbedded with marl and claystone.

The marlstone is dark grey and very hard. The marl is light to dark grey with minor red brown and is much softer and locally silty. The claystone is red brown to grey, hard and slightly calcareous.

The age of this section is Campanian - Coniacian.

Herring Formation (3324 - 3381 m)

This formation consists of interbedded limestones and marls.

From 3324 to 3335 m is a thick relatively clean, light grey limestone. Beneath it are interbedded white to grey to black, soft to hard, silty, glauconitic marls and grey to pink to red, soft to hard, glauconitic, argillaceous, micro to crypto crystalline limestones. There are also minor interlaminations of dark grey green and brown, subfissile, non to very calcareous, locally silty, locally glauconitic shale.

This formation is dated as Turonian (from 3325 m).

Plenus Marl Formation (3381 - 3419 m)

This formation is similar to the Herring Formation but generally more argillaceous. The main differences are the absence of the clean limestone bed (3324 - 3335 m) and the increase in argillaceous content especially towards the base of the Plenus Marl Formation. This latter feature is illustrated by the log curve trends over the interval.

This formation is of Turonian age.

Hidra Formation (3419 - 3522 m)

This formation consists of interbedded limestones and marls with minor shale.

The limestone varies in colour from grey to grey green to brown and is soft to hard, crypto to micro crystalline,

occasionally crystalline, locally glauconitic and pyritic, locally chalky and argillaceous. Occasionally it is sandy and grades to very fine, white to grey green sandstone. The marl is firm to hard, locally glauconitic, occasionally silty and in colour ranges from browns to green greys. The shale colours ranges from light grey to black to dark green greys and dark browns. They are locally very pyritic and glauconitic and occasionally silty and micro micaceous. This formation is dated Turonian (to 3425 m), Cenomanian (3425 - 3510 m) and Albian.

LOWER CRETACEOUS (3510 - 3665/3738 m)

CROMER KNOLL GROUP (3522 - 3666 m)

Rødby Formation (3522 - 3579 m)

This formation is predominantly shale with minor sandstones and rare stringers of limestone.

The shale ranges in colour from medium grey and blue green to olive black and rarely red brown. They are hard, blocky to fissile, locally calcareous, micaceous and glauconitic, and occasionally silty and sandy. The sandstone is light grey, very fine, subangular to subrounded. It has a calcareous cement, a locally abundant glauconite and argillaceous content and traces of pyrite. The limestone is light grey to pink to yellowish brown and is locally crypto-crystalline, crystalline and argillaceous.

The age of this formation is Albian.

Valhall Formation (3579 - 3666 m)

This formation consists of shales with stringers of limestone and occasional marl.

The shales are red brown to dark grey and are platy to fissile, non calcareous becoming calcareous with depth, locally earthy, micro-micaceous and carbonaceous. Towards the base of the section they become brownish black. The limestone varies in colour from very light grey to dark yellowish brown and is locally dolomitic, argillaceous or sucrosic. The marl is dark red brown, soft and silty.

This formation is dated Early Altian - Aptian (3580 - 3620 m), Early Aptian (3620 - 3630 m), Barremian - Late Hauterivian (3630 - 3661 m), Early Valanginian - Late Ryazanian (3661 - 3665 m) and Ryazanian - Volgian.

4.4 JURASSIC (3665/3738 - 3800 m)

HUMBER GROUP (3666 - 3800 m)

Kimmeridge Clay Formation (3666 - 3800 m)

This formation consists of shale with stringers of limestone.

The shale is light grey to black to brownish black, firm to hard, occasionally soft, blocky to subfissile, silty, locally calcareous, micro-micaceous, earthy and glauconitic. At the base of the section, there occurs a thin, very fine grained subangular, white sandstone with a clay matrix.

This interval is dated Ryazanian - Volgian (to 3783 m), Kimmeridgian (3783 - 3751.5 m) and Early Kimmeridgian - Late Oxfordian.

4.5. PERMIAN (3800 - 4850 m)

3800 - 4090 m

This interval consists of clear to white, occasionally pale

yellow, firm to hard, coarsely crystalline, clean salt with minor white, firm, blocky, crypto-crystalline, occasionally sucrosic anhydrite.

A core (No 1) was cut from 3815 to 3834 m, recovering salt with minor shale (1-2 mm) laminae.

The interval is dated as Zechstein (3800 - 4090 m).

4090 - 4197 m

This interval is the same as that above except that logs show the presence of sylvite and polyhalite. It is also a Zechstein age.

4197 - 4833 m

This interval consists of impure salt with occasional interbeds of anhydrite. The salt is clear to white, occasionally pale yellow and locally light to yellow brown to pinkish grey to reddish orange in colour. The anhydrite is white to pale browns to pink.

Again the interval is of Zechstein age.

4833 - 4850 m

This interval consists of limestone/anhydrite of moderate reddish brown with local white mottling colour. It is moderately hard, silty and grades to marl and shale. It is once again Zechstein age to 4850 m.

4.6

DEVONIAN ? (4850 - 5050 m T.D.)

This formation consists of interbedded and intergrading shales, siltstones and sandstones.

The shales are predominantly reddish brown with local orange and minor greys. They are hard, blocky, micro-micaceous, locally very calcareous/dolomitic and locally very silty grading to siltstone which in turn is locally sandy grading to sandstone. The sandstone is red brown to grey, has very fine to silt grain size, a good calcareous/dolomitic cement and is very hard. There are occasional stringers of limestone/dolomite and traces of anhydrite. Below 5000 m, the sandstone is locally very fine to coarse and occasionally conglomeratic. The clasts locally have a haematite coating and locally there is a strong siliceous cement.

A core (No 2) was cut at T.D. from 5038 to 5042 m (5044 to 5050 m logger's depth) recovering claystone (Sh) with a 30 cm sand stringer.

The interval is dated tentatively as Devonian.

5. HYDROCARBON SHOWS

Evaluation of hydrocarbon shows at the well site was carried out in a conventional manner. Below 198 m a complete hydrocarbon total gas detector (50 units - 1%) was operational together with a gas chromatograph for automatic and continuous gas analysis recorded as ppm by volume of C1 through C5.

Hydrocarbon shows on ditch cuttings were evaluated according to Norsk Hydro's geological well site manual.

5.1 GAS RECORD

198 - 260 m

No gas was recorded throughout this section.

260 - 620 m

Gas level varied between 0.4 and 1,4% methane (C1) in this interval, which consisted of massive clays with occasional thin stringers of sand. The gas level did not show any variation with the lithology.

620 - 2100 m

Gas levels continued to be low throughout this interval ranging from a trace to generally less than 0.5% C1. One peak of up to 1% C1 was recorded at 1480 m in the top of the Frigg sand. The interval consisted of clays with some sands and sandstones which generally had slightly higher amounts of gas than did the clays.

2100 - 2500 m

This unit was composed of Paleocene clays and sandstones which again contained only low amounts of gas ranging between traces

and 0.3%. The gas was composed largely of C1, but small amounts of ethane (C2) and occasional traces of C3 (propane) were recorded.

2500 - 3095 m

This unit consists of the lower part of the Heimdal sands and shales and Upper Cretaceous limestones and marls. The interval is marked by the gradual appearance of the heavier gases iC4 and nC4 (iso- and normal-butane). The back ground level remains low, ranging from less than 0.1% to 0.6% C1 with traces of C2, C3, iC4 and nC4.

3095 - 3124 m

Gas levels show a marked increase over this small unit which consists of marls and limestone stringers of Campanian age. Up to 32% of C1 to nC4 with a trace of C5 (pentane) was recorded and the ratio of C1 to C2+ was approximately three.

3124 - 3800 m

Below 3124 m, gas levels again become low ranging from less than 0.1 to 0.4% C1 with only traces of C2 to nC4. An occasional trace of C5 was noted. It is interesting to note that neither the back ground level, nor the ratio of C1 to C2+ increased upon entering the Kimmeridge Clay Formation (Hot Shale) at 3666 m.

3800 - 5050 m

The remaining part of the well consists of Zechstein evaporates and below 4850 m shales and sandstones of possibly Devonian age. The gas never rose above 0.1% and only C1 was recorded.

5.2

OIL STAIN AND FLUORESCENCE

2850 - 2920 m

Two thin limestone stringers in this interval of Maastrichtian marl are reported as having very poor shows. No oil fluorescence or cut was noticed in the cuttings until they were crushed, when traces of a very slow, greenish yellow fluorescent cut appeared. No increase in gas was noted over the interval.

3355 - 3365 m

Poor shows were again noted in limestones in the Herring Formation of Turonian age. This interval of the limestone is reported as having approximately 10% of the cuttings with a medium to dark brown oil stain. These cuttings showed only traces of a blue-white fluorescent and gave a slow, blue-white streaming fluorescence cut. While the gas level did not increase over this interval, it is interesting to note that the C2+ plus gases occurred, with C5 being recorded.

3640 - 3683 m

Show were noted in the shales of the Kimmeridge Clay Formation while drilling. No fluorescence or cut was seen until the cuttings were crushed and traces of slow green-yellow to blue white fluorescent cuts were seen. Again small increases in the C3+ fraction of the gases were noted over this interval. The shows were rated poor.

3730 - 3802.5 m

No shows were recorded from cuttings while drilling this section, but poor shows were recorded in twelve side wall samples collected over the interval. No fluorescence was seen but poor, slow to fast blue white fluorescent cuts and crush cuts were recorded. No gas increase was noted.

6. CORING

6.1 CONVENTIONAL CORES

Two cores were cut in the well, one in the Permian salt and one at total depth in the ? Devonian.

Core 1 was taken from 3815 m to 3834 m. 11.14 m (59.9%) of salt were recorded. No hydrocarbon shows were detected in the core which was cut because of a good drilling break and the occurrence of trace shows in sandstone cuttings when it was circulated out.

Core 2 was taken from 5038 m to 5042 m. (5044 m to 5050 m logger's depth). 3.74 m (93.5%) of silty claystone with a stringer of medium grained sandstone were recorded. No hydrocarbon shows were detected.

Descriptions of the cores are shown in Appendix 1.

6.2 SIDE WALL CORES

Side wall cores were taken from 2555m in the Paleocene and throughout the well to 5046 m in the ? Devonian. A total of four runs were made with recoveries of 21 out of 30 (run 1), 10 out of 30 (run 2), 16 out of 30 (run 3), 24 out of 45 (run 4). A total of 71 out of 135 cores were recovered.

In run No 1 there were five misfires and three empty bullets. In run No 2, 20 bullets were lost possibly due to too powerful charges.

In run No 3, there were ten misfires, three bullets were lost and one was empty.

In run No 4 there were seven misfires, four bullets lost and ten empty. Of the ten empty, seven bullets were broken. There were fourteen broken bullets in all. This plus the poor recovery indicates that the formation is extremely hard. This is borne out by the conventional core at T.D.

A detailed description of the side wall cores is given in Appendix 2.

7.

WIRELINE LOGGING

The following list is a summary of the wire line logs run in well 15/5-3 and shows the dates, logged intervals and run numbers of each log.

Log	Date	Logged interval	Run No
ISF/BHC/GR	26.08.80	198 - 612.5 m	1
"	04.09.80	606 - 2017.5 "	2
"	28.09.80	2001 - 3374 "	3
"	05.10.80	3300 - 3543 "	4
"	22.10.80	3523 - 3832 "	5
BHC/GR	28.11.80	3832 - 4349 "	6
BHC/GR	05.11.80	4349 - 4861.5 "	7
ISF/BHC/GR	26/27.11.80	4865 - 5044 "	8
FDC/GR/CAL	04.09.80	606 - 2011 m	1
FDC/CNL/GR/CAL	05.10.80	2001 - 3544.5 "	2
"	22.10.80	3523 - 3832.5 "	3
"	28.10.80	3832 - 4349 "	4
"	5/6.11.80	4349 - 4862.5 "	5
"	21.11.80	4862 - 5045 "	6
HDT	06.10.80	2002 - 3543.5 m	1
"	22.10.80	3523 - 3832 "	2
"	27.11.80	4865 - 5045 "	3
VELOCITY SURVEY	23.10.80	730 - 3830 m	1
"	28/29.10.80	600 - 4350 "	2
"	28.11.80	2010 - 5045 "	3
CST	6/7.10.80	2580 - 3543 m	1
"	07.10.80	2555 - 3543 "	2
"	29.10.80	3717 - 4310 "	3
"	28.11.80	4866 - 5046 "	4
HRT	07.09.80	150 - 1980 m	1

8. SPECIAL STUDIES

The biostratigraphic evaluation of the well has been performed by Robertson Research International Ltd. The results are presented in the report:

"Norsk Hydro 15/5-3 Norwegian North Sea well:
Biostratigraphy of the interval 225 - 5046 m T.D.

A geochemical study of the well has been carried out by the same company. Canned ditch cuttings samples over the interval 1500 m to 5046 m have been analysed for maturation level and source rock potential. The results of this study are presented in the report:

"Report on a geochemical evaluation of the Norsk Hydro 15/5-3 well, Norwegian North Sea".

APPENDIX 1

CORE DESCRIPTIONS



Norsk Hydro

Well no.	Core report			Core no's
15/5-3				1
Interval	Area	Cut	Date	
3815 - 3825 m	Norwegian North Sea	3815,0 - 3834,4 m	October 21, 1980	
Scale	Well R.K.B.	Recovery	Geologist	
1: 50	25.0m	3815.0-3826.14m (60%)	D.E.Nilsen/J.H.Skogen	
Depth scale	Re - recovery	Lithological column	Depths	Lithological descriptions
3815			3815.0 -	
3816			3819.5	<u>Halite</u> , w/ca 5% <u>Sylvite</u> , wh-clr- lt gy-occ tan in banded rock, v f-m xln,hd,fri,no vis por.
3817				thin lams of <u>Sh</u> , m-dk gy(<1mm). thin strgrs of <u>Anhy</u> , clr-wh.
3818				
3819				
3820			3819.5 - 3821.10	<u>Halite</u> ,w/ca 5% <u>Sylvite</u> , wh-lt-m gy, m-crs xln,hd,no vis por, thin lams of <u>Sh</u> , m gy, firm (<1mm).
3821			3821.10 - 3821.50	<u>Halite</u> ,w/ca 15% <u>Sylvite</u> , orng- rd-rd brn, crs-gravel size xls,hd, fri,no vis por.
3822				Tr <u>Anhy</u> , clr-milky,hd,fri.
3823			3821.50 - 3826.14	<u>Halite</u> ,w/trs-ca 5% <u>Sylvite</u> , clr- wh-tan, m-crs xls,hd,no vis por.
3824				Thin strgrs of <u>Anhy</u> , clr-wh,fri.
3825				
Well	Core report		Core no's	
15/5-3	1 of 2		1	



Norsk Hydro

Well no.	Core report				Core no's
15/5-3					1
Interval	Area	Cut			Date
3825 - 3826.14m	Norwegian North Sea	3815.0 - 3834.4m			October 21. 1980
Scale	Well R.K.B.	Recovery			Geologist
1: 50	25.0	3815.0 - 3826.14m(60%)			D. E. Nilsen/J. H. Skogen
Depth scale	Re - recovery	Lithological column	Depths	Lithological descriptions	Shows
3825			3821.50 - 3826.14	Halite, w/trs - ca. 5% Sylvite, clr-wh-tan, m-crs xln, hd, no vis por. Thin strgrs of Anhy, clr-wh, fri.	No shows
3826					
3826.14					
3827					
3828					
3829					
3830					
3831					
3832					
3833					
3834					
3835					
Well	Core report		2 of 2		Core no's
15/5-3					1



Norsk Hydro

Well no.	Core report			Core no's
15/5-3				2
Interval	Area	Cut	Date	
5038 - 5042 m	Norwegian North Sea	5038 - 5042m	November 28. 1980	
Scale 1: 50	Well R.K.B. 25m	Recovery 5038-5041.74m (94%)	Geologist M. Henderson	
Depth scale	Re - covery	Lithological column	Depth	Lithological descriptions
5038		M	5038.0	<u>Clyst</u> , dk reddish brn-gyish red, loc mot m gy-grnish gy, v hd, brit, blky, loc v slty, silic cmt, v sl calc, loc minor recrystallized calc-dism and occ veinlets, loc v mica, Musc w/ minor Biot, slickenslides on cleavage/bdg-dip 20-45°.
5039		M	5039.25	
5040		M	5039.9	<u>Clyst</u> , gyish red, hd, blky, irregular slickenslides, tr micro-mic, non-v sl calc <u>Sst</u> , mgy-gyish red, v hd, blky, brit, f-crs, pred m, subang - subrnd, pr srted, Qtz, wh-mgy, mod reddish orng, arg, silic mtx, minor calc, no vis por, looks recrystallized
5041		M	5040.2	<u>Clyst</u> , gyish red, v hd, blky, brit, m sdy-slty, mica, loc recrystallized calc, slickenslides on surfaces, dip~30°.
5042		NOT RECOVERED	5041.74	at base of core in crushed sample, <u>Clyst</u> , gyish red, mod hd, fri, v calc, sdy, slty, mot w/ lt olv gy.

APPENDIX 2

SIDE WALL CORE DESCRIPTIONS



Norsk Hydro

			SERVICE COMPANY Schlumb.
ASKED:	30		
SHOT:	25		
LOST:	-		
EMPTY:	4		
			SAMPLES RECOVERED: 21
WELL:	15/5-3	RUN N°: 1	
LICENCE:	PL 048	PAGE N°: 1	Misfires: 5
		DATE: October 7, 1980	GEOLOGIST: Beckman/ Berglund

tr : trace - M : medium - G : good

N°	DEPTHs (m)	REC %	LITHOLOGY	Fluorescence	CUT	IMAG
1	3543	-	Empty.			
2	3525	-	Empty.			
3	3500	10	Mrl, m gy, firm, sl micro-mic, sl fossiliferous, w/clr-pink gy, xln Lst. Sh, dk gy, olv gy w/blk spots, hd-vhd, fis, sl calc.			
4	3491	tr	Traces of Sh, a/a, fis, v hd.			
5	3479	5	Mrl, m gy, a/a, also firm-hd, w/dk gy-gy sh/blk, firm, micro-mic.			
6	3442	20	Sh, a/a, fis, tr micro-mica, tr pyr. Trs Lst, lt/gy-pink gy, firm, brit, tr glau. Trs Clst/sh, brnsh/blk, sft-firm, blk, micro-mic, calc.			
7	3424	25	Sh, olv gy, firm fis, heavily micro-mic, glau, slty, sl calc, Sh, olv gy-m. dk gy, firm, blk, sl micro-mic. Sh, olv gy, gysh blk, fis, hd, non calc, sl micro-mic, Lst, lt olv gy w/ dk gy spots, v hd, blk. Lst, lt olv gy-clr, lt gy, firm-hd, glau, sl arg. micro-mic, fracs filled w/ clr, xln, Lst. Trs Dol dk yelsh brn-dusky yelsh-brn, vhd, sucrosic (xln). Trs. Pyr.			
8	3418	50	Sh, dk gy-dk olv gy, sft-firm, blk-subfis, micro-mic, sl slty, non-calc.			
9	3410	10	Sh, m dk gy-dk gy, firm-hd, subfis, slty, micro-mic-calc. Lst, lt olv gy-pink sh, v hd.			
10	3382	18	Sst, grnsh gy-lt gy-clr, vf, subang, firm-hd, calc cmtd, glau, mica, arg in pt, well srted, pr per, no show.			
11	3338	18	Mrl, m dk gy-olv gy, firm-hd, blk, sl slty, sl micro-mic.			
12	3333	35	Mrl, a/a. Sh, dk gy-olv blk, firm-hd, blk, sl micro-mic, slty, calc.			
13	3318	15	Lts, wh, ptly v lt gy, hd-vhd, sl glau, tight, micro-xln, ptly arg.			
14	3285	30	Sh, gysh blk-blk, hd, fis, sl micromic, non-calc, lam w/ Sh, dk gy-olv gy, firm, subfis, calc, glau, fossiliferous, micro-mic, w/Sst lams a/a			



Norsk Hydro

			SERVICE COMPANY Schlumb.
			ASKED: 30
			SHOT: 25
			LOST: -
			EMPTY: 4
			SAMPLES RECOVERED: 21
WELL: 15/5-3			Misfires: 5
LICENCE: PL 048			GEOLOGIST: Berglund/ Beckman
DATE: October 8, 1980			

tr : trace - M : medium - G : good

N°	DEPTHs (m)	REC %	LITHOLOGY	Fluorescence	
				CUT	
15	3210	-	Empty.		
16	3190	20	Sh, lt gy, w/lams of m dk gy, firm, blky-subfis, sl calc-calc, micromic.		
17	3176	50	Sh, a/a grdg to MrL, micro-mic.		
18	3101	-	Misfire.		
19	3045	20	MrL, m dk gy-dk gy, firm, occ hd, sl slty.		
20	2975	30	MrL, blksh rd, sft-firm, blky, sl slty, tr microfoss.		
21	2913	-	Misfire.		
22	2889	25	Sh, m dk gy, firm-hd, subfis, fossiliferous, sl micro-mic, sl calc.		
23	2805	40	MrL, m lt gy, firm-hd, blky, sl micro-mic, ptly w/Lst. wh, firm.		
24	2715	-	Misfire.		
25	2673	60	MrL, m gy, sft-firm, sl micro-mic.		
26	2665	74	MrL, m dk gy-dk gy, sft-firm, sl micro-mic.		
27	2630	-	Misfire.		
28	2600	100	MrL, m dk gy, sft, sl slty, v sl micro-mic.		
29	2593	70	Sst, v lt gy, m-vf, subang-subrnd, fri-lse, sl glau, sl mica, sl slty, sl calc cmtd, rr cmtd, arg in pt, pr srtd, pr por.		
30	2580	-	Misfire.		



Norsk Hydro

				SERVICE COMPANY: Schlumb.
				ASKED: 30
				SHOT: 30
				LOST: 20
				EMPTY: -
				SAMPLES RECOVERED: 10
WELL: 15/5-3		RUN N°: 2		
LICENCE: PL 048		PAGE N°: 1		
		DATE: October 7, 1980	GEOLOGIST: Beckman/ Berglund	

tr : trace - M : medium - G : good

Nº	DEPTH(S) (m)	REC %	LITHOLOGY	Fluorescence	
				CUT	
1	3543	35	Sst, v lt gy, grnsh gy, vf, subang, fri-lse, calc, sl sctd, sly, arg, glau, micro-mic, well srted, pr por, no show.		
2	3535	40	Sst/slst, v lt gy, wh, vf-sly, subang, fri-lse, calc mtx, arg, glau, micro-mic, mod srted, pr por w/brown lst, xln, hd, no show.		
3	3525	-	Lost in hole.		
4	3515	40	Clst, m dkgy, sft, v calc, micro-mic, sl sly, glau.		
5	3500	-	Lost in hole.		
6	3495	-	Lost in hole.		
7	3491	-	Lost in hole.		
8	3485	-	Lost in hole.		
9	3479	-	Lost in hole.		
10	3475	-	Lost in hole.		
11	3442	-	Lost in hole.		
12	3424	-	Lost in hole.		
13	3410	-	Sh, m dk gy, dk gy, sft, blky, sly, calc.		
14	3382	-	Lost in hole.		
15	3338	-	Lost in hole.		
16	3318	28	Sh, m dk gy, sft-firm, blky-subfis, sl sly, calc, sl, micro-mic.		
17	3285	40	A/A, w/blk mtx (oxide) preferably in minute fractures.		



Norsk Hydro

		SERVICE COMPANY: Schlumb.
		ASKED: 30
		SHOT: 30
		LOST: 20
		EMPTY: -
		SAMPLES RECOVERED: 10
SIDE WALL CORES DESCRIPTION		
WELL: 15/5-3	RUN N°: 2	
LICENCE: PL 048	PAGE N°: 2	
	DATE: October 7, 1980	GEOLOGIST: Berglund/ Beckman

tr : trace - M : medium - G : good



Norsk Hydro

			SERVICE COMPANY Schlum.
ASKED:	30		
SHOT:	20		
LOST:	3		
EMPTY:	1		
SAMPLES RECOVERED:	16		
Misfires:	10		
GEOLOGIST:	Beckman/ Davies		

tr : trace - M : medium - G : good

Nº	DEPTHs (m)	REC #	LITHOLOGY	Fluorescence	
				CUT	
1	4310	30	Salt: clx-wh, occ ltgy, hd xltn, clean		
2	4253	50	Salt: a/a w/tr ls: pale yel brn, mod hd-fri, blky, f g struc, occ grn and brn specs.		
3	4191,1	50	Salt: a/a		
4	3802,5	30	Sh: brnsh blk, hd, subfis, carb, slty, micro-mic.		
5	3799	60	Cut: sl, bluish-wh, slow. Sh: olv blk a/a.		
6	3798,4		Cut: mod a/a. Lost in hole.		
7	3797,5	20	Sh: brnsh blk, hd, blky-subfis, micro-mic, calc, slty, no show.		
8	3796,4		Misfire.		
9	3794,4		Lost in hole.	N.B. All shale samples have good <u>petrolifereous odour</u>	
10	3792,5		Empty.		
11	3790,8		Misfire.		
12	3790	30	Sh: a/a non calc, sl carb. Cut: v sl a/a, slow.		
13	3787	20	Sh: a/a, sl calc Cut: a/a		
14	3787		Misfire		
15	3783,5	25	Sh: a/a, non calc. Cut: a/a		
16	3782,5		Lost in hole.		
17	3778,4		Misfire.		
18	3773	25	Sh: brnsh blk, hd, subfis, carb, slty, micro-mic. Cut: bluish-wh-yel, qd, fast.		



Norsk Hydro

		SERVICE COMPANY Schlum.
		ASKED: 30
		SHOT: 20
		LOST: 3
		EMPTY: 1
		SAMPLES RECOVERED: 16
		Misfires: 10
WELL: 15/5-3	RUN NO: 3	GEOLOGIST: Beckman/ Davies
LICENCE: PL 048	PAGE NO: 2	
	DATE: October 29, 1980	

tr : trace - M : medium - G : good

Nº	DEPTHs (m)	REC %	LITHOLOGY	Fluorescence
				CUT
				Ir/MG
19	3766	30	Sh: brnsh, blk, hd, subfis, carb, sity, micro-mic w/strg of Anhy-Gyp, cir-wh, xln. <u>Cut: blush-wh, sl, slow.</u>	
20	3759,9		Misfire.	
21	3753,4	35	Sh: gysh blk, a/a, sl sity. <u>Cut: a/a vs1.</u>	
22	3751,5	20	Sh: dk olv gy, a/a, sl mica, sity. <u>Cut: a/a.</u>	
23	3746		Misfire.	
24	3745	25	Sh: a/a <u>Cut: a/a, mod fast.</u>	
25	3737,9	30	Sh: dk gy a/a w/f dk/lt lam. <u>Cut: a/a, sl, slow.</u>	
26	3735,5		Misfire.	
27	3730	20	Sh: brnsh blk a/a. <u>Cut: a/a.</u>	
28	3726,9		Misfire.	
29	3722		Misfire.	
30	3717		Misfire.	
			All samples had good petroliferous odour.	



Norsk Hydro

			SERVICE COMPANY: Schlumb
ASKED:	45		
SHOT:	38		
LOST:	4		
EMPTY:	17		
SAMPLES RECOVERED: 24			
Misfires: 7			
GEOLOGIST: M. Henderson			

SIDE WALL CORES DESCRIPTION

WELL: 15/5-3 RUN N°: 4
 LICENCE: 048 PAGE N°: 1
 DATE: November 28, 1980

tr : trace - M : medium - G : good

N°	DEPTH (m)	REC	LITHOLOGY	Fluorescence	
				CUT	HMG
1	5046	25	Clyst, gyish red, mod hd, fri-plas, v slty, mica, calc, contains chunks of hard clyst, mot w/lt grnish gy-grnish gy, v calc, slty.		
2	5037	-	Empty.		
3	5035	12	Sst, gyish red, sft, firm, vf-f, ang-subrnd, v pr std, Qtz and Feldspar, mic, v calc, vary.		
4	5032	Tr	Slst, gyish red, fri, sdy, calc, arg, grds to Sst.		
5	5030,5	-	Empty.		
6	5030	12	Clyst, gyish red, hd, brit, blky-ptly, slty, sl micro mic, mod calc.		
7	5027	Tr	Anhy? lt gy clasts in gyish red arg mtx, sdy, v calc, recrystallised.		
8	5023	-	Empty. N.B. Most samples have been disturbed and appear much softer than in situ.		
9	5021	-	Poor penetration from hard bullets and 14 broken bullets.		
10	5014,5	-	Empty.		
11	5014	12	Clyst, gyish, red, hd, brit, blky-ptly, slty, sl micro mic, mod calc.		
12	5010,5	-	Misfire.		
13	5010	25	Slst, gyish red, fri, sdy, calc, arg grds to Sst.		
14	5005	-	Empty.		
15	5003.5	-	Misfire.		
16	5000	12	Sst, gyish red, hd, brit, ang-subrnd, v pr std, vf-f, Qtz and Feldspar mica, calc, v arg.		
17	4995	25	Clyst, gyish red, hd, brit, blky-ptly, slty, micro mic, mod calc.		
18	4990	-	Misfire.		



Norsk Hydro

			SERVICE COMPANY: Schlumb
			ASKED: 45
			SHOT: 38
			LOST: 4
			EMPTY: 17
			SAMPLES RECOVERED: 24
WELL: 15/5-3			Misfires: 7
LICENCE:			GEOLOGIST:
			M. Henderson

tr : trace - M : medium - G : good

N°	DEPTHs (m)	REC %	LITHOLOGY	Fluorescence	CUT
				Ir/MG	
19	4987.5	12	Slst, gyish red, hd, brit, blky, v arg, micro mic, v calc xln, - occ vf sdy.		
20	4983	-	Empty.		
21	4981	-	Misfire.		
22	4976.5	-	Lost in hole.		
23	4975.5	-	Misfire.		
24	4970.5	-	Misfire.		
25	4965	12	Cly, gyish red, mot w/lt grnish gy, sft, firm, v slty, mica, v calc.		
26	4964.5	-	Empty.		
27	4966	25	Slst, gyish red, hd, brit, blky, v arg, micro mic, v calc, occ vf sdy.		
28	4956	12	Clyst/Lst, lt brnish gy, firm, fri, fq calc, xln, in arg mtx, sl vf sdy.		
29	4945	Tr	Slst, gyish red, mod hd, fri, blky, v arg, v calc, vf calc xls.		
30	4944.5	28	Clyst/Sh, gyish red, hd, brit, plty, loc v micro-mic, lam, mod calc.		
31	4935	25	Sst/Slst, m lt gy-lt brnish gy, firm, fri, vf, v arg, v calc, anhy?		
32	4930	12	Sst, gyish red-lt brnish gy, vf-slt, hd, blky, brit, arg, v calc, mic.		
33	4929.5	12	Sst/Slst, m lt gy-lt brnish gy, vf-slt, firm, fri, v arg, mic, v calc.		
34	4927	-	Empty.		
35	4924	25	Sst/Slst m lt gy-lt brnish gy, vf-slt, firm, fri, v arg, v calc, tr Mica.		
36	4922	-	Empty.		



Norsk Hydro

SIDE WALL CORES DESCRIPTION		SERVICE COMPANY: Schlumb.
WELL:	15/5-3	ASKED: 45
LICENCE:	048	SHOT: 38
	RUN N°: 4	LOST: 4
	PAGE N°: 3	EMPTY: 17
	DATE: November 28, 1980	SAMPLES RECOVERED: 24
		Misfires: 7
		GEOLOGIST: M. Henderson

tr : trace - **M** : medium - **G** : good

APPENDIX 3

WELL SUMMARY

GEOLOGICAL WELL SUMMARY

WELL SUMMARY

Coord: N : 58° 45' 47,93" E : 01° 38" 12,05"		Spudded: AUGUST 22, 1980 Started drilling: AUGUST 22, 1980 At T.D.: NOVEMBER 27, 1980 Completed: DECEMBER 7, 1980		Well: 15/5-3																																																																																																						
Line: 508 310 SP: 606 Depths datum: R.K.B. Rig: Nortrym Water depth: 110 m RKB.elev: 25 m Stopped in: Devonian ? Sandstones and Shales.		T.D. Driller: 5042 m T.D. Logger: 5050 m		Country: NORWAY																																																																																																						
OPERATOR: NORSK HYDRO PRODUKSJON A/S		LICENCE: 048 OWNED BY: STATOIL / PETRONORD																																																																																																								
TARGETS: 1) PRIMARY; SANDSTONES OF TRIASSIC AGE. 2) SECONDARY; SANDSTONES OF THE MIDDLE JURASSIC "SLEIPNER" FORMATION.		RESULTS: The well encountered 1050 m of Zechstein evaporites over-lying 200 m of probable Devonian Shales and thin Sands. No pre - Cretaceous reservoirs were found. When cutting the 95/8" casing prior to completion of the well, small amounts of oil were circulated out of the hole. This probably originated in two thin sandstone stringers of Eocene age between 1474-1482 m, in the top of the Frigg Formation.																																																																																																								
<table border="1"> <thead> <tr> <th>CASINGS</th> <th>CORES</th> </tr> </thead> <tbody> <tr> <td>30" at 198 m</td> <td>CORE # 1 CUT: 3815 - 3834,6 m REC: 3815 - 3826,36 m 58,9 %</td> </tr> <tr> <td>20" at 605 m</td> <td>CORE # 2 CUT: 5038 - 5042 m REC: 5038 - 5041,74 m 84 %</td> </tr> <tr> <td>13 3/8" at 2002 m</td> <td></td> </tr> <tr> <td>9 5/8" at 3525 m</td> <td></td> </tr> <tr> <td>7" liner at 4860 m</td> <td></td> </tr> </tbody> </table>		CASINGS	CORES	30" at 198 m	CORE # 1 CUT: 3815 - 3834,6 m REC: 3815 - 3826,36 m 58,9 %	20" at 605 m	CORE # 2 CUT: 5038 - 5042 m REC: 5038 - 5041,74 m 84 %	13 3/8" at 2002 m		9 5/8" at 3525 m		7" liner at 4860 m		<p>STRUCTURAL TIME MAP BASE CRETACEOUS (M 2)</p>																																																																																												
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GEOLOGICAL WELL SUMMARY

DEPTHS m RKB	LITHO SECTION	SYSTEM/ SERIES	DESCRIPTIONS	LOCATED ON LINE: 508 310		WELL/I 15/5-3
				WATER	DEPTH:	
-2500			2500 <u>Sst</u> , a/a occ intbds <u>Marl</u> .	-3750	M : : C	w strgs <u>Lst</u> , wh-it gy, m dk gy brn gy, hd, blky, micro xln, loc -3738 sucrosic, loc arg, loc sdy tr -3751.5 glau, <u>Pyr</u> tr <u>Sst</u> , wh, vf-slt, subang, wh clay mtix, firm-hd, sm fri, 3802.5 low por.
-2550			2570	-3800	C#1	Halite, clir, wh, occ pl yel, firm, crs xln, clean.
-2600			2595 Lst, wh-it gy, loc pink, red blk-dusky red, chky, loc arg grdg to <u>Marl</u> , m gy, sft-firm, v sity.	-3850		w/strgs + lam <u>Anhy</u> , wh, firm, blky, crypto xln, occ sverosic.
-2650			2675 Loc <u>glau</u> . w/intbds Sh, dk gy, grn gy- grn blk-blk, firm, subfis-fis, calc, tr <u>glau</u> .	-3900		
-2700				-3950		
-2750				-4000		
-2800				-4050		
-2850				-4100		
-2900			2890 <u>Marl</u> , pl red, gy red, pl red brn, sft-firm, loc sity, bcmg lt gy-m dk gy, occ v sity.	-4150		
-2950				-4200		
-3000			2960 w strgs <u>Lst</u> , occ <u>Sh</u> lam.	-4250		
-3050			<u>Marl</u> , a/a bcm pred lt-m gy.	-4300		
-3100			tr <u>Sh</u> , clir Qtz, sity-f, ang- subrnd, lse.	-4350		
-3150				-4400		
-3200			3185m <u>Marl</u> , m dk gy-gy blk, hd, blk, bric, W/intbd <u>Clyst</u> , red-dk red brn, m gy-m dk gy, hd, blky, brit, lam, sl calc.	-4450		
-3250				-4500		
-3300				-4550		
-3350			3325 <u>Lst</u> , lt-yel gy, sft-hd, fri- brit. <u>Marl</u> wh, lt-dk gy, loc olv blk, sft-occ hd, firm, blky, loc sity,	-4600		
-3400			3381 loc micromic. tr <u>glau</u> ,	-4650		
-3450			3425 w intbds <u>Lst</u> , wh-m gy, pink -dusky red, lt brn, sft-hd, brit, micro-crypto xln, loc arg, ml cromic. tr <u>glau</u> .	-4700		
-3500			3510 Sh, olv blk, grn blk, dk grn	-4750		
-3550			3522 gy, dusky bl grn, m-dk gy, mod, hd-hd, blky-fis, calc-non calc, occ sity-vf sdy, w strg <u>Sst</u> , lt gy, lt-dk gy grn, vf, subang -	-4800	K	
-3600			3580 subrnd, mod hd-fri, calc cmt, low por. occ strg <u>Lst</u> .	-4850	A A	
-3650			3620 tr <u>glau</u> , <u>Pyr</u> .	-4900	M	
-3700			3630	-4950	M	
			3665 Sh, lt-m gy, gy blk, gy brn- brn blk, firm-hd, blky-sub fis, sity, micromic, loc carb, loc earthy, occ calc.	5000	M	
				C#2	M	
						Strgs <u>Sst</u> , m-dk brn red, lt- dk gy, vf-slt, mod-v hd, bcmg vf-crs, loc cong, silic/calc/dol cmt, mic.
						5038 TD 5050 m

SECTION B

OPERATIONS

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SECTION B

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1. LOCATION SURVEY

A site survey was performed by A/S Geoteam on the 15/5-3 location from March 14 to March 17, 1980. The 15/5-3 location was given as

58° 43' 48"N
01° 38' 09"E

The survey area was a square of 3.4 by 3.4 kilometers. The Decca Pulse 8 system was utilized for navigation.

M/V Geo Boy was used as survey vessel, and the survey equipment consisted of:

- echo sounder, dual channel side scan sonar and a deep tow boomer for bathymetric mapping and detailed sea floor investigations.
- a gravity core sampler for top soil sampling.
- a low energy sparker and boomer together with a high energy sparker and a high resolution seismic system for determination of thickness and stratification of sub bottom sediments.

The conclusion based on the site survey was:

- water depth varied from 106.5 m to 111.5 m below MSL within the survey area, a water depth 110.5 m below MSL was measured at the planned drilling location.
- the seabed consisted of thin layers of fine silty sand, in some places stiff, consolidated clay.
- no obstructions were found on the seabed, but a telephone cable crossed the SE corner of the survey area at a minimum distance of 1520 m from the planned drilling location.
- there was no evidence of shallow gas.

2. POSITIONING AND ANCHORING OF THE RIG

The location of the well 15/5-3 was defined as shot point 225 on seismic line 753-223, with a spud-in tolerance defined to be within aof exact location, 50 m radius according to position obtained by the Pulse 8 system.

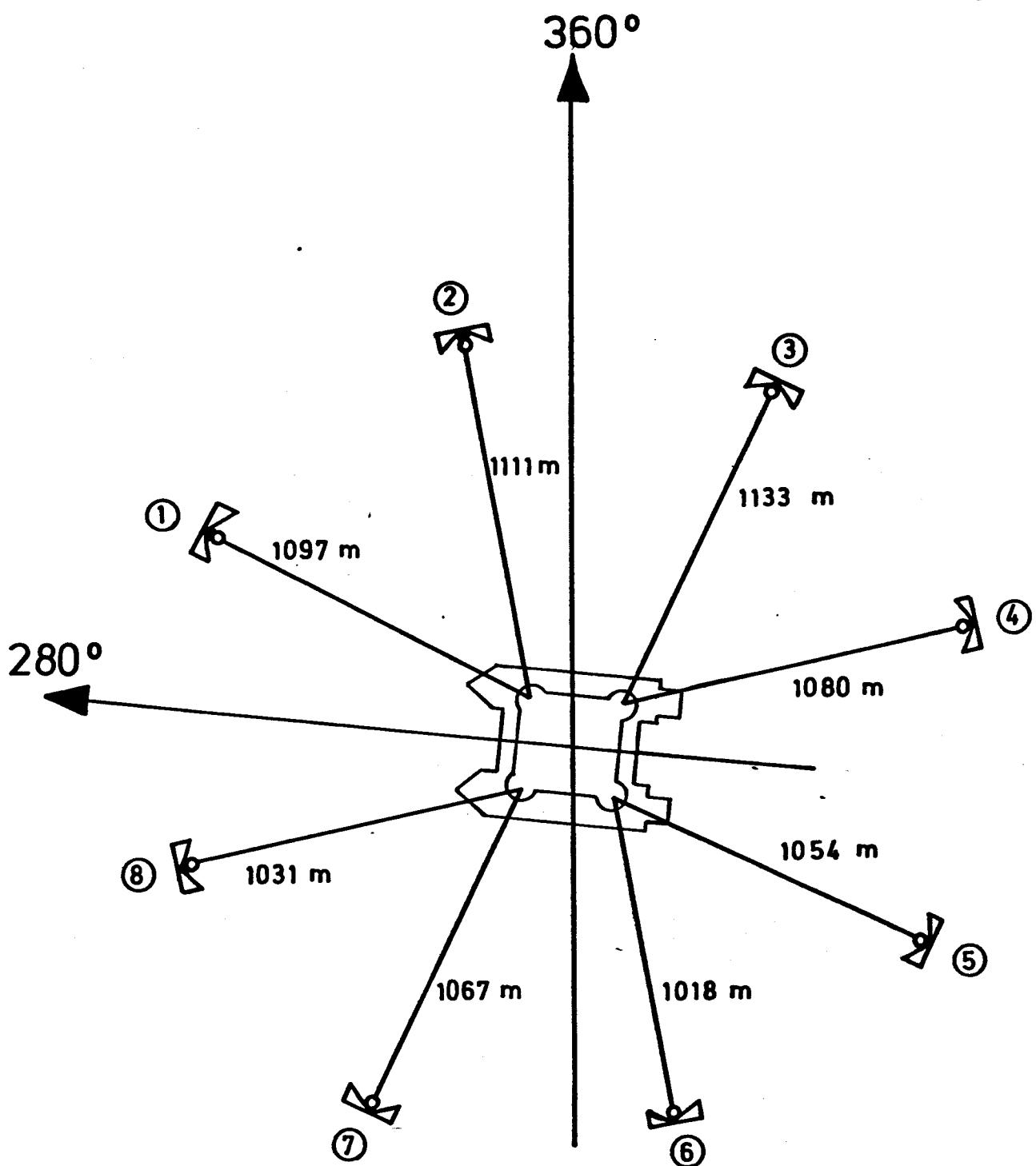
The rig was navigated from Florø and positioned onto the location by use of the Pulse 8 system. The first anchor (No. 5) was dropped when the rig was approximately 7 km in 128° bearing off location, at 0130 hrs 19th of August. All anchors were set the same day, and the position obtained by the Pulse 8 system was 19 meters off intended position on a bearing 107° . On August 21, due to high hole inclination, the rig was moved 50 m in direction SSE, and the well was respudded. On August 22, after being unable to stab into the hole after a connection, the well had to be spudded a third time. The final position of the well refers to this location and was determined by 3-D satelite positioning equipment. The final position obtained after 50 satelite passes was:

$58^{\circ} 43' 47.93''$ N
 $01^{\circ} 38' 12.05''$ E

This is 65 m in direction 127° off the intended position. The rig heading was 280° .

The Pulse 8 equipment was demobilized before the rig was on the final location, therefore simultaneously recorded Pulse 8 and satelite positioning data does not exist for this well.

Before drilling out of the 30" casing, all anchors were tested to 1112 kN tension.



Well coordinates : 58° 43' 47,93" N
01° 38' 12,05" E

Norsk Hydro Drilling Department	MOORING LINE PATTERN NORTRYM WELL 15/5-3	Gr. no.: 4 Date: 28/4 - 1980 Sign: KKO / Hes	Fig.: B - 1 Dwg. no.: 5
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3. OPERATION RESUME

3.1 Summary

Nortrym left Florø on August 17 at 0820 hrs., and arrived at the 15/5-3 location on August 19, dropping the first anchor at 0130 hrs. The 15/5-3 well was spudded the same day at 2030 hrs. and a 36" hole was drilled from 135 to 198 m. A single shot survey was run which showed a hole inclination of 4-1/2°. The rig was moved 50 m in a SSE direction and the well was respudded. A 36" hole was drilled to 151 m, but being unable to stab back into the hole after a connection, the well had to be spudded a third time. A 36" hole was drilled to 198 m and the 30" casing run and cemented with the shoe at 198 m. To cement back to the seabed 10.9 m³ cement slurry was pumped through a 3-1/2" tubing stinger into the 36" hole by 30" casing annulus. After having run the riser a 17-1/2" pilot hole was drilled to 615 m and displaced with 1.08 r.d mud prior to running the ISF/BHC/GR/SP log. As the logging tool would not pass below 359 m, a wiper trip to the bottom was made to clean the hole, whereafter the hole displaced with 1.20 r.d. mud before the logging tool was successfully run.

The 17-1/2" pilot hole was opened to 26" using an underreamer. Prior to running the 20" casing, the riser was pulled and a wiper trip with a 26" bit was made to bottom. As tight spots were encountered, a short trip to the 30" casing shoe was made before pulling out of the hole. The 20" casing was run and landed with the shoe at 605 m, and then cemented back to the seabed.

After having run and tested the BOP stack to full working pressure, the mud density was lowered to 1.10 r.d before the the 20" casing shoe track was drilled out. The following leak off test gave a leak-off at an equivalent mud weight of 1.44 r.d.

A 17-1/2" hole was drilled to 2029 m. A wiper trip was made before increasing the mud weight to 1.26 r.d prior to running the ISF/sonic - and FDC/CAL/GR logs.

After a wiper trip the 13-3/8" casing was run, landed and cemented with the shoe at 2002 m. At the end of the cement displacement operation, the return flow was totally lost. The top of the cement could not be determined by the temperature log, but cement in the mud return flow indicated that the cement was brought above the 20" casing shoe.

The pressure bled off immediately when bumping the plug, and the casing did not hold pressure when attempting to test. A wiper trip was made prior to setting an RTTS packer at 1960 m. The casing both above and below the packer was successfully tested, indicated that the cement at the casing shoe had set up.

The packer was retrieved and the cement and the 13-3/8" casing shoe drilled out. The subsequent leak-off test gave a leak off at an equivalent mud weight of 1.74 r.d.

A 12-1/4" hole was drilled to 3542 m. At approximately 3100 m the mud weight had to be increased to 1.46 r.d due to high total gas readings. Intermediate ISF/sonic/GR, FDC/CWL, HDT and CST logs were run. Due to problems with the HDT a wiper trip was made prior to running the HDT and the CST logs. The 9-5/8" casing was run, landed and cemented with the shoe at 3525 m. The temperature log indicated that the top of the cement was approximately 150 m above the 13-3/8" casing shoe.

The 9-5/8" casing shoe was drilled out and a leak-off test performed, which gave a leak-off at an equivalent mud density of 2.01 r.d.

An 8-3/8" hole was drilled to a total depth of 4863 m, interrupted by the following events:

- increased the mud weight to 1.30 r.d at 3711 m.
- Cut core No. 1 (3815 - 3834 m).
- Intermediate logging at 3834 m (ISF/sonic/GR, FDC/CNL/GR, HDT, SSL)
- Converted the mud to a salt saturated system at the same depth.
- Intermediate logging at 4350 m (Sonic/GR, FDC/CNL/GR, WST, CST).
- Increased the mud weight to 1.86 r.d at 4652 m.

At 4863 m the Sonic/GR and FDC/CNL logs were run, and a wiper trip made prior to running the 7" liner. The liner hanger was set hydraulically, but when slackening off weight the hanger slipped 3 m until the liner shoe stood on the bottom, with the top of the liner sleeve at 3375 m. The liner was cemented up to the hanger, and the liner packer on the setting sleeve was energized.

However, when attempting to test the liner overlap, the pressure bled off, and a squeeze cementing job was performed. The cement above the liner hanger was drilled out before successfully testing the liner overlap.

A tapered drill string consisting of 3-1/2" and 5" drill pipes above the bottom hole assembly was made up, the cement and flapper valve inside the liner hanger were drilled out, and firm cement was tagged at 4805 m. The BOP stack was pulled and rerun after having changed the lower pipe rams from 5" to 3-1/2". The BOP stack was tested to full working pressure, and cement and liner shoe drilled out prior to performing a leak-off test. The formation was tested to an equivalent mud weight of 2.22 r.d., having no leak off.

A 5-7/8" hole was drilled to 5003 m, and drilling continued with a 5-27/32" bit to 5038 m where the ISF/sonic/GR log was run. Core No. 2 was cut to 5042 m, which was total depth of the well.

After having run the SSL and CST logs the hole was plugged back to 145 m inside the 9-5/8" casing. The casing strings were cut with a mechanical cutter at the following depths: 9-5/8" at 182 m, 13-3/8" at 177.5 m, 20" and 30" at 141.6 m. The 13-3/8" by 20" annulus was squeeze cemented before cutting the 20" casing. The last anchor was pulled on December 7 the at 2203 hrs.

Weekly drilling report

Week 33	Weeks Progress	Report no 1 - 2	Page 1	of 25
Area North Sea	Well 15/5-3	Rig Nortrym		

Casing	Size						
	Setting depth (m)						

Date	Depth (m) Progress (m)	Pore Press grad (r.d.)	Mud Dens grad (r.d.)	Detailed operation
16.08				Unloading supply boat before leaving Florø.
17.08				Nortrym left Florø at 0820 hrs, bound for well 15/5-3.

Weekly drilling report

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Week 34	Weeks Progress	Report no. 3 - 5	Page 2	of 25
Area North Sea	Well 15/5-3		Rig Nortrym	

Casing	Size 30"				
	Setting depth (m) 198				

Date	Depth (m) Progress (m)	Pore Press grad (r.d.)	Mud Dens grad (r.d.)	Detailed operation
18.08				In transit to well 15/5-3.
19.08				Reached 15/5-3 location and dropped 1st anchor at 0130 hrs. Ran the anchors. Ballasted the rig to a draft of 70 ft. Made up the 36" bottom hole assembly and tagged the sea bottom at 135 m below RKB. Drilled 36" hole to 151 m.
20.08	151			Drilled 36" hole to 198 m. Displaced the hole with 41 m ³ high viscosity mud. Dropped the survey and pulled out of the hole to 134 m. Retrieved the survey which showed a hole inclination of 4-1/2°. Started to pull out of the hole and move the rig in direction SSE.
21.08	151			Continued to pull out of the hole and moved the rig 50 m in direction SSE. Changed 26" bit (No. 2) and the arms on the hole opener. Ran in the hole and tagged the sea bottom at 135 m. Drilled 36" hole from 135 m to 151 m. Attempted unsuccessfully to stab into the hole after a connection. Waited for the weather to improve.
22.08	190			Continued waiting for weather to improve. Deballasted the rig from 70 to 55 ft draft. Drilled 36" hole from 135 m to 145 m. Ballasted the rig down to 74 ft draft. Continued drilling 36" hole to 190 m. Ran a survey at 181 m.
23.08	198			Drilled 36" hole from 190 m to 198 m. Dropped the survey and displaced the hole with high viscosity mud. Made a wiper trip to 160 m and retrieved the survey. Displaced the hole with 47 m ³ mud. Pulled out of the hole and prepared to run the 30" casing. The 30" casing was run and landed with the shoe at 198 m and the wellhead 2 m above the seabed. Started cementing the 30" casing, but had to displace the lead slurry due to plugging of the suction lines of the cement unit. After unplugging the cement lines, the 30" casing was cemented.

Weekly drilling report

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Week 34	Week Progress	Report no	Page 3	of 25
Area North Sea	Well 15/5-3	Rig. Nortrym		

Casing	Size	30"					
	Setting depth (m)	198					

Date	Depth (m) Progress (m)	Pore Press grad (r.d.)	Mud Dens grad (r.d.)	Detailed operation
24.08	295		1.06	<p>Only seawater was used on tail in slurry due to problems in the mud room. Rigged up and ran 3-1/2" tubing stinger in the 36" hole - 30" csg annulus to 145 m. Pumped 12.8 ton cement.</p> <p>Pulled out of the hole, and ran in the hole with the jet sub and washed the wellhead. Pulled out of the hole. Rigged up and ran the pin connector on the 21" riser. Installed the diverter and pumped through and tested the diverter system to 3.4 bar. Broke down the 36" bottom hole assembly and made up the 17-1/2" bottom hole assembly with bit No. 3. Ran in the hole to 193 m and drilled out cement and the float shoe. Continued drilling 17-1/2" pilot hole to 295 m. Spotted 4.7 m³ gel mud on every connection. Ran a survey at 295 m.</p>

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Week 35	Weeks Progress	Report no	Page 4	of 25
Area North Sea	Well 15/5-3	Rig Nortrym		

Casing	Size 30"				
	Setting depth (m) 198				

Date	Depth (m) Progress (m)	Pore Press grad (r.d.)	Mud Dens grad (r.d.)	Detailed operation
25.08	615		1.06/1.08	Drilled 17-1/2" hole from 295 m to 615 m. Spotted 4.8 m ³ gel mud on every second connection. Ran surveys at 391 m and 504 m. Pumped 8 m ³ high viscosity mud and displaced the hole with 63.6 m ³ 1.08 r.d mud. Dropped the survey and pulled out of the hole. Rigged up and ran in the hole with the ISF/BHC/GR/SP logging tool, but the logging tool would not go below 359 m. Pulled the logging tool and removed the excentralizer. Ran back in the hole but still the tool would not go below 359 m. Rigged down the logging equipment and ran in the hole with bit No. 3 to 350 m. Made up the kelly and reamed the hole from 350 to 365 m.
26.08	615		1.08/1.20 - 1.15	Continued running in the hole to the bottom. Circulated and displaced the hole with 63 m ³ , 1.20 r.d mud. Pulled out of the hole, rigged up and ran the ISF/BHC/GR/SP log. Broke down the drill pipes and the heavy wall drill pipes, and made up a new bottom hole assembly with bit No. 4 and a 26" underreamer. Underreamed the 17-1/2" hole to 26" and pumped 7.9 m ³ high viscosity mud. Conditioned the mud and pulled out of the hole to the seabed. Pulled out of the hole after having displaced the riser with seawater and observed the level in the riser for 15 min.
27.08	615		1.20	Pulled the riser and set the riser joints back in the derrick. After having made up the cement plug inside the 18-3/4" wellhead, a 26" bit (No. 2) was made up and ran in the hole. Had to ram tight hole from 478 m to 615 m. Spotted 7.9 m ³ gel mud on every connection. After having spotted 7.9 m ³ gel mud and displacing it with 3500 strokes, pulled out of the hole to the 36" casing shoe and ran back to the bottom. Spotted 65 m ³ 1.20 r.d high viscosity mud and pulled out of the hole. Rigged up and started running 20" casing.

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Week 35	Weeks Progress	Report no.	Page 5	of 25
Area North Sea	Well 15/5-3	Rig Nortrym		

Casing	Size 30"	20"				
	Setting depth (m) 198	605				

Date	Depth (m) Progress (m)	Pore Press grad (r.d.)	Mud Dens grad (r.d.)	Detailed operation
28.08	615		1.20	Ran the 20" casing and landed same with the shoe at 605 m. Circulated prior to cementing. Started cementing, but stopped due to plugged suction line after having pumped 8 m ³ lead slurry. Displaced the cement with sea water while unplugging the suction line. Cemented the 20" casing, the top plug did not dump. Checked for back flow, backed out the running tool and washed the wellhead before pulling the running string. Rigged up and ran the BOP stack.
29.08	620			Landed the BOP stack. Tested the BOP stack and surface equipment to 690/240 bar after having repaired leak in low torque valve and discharge manifold on cementing unit. Set the wear bushing. Ran in the hole with a 17-1/2" bit (No. 5) to the float collar. Tested the casing and drilled the collar, shoe and new formation down to 620 m. No cement between the collar and the shoe.
30.08	845		1.10	Performed a leak off test obtaining a leak off gradient equivalent to 1.44 r.d mud density. Drilled 17-1/2" hole to 622 m. Pulled out of the hole, made up a new bottom hole assembly and ran in the hole (bit No. 6). Drilled 17-1/2" hole to 845 m. Ran surveys at 712 m and 807 m.
31.08	1308		1.10	Drilled 17-1/2" hole to 1110 m, and pulled out of the hole to the 20" casing shoe. Ran back to the bottom and drilled to 1308 m. Ran surveys at 902 m, 1006 m, 1110 m, and 1204 m.

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Week 36	Weeks Progress	Report no.	Page 6	of 25
Area North Sea	Well 15/5-3	Rig Nortrym		

Casing	Size Setting depth (m)	30"	20"	13-3/8"			
		198	605	2002			

Date	Depth (m) Progress (m)	Pore Press grad (r.d.)	Mud Dens grad (r.d.)	Detailed operation
01.09	1735		1.13	Drilled 17-1/2" hole to 1735 m. Ran surveys at 1308 m, 1431 m, 1535 m, and 1640 m. Changed liner on pump No. 1.
02.09	1971		1.13	Pulled out of the hole and laid down 31 joints of G pipe. Made up bit No. 7, picked up 25 joints of E pipe and ran in the hole. Drilled 17-1/2" hole to 1971 m. Ran surveys at 1830 m and 1925 m.
03.09	2029		1.18	Drilled 17-1/2" hole to 2029 m. Pulled 50 stands and ran back to the bottom. Reamed tight spot at 1450 m and from 1634 m to 2029 m. Circulated and conditioned the hole. Dropped the survey, but the pipe was stuck at bottom when attempting to pull the string. Maximum overpull 54 tons. Increased mud weight to 1.17 and pulled out of the hole. Tight hole from 2029 m to 1942 m and from 1422 m to 1403 m. Maximum overpull: 50 tons.
04.09	2029		1.26	Run in the hole. Tight spot at 1940 m, and reamed tight spot from 1940 m to 2029 m. Increased the mud weight to 1.26 r.d and pulled out of the hole. Ran the ISF/sonic and FDC/Cal/GR logs. Made up the cementing head and set it back in the derrick. Rabbited the heavy wall drill pipe to be used in the casing running string.
05.09	2029		1.26	Made up the 13-3/8" casing hanger and set it back in the derrick. Ran in the hole and circulated the mud. Pulled out of the hole and retrieved the wear bushing. Rigged up and started running the 13-3/8" casing.
06.09	2029		1.26	Ran and landed the 13-3/8" casing with the shoe at 2002 m. Circulated the mud and cemented the 13-3/8" casing. Lost partial returns after 1000 strokes, and had total loss after 5000 strokes. When bumping the top plug the pressure dropped from 172 bar to 103 bar immediately. Backed out the running tool and pulled out the running string. Set the seal assembly after

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Week 36	Weeks Progress	Report no.	Page 7	of 25
Area North Sea	Well 15/5-3	Rig Nortrym		

Casing	Size	30"	20"	13-3/8"			
	Setting depth (m)	198	605	2002			

Date	Depth (m) Progress (m)	Pore Press grad (r.d.)	Mud Dens grad (r.d.)	Detailed operation
07.09	2029		1.26	<p>having washed the wellhead with jet sub. Started testing the BOP stack to 312/240 bar.</p> <p>Finished testing BOP stack and set the wear bushing. Ran the temperature log. Laid down the 17-1/2" bottom hole assembly. Closed the shear ram and attempted to test the casing, but unsuccessfully. Ran in the hole and set the cup tester and backed off the running tool. Cloased the shear ram and tested to 345 bar, the shear ram did not leak. Retrieved the cap tester and set the wear bushing. Ran in the hole with 12-1/4" bit (No. 8) and new bottom hole assembly.</p>

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Week 37	Weeks Progress	Report no.	Page 8	of 25
Area North Sea	Well 15/5-3	Rig Nortrym		

Casing	Size Setting depth (m)	30"	20"	13-3/8"			
		198	605	2002			

Date	Depth (m) Progress (m)	Pore Press grad (r.d.)	Mud Dens grad (r.d.)	Detailed operation
08.09	2029		1.26	Circulated the mud and pulled out of the hole. Ran in the hole and set a RTTS packer at 1960 m. Tested the casing above the packer to 297 bar through the annulus. Tested the casing below the packer to 233 bar, the pressure bleeding off slowly as the packer slipped. Pressured up the annulus and pulled with 75 tons to get the packer free. Pulled out of the hole laying down the grade "G" pipe. Ran in the hole with a 12-1/4" bit.
09.09	2050		1.26	Picked up the grade "E" pipe and continued running in the hole. Drilled out of the 13-3/8" casing and down to 2034 m. Performed a leak off test giving a leak off gradient equivalent to 1.74 r.d mud weight. Continued drilling 12-1/4" hole to 2050 m. Pulled out of the hole, laying down 64 joints of grade "G" pipe. Ran in the hole with a 12-1/4" bit (No. 9) and a new bottom hole assembly. Picked up 64 joints of grade "E" pipe.
10.09	2120		1.26	Continued running in the hole, picking up grade "E" pipe. Reamed from 2029 m to 2050 m. Drilled to 2052 m. Pulled out of the hole, all three cones on bit locked due to junk. Made up bit No. 10 and ran in the hole. Drilled 12-1/4" hole to 2120 m.
11.09	2282		1.27	Drilled to 2125 m. Dropped the survey, but was not able to recover the survey tool as the bottom part of the tool was unscrewed from the fishing neck. Pulled out of the hole. Ran in the hole with bit No. 11. Drilled 12-1/4" hole to 2282 m. Ran survey at 2224 m. Dropped the survey at 2282 m.
12.09	2335		1.28	Pulled out of the hole. Ran in the hole with bit No. 12. Reamed from 2253 m to 2282 m. Drilled 12-1/4" hole to 2335 m, dropped th survey and pulled out of the hole. Ran in the hole with bit No. 13.

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Week 37	*Weeks Progress	Report no.	Page 9	of 25
Area North Sea	Well 15/5-3	Rig Nortrym		

Casing	Size Setting depth (m)	30"	20"	13-3 $\frac{1}{2}$ 8"			
		198	605	2002			

Date	Depth (m) Progress (m)	Pore Press grad (r.d.)	Mud Dens grad (r.d.)	Detailed operation
13.09	2568		1.28	Ran in the hole. Drilled 12-1/4" hole to 2568 m. Ran a survey at 2504 m, had misruns at 2438 m and 2447 m.
14.09	2598		1.27	Drilled to 2598 m. Ran a Totco survey at 2598 m. Pulled out of the hole. Pulled the wear bushing and tested the BOP stack to 312/240 bar. Tested the surface equipment.

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Week 38	1 Weeks Progress	Report no.	Page 10	of 25
Area North Sea	Well 15/5-3		Rig Nortrym	

Casing	Size 30"	20"	13-3/8"			
	Setting depth (m) 198	605	2002			

Date	Depth (m) Progress (m)	Pore Press grad (r.d.)	Mud Dens grad (r.d.)	Detailed operation
15.09	2647		1.28	Ran in the hole with bit No. 14. Drilled 12-1/4" hole to 2647 m.
16.09	2675		1.28	Drilled to 2674 m, dropped the survey and pulled out of the hole. Ran in the hole with bit No. 15. Broke the circulation at the 13-3/8" casing shoe. Continued running in the hole. The survey retrieved was a musrun, and ran a new survey, but got no results. Drilled 12-1/4" hole to 2675 m.
17.09	2721	1.26		Drilled 12-1/4" hole to 2721 m. Ran a survey at 2693 m and at 2721 m. Pulled out of the hole.
18.09	2721		1.26	Continued pulling out of the hole . Picked up the turbine (bit No. 16), made up a new bottom hole assembly and started running in the hole. Ran into a tight spot at 2250 m and got stuck pipe. Made up the kelly and worked the pipe free. Reamed the hole from 2298 m to 2706 m.
19.09	2825		1.26	Reamed the hole from 2706 m to 2721 m. Drilled 12-1/4" hole from 2721 m to 2825 m. Ran a survey at 2801 m.
20.09	2930		1.26	Drilled 12-1/4" hole to 2930 m. Ran a survey at 2895 m.
21.09	3022		1.27	Drilled 12-1/4" hole to 3022 m. Ran a survey at 2990 m.

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Week 39	1 Weeks Progress	Report no.	Page 11	of 25
Area North Sea	Well 15/5-3	Rig Nortrym		

Casing	Size Setting depth (m)	30"	20"	13-3/8"			
		198	605	2002			

Date	Depth (m) Progress (m)	Pore Press grad (r.d.)	Mud Dens grad (r.d.)	Detailed operation
22.09	3108	1.18	1.30	Drilled 12-1/4" hole to 3108 m. Ran a survey at 3068 m. Increased the mud weight due to high total gas readings.
23.09	3161	1.40	1.40	Drilled 12-1/4" hole to 3113 m. Checked for flow (no flow). Increased the mud weight to 1.40. Drilled 12-1/4" hole to 3161 m. Checked for flow at 3122 m and at 3161 m.
24.09	3240	1.40	1.46	Drilled 12-1/4" hole to 3240 m. Ran a survey at 3179 m.
25.09	3318	1.40	1.46	Drilled 12-1/4" hole to 3318 m. Ran a survey at 3283 m.
26.09	3345	1.40	1.46	Drilled 12-1/4" hole to 3345 m. Circulated, dropped the survey and pulled out of the hole. Observed the well for 10 min. at 3100 m. Reamed through tight spots at 2250 m. Broke down the turbine, pulled the wear bushing and started to test the BOP stack.
27.09	3354	1.40	1.46	Finshed testing the BOP stack to 312/240 bar. Tested the surface equipment. Ran the wear bushing, made up a new bottom hole assembly (bit No. 17) and ran in the hole. Reamed tight spots from 3138 m to 3345 m. Drilled 12-1/4" hole to 3354 m.
28.09	3376	1.40	1.46	Drilled 12-1/4" hole to 3376 m, dropped the survey and pulled out of the hole. Rigged up for logging.

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Week 40	Weeks Progress	Report no	Page 12	of 25
Area North Sea	Well 15/5-3	Rig Nortrym		

Casing	Size	30"	20"	13-3/8"			
	Setting depth (m)	198	605	2002			

Date	Depth (m) Progress (m)	Pore Press grad (r.d.)	Mud Dens grad (r.d.)	Detailed operation
29.09	3400	1.40	1.46	Ran the ISF/sonic/GR log. Made up bit No. 18 and ran in the hole. Drilled 12-1/4" hole from 3346 m to 3400 m.
30.09	3433	1.40	1.46	Drilled 12-1/4" hole to 3426 m. Changed the wash pipe. Drilled to 3433 m.
01.10	3495	1.40	1.46	Dropped the survey and pulled out of the hole.. Ran in the hole with bit No. 19 and drilled 12-1/4" hole to 3459 m.
02.10	3474	1.40	1.46	Pulled out of the hole to the 13-3/8" casing shoe. Attempted to hang off the drill string on the middle pipe ram using the hang off tool, but was not able to pass through the upper pipe rams due to high rig offset. Pulled out of the hole and removed the hang off tool. Displaced the riser with sea water. Ran in the hole and hung off the drill string on the middle pipe ram using a tool joint. Waited for the weather to improve. Recovered the drill string and ran in the hole. Drilled 12-1/4" hole to 3474 m. Changed the wash pipe.
03.10	3503	1.40	1.46	Drilled 12-1/4" hole to 3477 m, dropped the survey and pulled out of the hole. Ran in the hole with bit No. 2 and drilled 12-1/4" hole to 3503 m.
04.10	3542	1.40	1.46	Drilled 12-1/4" hole to 3542 m.
05.10	3544	1.40	1.46	Drilled 12-1/4" hole to 3544 m. Circulated, dropped the survey, and pulled out of the hole. Rigged up and ran the ISF/sonic/GR and FDC/CWL logs. Ran the HDT log, but the tool did not work. Pulled the tool and repaired a burned cable in the head.

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Week 41	Weeks Progress	Report no	Page 13	of 25
Area North Sea	Well 15/5-3	Rig Nortrym		

Casing	Size	30"	20"	13-3/8"	9-5/8"		
	Setting depth (m)	198	605	2002	3525		

Date	Depth (m) Progress (m)	Pore Press grad (r.d.)	Mud Dens grad (r.d.)	Detailed operation
06.10	3544	1.40	1.46	Repaired the HDT cable. Ran in the hole to 140 m to check the tool, but the tool did not work. Pulled the tool, and ran in the hole with bit No. 21. Reamed a tight spot from 3098 m to 3110 m. Ran in the hole to the bottom, circulated and pulled out of the hole. Rigged up and logged with the HDT from TD to 3200 m, but the cable failed. Pulled the tool and repaired the failure. Ran the HDT log and started to run the CST.
07.10	3544	1.40	1.46	Finished running CST No. 1, fired 25, 5 misfire, 4 empty. Repaired cable head and ran CST No. 2. Fired 30, lost 20. Made up the running tool and the pup joint to the 9-5/8" casing hanger and made up a crossover from the cement head to buttress casing on a pup joint. Ran in the hole with bit No. 21, circulated and pulled out of the hole.
08.10	3544	1.40	1.46	Retrieved the wear bushing, rigged up and ran the 9-5/8" casing, landed the casing with the shoe at 3525 m. Circulated and installed cement plugs in cement head.
09.10	3544	1.40	1.46	Repaired a leaking valve on the cementing unit and changed a valve on the cement head. Cemented the 9-5/8" casing and tested the casing to 379.5 bar. Washed the wellhead area and attempted to set the seal assembly, but the seal assembly leaked when attempting to pressure test. Pulled out of the hole and found seal rubber on top of the running tool. Ran the temperature log.
10.10	3544	1.40	1.46	Retrieved the seal assembly, washed the wellhead and set a new seal assembly. Tested the BOP to 600/240 bar. Set the wear bushing, laid down the 12-1/4" bottom hole assembly and made up the 8-3/8" bottom hole assembly (bit No. 22). Ran in the hole.

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Week 41	1 Weeks Progress	Report no	Page 14	of 25
Area North Sea	Well 15/5-3		Rig Nortrym	

Casing	Size	30"	20"	13-3/8"	9-5/8"		
	Setting depth (m)	198	605	2002	3525		

Date	Depth (m) Progress (m)	Pore Press grad (r.d.)	Mud Dens grad (r.d.)	Detailed operation
11.10	3568	1.40	1.46	Ran in the hole and drilled the cement and new formation to 3552 m. Performed a leak off test giving a leak off gradient equivalent to 2.01 r.d mud weight. Drilled 8-3/8" hole to 3568 m, dropped the survey and pulled out of the hole.
12.10	3595	1.35	1.46	Pulled out of the hole and laid down 9 joints of grade "G" pipe. Ran in the hole with bit No. 23 and drilled 8-3/8" hole to 3595 m.

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Week 42	Weeks Progress	Report no.	Page 15	of 25
Area North Sea	Well 15/5-3	Rig Nortrym		

Casing	Size Setting depth (m)	30"	20"	13-3/8"	9-5/8"		
		198	605	2002	3525		

Date	Depth (m) Progress (m)	Pore Press grad (r.d.)	Mud Dens grad (r.d.)	Detailed operation
13.10	3650	1.35	1.46	Drilled 8-3/8" hole to 3650 m, dropped the survey and pulled out of the hole.
14.10	3675	1.35	1.46	Pulled out of the hole, tested the surface equipment to 600 bar and ran in the hole with bit No. 24. Drilled 8-3/8" hole to 3675 m. Ran a survey at 3672 m.
15.10	3693	1.40	1.46	Drilled to 3682 m and pulled out of the hole. Ran in the hole with bit No. 25 and drilled 8-3/8" hole to 3693 m.
16.10	3711	1.40	1.80	Drilled to 3711 m, circulated and increased the mud weight to 1.80 r.d. Dropped the survey and pulled out of the hole.
17.10	3740	1.40	1.79	Continued pulling out of the hole, laying down 16 joints of grade "G" pipe. Ran in the hole with bit No. 26 (diamond bit), picking up 16 joints of grade "E" pipe. Drilled 8-3/8" hole to 3740 m.
18.10	3785	1.40	1.80	Drilled 8-3/8" hole to 3785 m. Ran a survey at 3760 m.
19.10	3815	1.46	1.80	Drilled 8-3/8" hole to 3815 m. Had a drilling break at 3810 m. Circulated for samples at 3810 m and 3815 m. Ran a survey at 3813 m. Pulled out of the hole and retrieved the wear bushing.

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Week 43	*Weeks Progress	Report no	Page 16	of 25
Area North Sea	Well 15/5-3		Rig Nortrym	

Casing	Size Setting depth (m)	30"	20"	13-3/8"	9-5/8"		
		198	605	2002	3525		

Date	Depth (m) Progress (m)	Pore Press grad (r.d.)	Mud Dens grad (r.d.)	Detailed operation
20.10	3829	1.46	.180	Tested the BOP stack to 600/240 bar. Tested the surface equipment. Set the wear bushing and ran in the hole with the core barrel and cut core No. 1 from 3815 m to 3829 m.
21.10	3834	1.46	1.80	Continued to core to 3834 m and pulled out of the hole, recovered 60% of the cored interval. Ran in the hole with bit No. 27. Circulated and pulled out of the hole.
22.10	3834	1.46	1.80	Continued pulling out of the hole. Ran the ISF/sonic/GR, WST (misrun), FDC/CNL/GR and the HDT logs. Ran in the hole with bit No. 27.
23.10	3834	1.46	1.81	Continued running in the hole, circulating and pulled out of the hole. Ran the SSL log. Ran in the hole with bit No. 28.
24.10	3834	1.46	1.80	Continued to run in the hole. Cleared the mud tanks and started to mix salt saturated mud. Displaced the casing and riser with salt saturated mud. Ran in the hole to 3815 m.
25.10	4020		1.80	Ran in the hole to the bottom, displaced the open hole with salt saturated mud and pulled out of the 9-5/8" casing shoe. Waited for barite supply. Ran in the hole and drilled 8-3/8" hole to 4020 m. Ran a survey at 4020 m.
26.10	4174		1.80	Drilled 8-3/8" hole to 4114 m, circulated, dropped the survey and pulled out of the hole. Laid down 35 joints of grade "G" pipe. Ran in the hole with bit No. 29, picking up 35 joints of grade "E" pipe. Reamed from 4106 m to 4114 m.

Weekly drilling report

Week 44	Weeks Progress	Report no	Page 17	of 25
Area North Sea	Well 15/5-3		Rig Nortrym	

Casing	Size	30"	20"	13-3/8"	9-5/8"		
	Setting depth (m)	198	605	2002	3525		

Date	Depth (m) Progress (m)	Pore Press grad (r.d.)	Mud Dens grad (r.d.)	Detailed operation
27.10	4302		1.80	Drilled 8-3/8" hole to 4245 m. Laid out 8 joints of grade "E" pipe and picked up 8 joints grade "G" pipe. Continued drilling to 4302 m. Ran a survey at 4217 m.
28.10	4350		1.80	Drilled 8-3/8" hole to 4350 m, circulated, dropped the survey and pulled out of the hole. Rigged up and ran the following logs: Sonic/GR/FDC/CNL/GR, and WST.
29.10	4350		1.80	Ran the SSL log, but pulled the tool due to problems with the cable. Repaired the cable and ran the SSL log. Ran the CST (2 runs, but did not fire the last run due to new orders). Retrieved the wear bushing. Repaired the cement unit and tested the BOP stack to 600/241 bar.
30.10	4395		1.80	Finished testing the BOP stack. Set the wear bushing and tested the surface equipment. Ran in the hole with bit No. 30, picking up 29 joints of grade "E" pipe and laying down 40 joints of grade "G" pipe. Reamed from 4255 m to 4311 m. Circulated and reamed the hole to the bottom. Drilled 8-3/8" hole to 4395 m.
31.10	4467		1.80	Drilled 8-3/8" hole to 4467 m. Ran surveys at 4417 m. Had a misrun at 4398 m. Circulated, dropped the survey and pulled out of the hole. Ran in the hole with bit No. 31.
01.11	4652		1.86	Continued to run in the hole. Laid down 6 joints of grade "E" pipe and picked up 6 joints of grade "G" pipe. Drilled 8-3/8" hole to 4652 m. Ran surveys at 4557 m and 4652 m. Pulled out 5 stands to retrieve the survey. (had 7 m fill on bottom)
02.11	4737		1.86	Ran back to the bottom after having retrieved the survey. Drilled 8-3/8" hole to 4737 m, circulated, dropped the survey and pulled out of the hole. Laid down 25 joints of grade "G" pipe, made up bit No. 32 and ran in the hole.

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Weekly drilling report

Week 45	Weeks Progress	Report no	Page 18	of 25
Area North Sea	Well 15/5-3		Rig Nortrym	

Casing	Size	30"	20"	13-3/8"	9-5/8"	7" liner	
	Setting depth (m)	198	605	2002	3525	4863	

Date	Depth (m) Progress (m)	Pore Press grad (r.d.)	Mud Dens grad (r.d.)	Detailed operation
03.11	4848		1.86	Ran in the hole, picking up 26 joints of grade "E" pipe. Drilled 8-3/8" hole to 4790 m, had a drilling break. Circulated and continued drilling to 4842 m. Ran a survey, pulled 3 stands and retrieved the survey. Reamed through a tight section at 4314 m when running back to the bottom. Drilled 8-3/8" hole to 4848 m.
04.11	4851		1.86	Drilled 8-3/8" hole to 4851 m, circulated and pulled out of the hole. Ran in the hole with bit No. 33, picking up 130 joints of grade "G" pipe.
05.11	4863		1086	Continued running in the hole, picking up 30 joints of grade "G" pipe. Drilled 8-3/8" hole to 4863 m, circulated and pulled out of the hole. Had a tight spot at 4842 m, picked up the kelly and reamed through. Rigged up and ran the following logs: Sonic/GR/FDC/CNL.
06.11	4863		1.86	Finished running the FDC/CNL log. Made up the circulation head on a drillpipe single, and the 7" liner shoe, catcher sub and landing collar to 2 joints of 7" liner. Ran in the hole with bit No. 34 to the bottom, circulated and pulled out of the hole.
07.11	4863		1.86	Made up the connection between the hanger and the packer. Rigged up and ran the 7" liner. Due to problems with the casing tong and excessive rust coating the last casing joints were made up with the manual rig tongs. Continued to run the liner on 5" drill pipe. No back flow from the annulus was observed. Broke the circulation after having run 20 stands, but got no return flow. Circulated down the choke-kill-lines to treat the mud. Circulated down the liner, got return flow when circulating at 10 strokes/min. Treated the mud for unbalance and high viscosity.

Weekly drilling report

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Week 45	Weeks Progress	Report no.	Page 19	of 25
Area North Sea	Well 15/5-3	Rig Nortrym		

Casing	Size	30"	20"	13-3/8"	9-5/8"	7" liner	
	Setting depth (m)	198	605	2002	3525	4863	

Date	Depth (m) Progress (m)	Pore Press grad (r.d.)	Mud Dens grad (r.d.)	Detailed operation
08.11	4863		1.86	Continued to run in the hole, circulating every 5 stands with 5 - 10 strokes/min. Circulated and treated the mud until having full returns at 10-20 strokes/min. Continued to run in the hole with full return flow. Tagged the bottom and picked up 3 m. Made up the cementing head, circulated, dropped the ball and set the liner hanger with 96 bar. Slacked off the weight, but the liner dropped 3 m. Increased the pressure and sheared the landing collar. Rigged up to cement the liner.
09.11	4683		1.86	Cemented the liner, the plug did not bump; but had no back flow. Was unable to set the packer due to excessive rig heave. Pulled the stinger above the liner hanger and reverse circulated. Got cement in the return flow. Made up the kelly, stabbed the stinger back into the liner and energized the packer. Pulled out of the hole, and ran in the hole with bit No. 34, and attempted to pressure test the liner overlap to 103 bar, but the pressure bled off to 63 bar. Pulled out of the hole and ran in the hole with an open ended drill pipe.

Weekly drilling report

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Week 46	Weeks Progress	Report no.	Page 20	of 25
Area North Sea	Well 15/5-3	Rig Nortrym		

Casing	Size	30"	20"	13-3/8"	9-5/8"	7" liner	
	Setting depth (m)	198	605	2002	3525	4863	

Date	Depth (m) Progress (m)	Pore Press grad (r.d.)	Mud Dens grad (r.d.)	Detailed operation
10.11	4863		1.86	Continued to run in the hole. Circulated the mud, hung off the drill string on the upper pipe ram and pressure tested the surface equipment to 207 bar. Took an injection rate test and performed a squeeze cementing job. Final squeeze pressure 187 bar. Pulled out of the hole, ran in the hole with bit No. 34 and drilled cement from 3336 m to 3375 m.
11.11	4863		1.86	Tested the liner overlap to 172 bar. Pulled out of the hole, laying down 126 joints of grade "E" pipe and the bottom hole assembly. Made up bit No. 35 and a new bottom hole assembly. Ran in the hole with 3-1/2" drill pipe.
12.11	4863		1.86	Continued to run in the hole with 5" drill pipe. Drilled out cement and the flapper valve inside the liner hanger. Continued to run in the hole, tagging the cement at 4805 m. Pressure tested the liner to 172 bar and pulled out of the hole.
13.11	4863		1.86	Displaced the riser with sea water and observed the well. Retrieved the wear bushing and pulled the BOP stack. Changed the lower pipe ram from 5" to 3-1/2".
14.11	4863		1.86	Finished to change from 5" to 3-1/2" middle pipe rams. Changed AX ring on the stack connector, rubber seals on upper pipe rams, polished the ball and installed new gaskets on the ball joint. Completed the testing of the BOP stack.
15.11	4863		1.86	Installed the ball joint, ran and landed the BOP stack. Attempted to test the BOP stack, but observed a leak around the kill line goose neck stab on the riser. Disconnected the goose neck and changed the seaw.

Weekly drilling report**- 31 -**

Week 46	Weeks Progress	Report no.	Page 21	of 25
Area North Sea	Well 15/5-3		Rig Nortrym	

Casing	Size Setting depth (m)	30"	20"	13-3/8"	9-5/8"	7" liner	
		198	605	2002	3525	4863	

Date	Depth (m) Progress (m)	Pore Press grad (r.d.)	Mud Dens grad (r.d.)	Detailed operation
16.11	4863		1.86	Were unable to connect the goose neck due to excessive rig heave. Disconnected the riser, hooked up the goose neck and connected the riser. Tested the BOP stack to 690/240 bar. Set the wear bushing and ran in the hole with bit no. 36. Attempted unsuccessfully to break the circulation.

Weekly drilling report

Week	47	Weeks Progress	Report no	Page	of
Area	North Sea	Well	15/5-3	22	25
				Rig	Nortrym

Casing	Size Setting depth (m)	30"	20"	13-3/8"	9-5/8"	7" liner	
		198	605	2002	3525	4863	

Date	Depth (m) Progress (m)	Pore Press grad (r.d.)	Mud Dens grad (r.d.)	Detailed operation
17.11	4863		1.86	Pulled 20 stands and broke the circulation with 221 bar. Circulated, ran back to the bottom and broke the circulation with 228 bar. Drilled the float collar and cement to 4860 m. Circulated and pulled out of the hole. Ran in the hole with bit No. 37.
18.11	4877	1.46	1.86	Ran in the hole to the bottom, reamed and washed from 4848 m. Drilled cement, the liner shoe and 3 m new formation to 4868 m. Performed a leak off test giving a min. leak off gradient equivalent to 2.22 r.d mud weight. Drilled 5-7/8" hole to 4877 m.
19.11	4888	1.46	1.86	Drilled 5-7/8" hole to 4888 m, circulated and pulled out of the hole. Waited on new bit breaker.. Ran in the hole. The box on the hydraulic jar broke, picked up the hydraulic jar. Continued to run in the hole with bit No. 38 (diamond bit).
20.11	4912	1.46	1.87	Ran in the hole to the bottom, laying down 7 joints grade "G" pipe. Were unable to rotate, pulled out to the 7" liner shoe. Had 556 kN overpull on the first single. Reamed back to the bottom and drilled 5-7/8" hole to 4912 m.
21.11	4940	1.46	1.86	Drilled 5-7/8" hole to 4935 m. Got 7 bbl pit gain, and the well was shut in. Got no pressure build up and continued drilling 5-7/8" hole to 4940 m.
22.11	4984		1.87	Drilled 5-7/8" hole to 4984 m. Circulated at 4945 m for samples.
23.11	5003		1.87	Drilled 5-7/8" hole to 5003 m, circulated, dropped the survey and pulled out of the hole.

Weekly drilling report

Week	48	Weeks Progress	Report no.	Page	of
Area	North Sea	Well	15/5-3	23	25
Rig		Nortrym			

Casing	Size	30"	20"	13-3/8"	9-5/8"	7" liner	
	Setting depth (m)	198	605	2002	3525	4863	

Date	Depth (m) Progress (m)	Pore Press grad (r.d.)	Mud Dens grad (r.d.)	Detailed operation
24.11	5013		1.86	Pulled out of the hole. Ran in the hole with bit No. 39 (diamond bit). Reamed from 4982 m to the bottom. Drilled 5-27/32" hole to 5013 m.
25.11	5027		1.86	Drilled 5-27/32" hole to 5027 m.
26.11	5038		1.87	Drilled 5-27/32" hole to 5038 m, circulated and pulled out of the hole, Ran the ISF/sonic/GR log.
27.11	5042		1.86	Finished logging. Ran in the hole with a core barrel and cut core No. 2 from 5038 - 42 m.
28.11	5042		1.86	Pulled out of the hole and recovered the core (100%). Rigged up and ran the following logs: SSL and CST.
29.11	PBTD 3325			Picked up 15 joints 3-1/8" and 6 joints 3-1/2" drill pipe and ran in the hole. Set balanced cement plugs at 4913 - 4813 m and 3425 - 3325 m.
30.11	PBTD 3325			Pulled out of the hole, laying down 5" and 3-1/2" drill pipes. When pulling the 3-1/8" drill pipe, the first stand broke at a tool joint when set back in the derrick, and went through the driller's house. Ran a junk basket and gauge ring on wire line. Hit an obstruction at 3361 m. Pulled out of the hole.

Weekly drilling report

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Week 49	Weeks Progress	Report no.	Page 24	of 25
Area North Sea	Well 15/5-3		Rig Nortrym	

Casing	Size Setting depth (m)	30"	20"	13-3/8"	9-5/8"	7" liner	
		198	605	2002	3525	4863	

Date	Depth (m) Progress (m)	Pore Press grad (r.d.)	Mud Dens grad (r.d.)	Detailed operation
01.12	PBTD 185			Set and EZ bridge plug on wire line at 3300 m. Ran in the hole to 530 m and displaced the hole to seawater. Pulled out of the hole. Ran in the hole with a perforating gun on wire line end. Pulled out of the hole. Perforated from 505 m to 503 m. Ran in the hole with drill pipe, attempted unsuccessfully to inject with 35 bar pressure. Set cement plug No. 3: 505 m - 455 m. Ran in the hole with a perforating gun. Perforated at 155 m, and pulled the gun. Retrieved the wear bushing, ran in the hole with a casing cutter and cut the 9-5/8" casing at 145 m.
02.12	PBTD 185			Pulled out of the hole, made up and ran in the hole with a spear. Retrieved the 9-5/8" casing stub with 146 kN overpull. Started getting gas and oil migration up the riser. Closed the shear ram, but got no pressure increase. Circulated down the kill-line and up the choke-line. Pressured up below the shear ram to 66 bar, where the pressure dropped to 14 bar. Rigged up and ran a gauge ring on wire line. Made up the casing cutter and ran in the hole and cut the 9-5/8" casing at 182 m. Pulled the cutter, made up a spear and retrieved the 9-5/8" casing stamp. Ran a gauge ring on wire line and ran and set a 13-3/8" EZ packer at 180 m. Made up a stinger and ran in the hole.
03.12	PBTD 180			Stinged into the packer and attempted unsuccessfully to circulate down the 9-5/8" x 13-3/8" casing annulus, through the performances at 503 - 505 m, up the 13-3/8" x 20" casing annulus and out through the perforations at 155 m. Max. pressure 138 bar. Pulled the stinger out of the packer. Closed the upper pipe ram and pressured up to 96 bar. Waited for the weather to improve.

Weekly drilling report

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Week 49	Weeks Progress	Report no	Page 25	of 25
Area North Sea	Well 15/5-3		Rig Nortrym	

Casing	Size	30"	20"	13-3/8"	9-5/8"	7" liner	
	Setting depth (m)	198	605	2002	3525	4863	

Date	Depth (m) Progress (m)	Pore Press grad (r.d.)	Mud Dens grad (r.d.)	Detailed operation
04.12	PBTD 145			Cut the 13-3/8" casing at 177.5 m and retrieved same. Squeeze cemented the 13-3/8" by 20" annulus with 35 m ³ slurry and set a cement plug from 173 to 145 m. Pulled the blowout preventers.
05.12				Cut the 20" and 30" casings at 141,6 m and retrieved same together with guidebase using 20" casing spear. Waited on weather to pull anchors.
06.12				Waited on weather to pull anchors. Pulled anchor No. 3.
07.12				Pulled the other anchors and had last anchor on the bolster at 2203 hrs.

3.3 TIME DISTRIBUTION

The total time spent to move the rig to the location, drill, and permanently plug and abandon well 15/5-3 was 113 days and 10 hours (2722 hrs).

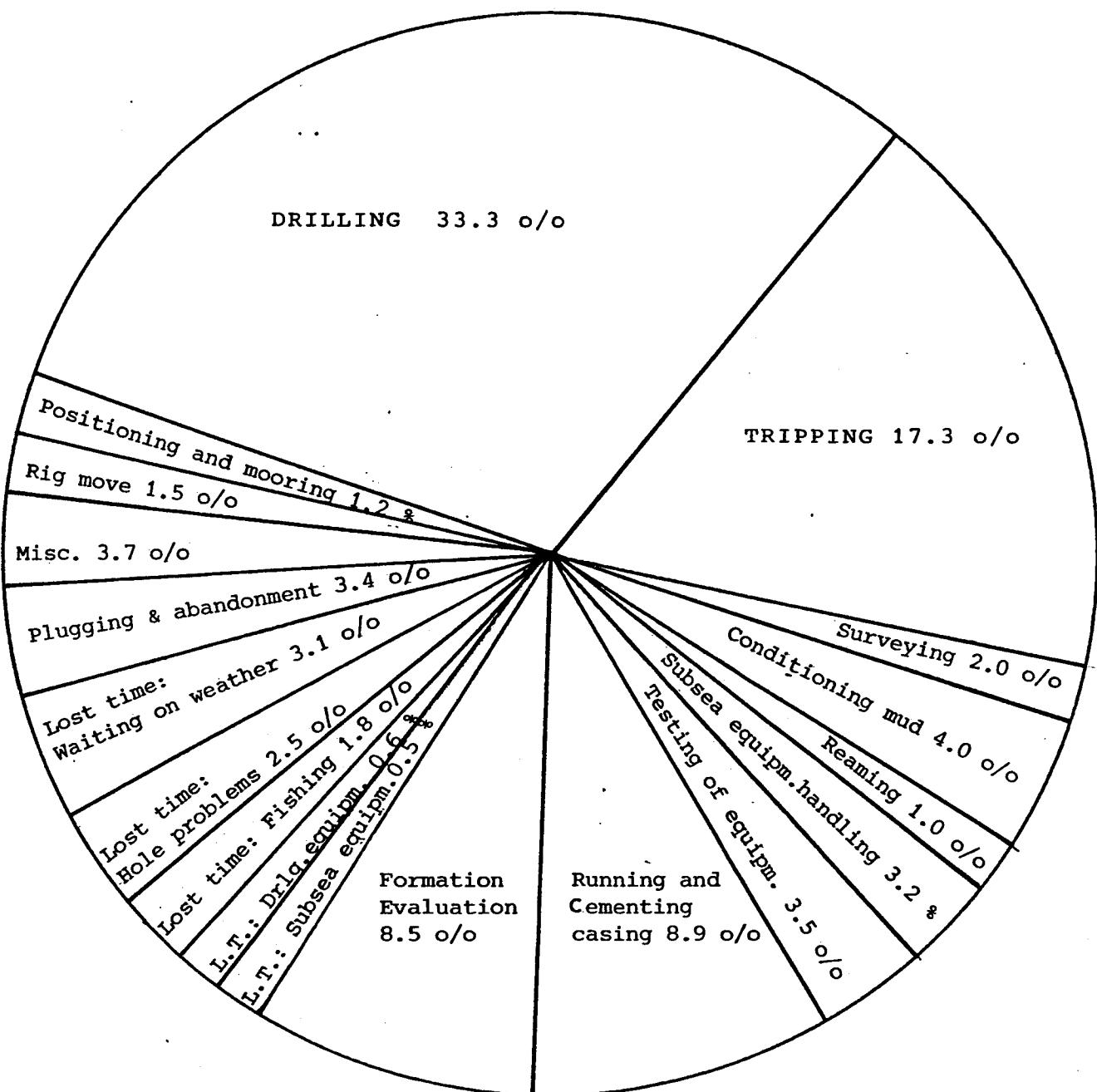
The operation can be divided as follows:

1.	Drilling of the well to T.D.	37.8 days
2.	Formation evaluation	9.7 days
3.	Lost time	9.8 days
4.	Plugging and abandonment	3.8 days

TABLE B-1

TIME DISTRIBUTION

Operation	Hours	Percentage of total time
1. Rig move	41.5	1.52
2. Positioning and mooring	32	1.18
3. Drilling	906.5	33.30
4. Tripping	470	17.27
5. Surveying	55.5	2.04
6. Conditioning mud	108	3.97
7. Reaming	26	0.96
8. Slipping and cutting drgl. line	10	0.37
9. Sub sea equipment handling	87	3.20
10. Testing of equipment	94	3.45
11. Running and cementing casing	242.5	8.91
12. Formation evaluation	232	8.52
13. Drills	2.5	0.09
14. Lost time: Drlg. equipment	15.5	0.57
" " Sub sea equipment	14	0.51
" " Fishing	48	1.76
" " Hole problem	68	2.50
" " Waiting on weather	84.5	3.10
" " Waiting on equipment	1	0.04
" " Waiting on order	3	0.11
21. Plugging and abandonment	92.5	3.40
22. Miscellaneous	88	3.23
	2722	100%
	= 113 days and 10 hours.	



Norsk Hydro Drilling Department	TOTAL TIME DISTRIBUTION WELL 15/5-3	Gr. no.:	Fig.:
		4	B-2
		Date: 5/5 - 1980	Dwg. no.:
		Sign: KKO / Hes	3

TABLE B-2HOLE DEVIATION

<u>DEPTH (M)</u>	<u>INCLINATION (DEGREES)</u>	<u>DIRECTION (DEGREES)</u>
181	0.50	19
198	1.50	67
295	1.00	109
391	1.00	157
500	0.75	167
615	0.50	92
712	0.75	104
807	0.75	99
902	0.75	94
1006	0.75	90
1111	0.50	80
1204	0.75	20
1308	0.25	304
1431	0.75	58
1535	0.50	290
1639	0.50	138
1735	0.25	224
1831	0.75	270
1925	0.75	254
2029	0.75	263
2124	1.00	261
2224	1.00	80
2282	1.00	56
2336	1.25	71
2504	1.00	116
2598	1.00 Totco	
2693	0.50	90

TABLE B-2 CONT.

<u>DEPTH (M)</u>	<u>INCLINATION (DEGREES)</u>	<u>DIRECTION (DEGREES)</u>
2721	1.00	91
2800	1.25	94
2895	2.00	94
2990	2.50	104
3086	1.75	99
3180	1.50	334
3283	3.00	81
3345	3.50	80
3376	4.00	83
3433	4.00	77
3477	3.50	88
3544	4.75	80
3568	3.00	310
3650	6.25	317
3672	6.25	45
3715	7.25	43
3813	8.00	40
4020	7.25	41
4117	7.25	34
4217	7.25	30
4416	6.00	21
4467	6.00	23
4557	6.75	18
4652	6.50	18
4737	6.50	4
4832	6.00	356

4. PERMANENT ABANDONMENT OF THE WELL

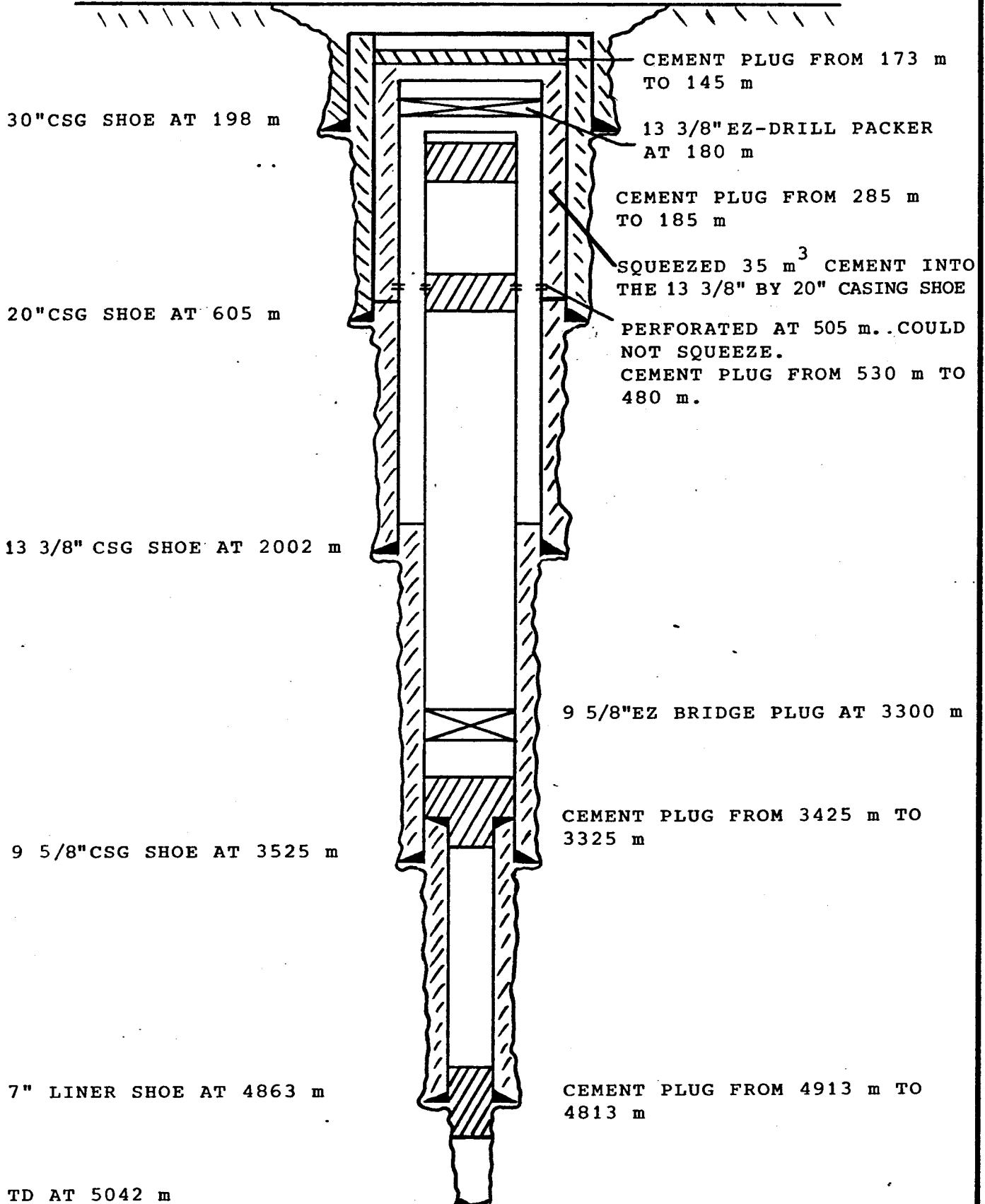
The well was abandoned as shown in Fig. B-3 and the abandonment program was carried out as follows:

1. Set a cement plug across the liner shoe from 4913 m to 4813 m.
2. Set a cement plug across the liner top from 3425 m to 3325 m.
3. Set an EZ bridge plug at 3300 m.
4. Perforated the casings from 505 m to 503 m.
5. Attempted to do an injection test. Did not succeed.
6. Set a cement plug from 530 m to 480 m.
7. Set a cement plug from 285 m to 185 m..
8. Perforated the casings at 155 m.
9. Cut the 9-5/8" casing at 182 m.
10. Set an 13-3/8" EZ-drill packer at 180 m.
11. Attempted to inject into the 9-5/8" casing by 13-3/8" casing annulus. Did not succeed.
12. Cut the 13-3/8" casing at 177.5 m.
13. Wqeeze cemented the 13-3/8" casing by 20" casing annulus.
14. Set a cement plug from 173 to 145 m.

15. Cut the 20" and 30" casing strings at 141.6 m.
16. Ran the TV with tape recorder and inspected the seabed near the well location.

No obstructions or debris were found in the vicinity of the abandoned well.

SEA BED AT 135 m RKB



5. PORE PRESSURE AND FORMATION INTEGRITY

5.1 Pore Pressure

The pressure detection started at 2030 m and was performed to a total depth of 5042 m. Drilling parameters and electric logs were used in this work. The results are given in the following table (ref. Fig. B-4).

Estimated pressure gradient (r.d.)				Most probable formation pressures (r.d.)	Actual mud densities (r.d.)
Depth m	Dc.exp.	Sonic log	Reported		
0-2900	1.07	1.07	1.07	1.07	Sea water -1.28
2960	1.13	1.20	1.13	1.13	1.26
3013	1.13	1.23	1.13	1.13	1.27
3090	1.18	1.30	1.18	1.18	1.27
3160	1.40	1.35	1.40	1.40	1.40
3200	1.40	1.34	1.40	1.40	1.46
3300	1.46	1.32	1.40	1.40	1.46
3595	-	1.45	1.35	1.40	1.46
3800	1.46	1.37	1.46	1.46	1.80
3800-					
4800		Salt			
4900	-	1.51	1.46	1.46	1.86
5000	-	1.48	1.46	1.46	1.87
To 5042	-	1.46	1.46	1.46	1.86

Note: The mud density was increased from 1.46 - 1.80 r.d. at 3715 m based on an expected pressure increase. Data from correlation wells shows fast increasing pressure in the Jurassic formation, but the expected pressure increase did not occur in this well.

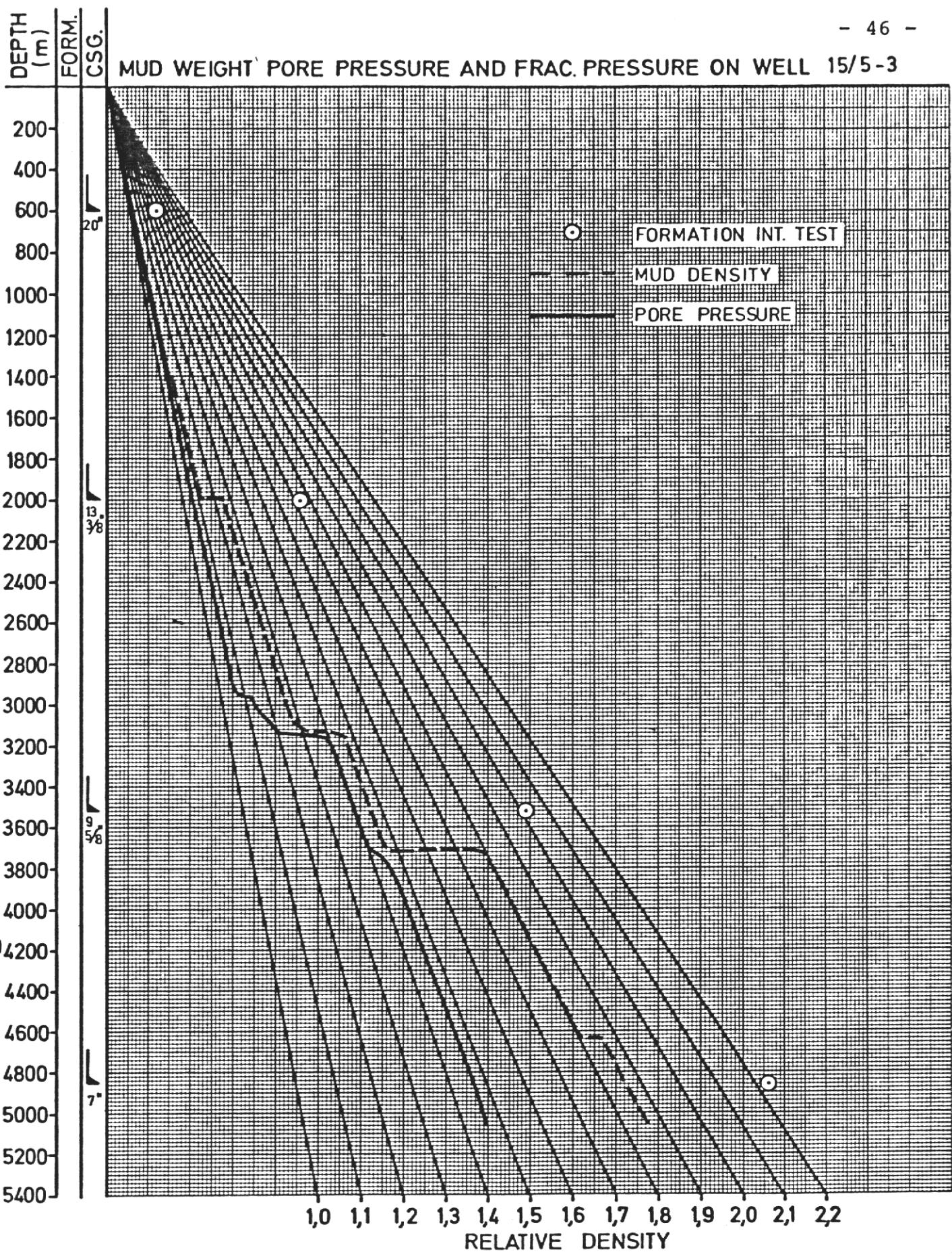
5.2 Formation Integrity

The following table shows the formation integrity tests.

20" csg.:	605 m	1.44 rd
13-3/8" csg.:	2002 m	1.74 rd
9-5/8" csg.:	3524 m	2.01 rd
7" liner:	4863 m	22.22 + rd

No leak-off was obtained at the 7" liner.

MUD WEIGHT PORE PRESSURE AND FRAC. PRESSURE ON WELL 15/5-3



Norsk Hydro Drilling Department	MUD DENSITY, PORE PRESSURE AND FRAC PRESSURE WELL 15/5- 3	Gr. no.: 4	Fig.: B-4
		Date: 29.1-81 Sign: JEH	Dwg. no.: 2

6. MATERIALS REPORT

6.1 Casings, liner, and wellhead

A Cameron 18-3/4" 700 bar W.P. housing wellhead system was used, and the 30", 20", 13-3/8", and 9 5/8" casing strings and the 7" liner were set as shown in Table B-3.

TABLE B-3

Size	Grade	Weight lbs/ft	Length m	Threads	Setting depth m
30"	B	460	14.46	ADT RB	
		310	50.07	" "	198
20"	K-55	133	14.77	LX	
	K-55	133	457.61	Buttress	605
13-3/8"	N-80	72	1867.78	Buttress	2002
9-5/8"	P-110	53.5	2690.28	VAM	
	N-80	47	700.12	Buttress	3525
7" liner	C-95	32	647.60	Buttress	
	C-95	35	834.9	Buttress	4863 X

x = Top of liner at 3375 m.

6.2

BOTTOM HOLE ASSEMBLIES

BIT NO. BIT SIZE BOTTOM HOLE ASSEMBLY

1 26" Bit - 36" hole opener - X0 - 36" stab - X0 - Bit sub - 9-1/2" monel - 36" stab -
5 x 9-1/2" DC - 3 x 8" DC - X0 - x 5" HW

2 26" Bit - 36" hole opener - X0 - 36" stab - X0 - bit sub - 9-1/2 monel - 36" stab -
5 x 9-1/2" DC - 3 x 8" DC - X0 - x 5" HW

3 17-1/2" Bit - 17-7/16" NB stab - 1 x 9-1/2" monel - 17-7/16" stab - 2 x 9-1/2" DC - 17-7/16"
stab - 3 x 9-1/2" DC - X0 - 3 x 8" DC - X0 - 15 x 5" HWDP

4 17-1/2" Bit - 26" hole opener - 17-7/16" NB stab - 1 x 9-1/2" monel - 17-7/16" stab -
2 x 9-1/2" DC - 17-7/16" stab - 3 x 9-1/2" DC - X0 - 3 x 8" DC - X0 - 15 x 5" HWDP

RR2 26" Bit - bit sub - 3 x 9-1/2" DC - X0 - 3 x 8" DC - X0 - 15 - 5" HWDP

5 17-1/2" Bit - junk sub - bit sub - 1 x 9-1/2" monel - 5 x 9-1/2" DC - X0 - 6 x 8" DC -
15 x 5" HWDP

6 17-1/2" Bit - 17-7/16" NB stab - 1 x 9-1/2" monel - 17-7/16" stab - 2 x 9-1/2" DC - 17-7/16"
stab - 4 x 9-1/2" DC - X0 - 9 x 8" DC - X0 - 15 x 5" HWDP

7 17-1/2" Same as for bit no. 6, except for only 6 x 5" HWDP

BIT NO.	BIT SIZE	BOTTOM HOLE ASSEMBLY
8	12-1/4"	Bit - junk sub - bit sub - 1 x 8" monel - 18 x 8" DC - jar - 3 x 8" DC - X0 - 15 x 5" HWDP
9	12-1/4"	Bit - junk sub - 12-3/16" NB stab - 1 x 8" monel - 12-3/16" stab - 1 x 8" DC - 12-3/16" stab - 2 x 8" DC - 12-3/16" stab - 15 x 8" DC - jar - 3 x 8" DC - X0 - 15 x 5" HWDP
10	12-1/4"	Same as for bit No. 9
11	12-1/4"	Same as for bit No. 9
12	12-1/4"	Bit - junk sub - 12-3/16" NB stab - 1 x 8" monel - 12-3/16" stab - 2 x 8" DC - 12-3/16" stab - 13 x 8" DC - jar - 3 x 8" DC - X0 - 15 x 5" HWDP
13	12-1/4"	Same as for bit No. 12
14	12-1/4"	Same as for bit No. 12
15	12-1/4"	Same as for bit No. 12
16	12-1/4"	Bit - turbine - X0- 12-3/16" stab - 1 x 8" monel - 12-3/16" stab - 2 x 8" DC - 12-3/16" stab - 11 x 8" DC - jar - 3 x 8" DC - X0 - 12 - 5" HWDP

BIT NO.	BIT SIZE	BOTTOM HOLE ASSEMBLY
17	12-1/4"	Bit - junk sub - 12-3/16" NB stab - 1 x 8" monel - 12-3/16" stab - 1 x 8" DC - 12-3/16" stab - 2 x 8" DC - 12-3/16" stab - 15 x 8" DC - jar - 3 x 8" DC - X0 - 15 x 5" HWDP
18	12-1/4"	Same as for bit No. 17
19	12-1/4"	Same as for bit No. 17
20	12-1/4"	Same as for bit No. 17
21	12-1/4"	Same as for bit No. 17
RR 21	12-1/4"	Same as for bit No. 17
22	8-3/8"	Bit - junk sub - bit sub - 1 x 6-1/2" monel - 15 x 6-1/2" DC - X0 - jar - X0 - 4 x 6-1/2" DC - X0 - 15 x 5" HWDP
23	8-3/8"	Bit - junk sub - 8-5/16" NB stab - 1 x 6-1/2" monel - 8-5/16" stab . 1 x 6-1/2" DC - 8-5/16" stab - 2 x 6-1/2" DC - 8-5/16" stab - 12 x 6-1/2" DC - X0 - jar - X0 - 4 x 6-1/2" DC - X0 - 15 x 5" HWDP
24	8-3/8"	Same as for bit No. 23

BIT NO.	BIT SIZE	BOTTOM HOLE ASSEMBLY
25	8-3/8"	Bit - junk sub - 8-5/16" NB stab - 1 x 6-1/2" monel - 8-5/16" stab - 1 x 6-1/2" DC - 8-5/16" stab - 2 x 6-1/2" DC - 8-5/16" stab - 17 x 6-1/2" DC - X0 - jar - X0 - 4 x 6-1/2" DC - X0 - 15 x 5" HWDP
26	8-3/8"	Diamond bit - 8-5/16" NB stab - 1 x 6-1/2" monel - 8-5/16" stab - 1 x 6-1/3" DC - 8-5/16" stab - 2 x 6-1/2" DC - 8-5/16" stab - 17 x 6-1/2" DC - X0 - jar - X0 - 4 x 6-1/2" DC - X0 - 15 x 5" HWDP
Core No.1	8-3/8"	Core bit - core barrel - X0 - 17 x 6-1/2" DC - X0 - jar - X0 - 4 x 6-1/2" DC - X0 - 15 x 5" HWDP
27	8-3/8"	Bit - 8-5/16" NB stab - 1 x 6-1/2" monel - 8-5/16" stab - 1 x 6-1/2" DC - 8-5/16" stab - 2 x 6-1/2" DC - 8-5/16" stab - 17 x 6-1/2" DC - X0 - jar - X0 - 4 x 6-1/2" DC - X0 - 15 x 5" HWDP
28	8-3/8"	Same as for bit No. 27
29	8-3/8"	Same as for bit No. 27, except for 32 x 5" HWDP

BIT NO. BIT SIZE BOTTOM HOLE ASSEMBLY

30	8-3/8"	Bit - junk sub - 8-5/16" NB stab - 1 x 6-1/2" monel - 8-5/16" stab - 1 x 6-1/2" DC - 8-5/8" stab - 2 x 6-1/2" DC - 8-5/16" stab - 17 x 6-1/2" DC - X0 - jar - X0 - 4 x 6-1/2" DC - X0 - 32 x 5" HWDP
31	8-3/8"	Same as for bit No. 30
32	8-3/8"	Same as for bit No. 30
33	8-3/8"	Same as for bit No. 30
34	8-3/8"	Same as for bit No. 30
RR 34	8-3/8"	Same as for bit No. 30
35	5-7/8"	Bit - junk sub + bit sub - 21 x 4-3/4" DC
36	5-7/8"	Bit - junk sub - junk sub - bit sub - 21 x 4.3/4" DC - jars - 3 x 4.3/4" DC
37	5.7/8"	Same as for bit No. 36
38	5-7/8"	Bit - 5-27/32" NB stab - short DC - 5-27/32" stab - 1 x 4-3/4" monel - 5.27/32" stab 1 x 4-3/4" DC - 5-27/32" stab - 26 x 4-3/4" DC - jars - 3 x 4-3/4" DC
39	5.27/32"	Same as for bit No. 38
40	5-27/32"	Core bit - core barrel - 1 short DC - 1 x 27/32" stab - 1 x 4-3/4" monel - 5-27/32" stab - 1 x 4-3/4" DC - 5-27/32" stab - 26 x 4-3/4" DC - 2 x jars - 3 x 4-3/4" DC

6.3 Mud report

For detailed mud properties, refer to table B-5.

36" hole, 30" casing

The 36" hole was drilled 198 m (third spud), using sea water and spotting high viscosity gel pills on each connection. Before running the casing the hole was displaced with spud mud.

Materials used in this section were bentonite, caustic soda, soda ash, lime and calcium chloride.

26" hole, 20" casing

The 21" riser was run prior to drilling 17-1/2" pilot hole to 615 m, using sea water and spotting 5 m³ high viscosity mud pills on every second connection. At 615 m 8 m³ high viscosity mud was pumped and the hole displaced with 64 m³, 1.08 r.d. mud.

However, as the Schlumberger logging tool would not pass below 359 m, a wiper trip to TD was made, and the hole was displaced with 64 m³, 1.20 r.d. mud.

The 17-1/2" hole was opened to 26" using an underreamer. 1.15 r.d. mud was used while underreaming, and at 615 m an 8 m³ high viscosity mud pill was displaced around. After having pulled the riser, a wiper trip with a 26" bit was made. Tight hole had to be reamed from 478 m to 615 m, spotting 3 m³ gel mud on every connection. 8 m³ gel mud was displaced around before making a short trip to the 30" casing shoe. 65 m³ 1.20 r.d. high viscosity mud was spotted on bottom before pulling out of the hole and running the casing. Mud materials used in this section were bentonite, caustic soda, soda ash, lime and baryte.

17-1/2" hole, 13-3/8" casing

The 17-1/2" hole was drilled without having any hole problems to 2029 m (TD), using a "seawater/dextrid" mud type. Mud weights varied from 1.10 r.d. to 1.13 r.d. A wiper trip to the 20" casing shoe was made at 1120 m and a round trip at 1735 m.

At 2029 m a 50 stand wiper trip was made. Running back, tight spots were reamed at 1450 m and from 1634 to TD, where the pipe got stuck. (Maximum overpull 490 kN). The hole was circulated and the mud weight increased to 1.17 r.d. before pulling out of the hole. Tight hole was encountered from TD to 1972 m and from 1422 m to 1403 m. Running back, tight spots were reamed from 1940 m to TD. The hole was circulated and the mud weight raised to 1.26 r.d. before logging. A wiper trip was made before successfully running and landing the 13-3/8" casing. At the end of the displacement of the cement the mud return flow was totally lost. Mud materials used in this section were bentonite, barite, caustic soda, soda ash, Q-broxin, Dextrid, Surflo W.300, salt and aluminium stearate.

12-1/4" hole, 9-5/8" casing

The 12-1/4" hole was drilled to a total depth of 3544 m. The interval from 2721 m to 3345 m was drilled using a turbine. The mud type was a seawater/polymer/Q.Broxin mud type. Mud weights down to 3113 m ranged from 1.26 to 1.28 r.d., where it was raised to 1.46 due to high gas readings. 1.46 r.d. mud weight was maintained when drilling the rest of the section. Throughout this section the following hole problems were encountered:

- reaming from 2029 m to 2050 m when running in the hole with a stiff bottom hole assembly (after the 13-3/8" casing job).

- reaming from 2250 m to 2721 m when running in the hole with the turbine.
- reaming tight hole at 2250 m when pulling out of the hole with the turbine.
- reaming from 3138 m to 3345 m (TD) when running in the hole with a new bit (after the diamond bit run).
- reaming from 3098 m to 3110 m when making a wiper trip within the log period after having drilled to the 9-5/8" casing setting depth.

The 9-5/8" cas run, landed and cemented with no difficulties.

Mud materials used in this section were bentonite, barite, caustic soda, CC-16, CMC-LV, HPD polymer, Dextrid, soda ash, sodium bicarbonate, surflo W-300, and torque trim.

8-3/8" hole, 7" liner

The 8-3/8" hole was drilled to a total depth of 4063 m. A seawater/Q-Broxin mud system was used down to 3834 m, where a salt saturated/Dextrid mud system was built and used to drill the rest of the section. The mud weight was held at 1.46 r.d. down to 3711 m, where it was raised to 1.80 r.d., and further raised to 1.86 r.d. at 4652 m, which was maintained to TD.

Throughout this section the following hole problems were encountered:

- reaming from 4106 to 4114 m when running in the hole with a new bit.

- had 7 m fill on bottom at 4467 m after having made a round trip.
- reaming through a tight section at 4814 after a 3 stand wiper trip.
- had 445 kN overpull at 4482 m when pulling out of the hole from TD (4863 m).

When running the liner, there was no back flow. The running was stopped, circulation initiated and had return flow when circulating at 10 SPM. The mud was treated for unbalance and high viscosity, and the running of the liner continued, circulating 5 - 10 SPM every 5 stand. The liner was landed and cemented having full return flow.

Mud materials used in this section where barite, caustic soda, CC-16, CMC-LV, HPD polymer, Dextrid, Q-Broxin, salt, soda ash, sodium bicarbonate, XC polymer, Durenex, and surflo W-300.

5-7/8" and 5-27/32" sections

A 5-7/8" hole was drilled 5027 m, and the well was drilled to a total depth of 5042 m using 5-27/32" bits.

The mud system used was the same as for the 8-3/8" section.

Throughout this section the following hole problems were encountered:

- were unable to rotate at 4881 (after a bit change). Pulled out to the 7" liner shoe, maximum overpull 556 kN. Reamed back to bottom.
- reamed tight hole from 4982 to 5003 m after a bit change.

- due to low annular velocities (3.5 - 4.5 m/min) the drill cuttings tended to load up in the riser. The cooling effect of the riser caused the salt to precipitate and mask the drill cuttings when drilling the interval from 5013 m to 5038 m.

Mud materials used in this section were bentonite, barite, caustic soda, CC-16, CMC LV HPD polymer, Dextrid, Q-Broxin, salt, soda ash, sodium bicarbonate, XC polymer, Durenex, Coat B-1400, and surflo W-300.

6.4 CEMENT REPORTS

The amounts of cement and cement additives are theoretical and do not include losses during transportation and losses on the rig.

30" CASING

The 30" casing was landed with the shoe at 198 m and cemented. The 30" casing was cemented back to the seabed by pumping cement through a 3-1/2" tubing stringer into the 36" hole - 30" casing annulus.

<u>Slurry</u>	<u>Composition</u>	<u>Total used</u>
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Lead slurry

Class "G" cement		19.2 ton
Yield	1.11 m ³ /ton	
Sea water	0.63 m ³ /ton	12.1 m ³
Caustic	9.48 kg/ton	0.182 ton
Econolite	0.15 m ³ /ton	2.88 m ³
Density	1.68 r.d.	
Thickening time	3.30 hrs. at 7° C (45° F)	

Spacer slurry

Class "G" cement		6.4 ton
Yield	0.80 m ³ /ton	
Sea water	0.48 m ³ /ton	3.07 m ³
Caustic	0.72 kg/ton	4.6 kg
Density	1.87 r.d.	
Thickening time	4.30 hrs. at 7° C (45° F)	

Tail in slurry No. 1 (4% CaCl₂)

Class "G" cement		10.87 ton
Yield	0.83 m ³ /ton	
Sea water	0.42 m ³ /ton	4.56 m ³
CaCl ₂	0.096 m ³ /ton	1.04 m ³
Density	1.87 r.d.	
Thickening time	1.55 hrs at 7° C (45° F)	

<u>Slurry</u>	<u>Composition</u>	<u>Total used</u>
<u>Tail in slurry No. 2</u> (used only sea water due to problems in the pump room.)		
Class "G" cement		5.97 ton
Yield	0.85 m ³ /ton	
Sea water	0.44 m ³ /ton	2.64 m ³
Density	1.87 r.d	

Grouting slurry

Class "G" cement		12.8 ton
Yield	0.85 m ³ /ton	
Sea water	0.39 m ³ /ton	5.0 m ³
CaCl ₂	0.143 m ³ /ton	1.83 m ³
Density	1.87 r.d	
Thickening time	52 min at 7° C (45° F)	

20" Casing

The 20" casing was landed with the shoe at 605 m and cemented back to the sea bed. Due to mixing problems 10 tons lead slurry was displaced around.

<u>Slurry</u>	<u>Composition</u>	<u>Total used</u>
<u>Lead slurry</u>		
Class "G" cement		100 ton
Yield	1.46 m ³ /ton	
Sea water	1.10 m ³ /ton	110 m ³
Econolite	0.05 m ³ /ton	5 m ³
Density	1.5 r.d	
Thickening time	6.01 hrs. at 27° C (80° F)	

<u>Slurry</u>	<u>Composition</u>	<u>Total used</u>
<u>Tail in slurry</u>		
Class "G" cement		10 ton
Yield	0.77 m ³ /ton	
Sea water	0.46 m ³ /ton	4.6 m ³
Density	1.89 r.d	
Thickening time	5.15 hrs. at 35° C BHST (95° F)	

13-3/8" CASING

The 13-3/8" casing was landed with the shoe at 2002 m and cemented. The return flow was partially lost after having pumped approximately 1/7 of total displacement volume, and totally lost after having pumped approximately 5/7 of total displacement volume. The temperature log was not conclusive, but due to cement contaminated return mud it is believed that the cement is brought above the 20" casing shoe.

<u>Slurry</u>	<u>Composition</u>	<u>Total used</u>
<u>Lead slurry</u>		
Class "G" cement		113.63 ton
Yield	1.41 m ³ /ton	
Fresh water	1.05 m ³ /ton	6.97 m ³
Econolite	0.05 m ³ /ton	5.68 m ³
Density	1.5 r.d	
Thickening time	5.05 hrs. at 41° C BHST (106° F).	

Tail in slurry

Class "G" cement		16.20 ton
Yield	0.76 m ³ /ton	
Fresh water	0.43 m ³ /ton	6.97 m ³
CFR-2L	0.026 m ³ /ton	0.42 m ³
Density	1.89 r.d	
Thickening time	3.35 hrs. at 53° C BHST (127° F)	

9-5/8" CASING

The 9-5/8" casing was landed with the shoe at 3525 m and cemented.
The top of the cement was not located from the temperature log.

<u>Slurry</u>	<u>Composition</u>	<u>Total used</u>
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Lead slurry

Class "G" cement		48.1 ton
Yield	1.22 m ³ /ton	
Fresh water	0.80 m ³ /ton	37.9 m ³
CFR-2L	0.0257 m ³ /ton	1.24 m ³
HR-GL	0.0089 m ³ /ton	0.43 m ³
Econolite	0.0355 m ³ /ton	1.70 m ³
Density	1.58 r.d	
Thickening time	6.02 hrs. at 72° C BHST (161° F)	

Tail in slurry

Class "G" cement		16.9 ton
Yield	0.77 m ³ /ton	
Fresh water	0.39 m ³ /ton	6.6 m ³
CFR-2L	0.0257 m ³ /ton	0.43 m ³
FL-1	0.0355 m ³ /ton	0.60 m ³
HR-GL	0.0027 m ³ /ton	0.04 m ³
Density	1.89 r.d	
Thickening time	4.58 hrs. at 100° C BHST (212° F)	

7" LINER

The 7" liner was set with the shoe at 4863 m and top of sleeve at 3375 m. The liner was cemented back to the hanger. When testing the liner overlap, it did not hold pressure. A squeeze cement job was then performed.

<u>Slurry</u>	<u>Composition</u>	<u>Total used</u>
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Lead slurry

Class "G" cement		13.45 ton
Yield	0.91 m ³ /ton	
Salt	0.37 ton/m ³ fresh water	5.2 ton
Saturated salt		
water	0.59 m ³ /ton	7.95 m ³
HR-12	0.6%	0.148 ton
Density	1.90 r.d	

Tail in slurry

Class "G" cement		30.16 ton
Yield	1.01 m ³ /ton blended cement	
Salt	0.37 ton/m ³ fresh water	14.6 ton
Saturated salt		
water	0.56 m ³ /ton blended cement	
Silica fluor (preblended in the cement)		
	15%	4.56 ton
HR-12 (preblended in the cement)		
	0.7%	0.22 ton
Halad-22a (preblended in the cement)		
	0.5%	0.16 ton
Density	1.90 r.d	

<u>Slurry</u>	<u>Composition</u>	<u>Total used</u>
<u>Squeeze cement slurry</u>		
Class "G" cement		7.1 ton
Yield	0.76 m ³ /ton	
Fresh water	0.38 m ³ /ton	2.70 m ³
CFR-2L	0.026 m ³ /ton	0.185 m ³
FL-1	0.035 m ³ /ton	0.0249 m ³
HR-GL	0.0044 m ³ /ton	0.0312 m ³
Density	1.98 r.d	

ABANDONMENT PLUGS

For detailed sequence of events, refer to chapter B-4 and figure B-3.

Plug No. 1

A balanced plug set across the 7" liner shoe from 4913 m to 4813 m.

<u>Slurry</u>	<u>Composition</u>	<u>Total used</u>
Class "G" cement		2.0 ton
Yield	0.91 m ³ /ton	
Saturated salt water	0.59 m ³ /ton	1.18 m ³
Salt	0.033 ton/ton cement	0.066 ton
HR-12 L	0.013 m ³ /ton	0.026 m ³
Density	1.89 r.d.	
Thickening time	4 hrs. 45 min.	

Plug No. 2

A balanced plug set across the 7" liner top from 3425 m to 3325 m.

<u>Slurry</u>	<u>Composition</u>	<u>Total used</u>
Class "G" cement		3.63 ton
Yield	0.77 m ³ /ton	
Fresh water	0.43 m ³ /ton	1.56 m ³
CRF-2L	0.013 m ³ /ton	.047 m ³
HR-12L	0.009 m ³ /ton	.033 m ³
Density	1.89 r.d.	
Thickening time	5 hrs. +	

Plug No. 3

A balanced plug inside the 9.5/8" casing from 530 m to 480 m.

<u>Slurry</u>	<u>Composition</u>	<u>Total used</u>
Class "G" cement		2.40 ton
Yield	0.77 m ³ /ton	
Fresh water	0.46 m ³ /ton	1.10 m ³
Density	1.89 r.d.	
Thickening time	4.5 hrs.	

Plug No. 4

A balanced plug inside the 9.5/8" casing from 285 m to 185 m.

<u>Slurry</u>	<u>Composition</u>	<u>Total used</u>
Class "G" cement		4.79 ton
Yield	0.77 m ³ /ton	
Fresh water	0.46 m ³ /ton	2.23 m ³
Density	1.89 r.d.	
Thickening time	5 hrs.	

Squeeze cement slurry

Squeeze cemented into the 13-3/8" casing by 20" casing after having:

- cut the 9.5/8" casing at 182 m
- set a 13-3/8" EZ drill packer at 180 m
- cut the 13-3/8" casing at 1775 m

<u>Slurry</u>	<u>Composition</u>	<u>Total used</u>
Class "G" cement		46.0 ton
Yield	0.76 m ³ /ton	
Fresh water	0.43 m ³ /ton	19.8 m ³
CFR-2L	0.026 m ³ /ton	1.2 m ³
Density	1.89 r.d.	

Plug No. 5

A balanced plug inside the 20" casing from 173 m to 145 m.

<u>Slurry</u>	<u>Composition</u>	<u>Total used</u>
Class "G" cement		7.3 ton
Yield	0.66 m ³ /ton	
Fresh water	0.39 m ³ /ton	2.86 m ³
Density	1.89 r.d.	

7. TOTAL COST REPORT

Location expences	N.kr.	525.000
Rig contract	"	36.000.000
Supplies	"	16.000.000
Services	"	15.000.000
Cost related to Operations	"	<u>7.475.000</u>
 TOTAL	Nkr.	<u>75.000.000</u>

TABLE B 4

BIT RECORD

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COUNTY				FIELD			STATE		SECTION		TOWNSHIP		RANGE		LOCATION						WELL NO.				
CONTRACTOR				RIG NO.	OPERATOR						TOOLPUSHER			SALESMAN									15/5-3		
GOLAR NOR / NORTRYM				NORSK HYDRO																					
SPUD	UNDER SURF.	UNDER INTER.	SET SAND ST.	REACHED T.D.	PUMP NO. 1						LINER	PUMP NO. 2			LINER	PUMP POWER			TYPE MUD						
DRILL PIPE		SIZE						TYPE		O.D.		NUMBER		O.D.		I.D.		LENGTH		DRAWWORKS POWER					
		TOOL JOINTS						DRILL COLLARS																	
NO.	SIZE	MAKE	TYPE	JET 32ND IN	SERIAL	DEPTH OUT	M.F.	HOURS	M./HR	ACCUM. DRLG. HRS.	WT. 1000 LBS. N	R.P.M.	VERT. DEV.	PUMP PRESS	PUMP OPERATION	S.P.M.	MUD		DULL. COND.			FORMATION REMARKS			
																1	2	WT.	VIS.	W.L.	T	B	G	OTHER	
1	26"	HTC	CSC 3 AJ	3 x 24		198	75	23 1/2	3.2	23 1/2	22	70	3/4	42	P	70	70	-	-	-	5	3	I		
	36"	SERVCO	HO			(12 M AND 4 1/2 HRS. ARE REAMING / REDRILLING)																			
2	26"	HTC	OSC 3 AJ	3 x 24	RM 371	198	78	17 1/2	4.5	41	44	70	1 1/2	48	P	70	70	-	-	-	3	2	I	RE-SPUD	
	36"	SERVCO	HO																						
3	17-1/2"	SMITH	SDS	3 x 22	WJ 838	615	417	18	23.1	59	35	115	1/2	159	P	100	100	0.08	-	-	2	3	I		
4	17-1/2"	SMITH	DSJ	3 x 28		615	417	9	46.3	68	22	50	1/2	150	P	100	100				2	8	I		
	26"	SERVCO	UR																						
5	17-1/2"	SMITH	SDS	3 x 24	WR 536	622	23	2 1/2	CEMENT	71	44	50	1/2	134	P	100	100	1.13	48	7	3	2	I	BT	
6	17-1/2"	SMITH	SDS	3 x 24	WR 332	1735	1113	46 1/2	23.9	117	22	120	1/2	220	P	95	95	1.10	46	7	6	5	1/8		
7	17-1/2"	SMITH	SDG	3 x 24		2029	294	16	18.4	133.5	266	150	3/4	220	P	95	95	1.13	55	7.5	4	3	I		
8	12-1/4"	HUGHES	XDG	3 x 13		2050	21	5	4.2	138.5	222	80	-	220	P	63	63	1.26	45	7	2	3	I	BT	
9	12-1/4"	HUGHES	XDG	3 x 13		2052	2	3.5	.6	142	133	70	1/2	-	220	P	62	62	1.26	55	6-8	3	CONES SKIDDED	DRILLED ON JUNK	
10	12-1/4"	HUGHES	XDG	3 x 13		2125	73	11	6.6	153	155	120	10	220	P	60	60	1.26	55	8	7	4	1/8	BT	
11	12-1/4"	HUGHES	XDG	3 x 13		2282	157	12.5	12.6	165.5	155	120	10	220	P	61	61	1.27	55	7-8	5	5	1/8		
12	12-1/4"	HUGHES	XDG	3 x 13		2335	53	7	7.6	172.5	111	110	1/2	220	P	60	60	1.28	51	7.8	4	3	I		
13	12-1/4"	HUGHES	XDV	3 x 13		2598	263	22.5	11.7	195	155	120	10	241	P	66	66	1.26	55	6-10	7	5	I		
14	12-1/4"	HUGHES	XDV	12-13-13		2674	77	28.5	2.7	223.5	258	90		241	P	64	64	1.28	45	55	8-10	3	3	I	
15	12-1/4"	HTC	XDV	12-13-13	264 FF	2721	47	18.5	2.5	242.0	258	80	100	10	241	P	64	64	1.28	45	55	9	3	I	
16	12-1/4"	DIAMOND BOART	LX 13	-	1600 CTS	3345	624	162	3.9	404	155	100	3 1/2	276	P	70	70	1.46	45	8.4					
17	12-1/4"	SMITH	F2	12-13-13	WJ 241	3376	31	23 1/2	1.3	435	244	55	4	217	P	52	52	1.46	45	8.2	3	8	I	BT, LT	
18	12-1/4"	HUGHES	XDV	12-13-13	265 FF	3433	57	38 1/2	1.5	473	267	90	4	224	P	54	55	1.46	45	9.8	4	7	I		
19	12-1/4"	HUGHES	XDV	12-13-13	266 FF	3477	44	25 1/2	1.7	499	267	100	3 1/2	241	P	57	57	1.46	49	8.7	3	8	I		

TABLE B 4

BIT RECORD

PRINTED IN U. S. A.

COUNTY				FIELD			STATE		SECTION		TOWNSHIP		RANGE		LOCATION				WELL NO.			
CONTRACTOR				RIG NO.	OPERATOR		NORSK HYDRO						TOOLPUSHER		SALESMAN				3			
SPUD	UNDER SURF.	UNDER INTER.	SET SAND ST.	REACHED T.D.	PUMP NO. 1	LINER			PUMP NO. 2			LINER			PUMP POWER		TYPE MUD					
DRILL PIPE		SIZE			TYPE	O.D.			NUMBER			O.D.			I.D.		LENGTH		DRAWWORKS POWER			
TOOL JOINTS		JET 32ND IN			SERIAL	DEPTH OUT			DRILL COLLARS						SPM		MUD		DULL. COND.	FORMATION REMARKS		
NO.	SIZE	MAKE	TYPE	JET 32ND IN	SERIAL	DEPTH OUT	M	HOURS	M/HR	ACCUM DRLG HRS.	WT. 1000 N	R P M	VERT DEV.	PUMP PRESS	PUMP OPERATION	1	2	WT.	VIS.	W.L.	T B G OTHER	
20	12-1/4"	HUGHES	XDV	1 X 12 2 X 13	232 WK	3544	67	36 1/2	1.8	535½	267	100	3½	241/262	P	58	59	1.46	50	8.9	4 8 I	
21	12-1/4"	HUGHES	XDV	3 X 13	228 WK	WIPER TRIP																
RR21	12-1/4"	HUGHES	XDV	3 X 13	228 WK	WIPER TRIP																
22	8-3/8"	SMITH	SVH	3 X 11	AF 3401	3568	24	13	1.8	548½	111 178	80	3⁹	241	P	44	43	1.46	45	7.4	5 7 1/8 BT + DRILLED CMT.	
23	8-3/8"	HUGHES	J3	2 X 10 1 X 11	JE 062	3650	82	28	2.9	576.5	155	80	1⁹ 64	241	S	80	-	1.46	47	7.0	7 5 1/6	
24	8-3/8"	SMITH	SVH	1 X 10 2 X 11	AF 3613	3682	32	18	1.8	594.5	133 178	80	6¹ 4	241	P	40	40	1.46	47	6.5	3 8 I BT	
25	8-3/8"	HUGHES	J33	2 X 10 1 X 11	WN-246	3715	33	24.5	1.35	619.0	155 169	80/60	7¹ 4	241	S	68	68	1.46	40 50	8-10	3 4 I	
26	8-3/8"	D. BOART	TB 521	-	7900107	3815	100	47.5	2.1	666.5	133 142	140/45	8	220	S	98	98	1.8	55	5-6	- - -	
CB-1	8-3/8"	D. BOART	CB 307	-	7080321	3834	19	5	3.8	671.5	80			82	S	80		1.8	60	5.8	GOOD	
27	8-3/8"	HUGHES	J33	2 X 10 1 X 11	WN-248	WIPER TRIP									S							
28	8-3/8"	HUGHES	XDG	2 X 10 1 X 11	WK 554	4114	280	21 1/2	13.0	693.0	133 142	90/100	7¹ 4	240	P	70		1.8	55	1.9	4 6 I BT	SALT ANHYDRITE
29	8-3/8"	HUGHES	XDG	2 X 10 1 X 11	WK 555	4350	236	28	8.4	721	155	80	7¹ 4	241	S	69	68	1.8	55	2.6	5 7 I BT	SALT ANHYDRITE
30	8-3/8"	SMITH	SVH	2 X 10 1 X 11	AL 7761	4467	117	19	6.2	740	175	100	6	241	S	69		1.8	58	3.2	6 8 I	" "
31	8-3/8"	HUGHES	XDG	2 X 10 1 X 11	119 RK	4737	270	24	11.3	764	155	90	6	248	S	68		1.86	61	3 7 8 I	BT	" "
32	8-3/8"	HUGHES	XDG	2 X 10 1 X 11	556 WK	4851	114	18	6.3	782	155	90/100	6	248	S	68		1.86	56	4.1	8 8 I	SALT - MARL SHALE
33	8-3/8"	SMITH	SVH	2 X 10 1 X 11	AL 7752	4863	12	6	2.0	788	178	90	6	241	S	64		1.86	58	5.3	2 4 I	SHALE + MARL
34	8-3/8"	SMITH	SVH	-	AF 3407	WIPER TRIP																
RR34	8-3/8"	SMITH	SVH		AF 3407	WIPER TRIP																
RR34	8-3/8"	SMITH	SVH		AF 3407	DRILLING 39 M CEMENT																
35	5-7/8"	HUGHES	WR	REG	400 FF	DRILLING FLAPPER VALVE													3 5 I	BT		
36	5-7/8"	HUGHES	OMVJ	REG	488 LF	DRILLED 55 M CEMENT													4 6 I	BT		
37	5-7/8"	SMITH	F5	3 X 11	AN 1605	4888	25	17.5	1.4	805.5	66	45		262	S	57	1.86	65	6.2	1 4 I	6	

PRINTED IN U. S. A.

BIT RECORD

TABLE B 4

DAILY MUD PROPERTIES

TABLE B-5

1

WELL: 15/5-3

SPUD MUD

DATE	DEPTH	SP.GR. WT.	VIS SEC.	CORR. 115°F	GELS		PH	FLUID LOSS		CL, X 10³ CACL NACL MGL	ALKALINITY			TH PPM	RETORT			CEC LBS/ BBL	% SAND	MG++ PPM		
					PV	YP		10"	10'		BLACK STRIP	100PSI API	500PSI 300°F HP.HF	PF	PM	MF	% OIL	% SOL	% WATER			
24.08	198	1.05	100																			
25.08	390	1.08																				
26.08	615	1.08																				
27.08	615	1.15	44	5	15	4	10		8		8.4											
28.08	615	1.15	100		HIGH VISCOSITY PILL																	
29.08																						
30.08	623	1.05	48	15	7	1	7	9.5	6.6			27	.3		.6	840	5	93	20			
31.08	940	1.13	46	15	6.5	3	11	9.4	7.2			22	.25		.6	320	6	93	22.5			
01.09	1354	1.10	.48	16	10	3	7	9.5	7.0			24	.3		.65	280	6	93	18			
02.09	1735	1.13	47	15	9.5	5	5	9.3	7.4			26	.3		.6	800	5	93	20			
03.09	2020	1.13	55	16	12	5	5	9.4	7.5			24	.3		.6	820	6	93	18.5			
04.09	2020	1.18	55	13	12.5	5	10	9.3	8.2			24	.3		.6	800	8	91	19			
05.09	2028	1.34	48	16	13	5	12	9.0	16			25	.2		.7	1940	15	84	20			
06.09	2030	1.33	47	13	13	6	12	9	15			25	.2		.6	2000	14	85	20	1/2		
07.09	MIXING	NEW MUD ON SURFACE																				
08.09	1977	1.26	54	20	9	3	6	9.6	8			15	.3		.6	600	7	92	15	TR		
09.09	2002	1.26	45	11	8	3	6	9.8	7			15.3	.4		.7	600	7	92	15	TR		
10.09	2051	1.26	56	17	10	3	7	9.8	8.4			15.6	.4		.8	800	7	92	15	TR		
11.09	2115	1.26	55	17	7	3	7	9.8	8			15.5	.4		.8	800	9	90	15	TR		
12.09	2283	1.27	55	17	8	3	7	9.9	7.8	22		15.5	.4		.8	880	10	89	15	1/2		
13.09	2336	1.28	51	18	7	3	7	9.7	7.8	21		15.7	.4		.8	840	10	89	13	1/2		
14.09	2567	1.28+	49	17	8	3	7	9.7	7.6	21		16	.35		.8	880	9	90	12.5	1/2		
15.09	2599	1.27	55	18	10	3	7	9.8	8.2	23		16	.3		.8	960	9	90	13	1/2		
16.09	2647	1.28	47	17	7	3	6	9.8	7	20		17.2	.4		.8	1000	8	91	12.5	0		
17.09	2676	1.28	50	15	9	3	7	9.5	8	23		17.8	.35		.8	1000	9	90	12.5	0		
18.09	2721	1.26+	47	14	10	3	7	9.5	7.8	23		18.4	.35		.8	880	9	90	12.5	0		
19.09	2825	1.26	51	15	10	3	9	9.5	7.8	22		19.5	.3		.9	960	8	91	12.5	0		

DATE SPUD:

DATE T.D.:

17.08.80

TABLE B-5

DAILY MUD PROPERTIES

WELL: 15/5-3

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DATE	DEPTH	SP.GR. WT.	SEC.	VIS	CORR. 115°F	GELS			BLACK STRIP	FLUID LOSS		CL X 10 ³	ALKALINITY			TH PPM	RETORT			CEC LBS/ BBL	% SAND	MG ⁺⁺ PPM
						PV	YP	10"		100PSI API	500PSI 300°F HP HT		PF	PM	MF		% OIL	% SOL	% WATER			
						PASCALS		10'														
20.09	2930	1.26	50		14	11	3	10	9.4	8.4	19.2	19	.3	.3	.9	520		8	90	12.5	0	
21.09	3018	1.27	45		12	10	4	11	9.2	8.8	19.8	19	.2	.2	.4	560		8	90	12.5	0	
22.09	3107	1.27	46		13	14	5	13	9.2	9.2	20.4	20	.2	.2	1.0	280		10	89	12.5	TR	
23.09	3159	1.40	50		15	11	3	20	10.1	9.6	20.8	21	.4	6.1	1.3	320		17	82	17.5	TR	
24.09	3235	1.46	49		22	8	4	15	9.3	9.8	21.2	22	.3	2	.9	320		18	81	17.5	TR	
25.09	3318	1.46	51		21	10	4	20	8.8	12.2	21.8	23	.1	.9	.4	406		19	80	20	TR	
26.09	3345	1.46	45		21	6	3	14	9.3	8.4	19.2	24	.3	1.5	.8	280		18	81	20	TR	
27.09	3352	1.46	53		21	7	3	18	9.1	9.4	21.8	24	.2	1.6	.8	360		19	80	20	TR	
28.09	3376	1.46	45		17	6	2	18	10.1	8.2	21.6	24	.4	2.3	1.4	200		16	83	17.5	TR	
29.09	3398	1.46	46		21	7	3	16	9.6	8.6	21.8	22	.2	1.5	.9	200		16	83	17.5	TR	
30.09	3431	1.46	45		17	9	3	16	9.0	9.8	21.8	23	.2	.9	.8	160		17	82	17.5	TR	
01.10	3456	1.46	46		17	11	3	16	9.0	8.6	24	23	.2	1.2	.9	200		17	82	17.5	TR	
02.10	3470	1.46	47		18	8	3	15	9.1	8.2	35	23	.3	1.5	.8	160		16	83	17.5	TR	
03.10	3502	1.46	49		17	12	5	21	9.1	8.7	48	22	.2	1.2	.7	200		17	82	20.2	TR	
04.10	3540	1.46	49		18	12	5	18	9.4	8.9	39.5	23	.5	1.1	1.0	240		17	82	20.5	TR	
05.10	3540	1.46	50		19	12	5	18	9.3	8.9	37	23	.4	1.0	.9	240		17	82	20.5	TR	
06.10	3544	1.46	50		20	12	7	19	9.3	9.1	38	23	.4	1.0	.8	260		18	81	20.5	TR	
07.10	3544	1.46	50		20	12	7	19	9.4	9.0	39	23	.5	1.2	1.0	240		18	81	20	TR	
08.10	3544	1.46	50		20	12	7	19	9.4	9.0	39	23	.5	1.2	1.0	240		18	81	20	TR	
09.10	3544	1.46	50		20	12	7	19	9.4	9.0	39	23	.5	1.2	1.0	240		18	81	20	TR	
10.10	3544	1.46	50		20	12	7	19	9.4	9.0	39	23	.5	1.0	1.2	240		18	81	20	TR	
11.10	3568	1.46	45		18	7	2	6	9.8	7.4	21.5	23	1.2	3.7	2.0	240		17	82	20	.75	
12.10	3591	1.46	44		20	6	2	8	9.4	7.2	19.6	23	.9	2.6	1.7	380		17	82	20	TR	
13.10	3649	1.46	47		26	7	2	7	9.4	7.0	18.5	23	.8	2.4	1.3	300		17	82	18	TR	
14.10	3674	1.46	45		20	6	2	6	9.5	6.4	18.2	23	1.1	2.5	2.0	380		16	83	18	.25	
15.10	3692	1.46	47		21	7	2	7	9.5	6.5	18.4	23	1.1	2.5	2.0	240		16	83	18	.25	
16.10	3715	1.8	55		30	10	6	14	9.2	7.1	19.8	23	.3	1.3	.8	200		19	80	18	.5	
17.10	3740	1.79+	58		34	11	3	21	9.7	6.2	20	23	.4	2.3	1.2	200		28	71	20	.25	

DATE SPUD:

DATE T.D.:

DAILY MUD PROPERTIES

TABLE B-5

WELL: 15/5-3

3

DATE	DEPTH	SP.GR.	VIS SEC.	CORR. 115°F	GELS		PH	FLUID LOSS		CL, 10 ³ CACL NaCl MG/L	ALKALINITY			TH PPM	RETORT			CEC LBS/ BBL	% SAND	MG PPM
					PV	YP		PASCALS 0	10		BLACK STRIP	100PSI API	500PSI 300°F HP HT	PF	PM	MF	% OIL	% SOL	% WATER	
18.10	3783	1.80	53	39	9	3	13	10.1	5.4	20.0	21	.6	2.3	1.4			27	72	20	.25
19.10	3815	1.80	56	38	10	3	11	9.8	5.6	20.4	21	.6	2.3	1.2			27	72	17.5	.25
20.10	3826	1.80	60	34	10	3	12	9.5	5.8	21.2	22	.4	1.5	1.4			28	71	20	.25
21.10	3834	1.80	47	31	7	2	9	9.6	5.4	22.0	33	.5	1.7	1.7			26	72	20	.25
22.10	3834	1.80	47	31	7	2	9	9.6	5.4	22.0	33	.5	1.7	1.7	960		26	72	20	.25
23.10	3834	1.81	55	32	8	2	9	9.7	5.8	23.0	48	.4	1.8	1.5	1000		27	71	20	.25
24.10	3834	1.80	73	38	11	2	13	8.9	4.7	15.0	190	.1	.6	.5	640		21	70	7.5	TR
25.10	4015	1.80	55	45	6	1	5	9.0	1.8	12.0	192	.2	.7	.5	560		20	71	7.5	TR
26.10	4114	1.81	55	45	7	1	8	8.8	1.9	19.0	185	.2	.9	.6	400		21	70	7.5	TR
27.10	4297	1.80	61	51	7	1	6	8.9	1.8	12.4	190	.1	.8	.5	400		23	68	7.5	TR
28.10	4350	1.80	57	48	5	2	9	8.8	2.6	11.8	180	.1	.6	.5	600		23	69	7.5	TR
29.10	4350	1.80	57	48	5	2	9	8.6	2.6	11.8	180	.1	.6	.5	600		23	69	7.5	TR
30.10	4388	1.80	54	40	6	3	7	8.8	3.4	14.5	184	.1	1.1	.4	360		23	68	5	TR
31.10	4467	1.80	58	42	7	3	7	9.0	3.2	16.3	184	.1	1.3	.5	360		23	68	5	TR
01.11	4653	1.86	57	40	6	3	7	9.0	2.9	16.0	184	.1	1.2	.4	440		24	67	5	TR
02.11	4738	1.86	61	40	7	3	8	9.0	3.0	16.4	183	.1	1.1	.4	480		23	68	5	TR
03.11	4848	1.86	56	40	8	3	10	8.7	4.1	16.9	182	.1	.6	.4	500 CA		23	68	5	TR 400
04.11	4851	1.86	56	40	7	3	16	8.5	4.5	16.9	183	.1	.6	.4	620		23	68	5	TR 500
05.11	4864	1.86	58	45	8	4	13	8.1	5.3	17.1	185	TR	.3	1.4	600		22	68	5	TR 780
06.11	4864	1.86	60	43	9	4	13	8.0	5.5	17.0	185	TR	.3	1.6	600		22	68	5	TR 780
07.11	4864	1.86	70	47	9	5	15	8.0	6.0	17.6	184	TR	TR	1.6	600		22	68	5	TR 780
08.11	4864	1.86	51	38	6	2	9	8.0	6.0	17.6	184	TR	TR	1.6	600		22	68	5	TR 780
09.11	4864	1.86	50	38	5	1	6	9.0	6.3	19.4	184	1.1	8.6	2.1	870		22	68	5	TR 850
10.11	4864	1.86	50	38	5	1	6	9.0	7.1	20.7	184	1.1	8.6	2.1	870		22	68	5	TR 850
11.11	4864	1.86	50	38	5	1	6	9.0	7.1	20.7	184	1.1	8.6	2.1	870		22	68	5	TR 850
12.11	4864	1.86	50	38	5	1	6	9.2	7.1	20.7	184	1.1	8.6	2.1	870		22	68	5	TR 850
13.11	4864	1.86	50	38	5	1	6	9.2	7.1	20.7	184	1.1	8.6	2.1	870		22	68	5	TR 850
14.11	4864	1.86	50	38	5	1	6	9.2	9.2		182	.3	8.4	.6	870		22	68	5	TR 850

DATE SPUD:

DATE T.D.:



DRILLING PROGRESS, WELL 15/5 - 3

(CONTINUED)

