3

MOBIL EXPLORATION NORWAY INC.

EXPLORATION WELL 35/11-1

Final well report.

License 090.

FORTROLIG
i h.t. Beskyttelsesinstruksen,
jfr. offentlighetsloven
§..... nr.....

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ENCLOSURE
Enclosure 1 Final composition log
Enclosure 2 Computer processed log interpretation
Enclosure 3 Computer processed log interpretation
Enclosure 4 V.S.P. display

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SECTION 1

GENERAL

1.1. LICENSE INFORMATION

DATE: 19 February 1985

AFE NO: 84300

WELL DESIGNATION: 35/11-1

WELL CLASSIFICATION: New field wildcat

RIG DATA:

CONTRACTOR: Golar Nor Offshore S.A.

RIG NAME: "NORTRYM"

RIG TYPE: Semisubmersible drilling rig

DRILLING DRAFT: 21.3 meters (above mean sea level)

KB ELEVATION: 25.0 meters

KB TO SEABED: 384.6 meters

WELL LOCATION AND DATA:

COUNTRY: Norway, North Sea

LICENSE: 090 (Block 35/11)

LATITUDE: 61° 10' 59.27" N

LONGITUDE: 03° 39' 44.95" E

SEISMIC LOCATION: SG - 8043 - 205 shot point 2360

WATER DEPTH: 359.6 meters

INTEREST:

Mobil (Operator)	40% (80% cost)
Statoil	50%
Norsk Hydro	10%

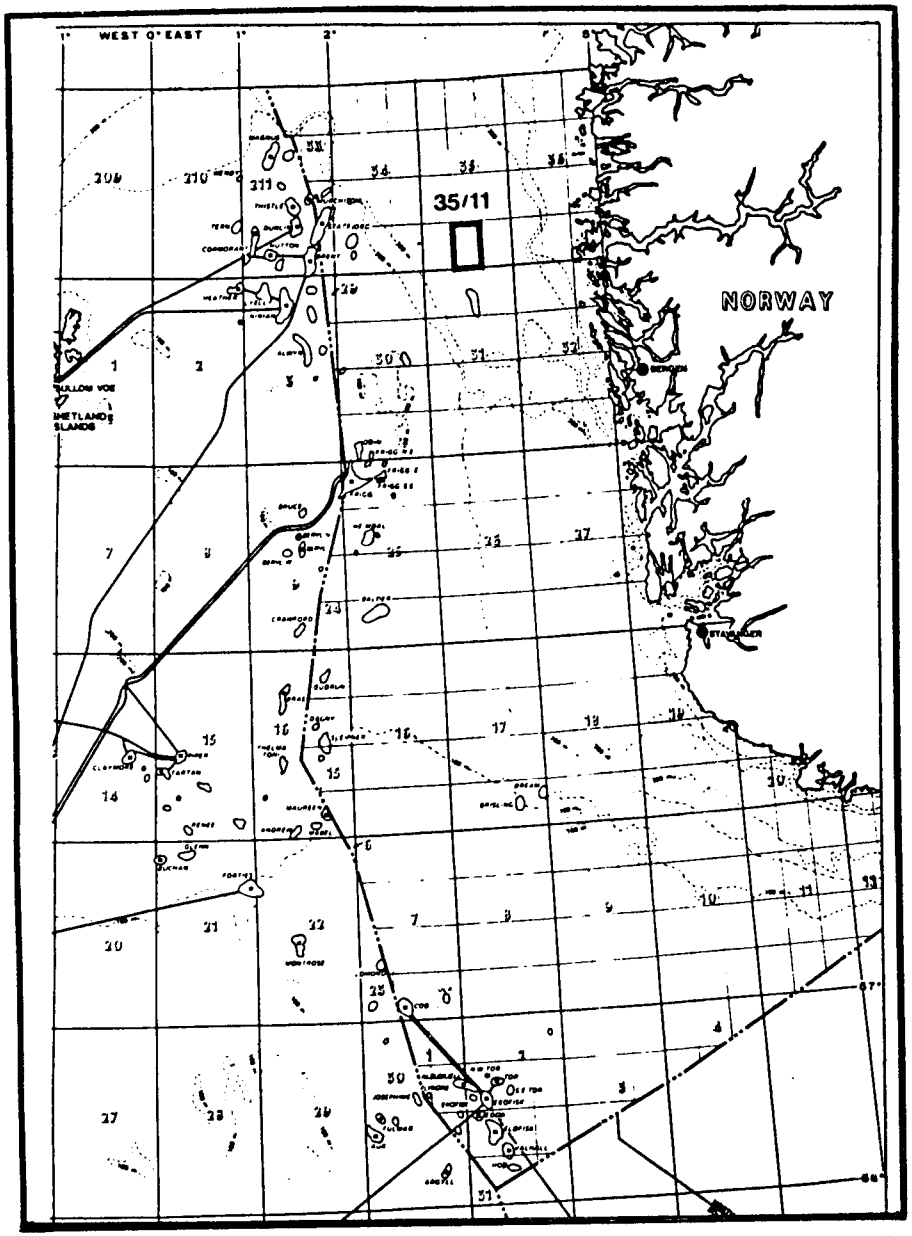
OBJECTIVES: Brent and Viking Group sands.

RESULT: Dry well

SPUD DATE: 23 May 1984

PRESENT STATUS: Plugged and abandoned.

TOTAL DEPTH: 3361 meters



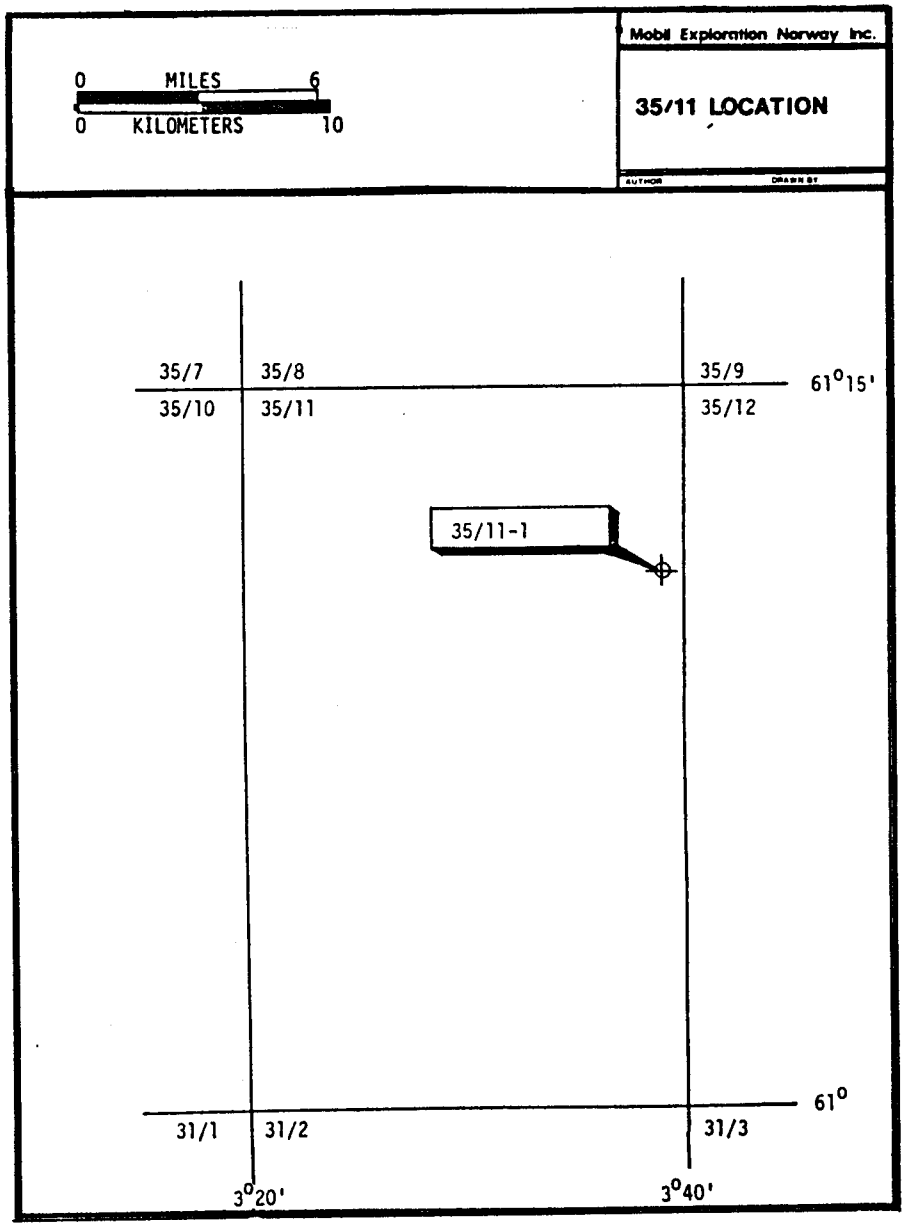


FIGURE 1 - 1
LOCATION MAP

1.3 WELL DATA SUMMARY

GENERAL DESCRIPTION

The well was spudded 23 May 1984, and was drilled on the "A" structure close to the border between Block 35/11 and Block 35/12. This was the first well to be drilled in Block 35/11, See Figure 1-1.

The primary objective of the well was to penetrate all potential productive horizons in the Jurassic and to penetrate the Triassic. The well was drilled to 3361 m KB which is approximately 96 meters into the rocks of Triassic. One core was recovered in the Brent Group in the interval from 2552.8 to 2562 m KB. The Jurassic was fully penetrated and no testing was undertaken. The well was considered as a "dry well" and was plugged and abandoned after 78 days on location.

WELL DRILLING TIME:

SPUD DATE	:	23 May 1984 at 1425 hrs.
ABANDONED	:	5 August 1984 at 0200 hrs.
DATE RIG ON LOCATION:		21 May 1984 at 1830 hrs.
DATE RIG RELEASED	:	7 August 1984 at 0500 hrs.
NUMBER OF DAYS ON LOCATION:		78 days

GEOGRAPHICAL DATA:

	Elevation: (mSS)	Drill Depth: (mKB)
TOP PALEOCENE	936.4	1321.0
TOP CRETACEOUS	1380.4	1765.0
TOP JURASSIC	1633.4	2018.0
TOP BRENT	2084.4	2469.0
TOP DUNLIN	2171.9	2556.5
TOP STATFJORD	2586.9	2971.5
TOTAL DEPTH	2976.4	3361.0

WELL PROGRAM:

Hole Size (inch)	Casing Size (inch)	Drill Depth (mKB)	Casing Depth (mKB)
36	30	510.0	506.5
26	20	1015.0	1003.0
17 1/2	13 3/8	2029.0	2026.0
12 1/4	9 5/8	2439.0	2425.7
8 1/2		3361.0	

SIDEWALL CORING:

Three CST runs were carried out and 83 samples of 130 shots were recovered. (Recovery 63.85%).

CST Run No.	Shots	Samples	Recovery %
1	30	30	100
2	30	19	63.3
3	70	34	48.6

CONVENTIONAL CORING:

Core No.	Interval (m)	Recovered (m)	Recovery %
1	2552.8-2562.8	9.3 m	93.0%

LOGGING PROGRAM:

Type of Log	Run No.	Interval (m)
ISF/LSS/GR	1	506.0 - 1012.5
	2	1003.2 - 2027.0
	3	2026.5 - 2438.0
ISF/LSS/MSFL/GR	4	2426.5 - 3361.0
LDL/CAL/GR	1	1003.2 - 2026.0
	2	2027.0 - 2436.0
LDL/CNL/NGS	3	2426.5 - 3361.0
HRT	1	380.0 - 2390.0
CST/GR	1	1035.0 - 2027.0
	2	2114.0 - 2428.0
RFT	1	2113.0 - 2276.0
	2	2426.5 - 3242.0
SHDT/GR	1	2026.5 - 2438.0
	2	2426.5 - 3361.0
VSP/Check shot	1	550.0 - 3361.0
Temperature log	1	375.0 - 970.0
	2	375.0 - 970.0
	3	380.0 - 2010.0
NGS	1	2027.0 - 2430.0
	2	2426.0 - 3361.0

LIST OF CONTRACTORS

TYPE OF SERVICE		SERVICE COMPANY
Drilling contractor:		Golar Nor Offshore S.A.
Mud logging	:	The Analysts International S.A.
Electrical logging	:	Schlumberger Inland Services, Inc.
Mud service	:	Norsk Petroleum Services A.S.
Coring service	:	Norton Christiansen Drilling Products
Cementing service	:	Halliburton Overseas Limited (Norway)
Casing service	:	Nor Casing A.S.
Directional survey	:	Scientific Drilling Controls Limited SII Servco
Drilling jars	:	Kl Oil Tools A.S.
Surface production test equipment	:	Otis Overseas Inc.
Helicopter service	:	Helicopter Service A.S. Luft Transport A/S
Standby boat	:	"Rongos" Kåre Misje & Co.
Supply boats:	:	"Stad Scandia" - Stad Seaforth Shipping "Stad Sailor" - " " " "Skandi Alfa" - Austevoll Supply A/S "Northern Fortune" - Støbakk & Volle "Viking Queen" - Laurits Eidesvik & Co.
Site survey	:	"Geo Scanner" - A/S Geoteam
Navigation service	:	Racal Survey Norge A/S

SECTION 2

GEOLOGY, GEOPHYSICS AND FORMATION EVALUATION

2.1 PURPOSE AND OBJECTIVES OF THE WELL.

The work obligation for Eighth Round licence 090 calls for three exploration wells, all to be drilled to 4000 meters or to Triassic sediments. One of the wells has to test a Lower Cretaceous stratigraphic play that runs north-south through the middle of Block 35/11. The block must also be covered by at least a 1x1 kilometer grid of good quality seismic.

Well 35/11-1 reached a TD of 3361 meters in rocks of Triassic age, and thus met the requirements put forward in the work obligation. Its primary objective was to assess the hydrocarbon potential in Middle to Upper Jurassic strata on the "A" structure that straddles the border between Block 35/11 and the unlicenced Block 35/12. Sands of Lower Jurassic age were regarded as secondary objectives.

2.2 RESULTS

The well reached Jurassic strata at 2018 meters KB. The 451 meter thick Viking Group is dominated by argillaceous material, but water-wet arenitic sections with a net reservoir thickness of 77.7 meters are scattered throughout. Average porosity in the reservoir section is 20.6%.

The top of the Brent Group was penetrated at 2469 meters KB. Interbedded coals, clays and thin sands dominate the Ness Formation. The Etive Formation and large parts of the Dunlin Group are mainly arenitic. The gross thickness of the interval between the top Brent Group and the Statfjord Formation is 502.5 meters. The net reservoir thickness in this part of the well is 255.2 meters with an average porosity of 17.2%. No hydrocarbons were present.

The well reached the top of the Statfjord Formation at 2971.5 meters and was drilled to a TD of 3361 meters in sediments of the Hegre Group. This Lower Jurassic to Triassic section consists to a great extent of sandy intervals, none of which were found hydrocarbon bearing. The net reservoir section was 208.8 meters over a gross interval of 384.3 meters. The average porosity was 13.7%

Details of the formation evaluation and RFT results are described in a separate chapter.

2.3 STRATIGRAPHY

The biostratigraphic evaluation of Well 35/11-1 was performed by Paleoservices Ltd. The results of their findings are contained in a special report. The analysis was based on ditch cuttings supplemented by sidewall cores. A copy of the ISF/LSS log was used to facilitate boundary placements.

The results of the analysis are summarized below:

510m-550m	Late Pliocene/Pleistocene
	Probable unconformity
550m-700m	Early Pliocene/Late Miocene
	Unconformity
700m-850m	Late Oligocene
850m-1140m	Middle and Early Oligocene
	Unconformity
1140m-1290m	Early Eocene
1290m-1440m	Basal Eocene?-Late Paleocene
1440m-1700m	Late Paleocene
1700m-1760m	Early Paleocene
1760m-1780m	Late Maastrichtian
1780m-1830m	Late-Early Maastrichtian
1830m-1990m	Campanian
1990m-2025m	Santonian
	Unconformity
2025m-2230m	Late Callovian-?Early Oxfordian
2230m-2287m	Indeterminate
2287m-2324m	Middle Callovian
2324m-2448m	Early Callovian-?Latest Bathonian
2448m-2470m	Late Bathonian
	Probable Unconformity
2470m-2533m	Probably Bajocian
2533m-2585m	Bajocian?-Aalenian
2585m-2656.5m	Early Toarcian?-Late Pliensbachian
2656.5m-2995m	Pliensbachian-Hettangian (Undifferentiated)
2995m-C3012M	Late Triassic, Rhaetian
C3012m-3362.5m	Triassic: Rhaetian and/or older?

2.4 LITOSTRATIGRAPHY

The following summary is mainly based on descriptions of ditch cuttings supplemented by descriptions of sidewall cores and the one core that was cut in the Middle Jurassic. Wireline logs were used to define formation boundaries.

Nordland and Hordaland Groups (510-1421m)

510m-550m. This section was composed of clay which was grey in color, very soft, sticky, and predominantly sub-blocky in nature, although it was occasionally amorphous and slightly calcareous.

550m-720m. From 550m the lithology was characterised by loose sands which comprised clear, milky, grey, occasionally light orange quartz grains. These were predominantly coarse grained, ranged from medium to very coarse. Generally, sorting could be described as moderate, with grains sub angular to round. Abundant mica was occasionally present.

Heavy traces of lignite were seen, especially around 630m. It appeared dark brown to black, moderately firm, fibrous and occasionally brittle.

Some limestone which was buff in color, firm and cryptocrystalline was observed at 650m.

Between 700m-720m the sands graded into siltstone, grey to brown, occasionally green, very soft, although occasionally moderately firm, sub-blocky, argillaceous and noncalcareous.

720m-1003m. The sands and siltstones above 720m were succeeded by clays which became slightly firmer with depth. In the upper part of this section the clay was grey, very soft, sticky, amorphous and non- calcareous. Shell fragments were common throughout this clay section, with some microfossils and foraminifera present below 900m. Small traces of sand and limestone were detected and were essentially the same in composition as those in the overlying sequence.

These sands were notably finer. By 1000m, the clay had graded into a grey, grey/brown, occasionally green claystone. This was moderately soft, but was firm in parts, blocky in nature and slightly calcareous.

1003m-1300m. This interval was composed of a uniform claystone sequence interbedded with thin limestone stringers which became increasingly dolomitic with depth.

The claystones were light to medium brown in color at the top of the interval, grading to light grey at the base. These clays were non- calcareous and glauconitic and, in parts, silty and micaceous.

The limestone stringers were red/brown, very hard and microcrystalline. As their magnesium content increased, they became lighter in color and more crystalline in nature.

Occasional small, loose sand horizons were encountered in the upper part of the interval. They consisted generally of clear or milky quartz grains, medium to coarse, sub angular to sub round. The sands were fairly well sorted. The first appearance of tuff was at 1300m.

Rogaland Group (1321-1765m.

Balder Formation (1321-1365m). Paleocene tuff, light grey and light green, speckled black, soft to firm, blocky, crumbly and non to slightly calcareous, made up the characteristic part of the lithology in the Balder Formation. The remainder reflects a similar sequence of claystone and limestone stringers as above.

Sele/Lista Formation (1365-1765m). The lithology in these formations reflected a similar sequence of claystone, limestone and dolomite stringers as above, with the addition of a larger sequence where sandstones made up part of the lithology. Traces of tuff occured down to 1520 meters. Sandstones were encountered from 1440m to the base of this interval. They were composed of clear quartz grains, fine to medium, generally subrounded to rounded, moderately well sorted and poorly cemented with a carbonate cement.

The limestone stringers were buff, hard, and microcrystalline, whereas the dolomite tended to be white, hard and crystalline.

Shetland Group (1765-2018m)

Calcareous claystones are important in this interval. They were predominantly grey, grey-brown, moderately firm, blocky, moderately to very calcareous and glauconitic. In parts they were subfissile and had some associated pyrite. From 1830m to the base of the interval the claystones became softer and increasingly sticky in nature as their carbonate content was greatly reduced.

Limestone was significant at 1764m where it appeared white to cream, soft to moderately hard, amorphous to blocky, sugary in texture, microcrystalline and argillaceous.

In the latter 150m of this interval siltstones became increasingly evident, particularly at 2018m. They were red/brown, soft, blocky, argillaceous and noncalcareous.

Viking Group (2018-2469m)

This section was characterised by a sequence of claystone with limestone and sandstone units.

A section of limestone interbedded with claystone, sandstone and siltstone was encountered between 2030m and 2100m. These limestones were light grey to brown in colour, moderately hard, microcrystalline, and had a dull yellow fluorescence, occasionally with a weak crush cut.

The claystone was typically light grey, grey/brown, soft, amorphous, slightly calcareous and very silty in parts. A sand section between 2100m and 2190m was composed of clear to translucent, loose quartz grains which were predominantly medium to coarse in size, subangular to rounded, and moderately well sorted. Occasional yellow fluorescence was seen, but no cut was observed. The quartz grains were occasionally bonded with a moderately hard calcareous cement. Traces of mica, glauconite, and lignite were also observed.

Interbedded with the sand was a sequence of grey/brown claystone which was soft to moderately firm, amorphous to blocky, silty and calcareous in parts, occasionally grading to siltsone. The claystone continued fairly homogeneously to the end of this section with associated traces of pyrite and lignite. Occasional limestone stringers were encountered within this sequence. They appeared dark grey in color, firm to moderately hard, crystalline and argillaceous.

Another sand unit was seen between 2245m and 2285m. It was composed of translucent loose quartz grains, which were predominantly medium sized, but ranged from fine to coarse. They were subrounded to subangular, well sorted, and were occasionally bonded with a moderately hard calcareous cement. Although a dull yellow fluorescence was observed, there was no cut. Between 2413m and 2439m, limestones reappeared. They were white to grey, soft to firm, crystalline and very argillaceous.

Brent Group (2469-2556.5m)

This section was composed primarily of claystone with interbedded coal seams, limestone and sandstone beds. The claystone was essentially the same in appearance as that occuring in the overlying sequence, grey/brown in color, soft to firm, amorphous, grading to blocky and subfissile with depth, moderately silty and slightly calcareous.

Several coal seams were encountered in the Ness Formation. They were generally between 4-6m in thickness and appeared black in colour, hard, blocky, brittle and silty in part.

From 2534m and downwards the amount of sandstone became significant. This sandstone consisted of clear, milky, white quartz grains which were subrounded to angular, medium in size and well sorted. The sandstone had good visible porosity and a moderately hard silica cement. Biotite occurred occasionally. These sands had no fluorescence and no cut.

Dunlin Group (2556.5-2971.5m)

The Dunlin Group was characterised by sandstone with interbedded claystone and traces of coal, limestone and siltstone.

The sandstone was relatively homogeneous throughout this section and appeared milky white in color, fine to medium in grain size, sub- angular to subrounded, well sorted, with a generally soft, moderately calcareous clay matrix. These sands had no fluorescence and did not yield a cut.

The interbedded claystone was essentially similar to the claystone in the above interval: grey/brown, occasionally white, soft, occasionally firm, amorphous grading to blocky, moderately sticky in nature and slightly to moderately calcareous. Traces of coal were evident throughout the interval.

Statfjord Formation (2971.5-3265m)

Sandstone interbedded with claystone and occasional thin beds of coal made up the characteristic lithology in this interval. The sandstone was clear to milky white, fine to very coarse, subangular to angular, moderate to poorly sorted with a soft clayey matrix. The sands had no fluorescence and did not yield a cut.

The interbedded claystone was essentially white to light grey, becoming red/brown towards the bottom of the interval, soft to moderately blocky and occasionally laminated with dark carbonaceous material. Traces of coal occured in the uppermost part of this interval. Small traces of white, soft to moderate firm, microcrystalline limestone were also observed.

Hegre Group (3265-3361m)

The Hegre Group was dominated by sandstone interbedded with red/brown clay.

The sandstone, generally the same as in the section above, was clear to milky white, occasionally yellow to orange, fine to very coarse, subrounded to subangular, moderate to well sorted often with a clayey matrix. No fluorescence or cut was seen in this sand.

The claystones frequently appeared red/brown in color, although in all other ways similar to the preceeding claystones.

2.5 HYDROCARBON SHOWS

A total gas detector and a gas chromatograph were used to evaluate hydrocarbon shows below the 30" casing shoe. In addition, shows on ditch cuttings were evaluated according to the "Geological Wellsite Manual" produced by Mobil Exploration and Producing Services Inc.

No oil stain and only minor fluorescence was recorded in cuttings, sidewall cores or cores in this well.

A summary of the gas record follows:

505.5-2018m. This interval is characterized by generally low background gas varying from trace amounts to 0.3% methane with peaks of .4 and .5% methane between 910 and 960 and between 1100 and 1110 meters respectively. The mud weight was gradually increased from 9.0 to 11.0 PPG over this interval.

2018-2054m. The background gas increased dramatically at 2018 meters with a peak of 8.1% methane, 0.3% ethane and 0.15% propane. The background gas dropped quickly off again and fluctuated between .2 and 1.5% methane below 2030 meters. The mud weight remainded 10.9 PPG throughout this entire interval.

2054-2445m. Before drilling out of the 13 3/8" casing shoe, the mud weight was increased to 12.1 PPG and gradually increased further to 13.1 PPG. While drilling, the maximum gas recorded was 0.5% methane with traces of ethane. The background gas remained generally below .2%.

2445-3361m. As it became apparent that the penetrated formations were normally pressured, the mud weight was gradually decreased from 13.0 to 11.0 PPG for the remainder of the well. The background gas was below .1% in this interval.

2.6 SIDEWALL CORE DESCRIPTION

Three CST runs were carried out in Well 35/11-1. Tables 2-1 through 2-6 on the following pages describe the side wall cores.

TABLE 2 - 1

Mobil Exploration Norway Inc. SIDE WALL CORES

RUN No.: 1

GEOLOGIST: DBW/JDF WELL NAME: 35/11-1 DATE: 06/25/84

No.	DEPTH	LITHOLOGY AND SHOW DESCRIPTION	REC. IN CM	POROSITY			SHOW			
				PR	FR	GD	TR	PR	FR	GD
30	1035	Clayst :dk gry,micaceous,soft,noncalc.								
29	1074	a/a,sl calc-noncalc.								
28	1139	Siltst :lt grn,arg,grading to vcrs sst.								
27	1165	Clayst :grn-gry,soft,noncalc.								
26	1258	Clayst :a/a,dk grn-gry,noncalc.								
25	1266	Clayst :dk red,firm,micaceous calc.								
24	1314	Clayst :dk gry,micaceous,firm,noncalc.								
23	1347	Clayst :vdk gry,firm,noncalc.								
22	1408	Clayst :a/a,noncalc.								
21	1435	Sandst :lt grn-gry,vfgr,arg,friable,sand fraction								
		composed of qtz,clr,arg fract is grn,								
		random inclusions of black mat,noncalc.								
20	1468	Clayst :gry,gry-brn,v sandy,calc,glauc stroaks,soft.	1.5							
19	1497	Clayst :dk brn-gry,firm,noncalc.								
18	1517	Clayst :dk gry-gry,a/a,noncalc.								
17	1545	Clayst :gry,soft,noncalc,tr glauc.	2.0							
16	1614	Clayst :dk gry,noncalc,firm.								
15	1660	Clayst :gry,soft,noncalc.	1.5							
14	1685	Clayst :dk gry,micaceous,noncalc,								
		randomly mottled with v arg sandst,vfg-silt.								
13	1720	Clayst :gry,soft,calc.	2.0							
12	1757	Clayst :gry,calc,micaceous,hard.								
11	1771	Clayst :gry,mod frm,calc.	1.5							
10	1785	Limest :wt,frm,chalky.	1.0							
9	1823	Clayst :dk gry,gry,calc,tr pyr,mica.	1.0							
8	1833	Clayst :dk gry,gry,calc,tr pyr,mica.	1.0							
7	1875	Clayst :dk gry,calc,pinpt mineral flour.								
6	1933	Clayst :dk gry,w/lt gry sandy streaks,	1.0							
		sand is vfgr,clr,noncalc.								
5	1965	Clayst :gry,dk-gry,firm,v sl calc.	0.5							

COMMENTS:

Form. MOEX N 12/H-1-76

TABLE 2 - 2

Mobil Exploration Norway Inc. SIDE WALL CORES

RUN No.: 1

GEOLOGIST: DBW/JDF WELL NAME: 35/11-1 DATE: 06/25/84

No.	DEPTH	LITHOLOGY AND SHOW DESCRIPTION	REC. IN CM	POROSITY			SHOW			
				PR	FR	GD	TR	PR	FR	GD
4	1997	Clayst :gry,dk-gry,firm,v sl calc.	0.5							
3	2023	Siltst :gry-dkgry,v sandy,vf gr,mica,bedding.	1.0							
2	2025	Siltst :gry-dkgry,streaked w/ltgry sandy stringers,	1.5							
		v sandy,vfgr,mica,glauc,no flour.								
1	2027	Siltst :gry,dkgry,v sandy,vfgr,mica,pyr nod,	1.5							
		streaked w/vf sand,lt gry,no flour.								

COMMENTS:

Form. MOEX N 12/H-1-76

TABLE 2 - 3

Mobil Exploration Norway Inc. SIDE WALL CORES

RUN No.: 2

GEOLOGIST: J.M.Eagan WELL NAME: 35/11-1

DATE: 12/7/84

No.	DEPTH	LITHOLOGY AND SHOW DESCRIPTION	REC. IN CM	POROSITY			SHOW			
				PR	FR	GD	TR	PR	FR	GD
30	2028	Misfire								
29	2036	Misfire								
28	2048	Misfire								
27	2057	Misfire								
26	2075	Misfire - failure of line two - failure of gun								
25	2107	Misfire								
24	2114	Sandstone :gray w/wt streaks,firm,	2.5			X				
		fine grained qu arenite,sl calc.								
23	2123	Sandst :lt gray,f grained,firm,sl arg,	2.5			X				
		well sorted qu arenite,sl calc.								
22	2132	Misfire								
21	2145	Sandst :lt gray,f-med grained,noncalc,firm w/lamina	2.0							
		of dk gray sltst+clayst.			X					
20	2157	Clayst :w/sst,dk brown,silty,calc clayst w/lamina of	2.5	X						
		f-med,silty,calc sst + gray,sandy calc sltst.								
19	2175	Misfire								
18	2188	Clayst :dk brown,sl calc,firm.	2.5							
17	2200	Clayst :dk brown-gray,sl calc,firm.	2.5							
16	2213	Misfire								
15	2225	Clayst :dk brown-gray,firm,calc	3.0							
14	2243	Sandst :lt gray,s+p,firm,f grained,well sorted,	3.0			X				
		calc,qu arenite,sl arg.								
13	2252	Misfire								
12	2258	Sandst :lt gray,s+p,firm,f-med grained,sl arg,noncalc	3.0			X				
11	2268	Sandst :lt gray,sl firm,f-med,sl arg,noncalc.	2.0			X				
10	2287	Misfire - failure of line one.								
9	2298	Clayst :dk brown-gray,firm,sl calc.	3.0							
8	2315	Clayst :dk brown,firm,sl silty,sl calc.	3.0							
7	2325	Clayst :dk brown-gray,firm,sl silty,calc.	3.0							
6	2350	Clayst :dk brown-gray,firm,calc.	3.0							

COMMENTS:

Form. MOEX N 12/H-1-76

TABLE 2 - 4

Mobil Exploration Norway Inc. SIDE WALL CORES

RUN No.: 2

GEOLOGIST: J.M.Eagan WELL NAME: 35/11-1

DATE: 12/7/84

No.	DEPTH	LITHOLOGY AND SHOW DESCRIPTION	REC. IN CM	POROSITY			SHOW			
				PR	FR	GD	TR	PR	FR	GD
5	2375	Clayst :dk brown-gray,firm,silty,noncalc.	2.5							
4	2390	Clayst :dk brown-gray,silty,firm,calc.	2.5							
3	2408	Clayst :vdk gray,firm,noncalc,rare pyr.	2.5							
2	2415	Limest :gray,hard,v arg.	<1.0							
1	2428	Clayst :dk brown-gray,firm,sl calc.	2.5							
18										
17										
16										
15										
14										
13										
12										
11										
10										
9										
8										
7										
6										
5										
4										
3										
2										
1										

COMMENTS:

Form. MOEX N 12/H-1-76

TABLE 2 - 5

Mobil Exploration Norway Inc. SIDE WALL CORES

RUN No.: 3

GEOLOGIST: JRD/JDF WELL NAME: 35/11-1 DATE: 02/08/84

No.	DEPTH	LITHOLOGY AND SHOW DESCRIPTION	REC. IN CM	POROSITY			SHOW			
				PR	FR	GD	TR	PR	FR	GD
1	3363	Sst :grn gry,v firm,f-m,subrnd,qtz,mica,kaol,v calc.	2.0		X					
3	3347	Clyst :red brn,occ grn slt,firm,qtz,mica,mod calc.	3.0	X						
4	3331	Sst :lt grn,red oxidation,firm,qtz,mica,v calc,f-m.	1.5		X					
5	3323	Clyst :a/a,grn reduction spots.	2.0	X						
6	3303	Sst :rd-wt speckled,f,qtz,mica,Fe-oxide,v calc,	2.0			X				
		kaol,firm.								
31	2958	Clyst :blk,firm,si fis,mica,poss organic rich.	2.0	X						
32	2935	Clyst :lt gry,sl firm,amorph,c mica,gravel(qtz),	2.0		X					
		tr calc.								
33	2913	a/a	2.5		X					
34	2888	Clyst :dk gry,si fis,mod firm,qtz,mica.	1.0	X						
36	2848	Sst :wt-lt gry,soft,calc,well sorted,f,qtz,mica.	1.5			X				
37	2839	a/a,less calc.	1.5			X				
38	2825	Sst :a/a w/clay laminae (blk,mica,fis).	2.0		X					
39	2813	Sst :wt-lt gry,sl firm,calc cem,m,well sort,subrnd,	1.5			X				
		clear qtz.								
41	2787	Sst :wt,m,mod firm,tr calc,cl qtz,	2.0	X						
		clay lam (brn,pyr,mica).								
43	2753	Clyst :dk gry,sl fis,sl firm,	2.0	X						
		laminations of wt snd (a/a).								
44	2745	1/2 Clyst :a/a,1/2Sst :lt gry-wt,firm,trcalc,m,clqtz.	2.5		X					
45	2736	Clyst :dk gry,firm,sl fis,occ mica,	2.0	X						
		several laminations of wt snd.								
46	2719	Sst :lt gry,v hard,abund calc cem,cl qtz,subrnd,f-m.	3.5		X					
49	2657		2.0	X						
50	2642	Sst :gry,sl fis,firm,qtz,grading into vf snd.	2.0		X					
51	2617	Sst :qtz,clr-milky wt,occ gry-grn,f-m,occ vcrse,	2.5		X	X				
		friable,sa-sr,pr srt,cly-slt,calc.								
52	2607	Sst :a/a,streaked and interbedded w dk gry silty shale.	2.5	X						
53	2581	Clyst :dk gry-blk,frm,micaceous.	2.5	X						

COMMENTS:

no shows, no cut, no fluor, no odor

Form MOEX N 12/H-1-76

TABLE 2 - 6

Mobil Exploration Norway Inc. SIDE WALL CORES

RUN No.: 3

GEOLOGIST: JRD/JDF WELL NAME: 35/11-1 DATE: 02/08/84

No.	DEPTH	LITHOLOGY AND SHOW DESCRIPTION	REC. IN CM	POROSITY				SHOW			
				PR	FR	GD		TR	PR	FR	GD
55	2547	Sst :qtz,clr-milky wt-m-f,well sorted,	2.5			X					
		qtz overgrowths common,tr biotite.									
56	2514	Clyst :dk gry,frm,micromica.		X							
58	2480	Sst :qtz,clr-milky wt,strked w clyst stringers,	2.0	X	X						
		dk br-gr,f-m,occ crse,sr-sa,mod srt,friable,									
		wt cltst matrix noncalc.									
59	2462	Clyst :dk br-gry,frm,micaceous.	2.0	X							
60	2448	Clyst :a/a.	2.5	X							
61	3356	Sst :red-brn,f-vf,frm,mod sort,sr-sa,comm slt-cly	0.5	X	X						
		frac in pore syst,Ip calc.									
62	3282	Sltst/Sst :vfg,red-br,well cmt,v calc.	1.0								
63	3258	Sst :clr-milky wt,occ grn,med pr,well srt,friable,	2.5								
		common with clyst matrix,non calc,micaceous.									
64	3243	Sst/Sltst :wt-lt gry,grn,vf-f,Ip calc,abund qtzfrag,	3.5								
		vcrse pebble,variegated.									
65	3225	Lithology a/a,Ip v calc.	3.5								
67	3183	Sst :grn,vfg-slt,micaceous,non calc,frm.	2.5								

COMMENTS:

no shows, no cut, no flour, no odor

Form. MOEX N 12/H-1-76

2.7 CONVENTIONAL CORE DESCRIPTION

In Well 35/11-1 one conventional core was cut between 2552.8 and 2562.8 meters. 9.3 meters were recovered. A core description follows on the next page in Table 2-7.

TABLE 2 - 7

Mobil MOBIL EXPLORATION NORWAY INC.

PAGE ..... OF .....

graphic core log

WELL NO. 35/11-1 PLATFORM ..... FIELD WILDCAT

CORE NO. one FROM 2552.8 M TO 2562.8 M RECOVERED 9.3 M 93 %

FORMATION Brent DATE 17/7/84

VERTICAL SCALE 1 : 100
(1 DIVISION = 0.5 METER)

CORING RATE (MIN/METER) 0 10 20

OIL & GAS SHOWS
PERMEABILITY
POROSITY Type
POROSITY Grade

GRAIN OR CRYSTAL SIZE
.003 - .062 MM MICRO
.062 - .125 MM Vy FN
.125 - .250 MM FINE
.250 - .500 MM MED
.500 - 1.00 MM CRSE
> 1.00 MM Vy CRSE

DESCRIBED BY: J.R.Dixon, J.M.Eagan

DEPTH	DIP	G F S	G F S	G F P	LITHOLOGY	REMARKS
						Samples examined every meter at the half meter mark.
2552.8						Ss-cl,milky wh qu,subrnd-ang, qu overgrowths,biotite, minor silica cmt,sl kaol,firm
2553.5						Ss-a/a,well sorted.
2554.5						Ss-cl,milky wh qu,some biotite, sl silica cmt,well sorted, subrnd-ang,firm.
2555.5						Ss-cl,milky wh qu,qu overgrowths, good amt silica cmt, abundant biotite,hard,subrnd-ang.
2556.5						Ss-cl,milky wh qu,qu overgrowths common,good silica cmt,kaol, abundant biotite,occ muscovite, hard,well sorted,subrnd-ang.
2557.5						Ss-cl,milky wh qu,complete silica cmt,qu overgrowths, abundant biotite,v hard ,kaol.
2558.5						Ss-cl,milky qu,complete silica cmt, qu overgrowths,abundant biotite, hard,well sorted.
2559.5						Ss-cl,milky qu,significant qu overgrowths,silica cmt,hard, sl kaol,well sorted.
2560.5						Ss-cl,milky whqu,abundant biotite, v strong silica cmt,hard,kaol? well sorted.
2561.5						Ss-cl,milky qu,abundant biotite,
2562.1						strong silica cmt,hard,biotite. Ss-a/a.

MOEX N 82 A

2.8 CORE ANALYSIS

A conventional core analysis was performed by Core Lab Norsk on the core that was taken in Well 35/11-1. Surface Core Gamma, fluid saturation and summation of fluids, air permeability, helium porosity and grain density were determined. The results are contained in a report by Core Lab.

2.9 FORMATION EVALUATION

2.9.1 Petrophysical Evaluation

Wireline logs from the captioned well were interpreted for reservoir rock quality and hydrocarbon production potential. Two sets of logs covering the intervals 2005m - 2445m and 2422m - 3367m were analyzed. No hydrocarbon shows were interpreted from the logs as all sands had high water saturations. Interpretation results for reservoir rock are tabulated below.

Results which indicate the presence of reservoir rock:

	Interval (m)	Gross (m)	Net (m)	Ratio Net/Gross	Ave Por	Ave VSH
Part A:	2023.0-2445.4	415.6	77.7	.187	.206	.184
Part B:	2425.0-3355.8	931.0	464.1	0.498	0.156	0.151
	2569.0-2745.3	276.5	117.3	0.424	0.172	0.247
	2745.5-2971.3	226.0	137.9	0.610	0.172	0.128
	2971.5-3355.8	384.5	208.8	0.543	0.137	0.112

Shale volume was calculated from the density/neutron logs. Porosity was determined primarily from the density log corrected for volume of shale. A matrix density of 2.65 gm/cc was used along with a fluid density 1.1 gm/cc. Where the density was unreliable (3237-3356m), shale corrected sonic porosity was used. Water saturations were calculated using the Archie relationship. The constants used in this equation were:

a = 1.0
m = 1.8
n = 1.9

The following water resistivities were used:

0.07 at 124^{o}F at 2030m (62,000 ppm NaCl)
0.08 at 146^{o}F at 2422m (45,000 ppm NaCl)
0.13 at 181^{o}F at 3237m (22,000 ppm NaCl)

Interpretation cutoff values were:

Volume shale upper	0.5
Porosity lower	0.10
Water saturation upper	0.50

There appears to be an Rw change below approximately 3237m. This freshening of formation water corresponds to increased hole wash-out. Over this interval, sonic porosity was used as the density data proved unreliable. This sonic porosity was calibrated to reliable density porosity uphole.

Enclosed are prints of the analysis log for the two analyzed intervals.

2.9.2 RFT Summary.

One RFT run was performed in the Upper Jurassic and one in the Middle and Lower Jurassic section of this well. Formation pressures were recorded from permeable zones, and a sample of the formation fluids were recovered during both runs.

Gradients representative for the Upper and for the Lower to Middle Jurassic sections are 1.44 and 1.42 PSI/m respectively (Figure 2-1 and Figure 2-2).

The two samples, one taken at 2113 the other at 2535 meters KB, both consisted of formation water which was contaminated by a potassium chloride based mud filtrate. Further details on the RFT samples are contained in reports from Core Laboratories dated 10 August and 9 September 1984, respectively.

WELL 35/11-1 RFT DATA

SOGNEFJORD/FENSFJORD/KROSSFJORD FORMATION

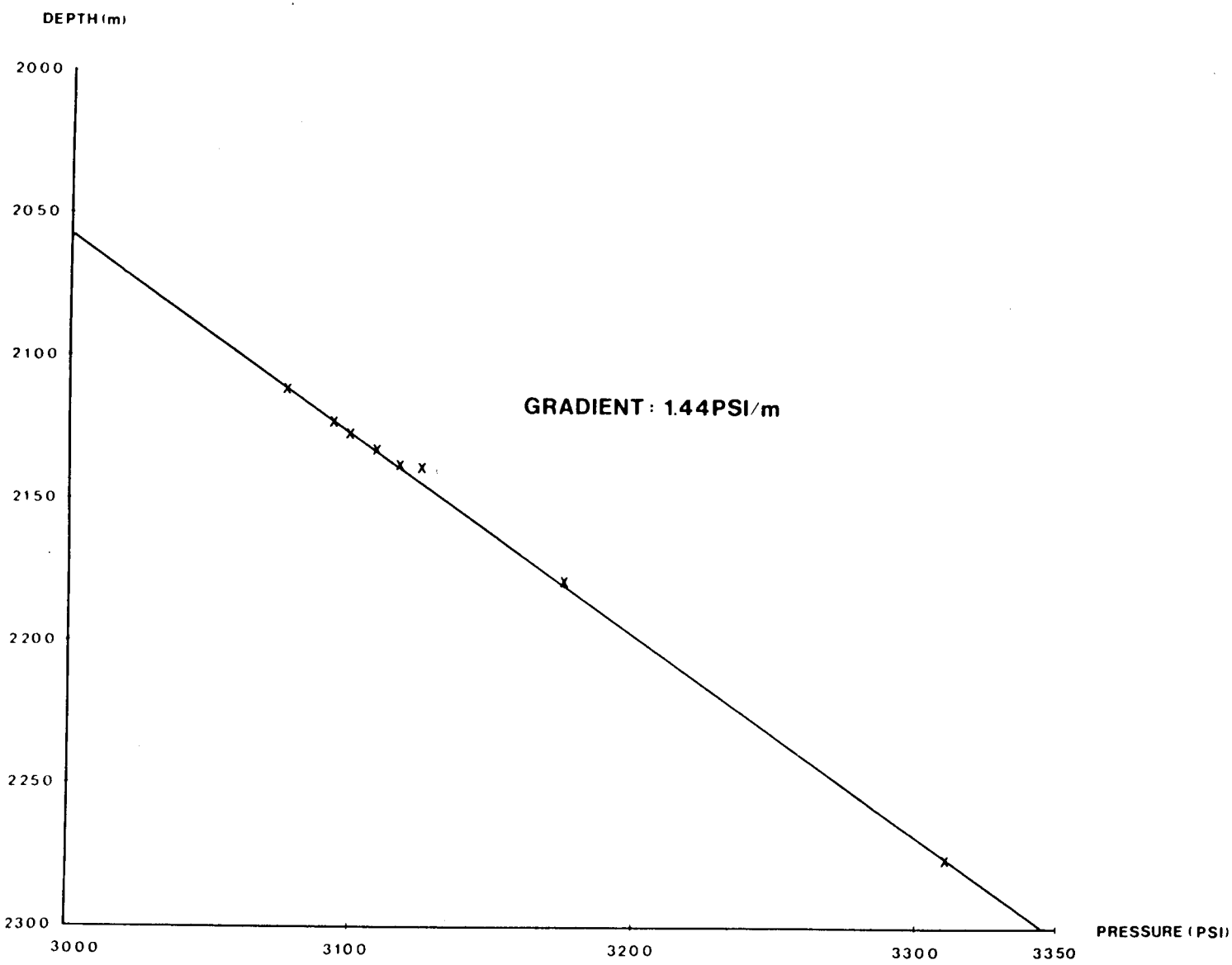


Fig 2-1

WELL 35/11-1 RFT DATA

BRENT GROUP/DUNLIN GROUP/STATFJORD FM AND HEGRE GROUP

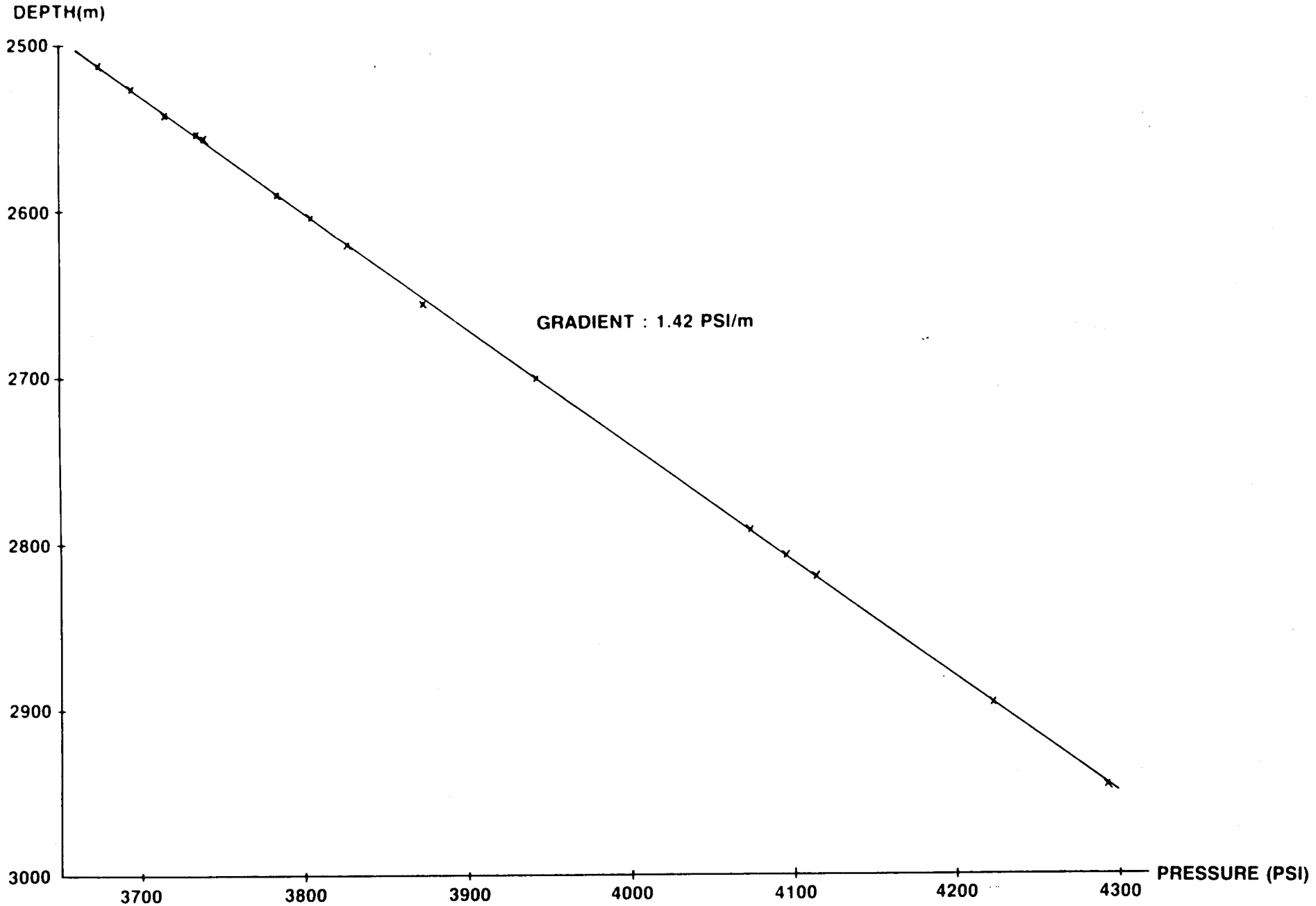


Fig 2 - 2

2.10 WELL VELOCITY SURVEY

2.10.1 V.S.P. SURVEY

A V.S.P.check shot was conducted in the 35/11-1 Well on 1 August 84 using a Bolt air gun (80 cu.in. capacity at 2000 psi) suspended at a depth of 10 m as the energy source. Levels were shot at 25 m depth intervals between 3365 and 1500 m below KB, and with approximately 100 m depth spacing for levels between 1500 and 550 m below KB. The levels above 1500 m have not been included in the V.S.P. due to the large depth intervals between these levels.

The V.S.P. displays were produced using the following sequence: A source signature deconvolution (260 ms derivation window) was applied to the stacked data in an attempt to collapse the bubble energy into the first arrivals. Downgoing wave subtraction and Special V.S.P. Deconvolution (using operators designed from the downgoing wave on a trace by trace basis with a window length of 1550 ms) were applied as appropriate during processing.

In order to clarify any dipping events within the data, tracking filters enhancing dips of up to 1 ms/trace were applied to the undeconvolved and deconvolved data. Two versions of the upgoing wave displays were produced; one with a wide bandwidth filter and the other with the time variant filter.

Although the recorded data appears of good quality, and no instrumental problems were encountered, the final upgoing and deconvolved upgoing wavefield displays show rather poor continuity of events. This was considered to be attributable to the nature of the sub-surface. However, in order to enhance data quality, SSL reprocessed the upgoing wavefield and applied a 9:1 horizontal median pick to the deconvolved and undeconvolved upgoing wavefields. This has the effect of enhacñcing events showing little or no moveout per trace across the data; this is in contrast to the 1 ms/trace tracking filter applied to the original versions of these displays. The tracking filter has the effect of enhancing dipping events within the data showing moveout of up to 1 ms/trace to the left.

Enclosure 4 is the Synthetic Seismogram, Impedence log and VSP display for the 35/11-1 well. The VSP is displayed in sections C, D and E of the enclosure. They where generated as follows:

The Transposed VSP

A window from each trace is taken starting from the first arrival (time-depth) curve such that the end of the window from one trace defines the start of the window from the next trace. These windowed traces are then combined to form a single trace and this is placed at the left hand edge of the display. The next trace is produced in a similar manner except the start of each window is defined is defined as being the end of the window used to produce the previous trace. In this display all primary reflections appear at true times and depths along the left hand side of the display in order to compare with the synthetic seismogram and the seismic section.

The Composite VSP

This is produced in a similar manner to the first trace in display C, but with the start of the window offset 50 ms from the first arrival curve. The trace is repeated 24 times. This display is the best tie with the seismic data.

The Full Fold Stack

This is a simple stack of all deconvolved upgoing wavefield traces. The full trace length for each level being used.

The data quality of the final VSP was a little disappointing. The field records showed some noise trains of approximately 50 - 60 HZ, but these were removed by filtering. A low amplitude tube wave arrival may also have resulted in slight discontinuity of events in the final display (C). The tie of display D with the seismic section is good down to the top of the Dunlin Formation, but poor below. This concurs with the seismic data quality which is very poor below the Dunlin Formation.

2.10.2 VELOCITY LOG AND SYNTHETIC SEISMOGRAM

From the Sonic log and Check Shot/VSP first arrivals, SSL generated a corrected velocity log. This log was used to tie all lithologic tops to the seismic data.

From the Sonic and Density logs, SSL generated a suite of synthetic seismograms. Zero phase and minimum phase synthetics with normal and reverse polarities were produced. The minimum phase normal polarity synthetic ties the seismic section well. The seismic tie of the synthetic is in fact better than that of the VSP.

SECTION 3

DRILLING OPERATION

3.1 SITE SURVEY SUMMARY

A/S GEOTEAM performed a site survey at the intended drilling rig location Block 35/11-1. The field work took place between 5 April and the 17 April 1984 aboard the M/V GEO SCANNER.

The survey entailed the acquisition of high resolution digital seismic data using bolt airguns, and analogue programme using echo-sounder, side scan sonar and deep towed sparker.

The results of the fieldwork have been fully processed and interpreted and are partially in this summary. The survey was a combined seafloor investigation, bathymetric and high resolution seismic survey.

Bathymetry: The water depth at location is 359.6m mean sea level(MSL). The minimum water depth in the area is 358.7 m (MSL) which is 4 Km to the S-E of proposed location. The maximum water depth seen in the area is 368.9 m (MSL) which is 4.2 Km to the north/west of proposed location. The general gradient in the area is to the north/west and is of the order of 1:820.

Seabed features: A total of 317 pockmarks have been identified in the area from the records obtained. The average density is 20 per square kilometre. The average depth of these is 1-2 m, though some are of greater depth. None of the pockmarks were seen to be active.

Shallow soils: The seabed and subseabed is made up of a series of soft laminated clays 10 m thick at location. Below this lies a stiff clay unit which overlies an erosion surface. To the west a hard clay unit underlies this surface but to the east a unit of glacial till exists.

Anchoring conditions: Anchoring conditions in the area were expected to be extremely poor, due to the very soft clay seabed having little, to no, holding power. Piggy-back anchors recommended.

Obstructions: No obstructions have been identified in the area.

Deeper Geology: The Quaternary soils exist to a thickness of 107 m at location, overlying an upper pliocene sand and clay unit. This overlies an erosion surface cut into a series of Lower Pliocene and Miocene sands and shales (545 m M.S.L.). These sediments overlie an Oligocene series which thins and finally pinches out to the East against an area of disturbed Eocene shales and clastics. Base Eocene is marked by a Tuff and Clay layer which is prone to swelling. Palaeocene sediments of shales and clastics extend to a depth of 1150 m below M.S.L. where top chalk is marked by a slight unconformity. Below this depth further lithology is uncertain due to lack of character in the reflectors.

Drilling hazards: None expected.

3.2 RIG POSITIONING AND ANCHORING

The drilling rig "Nortrym" was navigated from block 30/9 to well location 35/11-1 in the Norwegian sector. See figure 3-1.

Racal Pulse-8 was used as the primary navigation system during the period from 18 May to 28 May 1984.

The final position was established using a JMR-4 Sealand Surveyor Satellite Positioning System on 27 May 1984.

Final Position of well 35/11-1:

Latitude	:	61^{o} 10' 59.27"
Longitude	:	03^{o} 39' 44.95"
Eastings	:	535 626.04
Northings	:	6 783 527.29
Rig heading	:	355^{o}
Number of 3-D passes:		35

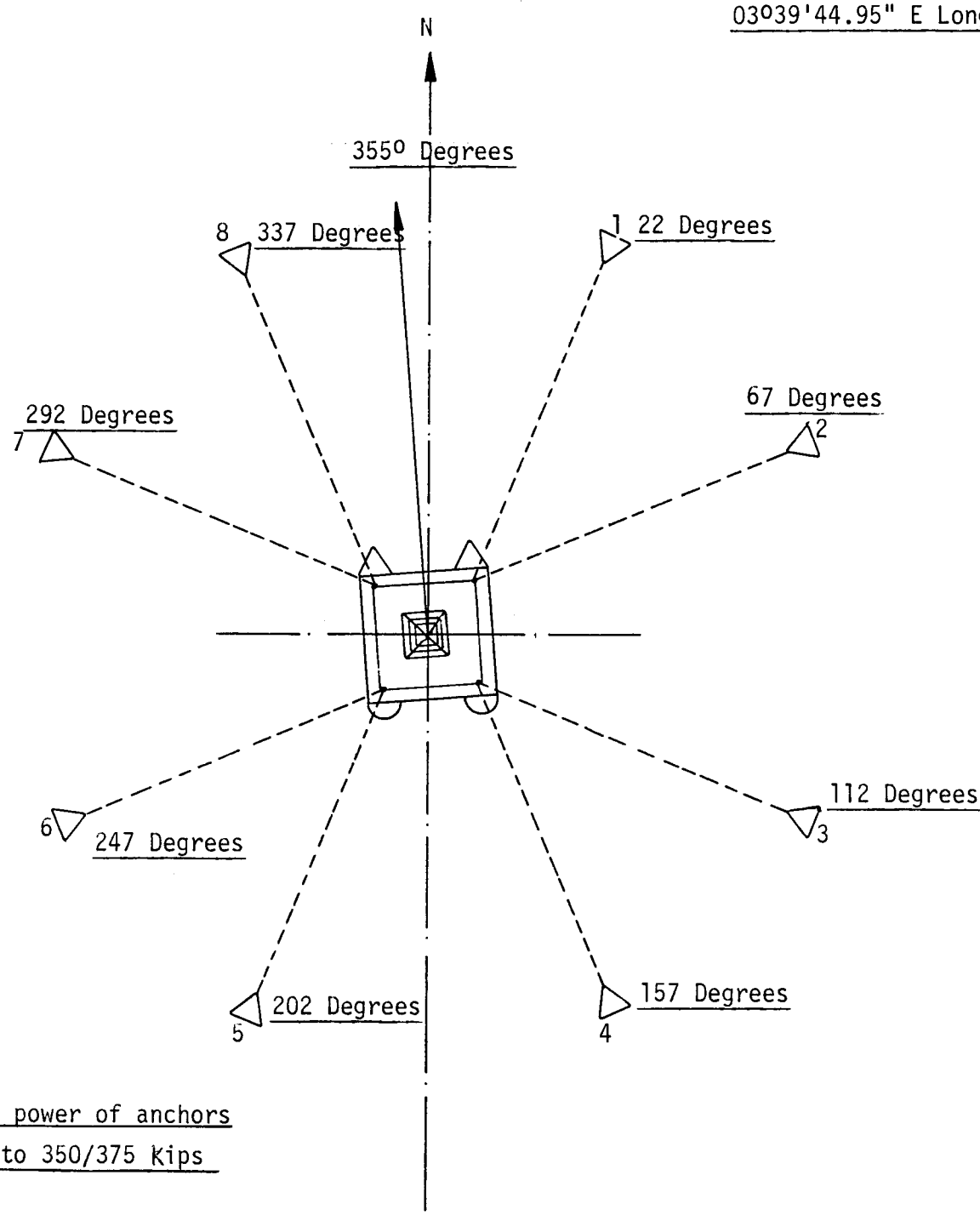
This position is 41 meters on a bearing of 241^{o} from the intended location.

LOG OF POSITIONING AND ANCHORING

TABLE 3 - 1

Date	Time	Event
18.05.84		Installed pulse-8 and satellite navigation equipment on "Nortrym"
20.05.84		"Nortrym" commenced recovering anchors.
21.05.84	0430	"Nortrym" under way to new location.
	1825	"Nortrym" 1.2 km from anchor No. 5 drop point additional chain being added to all anchors.
	2120	Commence run in to drop No. 4 anchor
	2137	No. 4 anchor on bottom.
	2151	"Nortrym" on location and running No. 8 anchor.
22.05.84	0208	No. 5 anchor on bottom.
	0210	Re-running No. 5 anchor.
	0333	No. 1 anchor on bottom.
	0409	No. 5 anchor on bottom.
	0733	No. 3 anchor on bottom.
	1043	No. 7 anchor on bottom.
	1115	No. 5 anchor on bottom after second re-run.
	1220	No. 6 anchor on bottom.
	1350	No. 2 anchor on bottom.
	1615	No. 6 anchor after re-run.
	1620	"Nortrym" commences deballasting.
	2130	"Nortrym" commences final positioning.
	2145	Complete ballasting.
23.05.84	1100	Commenced Pulse-8 data logging.
	1350	Complete Pulse-8 data logging.
	1500	Pulse-8 equipment demobilised.
23.05.84		Due to movement of rig during the night the collection of 3-D satellite data had to be started again.
25.05.84		Collecting satellite data.
26.05.84	1910	35 good 3-D satellite passes collected.

Rig heading : 355 degrees
Well coordinates: 61°10'59.27" N Lat.
03°39'44.95" E Long.



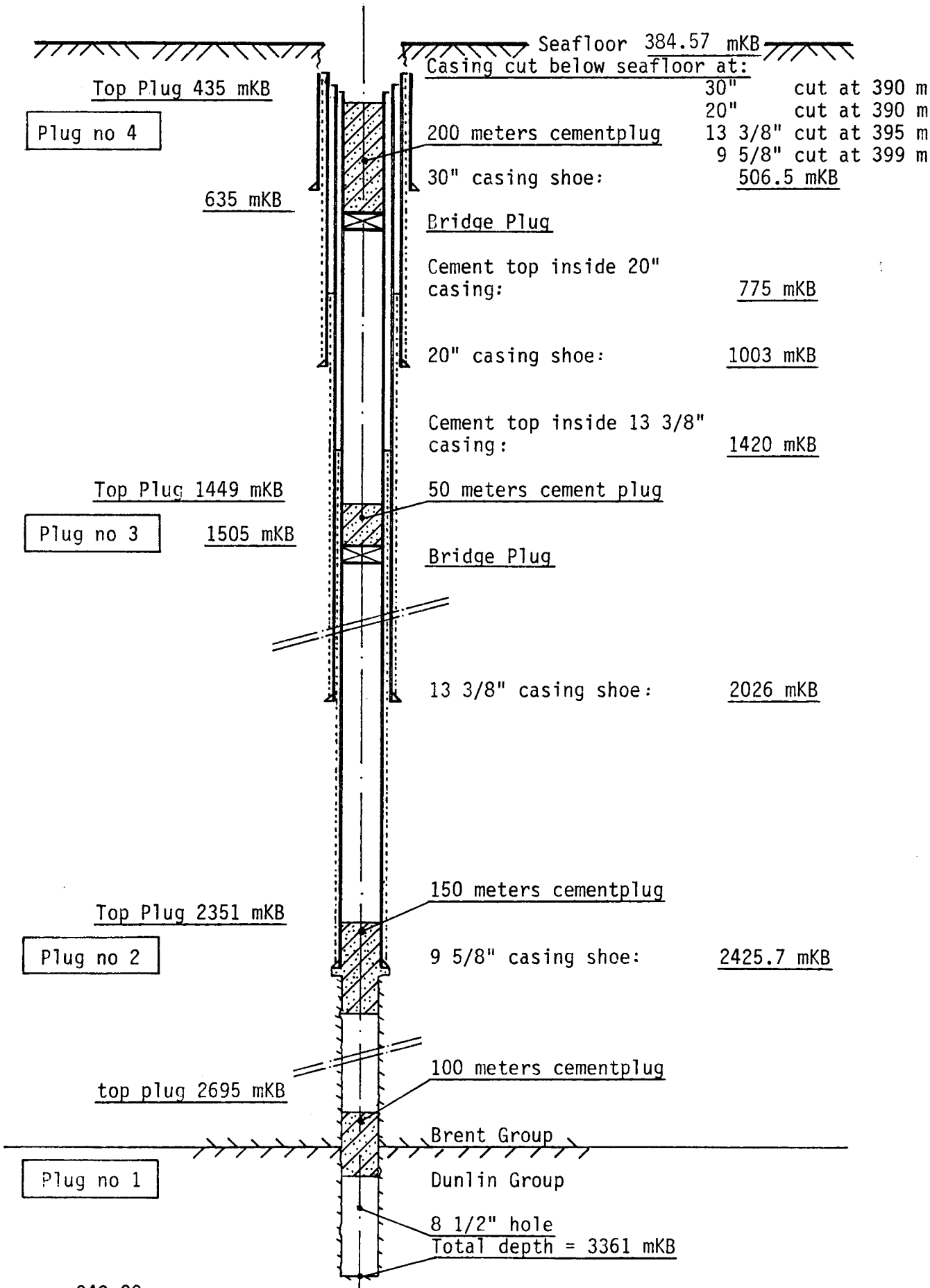
Holding power of anchors
tested to 350/375 Kips

Anchor no.:	1	2	3	4	5	6	7	8
Degrees:	22	67	112	157	202	247	292	337
Length (m):	1652	1635	1589	1582	1548	1530	1574	1617
Tension (Kips):	255	275	230	255	285	265	275	250

SEMISUBMERSIBLE DRILLING RIG "NORTRYM"	FIGURE 3-1 ANCHOR PATTERN	WELL 35/11-1

3.3 FINAL WELL DIAGRAM WELL 35/11-1

FIGURE 3-2



rs 943.22

3.4 DRILLING TIME

The total time spent to move the semisubmersible driling rig to location, drilling well 35/11-1 to 3361 m and plug back and abandon well took 78 days or 1872 hours.

See Drilling Time curve, figure 3-3, on the following page.

The drilling operation can be divided into the following activities.

DRILLING TIME OF WELL 35/11-1

TABLE 3 - 2

ACTIVITY	Actual (days)	Cumulated (days)
Move to location/anchoring and preparing to drill	3.2	3.2
36" Hole Section		
- Drilled 36" hole to 510 m	5.0	8.2
- Ran and cemented 30" csg. at 506.5 m	2.0	10.2
26"Hole Section		
- Rigged up/down riser and diverter	2.5	12.7
- Drilled 26" hole to 1015 m	4.6	17.3
- Ran and cemented 20" csg. at 1003 m (Squeezed off water flow)	8.7	26.0
- Nippled up BOP and riser	1.6	27.6
- Performed formation test	0.3	27.9
17½" Hole Section		
- Drilled 17½" hole to 2029 m	8.7	36.6
- Electric logging	0.7	37.3
- Ran and cemented 13 3/8" csg. at 2026 m	3.2	40.5
- Performed formation test	1.9	42.4
12 1/4" Hole Section		
- Drilled 12 1/4" hole to 2439.5 m	8.3	50.7
- Electric logging	1.5	52.2
- Ran and cemented 9 5/8" csg. at 2425.7 m	2.2	54.4
- Performed formation test	0.6	55.0
8½" Hole Section		
- Drilled 8½" hole to 2552 m	1.9	56.9
- Cored 10 m	0.5	57.4
- Drilled 8½" hole to 3361 m	13.9	71.3
- Electric logging	2.1	73.4
Plug back and abandon well	4.1	77.5
Pull anchors and demobilize	0.5	78.0

DRILLING TIME VS DEPTH

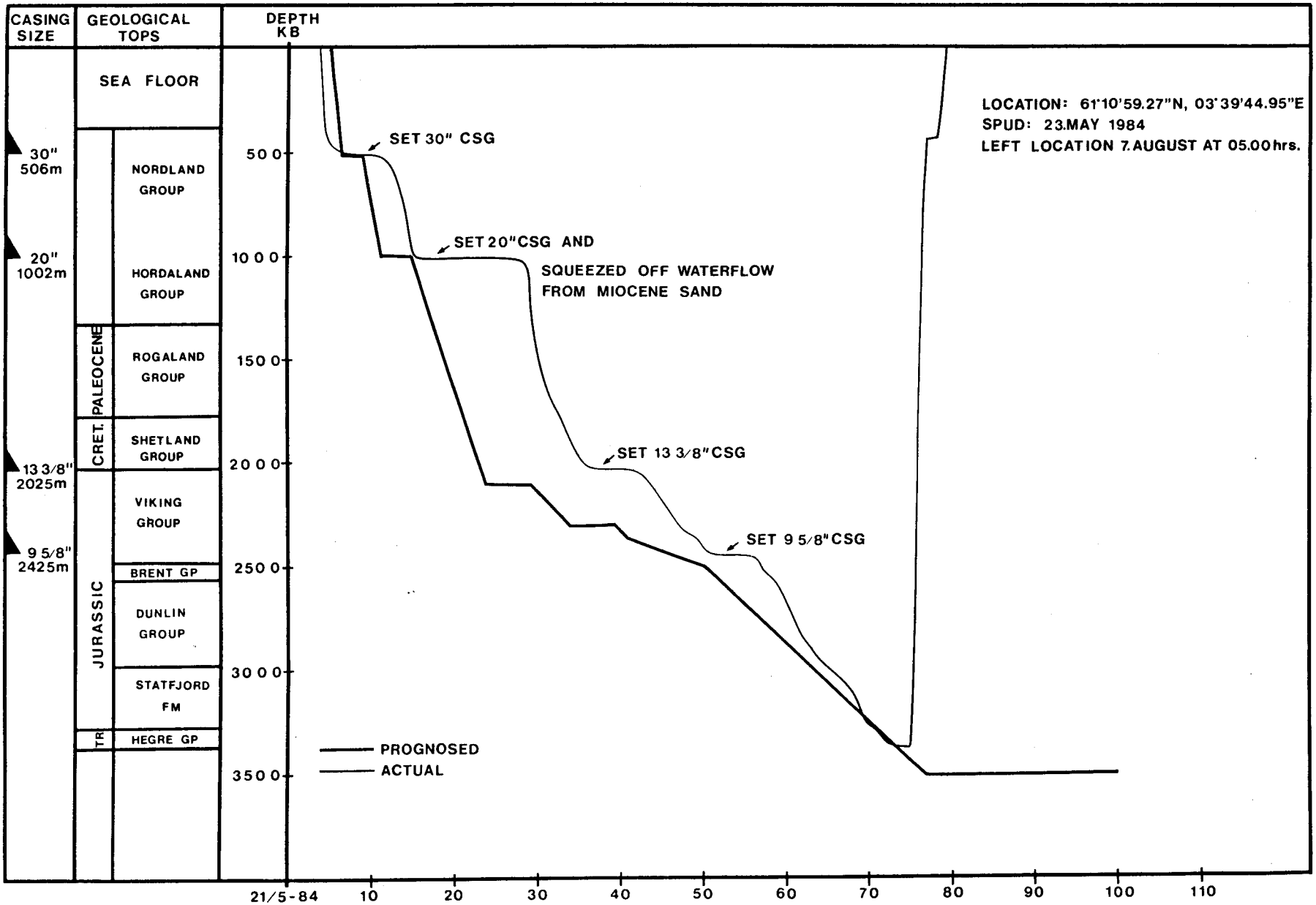


FIGURE 3 - 3

DRILLING TIME CURVE

3.5 DRILLING OPERATION BY HOLE SECTION.

3.5.1 DRILLING 36" HOLE SECTION AND RUNNING 30" CASING

The well was spudded at 1425 hours 23 May 1984. The 36" hole section was drilled from the seafloor at 384.6 m to 510 m. The water depth was 359.6 m. The 36" hole section was drilled through boulder beds causing the bit to build angle. Drilling parameters attained in this hole section are summarized below.

Rate of penetration

Total hole section drilled:	125.4 m
Average ROP while rotating:	112 m/day (4.6 m/hr)
Rotating hours:	25.5 hrs
Overall average ROP including non rotating time:	34.2 m/day (1.4 m/hr)
Number of bits:	2
Bit type:	17½" SDS Smith 26" DS Smith

The drilling rig was positioned and the 36" hole drilled, surveyed and cased within 9 days. One day lost due to anchor-winch no. 8 on north/west side breaking down.

Drilling sequence:

- No Temporary Guide Base was used.
- Drilled 17 1/2" pilot hole, surveying with Totco and single shot magnetic surveys.
- Open hole to 26" with hole opener and bullnose.
- Open hole to 36" with hole opener and 17 1/2" pilot bit.
- After two unsuccessful runs with 30" conductor, ran 36" hole opener with 26" bit before successfully setting and cementing 30", 310 lb/ft, B, Vetco ADT casing at 506.5 m KB.
- The marine riser was not installed for this section and consequently no cutting returns or gas was seen at the surface.

Drilling fluid:

Seawater with high viscosity slugs of prehydrated gel and spud mud on every connection.

Hole problems:

- Original spud location was drilled with 17 1/2" pilot hole from 384.6 m to 427 m. Totco surveys indicated deviation of 0.3 degrees at 390 m where the bit first took weight and 3.5 degrees at 417 m. Deviation was too high and it was decided to respud the well.

  Repositioned the drilling rig and took Totco survey at seabed of 0.5 degrees. Drill 17 1/2" pilot hole with no further deviation problems.

- Drilled on boulders at 415 m to 486 m. Some slow drilling.

- Ledge at 480 m prevented casing from getting to bottom on first two attempts. After clean out trip with 36" hole opener and 26" bit, the ledge was adequately removed and the 30" casing was run.

- Lost cone off 36" hole opener on final run. It was never recovered although magnet run was attempted.

- Breakdown on anchor winch no. 8 resulted in 27 hours downtime. Retaining plate on one side of windlass, which holds down the hub of the winch broke off and left winch cocked in the hub cradle.

Note: Use of "Scorpio" ROV diving vehicle was invaluable for location of the bore hole. Method was to drill the hole and before pulling string, locate the hole position with ROV's sonar (picking up echo from drill collars). A mark was made on the sonar screen grid showing distance and bearing to the hole from the "Scorpio" which remained in its garage (fixed point) until a further BHA in the casing string was lowered and picked up by sonar. The distance and direction of the new string of casing is determined from the difference between the original mark on the sonar screen and the new sonar signal. The rig position can then be adjusted using anchor chains to position string over the hole.

The sonar application with the ROV is espacially useful when not running a Temprorary Guide Base and guidelines such as in 35/11-1.

3.5.2 DRILLING 26" HOLE SECTION AND RUNNING 20" CASING

The 26" hole section was drilled below the 30" casing in the interval from 510 m to 1015 m. The deviation of the borehole was kept less than 1.0 degrees. Drilling parameters attained in this hole section are summarized below.

Rate of pentration

Total section drilled:	505 m
Average ROP while rotating:	525.6 m/day (21.9 m/hr)
Rotating hours:	23 hours
Overall average ROP including non rotating time:	175.6 m/day (7.3 m/hr)
Number of bits:	2
Bit type:	14 3/4" SDT Smith 26" DS Smith

Prior to drilling this section the marine riser and diverter element were installed. Seventeen days were required to drill this hole section, run casing and squeeze off the water flow.

Drilling fluid

Unweighted gelled seawater mud combined with frequent spotting of viscous pills.

Drilling sequence:

A 14 3/4" pilot hole was drilled with gelled seawater mud to 1015 m. Due to drilling in a sand section, much time was used circulating and reducing mud weight as the solids control equipment was unable to handle the large cuttings load as a result of high rate of penetration.

- The hole was opened to 26" and again it was necessary to circulate to separate cuttings from mud several times.

- The hole was displaced with 10.5 ppg mud.

- Prior to unlatching and pulling the riser and diverter, the riser was displaced to seawater.

  The dumpvalve was opened on riser and the resulting reduced hydrostatic head allowed the well to start flowing. After closing the dumpvalve and displacing the riser to 9.2 ppg mud, the flow stopped.

- After running back to bottom and circulating 9.2 ppg mud in the hole at a slow rate, mud losses were quantified to 1 bbl/min and shortly after increased to 5 bbls/min.

Note: It was not expected that the course sand section encountered from 550 m to 680 m would cause any hole stability problems.

As a result of this the hole was displaced with 10.5 ppg mud and no flow was observed. The riser was again displaced to seawater and the dumpvalve on riser was opened. The well started to flow. Additional 10.5 ppg mud was pumped in the hole and the flow was temporarily stopped. During this period the riser and the diverter were unlatched and pulled to surface. Again the hole was displaced with 10.5 ppg mud.

- The 26" bit was run into the open hole to ream to 1015 m. Tight spots were encountered between 600-700 m in the sand sequence and 45 m of fill at bottom was drilled out. After 2 trips to bottom the hole was displaced to 10.8 ppg mud.

- Although the well would not stay static, it was decided to run the 20" casing and cement back to surface in an attempt to seal off the salt water flow.

  This resulted in the 20" casing parting at the wellhead. See special report "20" Casing Failure". The 20" casing was successfully fished out. See Section 4.14.1.

- The 26" bit was then reamed through tight spots and the hole displaced to 11.1 ppg mud. A second attempt was made to run 20" casing and it had to be circulated down through a tight spot at 570 m to 606 m. Below this tight spot the casing was run without problems and the 20" casing shoe was set at 1003.0 m KB.

- The 20", 133 lb/ft, X56, Vetco LS casing was cemented and returns were observed at the wellhead. Initially the well died but was soon flowing again between the 18 3/4" and 30" housing.

- In an attempt to stop the seawater flow, the 20" casing was perforated and the annulus was squeeze cemented 4 separate times to seal off the annulus. The water flow was substantially reduced after each squeeze job until it was finally stopped.

- The 20" casing shoe was drilled out and a leak-off test of 11.5 ppg EMW was obtained.

Note: See special report "Problems encountered with uncontrolled shallow in water flow", see Section 4.14.2.

Pore pressure

Throughout this section the pore pressure was normal hydrostatic pressured.

3.5.3 DRILLING 17 1/2" HOLE SECTION AND RUNNING 13 3/8" CASING

The 17 1/2" hole section was drilled below the 20" casing in the interval 1015 m - 2029 m KB using a fresh water KCl-polymer mud. Drilling parameters attained in this hole section of Tertiary and Cretaceous claystone are summarized below:

Rate of Penetration

Total section drilled:	1014 m
Average ROP while rotating:	263 m/day (11m/hr)
Rotating hours:	92.5 hours
Overall average ROP including non rotating time:	135 m/day (5.6 m/hr)
Number of bits:	4
Bit type:	17 1/2" SDS 17 1/2" SDT 17 1/2" SDGH (center jet) 17 1/2" SDT (center jet)

The 17 1/2" hole was drilled, logged and 13 3/8" casing was set within 12 days.

Drilling Sequence

Drilled 17 1/2" hole section and surveyed with single shot and multishot magnetic survey.

Ran and cemented 13 3/8", 72 lb/ft, N80, BTC casing at 2076 m KB.

Hole Geometry

The caliper log from the Litho Density Tool (LDT) was the only caliper run. It indicated an average hole size of 18 1/2".

The major wash out sections were between 1371 m to 1493 m and 1585 m to 1737 m where the hole size was 20 ½". The hole section in the Cretacous interval was 18" with no large washed out sections.

The washed out hole section corresponds to the overpressured Paleocene claystone section where the estimated pore pressure was 11.8 ppg. See figure 4-4, "Sonic plot and hole geometry".

Hole problems

The main problem encountered while drilling this section was the tight hole condition experienced while making wiper trips and pulling out of the hole to change bits.

Tight hole and overpull was experienced while drilling the hole section below 1705 m. Notable tight spots were located at 1125 m to 1138 m, 1487 m to 1705 m and 1760 m to 1980 m. In response to the tight hole problems the mud weight was raised to 10.5 ppg at 1410 m and further raised to 11.0 ppg at 1750 m.

The majority of the hole was drilled with 11.0 ppg mud with a potassium ion concentration of 75000 - 80000 mg/liter. The 17 1/2" hole section was drilled efficiently with the KCl-polymer mud and achieved satisfactory hole geometry except in the overpressured claystone sections.

Pore pressure

Normal pressured formations were encountered to 1350 m KB. An increase in pore pressure reached a maximum value of 9.6 ppg EMW at 1530 m and dropped back to normal hydrostatic pore pressure at 1850 m. See sonic plot Figure 4-4.

Leak-off test at 13 3/8" casing shoe

The original leak-off test at the 13 3/8" shoe was taken to 15.83 ppg EMW at which time the formation fractured. Subsequent leak-offs were 13.0, 13.13 and 13.22 ppg EMW. A cement squeeze at the shoe was then attempted. No cement was able to be squeezed around the shoe as the fracture had apparently healed. Five meters of new hole were drilled and a formation integrity test to 15.0 ppg EMW was performed. The test was not taken to leak-off.

3.5.4 DRILLING 12 1/4" HOLE SECTION AND RUNNING 9 5/8" CASING

The 12 1/4" hole section was drilled below the 13 3/8" casing in the interval 2029 m to 2439.5 mRKB, using a seawater KCl-polymer mud. Drilling parameters in this section of Upper Jurassic claystone, sandstone and minor limestone are summarized below:

Rate of penetration

Total section drilled:	410.5 m
Average ROP while rotating:	75.7 m/day (3.14 m/hr)
Rotating hours:	130.5 hours
Overall average ROP including non rotating time:	43.6 m/day (1.82 m/hr)
Number of bits:	4
Bit Type:	12 1/4" SDGH Smith
	12 1/4" J 11 Hughes
	2 x 12 1/4" F2 Smith

The 12 1/4" hole was drilled, logged and cased within 15 days. One day was lost due to repair of one of the BOP control pods.

Drilling sequence

The 12 1/4" hole section was drilled and surveyed with single and gyro multishot magnetic surveys. The hole was straight with a maximum deviation of 1.32° in direction of S85E at 2439.0 m KB and having a dogleg severity less than 0.5°/30 m throughout the hole section.

The 12 1/4" hole section was shortened due to lost circulation which occurred while drilling at 2439 m with 13.0 ppg mud. Otherwise, the section was drilled with no problems.

Ran and cemented 9 5/8", 53.5 lb/ft, C95, BTC casing at 2425.7 m KB.

Hole geometry.

Caliper logs indicated the hole to be in gauge with an average hole size of 12.3". There were a few minor sections where the hole was 13".

Mud properties.

The interval was drilled with a seawater KCl-polymer mud with a Potassium ion concentration of 51,000 ppm. High gel strengths and yield points resulted from carbonate contamination which was later treated out with lime. These high properties probably contributed to the lost circulation which occurred while drilling at 2439 m. Overall the KCl-polymer mud resulted in good hole conditions.

Hole problems

In response to expected abnormal pore pressures the mud weight was increased from 11.0 ppg to 12.0 ppg at 2050 m and further to 13.0 ppg at 2200 m. During trips, no excessive overpull was experienced except tight hole problems encountered between 2149 m to 2320 m.

At 2439.5 m lost circulation occurred. Lost circulation was complete although the hole would stay full while not circulating. The mud weight at the time was 13.0 ppg. The mud weight was then lowered to 12.5 ppg and Lost Circulation Material (LCM) was added to the mud system. The well was logged and the 9 5/8" casing was run and cemented with no lost returns while cementing.

Circulation was probably lost in either the highly permeable Viking sand which comes in at 2113 m, (84 m below the 13 3/8" shoe) or at 2439 m. It is also possible but unlikely that circulation was lost at the 13 3/8" shoe which had a repeatable formation integrity test of 15.0 ppg EMW.

Pore pressure

RFT results, indicate the Jurassic Viking sands in the well to be normally pressured to 8.6 ppg EMW. See Figure 2-1 and Figure 4-5.

The Sonic log analysis agrees with the RFT results. However, the sonic plot does indicate pore pressure of 10.5 ppg EMW in the interval 2230 m - 2380 m. This interval corresponds with the tight spots encountered while tripping. Pore pressure at the bottom of the 12 1/4" hole section is normal at 8.6 ppg EMW. There were no indications of overpressure from surface monitored parameters of gas, ROP, temperature or shale density. See Figure 4-4 and Figure 4-5.

Bottom hole temperature.

BHT is 73.3^{o}C with a geothermal gradient of 3.32^{o}C per 100 meters.

3.5.5 DRILLING 8 1/2" HOLE SECTION

The 8 1/2" hole section was drilled below the 9 5/8" casing shoe in the interval from 2439.5 m to 3361 m. Drilling paramenters in this section of Middle and Lower Jurassic and Triassic was characterized by sandstones interbeded with claystone and is summarized as follows:

Total section drilled:		921.5 m
Average ROP while rotating:		97.42 m/day (4.06 m/hr)
Rotating hours:		227 hours
Overall average ROP including non-rotating hours:		56.41 m/day (2.35 m/hr)
Number of bits:		14
Bit type:	5 x	8½" SDGH Smith
		8½" RC6H(core head) Christensen
		8½" F2 Smith
	3 x	8½" F2L Smith
		8½" F3 Smith
		8½" Ballaset Christensen
	2 x	8½" F4G

The 8½" hole section was drilled, logged and plugged within 22 days.

Drilling Sequence

The 8½" hole section was drilled to a total depth of 3361 m without any hole instability problems. The mud was weighted up to 13.0 ppg at 2550 m just before coring formation. The hole was cored from 2552.8 m to 2562.8 m and 9.3 m of core was recovered. The mud weight was then reduced to 12.0 ppg and further reduced to 11.1 ppg while drilling at 2725 m. It was realized that the pore pressure in the Middle and Lower Jurassic was normal pressured.

The ROP in the 8½" hole section was relatively consistent and a rate of 6 m/hr was obtained. In some short intervals containing limestone and siltstone the ROP dropped to 1.7 m/hr.

The ROP was very slow through the Triassic section which probably contributed to the washout sections below 3200 m.

The hole was logged without any problems and the well was plugged back and abandoned. See plug back and abandonment program section 3.7.

Bottom Hole Temperature

29.30 hrs after circulation had stopped, the static bottom hole temperature was 107.8°C. The geothermal gradient is 3.45°C per 100 meter.

TABLE 3 - 3

EXTRACT OF DAILY DRILLING ACTIVITIES
DATE: 21 MAY TO 21 JUNE 1984

DAY MONTH	DEPTH (m)	METERS DRILLED (m)	AVERAGE ROP DRILLING (m/hr)	OPERATION	REMARKS
21 May	-	-	-	Rig move.	Rig released from Norsk Hydro at 0430 hrs. 21 May 1984.
22 May	384.6	-	-	Rig move, run anchor.	
23 May	427	42.4	7.0	Drill 17½" pilot hole to 427 m.	Abandoned due to high angle. 3.5 degress at 417 m.
24 May	486	101.4	6.1	Drill 17½" pilot hole to 486 m.	
25 May	510	24.0	8.0	TD Pilot hole, open hole to 26".	Total depth pilot hole 510 m.
26 May	510	-	-	Open hole to 36".	Fail to run 30" casing past 486 m. POOH.
27 May	510	-	-	Anchor winch repair.	Anchor winch broke down while repositioning of drlg.rig.
28 May	510	-	-	Ream, run 30" casing.	Fail to run 30" casing past 480 m. POOH.
29 May	510	-	-	Ream ledge at 480 m, POOH, Fish.	Lost cone off under-reamer.
30 May	518	-	-	Run 30" casing, cement, drill.	30" csg. set at 506.5 m, drill 26" new hole to 514 m.
31 May	563	45.0	22.5	Rig up to run riser and diverter.	Function tested diverter and liner.Drill pilot hole to 563m.
1 June	931	368.0	24.5	Drill 14 3/4" pilot hole to 931m.	Controlled drilling. 3 singles in an hour.
2 June	1015	84.0	21.0	TD Pilot hole. Log hole.	Total depth pilot hole 1015m. Run E-logs ISF/LGS/GR/SP.
3 June	1015	-	-	Open hole to 26".	
4 June	1015	-	-	TD 26" hole.	Displace riser to seawater. Open dumpvalve. Well flowing.
5 June	1015	-	-	Pull riser. Wiper trip to TD.	Observe well for seawater flow.
6 June	1015	-	-	Run 20" casing. Retrieve fish.	20" casing parted at wellhead. 20" casing shoe at 594 m.
7 June	1015	-	-	Wiper trip to TD.	Tight spots at 570m, 715m, 729m. Well flowing.
8 June	1015	-	-	Run and set 20" casing at 1003 m.	Tight at 618 m. Partially circulated casing down.
9 June	1015	-	-	Cement 20" casing.	No backflow after displacement of cement.
10 June	1015	-	-	Run BOP and riser. Run temp.log.	Function tested BOP and tested kill/choke lines.
11 June	1015	-	-	Perforate 20" csg. Cement annulus	Well still flowing.
12 June	1015	-	-	Drill cement. Squeeze cmt. annulus.	No success while testing perforation. No visuable flow.
13 June	1015	-	-	Drill cement. Squeeze cmt.annulus	Wait on cement to set up.
14 June	1015	-	-	Drill cement. Perforate 20" csg.	Circulate and condition mud.
15 June	1015	-	-	Squeeze cement annulus.	Well not flowing.
16 June	1020	5.0	10.0	Drill cement and new formation.	Tested perforation/casing. Performed F.I.T to 11.5 ppg EMW.
17 June	1140	120.0	11.4	Drill 17½" hole and survey	Displace hole to KCL-polymer mud.
18 June	1484	344.0	19.1	Wiper trip. Cont.drill and survey.	Tight hole 1125 m to 1138 m.
19 June	1690	206.0	14.7	Short trip. Cont.drill and survey	Tight hole at 1446 m.
20 June	1730	23.0	9.2	POOH. Test BOP. Wiper trip.	POOH due to washed out nozzle on bit. Tight hole 1450-1690m.
21 June	1808	95.0	6.7	Drill 17½" hole and survey. Ream.	Ream tight spot 1680 m to 1737 m.

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EXTRACT OF DAILY DRILLING ACTIVITIES
DATE: 22 JUNE TO 23 JULY 1984

DAY MONTH	DEPTH (m)	METERS DRILLED (m)	AVERAGE ROP DRILLING (m/hr)	OPERATION	REMARKS
22 June	1904	96.0	5.0	Drill 17½" hole. Short trip.	
23 June	1970	66.0	5.3	Drill and survey. Wiper trip.	Circulate hole. Tight hole 1677 m to 1705 m.
24 June	2029	59.0	4.9	Drill 17½" hole to TD at 2029m.	Tight hole 1980 m to 1781 m. Needed to clean stabilizers.
25 June	2029	-	-	Wiper trip. Circ. Condition hole.	Run E-logs. ISF/LSS/GR/SP, LDT/CAL/GR, CST
26 June	2029	-	-	Wiper trip. Run 13 3/8"casing.	Hole in good condition.
27 June	2029	-	-	Cement 13 3/8" casing at 2026m.	No success setting seal assy. Run HRT log.
28 June	2029	-	-	Set seal assy. Work on drawwork.	Change out brake rims on drawwork.
29 June	2029	-	-	Test BOP.	Tested kill/choke manifold. Completed repair on drawwork.
30 June	2035	6.0	4.0	Drill cmt. and new form. at 2023m.	Performed FIT. Failed. Squeeze cement below 13 3/8" shoe.
1 July	2083	48.0	3.7	Drill cement. Drill 17½" hole.	Successful FIT to 15.0 ppg EMW.
2 July	2138	55.0	3.4	Drill and survey 12 ¼" hole.	
3 July	2186	48.0	3.0	Drill 12 1/4" hole. POOH.	Trip to change bit. Raised mud weight to 12.6 ppg.
4 July	2245	59.0	2.9	Drill 12 1/4" hole ahead.	Drilling break, max. ROP 14.2 m/hr. Flow check. No flow.
5 July	2315	70.0	3.9	Drill 12 1/4" hole.Short trip.	Drilling break. No flow. Tight hole 2235 m to 2149 m.
6 July	2348	33.0	3.3	Drill 12 1/4" hole. Test BOP.	Tested kill/choke manifold.Yellow pod did not close.
7 July	2350	2.0	2.0	Cont.test BOP. Drill 12 1/4" hole.	Function tested yellow pod on BOP.
8 July	2418	68.0	2.8	Drill and survey 12 1/4" hole.	
9 July	2439.5	21.5	2.4	Drill ahead. Wiper trip. POOH.	Lost circ. POOH. Hole taking fluid while not pumping.
20 July	2439.5	-	-	Flow check. RIH to TD.	Pump LCM and cond.mud. Regain circulation.
11 July	2439.5	-	-	Logging in open hole.	Run E-logs. ISF/LSS/GR/SP, LDT/CNL/NGT, SHDT RFT CST.
12 July	2439.5	-	-	Wiper trip to TD. Run 9 5/8" csg.	Hole in good condition. No fill on bottom.
13 July	2439.5	-	-	Cont.9 5/8" csg at 2025.7m.Run logs.	Run E-logs. Temp log. Set seal assembly.
14 July	2444.0	4.5	3.0	Test BOP. Drill cmt.and new form.	Conditioned mud. Performed LOT of 13.8 ppg EMW.
15 July	2505.0	61.0	3.8	Drill 8½" hole. Bit trip.	Drilling break max. 18 m/hr. No flow.
16 July	2552.0	47.0	4.7	Drill and survey 8½" hole. POOH.	Circulate bottoms up. Mud weight increased to 13.0 ppg.
17 Juky	2596.0	44.0	4.4	Cut core. Cont. drill 8½" hole.	Cut 9.2 m core from 2552.8 m. 100% recovery. No shows.
18 July	2682.0	86.0	3.9	Drill and survey 8½" hole.	Reduce mud weight to 12.0 ppg.
19 July	2756.0	74.0	5.2	Drill ahead. Bit trip.	Fail to retrieve survey.
20 July	2852.0	96.0	6.0	Drill 8½" hole. Wiper trip.	Torque problems. Low ROP below 2849 m. Hole in good cond.
21 July	2890.0	38.0	6.3	POOH. Test BOP. Cont. drill ahead.	Tested kill/choke manifold.
22 July	2977.0	87.0	6.7	Drill & surv. 8½" hole. Bit trip.	
23 July	2990.0	13.0	2.0	Drill 8½" hole. Bit trip.	High torq. at 2980m. Change bit & roller reamer. Ream to TD.

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TABLE 3 - 4

EXTRACT OF DAILY DRILLING ACTIVITIES
DATE: 24 JULY TO 7 AUGUST 1984

DAY MONTH	DEPTH (m)	METERS DRILLED (m)	AVERAGE ROP DRILLING (m/hr)	OPERATION	REMARKS
24 July	3027.0	37.0	3.4	Drill 8½" hole. Bit trip.	Change bit & roller reamer. Ream tight hole 2983 m to TD.
25 July	3062.0	35.0	3.3	Drill 8½" hole. Bit trip.	L/D roller reamer. M/U turbine. Ream 2994 m to 3054 m.
26 July	3086.0	24.0	2.1	Drill 8½" hole. Bit trip.	L/D turb.M/U roller reamers.Ream to TD. Drlg.break. No flow.
27 July	3196	110.0	4.7	Drill 8½" hole ahead.	
28 July	3260	64.0	3.0	Drill and survey 8½" hole.POOH.	
29 July	3284	24.0	2.7	Test BOP.RIH.Drill 8½" hole ahead.	Ream 3230 m to 3260 m.
30 July	3355	71.0	2.0	Drill 8½" hole ahead.	
31 July	3361	6.0	3.0	Drill 8½" hole to TD. Run logs.	Circ. Cond. hole. Run E-logs. ISF/LSS/GR/SF,CNL/LDT/CAL/GR.
1 Aug.	3361	-	-	Continue run logs.	Run E-logs. VSP, SHDT/GR, RFT, CST.
2 Aug.	3361	-	-	Finish logging. Set cmt.plug 1&2.	Run E-logs. CST. Cond. hole and RIH with open ended DP.
3 Aug.	-	-	-	Set E-ZSV bridge-plug.Set cement plug no. 3.	Tested cement plug no.2. Tested E-ZSV plug.
4 Aug.	-	-	-	Set E-ZSV bridge-plug. Set cement plug no. 4. Cut 9 5/8" csg at 399m	Tested E-ZSV plug. POOH 9 5/8" csg.
5 Aug.	-	-	-	Pull BOP and riser. Cut casings.	Cut 13 3/8" csg at 395m.POOH 13 3/8" csg.Cut 20"csg at 390m.
6 Aug.	-	-	-	Cut csgs. Retrieve PGB, guidelines	POOH 20" csg.Cut 30" csg at 390m.Retrieved PGB and 30" stub.
7 Aug.	-	-	-	Pull anchors.	Used ROV for seafloor survey.

TABLE 3 - 5

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3.7 PLUG BACK AND ABANDONMENT

The well was plugged and abandoned as a "dry well" after reaching a total measured depth of 3361 m KB. The attached final well diagram Figure 3-2 illustrates the present condition of the well. The abandonment plugs are as follows.

Plug No. 1

Interval:	2695-2795 m KB (separates Dunlin and Brent Group.
Length:	100 m
Cement Slurry:	23.2 bbls 15.8 ppg slurry with 112 sx Class "G" cement + 4.57 gps fresh water + 0.15 gps CFR2L + 0.40 gps Halad 10L.

PLug No. 2

Interval:	2351-2501 m KB (across 9 5/8" shoe)
Length:	150 m.
Cement Slurry:	34.8 bbls of 15.8 ppg slurry with 168 sx Class "G" cement + 4.71 gps fresh water + 0.10 gps CFR2L + 0.30 gps Halad 10L.

Tagged plug No. 2 with 10 000 lbs weight. Pressure tested plug to 1500 psi for 10 minutes.

Displaced with 180 bbls of 14.5 ppg mud on top of plug.

Plug No. 3

Depth:	1505 m KB
Type of Plug:	9 5/8" EZ drill bridge plug set on wireline. Pressure tested plug to 500 psi for 10 minutes. Placed 50 m long cement plug on top of bridge plug.
Cement Plug Interval:	1449-1499 m KB
Cement Slurry:	11.6 bbls of 15.8 ppg slurry (neat cement) with 57 sx Class "G" cement + 5.08 gps fresh water.

Plug No. 4

Depth:	635 m KB
Type of Plug:	9 5/8" EZ drill bridge plug. Pressure test plug to 500 psi 10 min. Placed 200 m cement plug on top of bridge plug.
Cement Plug Interval:	435-635 m KB
Cement Slurry:	46.4 bbls of 15.8 ppg slurry (neat cement) with 219 sx Class "G" cement + 5.08 gps fresh water.

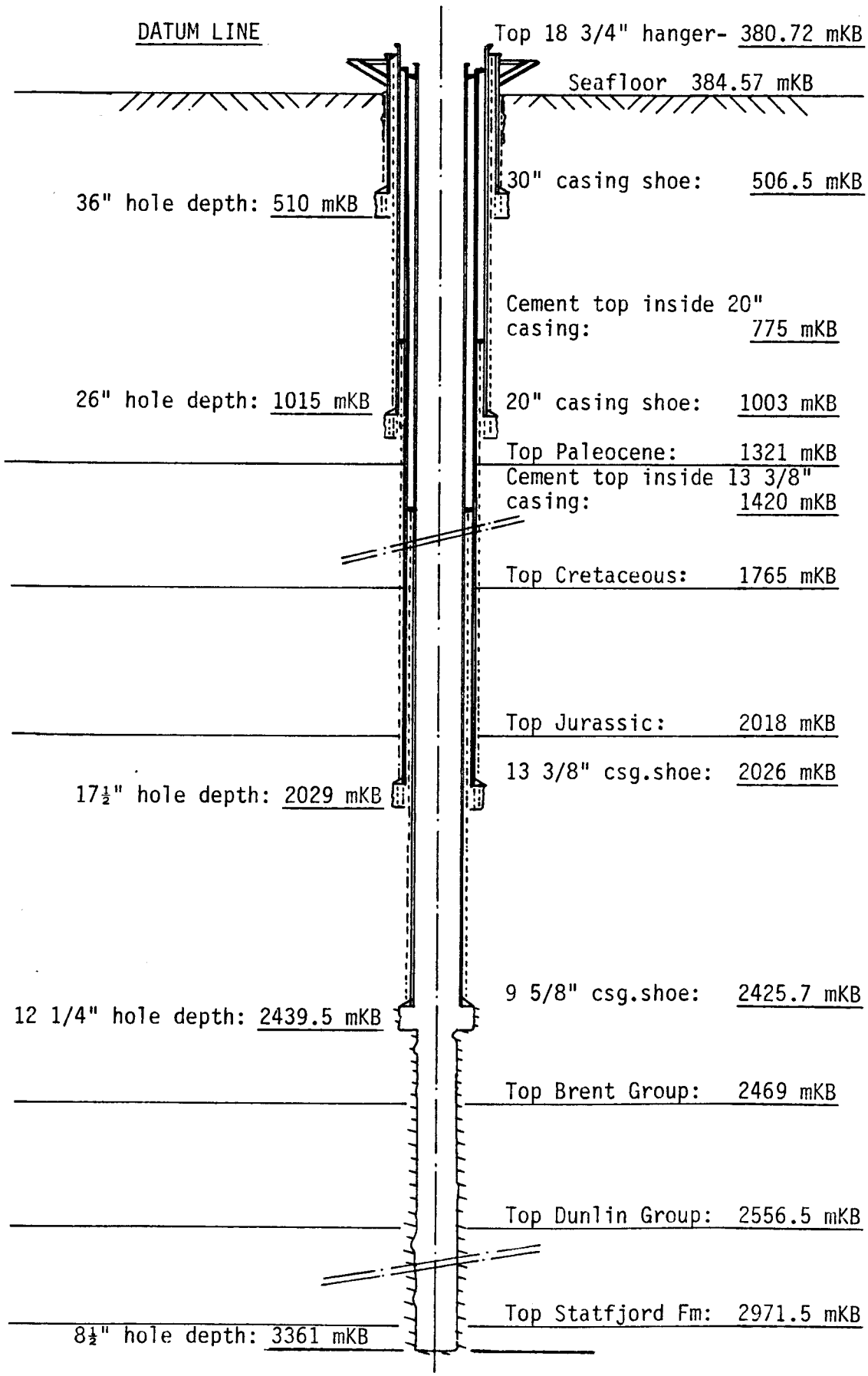
Casing Cutting

The 9 5/8" casing was cut at 399 m KB and retrieved with casing spear. The 13 3/8" casing was cut at 395 m KB and retrieved with casing spear. The 20" casing was cut at 390 m KB and retrieved with casing spear. The 30" casing was cut at 390 m KB and retrieved with guidelines.

SECTION 4
DRILLING DATA AND SPECIFICATIONS

4.1 WELLBORE SCHEMATIC

FIGURE 4-1



rs 943.22

4.2 SUBSEA ASSEMBLY

Subsea Wellhead System

A Cameron 18 3/4" 10 000 psi working pressure (WP) 3 hanger housing wellhead system was used for the 35/11-1 well. The standard casing program of 30", 20", 13 3/8", 9 5/8" and 7" was planned.

The 7" liner was not required as there were no requirements for tesing.

The sea bottom in the area was very soft down to 6 m below the seafloor. Therefore, no Temporary Guide Base (TBG) was used due to the potential of tilting the TBG caused of the soft sea bottom.

There were some problems with the wellhead system that should be noted:

- Seal Assemblies - 3 attempts before successful test on each of the 13 3/8" and 9 5/8" seal assemblies.

- 18 3/4 wellhead running tool - threaded tool. Extremely difficult to release tool from the wellhead after cementing the 20" casing.

The Figure 4-2 illustrates the arrangement of the wellhead system which was used.

BOP STACK

Figure 4-3 illustrates the Cameron 18 3/4" 10 000 psi (WP) BOP system that was used. The system was composed of the following from bottom (trimmed for H_2S service).

Lower pipe ram:	5" 10 000 psi WP Cameron Type "U"
Middle pipe ram:	5" 10 000 psi WP Cameron Type "U"
Upper pipe ram:	7 5/8" x 3 1/2" 10 000 psi WP Cameron Type "U"
Blind shear ram:	Cameron 10 000 psi WP
Lower Annular:	18 3/4" Hydril Type "GL" 5000 psi WP
Upper Annular:	18 3/4" Hydril Type "GL" 5000 psi WP

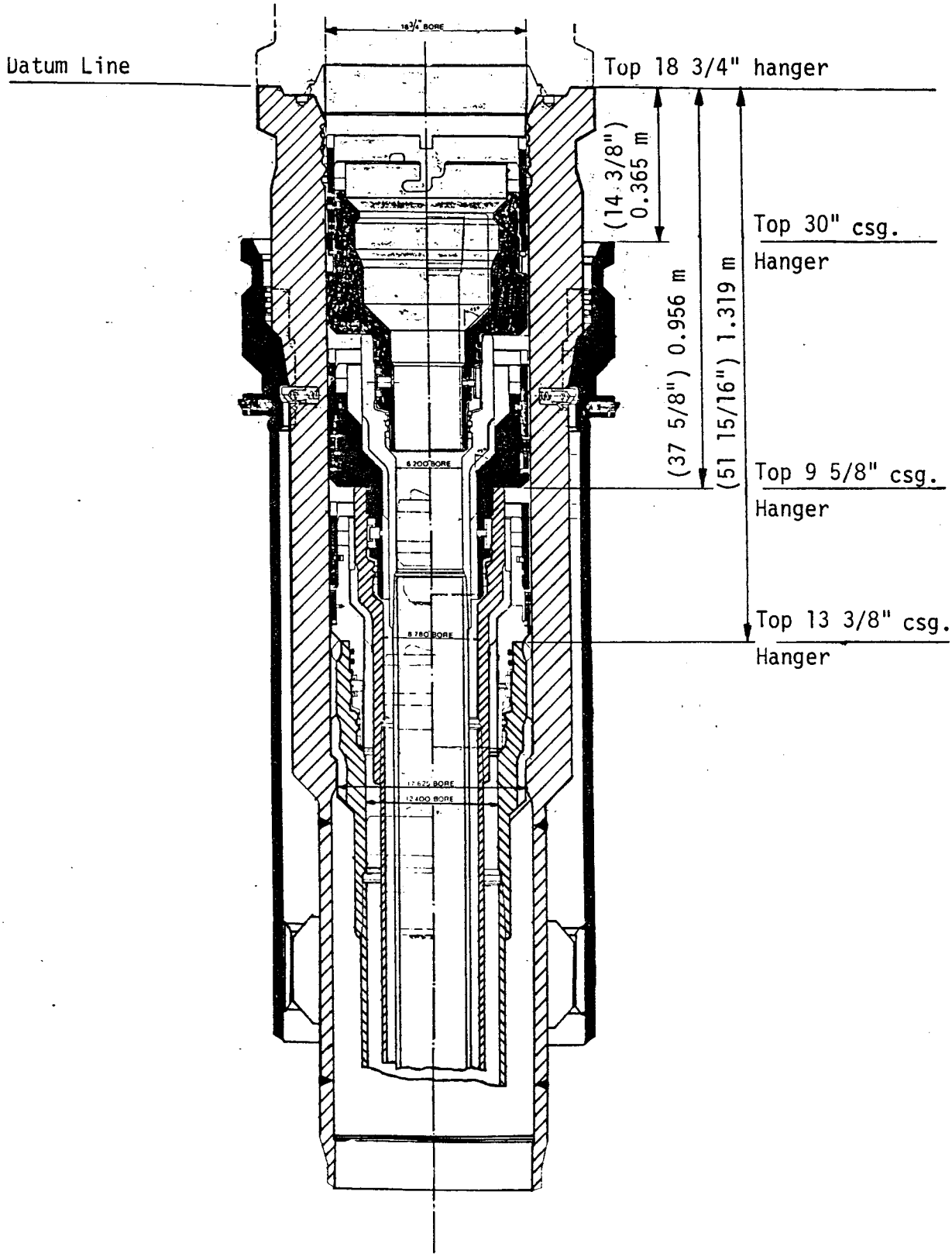
In addition to hydraulic operation, the two lower sets of pipe rams and shear rams can be opened and closed by acoustic control. The marine riser package can also be unlocked acoustically.

RISER

Marine riser 20.5" OD x 1/2" wall by 50' long with RCK connectors with 10000 psi integral choke and kill lines.
Choke lines are 4" OD x 2.728" ID. Ran 16 joints of Eccofloat (Symtactic foam) riser for buoyancy.

18 3/4" SUBSEA WELLHEAD SYSTEM

FIGURE 4-2



18 3/4" - 10.000 psi WORKING PRESSURE, UNDER WATER WELLHEAD SYSTEM
Casing program - 30", 20", 13 3/8", 9 5/8", 7"

CAMERON 18 3/4" BOP SYSTEM AND MEASUREMENT DATA.

NORTRYM

FIGURE 4-3

WELL : 35/11-1

DATE : 23 May 1984

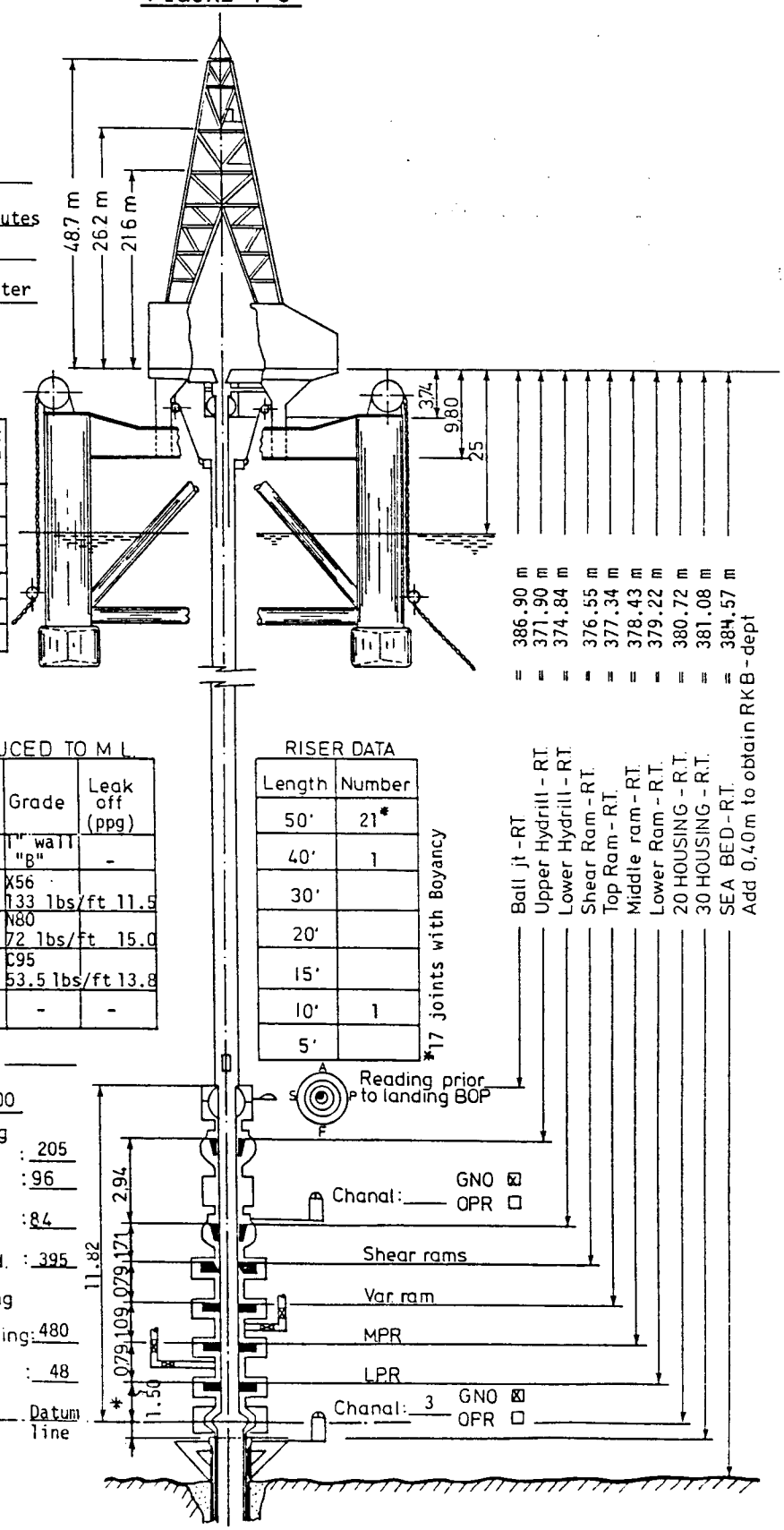
Tidewater data

Standard port : Bergen

Time diff : 15 minutes

Heigth diff : Factor 1.3

Mean range : 0.6 meter



GUIDE LINE DATA

Guide Line No	Canged Date	Slipped Date	Present Length m
1			457
2			457
3			457
4			457
Y.Pod			
B.Pod			

CASING DATA DEPTH REDUCED TO M L

Size	RKB - Shoe	RKB - Housing	Number of Jts.	Grade	Leak off (ppg)
30"	506.5	381.08	10	1" wall "B"	-
20"	1003.0	380.72	52	X56 133 lbs/ft	11.5
13 3/8"	2026.0	382.04	140	N80 72 lbs/ft	15.0
9 5/8"	2425.7	384.68	153	C95 53.5 lbs/ft	13.8
7"	-	-	-	-	-

Bottoms of ribs below datum: _____

RISER DATA

Length	Number
50'	21*
40'	1
30'	
20'	
15'	
10'	1
5'	

WEIGHT DATA Lbs x 1000

Wt. ind. reading when landing Pinconn. ind. slip jt. & sup. ring : 205

LMP in air. act wt. : 96

LMP in SW. " " : 84

Stack in SW + 100 riser, Wt. ind. : 395

Wt. ind. reading before landing stack, incl. riser, slip jt, sup. ring: 480

Riser tens. setting, ea. : 48

* WITH COLLET CONNECTOR 1.50 m

4.3 PORE PRESSURE

Pore pressure measurements (RFT data) were taken in the Viking Group, Brent Group, Dunlin Group, Statfjord Formation and in Triassic.

The RFT test results and interpretation of borehole related to tight hole, drill kicks and mud weight indicated the pore pressure to be normal pressured (8.6 ppg EMW) throughout the borehole with only a small increase in pore pressure at 3242 m KB to 9.09 ppg EMW.

RFT runs were done at the end of the 12 1/4" and 8 1/2" hole sections. Plotted in Figure 4-5 are the gradients for pore pressure, fracture pressure and mud weight used to drill the well to total depth. The table below details the RFT results for all the permeable zones.

RFT DATA

TABLE 4 -1

Depth (mKB)	Formation	Formation Pressure (psi)	(ppg EMW)
2113	Viking GP	3076	8.53
2123		3093	8.54
2127		3098	8.54
2133		3108	8.54
2138		3116	8.54
2144		3124	8.54
2179		3175	8.54
2276		3310	8.52
2509	Brent GP	3673	8.58
2517.5		3685	8.58
2523		3693	8.58
2535		3713	8.59
2538		3714	8.58
2550		3733	8.58
2552		3737	8.58
2587.5	Dunlin GP	3782	8.57
2601.5		3803	8.57
2618		3826	8.57
2653		3872	8.55
2698.5		3942	8.56
2790		4074	8.56
2805		4094	8.56
2818		4112	8.55
2895		4221	8.55
2945		4292	8.54
3011.5	Statfjord FM	4387	8.54
3071		4474	8.54
3143		4623	8.62
3192.5	Triassic	4824	8.86
3242		5025	9.09

The only indication of abnormal pore pressure was in the Tertiary shales between 1250-1750 m KB. This was evidenced by the tight hole conditions and all reaming that was necessary to stabilize the hole. The Sonic log analysis together with borehole size and comments are all presented in Figure 4-4.

Drilling breaks and high gas readings were encountered between 2018-2060 m KB. No RFT data was taken in the 17½" hole section.

Samples

Depth 2113 m, water sample 0.149 ohm-m at 58°F
Depth 2535 m, water sample 0.133 ohm-m at 64°F.

DST

None.

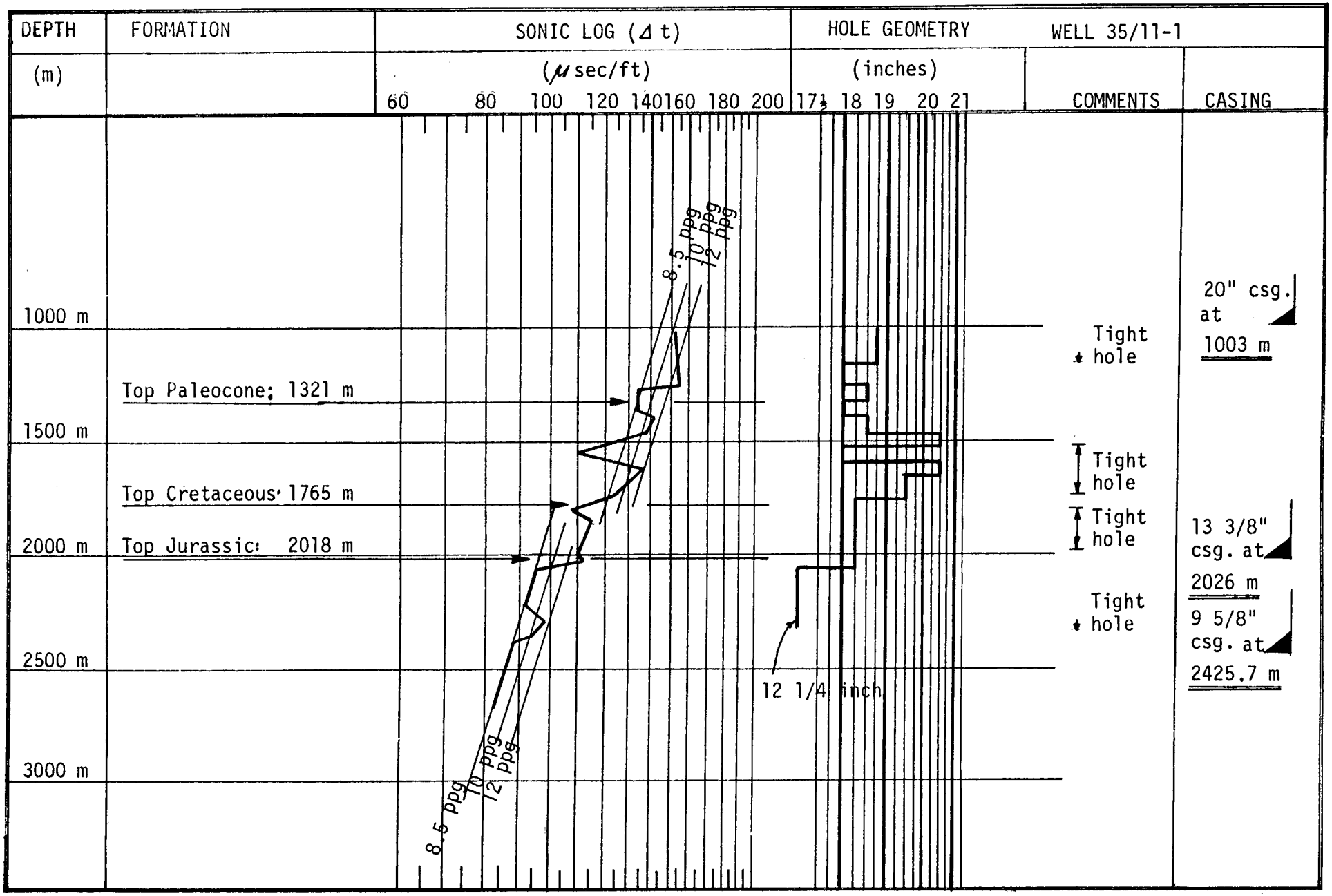


FIGURE 4 - 4

SONIC LOG PLOT AND HOLE GEOMETRY

4.4 FORMATION LEAK-OFF TEST RESULTS

The formation leak-off tests were carried out after drilling out approximately 5 meters of new hole below 20", 13 3/8" and 9 5/8" casing shoe. The hole was cleaned out and circulated until uniform mud weight was obtained. The leak-off test was obtained as presented in the table below.

LEAK-OFF TEST RESULTS

TABLE 4 - 2

Casing Size (inch)	Casing depth (m)	Open hole depth (m)	Formation leak-off test (ppg EMW)
20	1003	1020	11.5 (leak-off tested)
13 3/8	2026	2035	15.83 (fracture tested)
	2026	2040	15.0 (formation integrity test)
	2118	-	13.2 (lost circulation while drilling at 2439 m. Suspect lost circulation in Viking group-sand which is 83 m below 13 3/8" shoe.)
9 5/8"	2425.7	2444	13.8 (leak-off tested)

Leak-off test below 13 3/8" casing shoe

The original leak-off test at the 13 3/8" shoe was taken to 15.83 ppg EMW at which time the formation fractured. Subsequent leak-offs were 13.0, 13.13 and 13.22 ppg EMW. A cement squeeze at the shoe was then attempted. No cement was able to be squeezed around the shoe as the fracture had apparently healed. Five meters of new hole were drilled and a formation integrity test to 15.0 ppg EMW was performed. The test was not taken to leak-off.

The fracture gradient curve in Figure 4-6 does not reflect the abnormally high formation integrity test below the casing shoe at 2026 m.

4.4.1 TEMPERATURE GRADIENT

The temperature gradient is based on available Bottom Hole Logging Temperature (BHLT) from available wireline logging maximum thermometers. The prognosed temperature versus depth is shown in Figure 4-6.

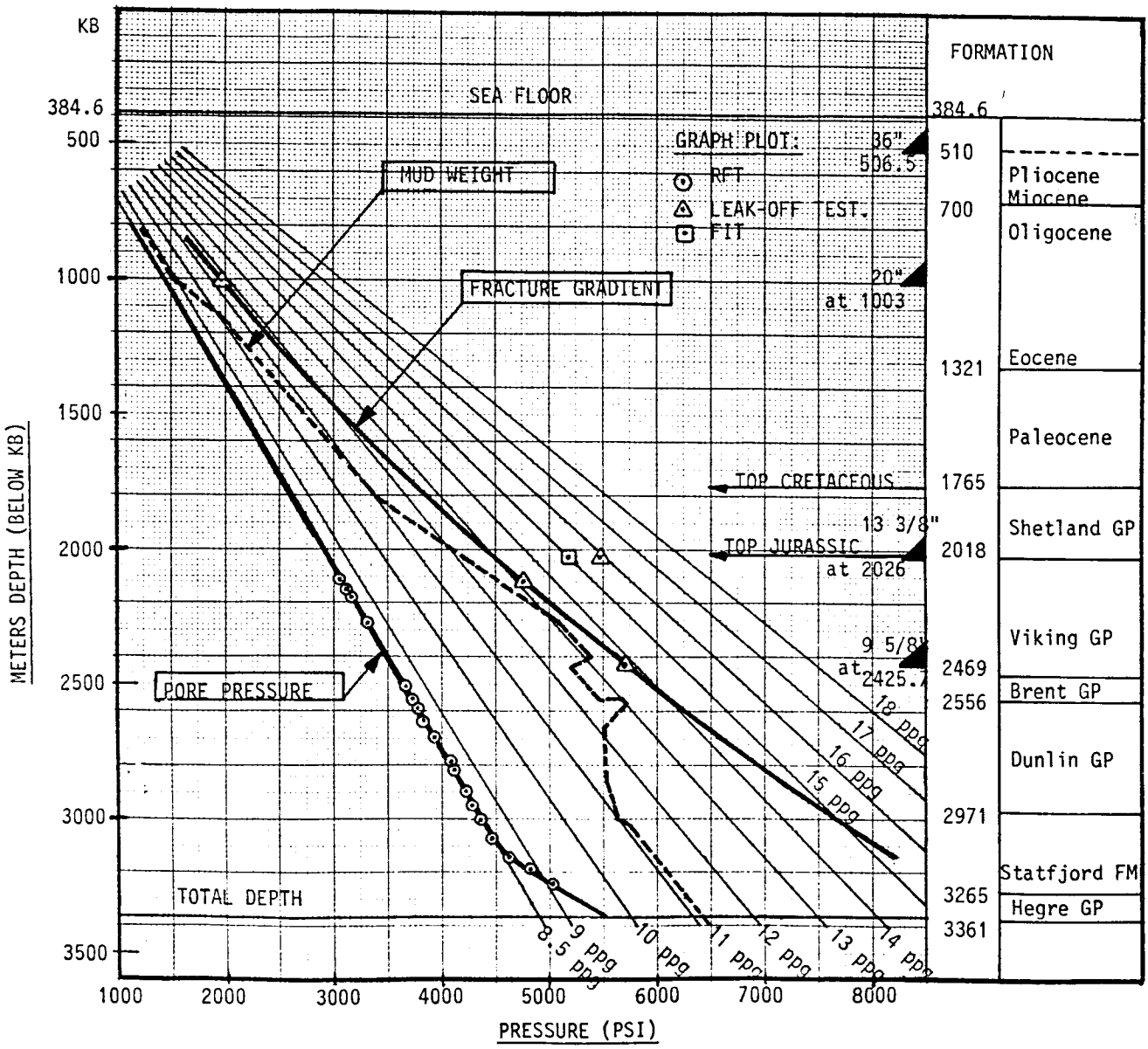
The bottom hole temperature is based on actual log runs to bottom and temperature measurements at various depths. Based on these, the static formation temperature have been found by reading and comparing the bottom hole temperature relatively long time after circulation was stopped.

The mean temperature gradient from seabed to total depth is $5^{o}C + 3.45^{o}C/100$ m.

PORE PRESSURE , FRACTURE GRADIENT AND MUD WEIGHT

WELL 35/11-1

FIGURE 4 - 5



COMMENTS:

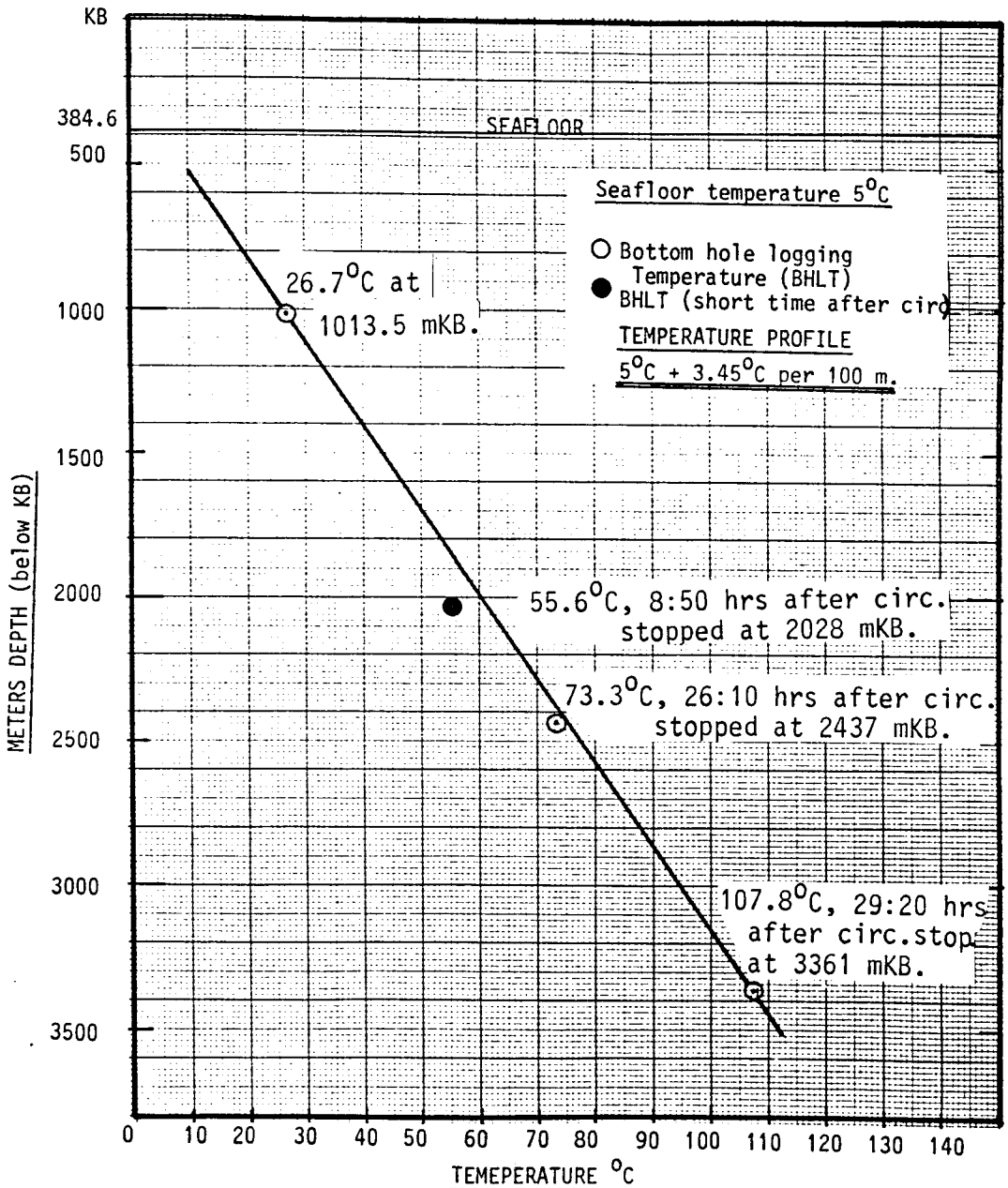
Sonic log data in Figure 4-4 and borehole instability related to drilling problems in Tertiary Oligocene - Paleocene claystones indicate overpressured shales in this interval. However, the sonic log interpretation indicates these pore pressures to be as high as 11.8 ppg EMW.

Equivalent pore pressure, based on sonic data interpretation, is showing normal pore pressure gradient in Jurassic and in Triassic, which is confirmed by the plotted RFT data above.

TEMPERATURE VS. DEPTH

WELL 35/11-1

FIGURE 4 - 6



WELLBORE TEMPERATURE PROFILE

(Based on temperature measurements in well 35/11-1)

4.5. BIT RECORD AND ROP SUMMARY

Table 4-3 and 4-4 are a copy of the rig bit record containing hydraulic and penetration rates. The bit record can be summarized by hole section as follows.

Drilling the 36" hole section

This hole section was drilled using 2 drilling bits, a 17½" SDS tooth bit and 26" DS tooth bit for soft formations. The 17½" hole was opened to 36" using a 26" hole opener with a bullnose and a 36" hole opener with a 17½" bit. Before running 30" casing, the hole was reamed using a 36" hole opener and a 26" bit.

The average rate of penetration (ROP) to drill the 17½" pilot hole was 4.6 m/hr (112 m/day) and this ROP includes the drilling time it took to respudd the well. Drilling rate was obtained in the range of 7.0-8.0 m/hr while making the 17½" pilot hole. This interval was drilled in soft formation with boulder beds that could cause the bit to kick off (build angle).

Drilling the 26" hole section

The hole section was drilled using 2 drilling bits, a 14 3/4" SDT tooth bit and a 26" DS tooth bit for soft formation. The 14 3/4" hole was opened using a 26" hole opener. The ROP to drill the 14 3/4" pilot hole was 21.9 m/hr (525.6 m/day) with a maximum ROP of 24.5 m/hr. This interval was "control drilled". Only 3 singles per hour were drilled. Drilling through a sand section created problems for the solids control equipment to handle the big load of cuttings.

Drilling the 17½" hole section

This hole section was drilled using 4 drilling bits, all bits were 17½" tooth bits and drilled the 17½" hole section having a ROP of 11.0 m/hr (263 m/day). In the upper section of the 17½" hole, a maximum ROP of 19.1 m/hr was obtained. In the lower sections, an ROP of 5.0 m/hr was obtained. Tight hole problems were experienced and wiper trips were often required. This section was drilled through the Oligocene-Paleocene claystone which was indicated to be overpressured.

Drilling 12 1/4" and 8½" hole sections

The 12 1/4" hole section was drilled using 4 drilling bits. One bit was a 12 1/4" tooth bit for soft formations and the other bits were 12 1/4" insert bits for soft to medium formation. Drilling the 8½" hole section 14 drilling bits were used including one core bit. Most bits were 8½" insert bits for soft to medium formation. The ROP in the 12 1/4" and 8½" hole sections was very low and was respectively 3.1 m/hr (75.7 m/day) and 14.0 m/hr (97.4 m/day). This section was drilled using a heavy mud weight which resulted in high overbalance over the formation pressure and very low ROP.

BIT RECORD

TABLE 4 - 3

COMPANY MOBIL EXPLORATION NORWAY INC. WELL NO. 35/11-1 PAGE NO. 1

BIT RUN	BIT NO.	DEPTH IN	SIZE	MAKE	TYPE	IADC CODE	FLOW AREA OR JETS 32 NDS.	METRE	HOURS DRLG.	WT./ 1000	AVG. R.P.M.	TOTAL REVS	COND. T.	COND. B.	COND. G.	DEV.	M/HR AVG. ROP.	STAND PIPE PRESSURE	AVG. MUD FLOW IN GPM	REMARKS
1	1	386	17.5"	SMITH	SDS	1-1-4	3x24 1x32	42.5	3.7	2	90/130	23,000	2	1	IN		15	2400	1000	ABANDON HOLE DUE TO HIGH DEVIATION.
RR1	1	386	17.5"	SMITH	SDS	1-1-4	4 x 14	124	13.9	5-10	100	83,000	8	4	1/4		10	2500	1000	SPUD WELL, 17.5" PILOT HOLE.
			26"	SERVCO			OPEN	124	7	0-10	60	19,000								OPEN HOLE TO 26"
			36"	SECURITY			3 x 16	124	10	0-10	80	28,000								OPEN HOLE TO 36"
2	2	510	26"	SMITH	DSJ		3 x 18	8.5	2.5	20-30	70	11,000	1	1	IN		4	2800	982	DRILL CMT AND 8.5m NEW FORMATION.
3	3	518.5	14.375"	SMITH	MSDTC		3 x 16	496.5	21	2-25	80/100	68,000	3	4	IN		50	2900	980	DRILL 14.375" PILOT HOLE.
			26"	SMITH U/R	DS	1-1-1	OPEN													OPEN HOLE TO 26"
4	4		17.5"	SMITH	SDS	1-1-4	4 x 16													DRILL CMT PLUGS
RR1	4	1015	17.5"	SMITH	SDS	1-1-4	4 x 16	5	2.6	25	130	12,000	3	2	IN		40	2150	1000	DRILL CMT AND 5m NEW FORMATION.
5	5	1020	17.5"	SMITH	SDT	1-2-4	4 x 16	670	28.5	20-35	120	184,000	5	4	IN		15-40	3200	900	PRESSURE LOSS, CENTRE NOZZLE WASHED OUT.
6	6	1690	17.5"	SMITH	SDGH	1-3-5	2x18 1x16 1x14	239	32.1	50-70	120	243,000	5	4	IN		5-15		850	WASHED OUT NOZZLE.
7	7	1929	17.5"	SMITH	SDT	1-2-4	2x18 1x16 1x14	100	19	45-60	130	107,000	3	4	IN		8	3200	830	HIGH TORQUE
8	8	2029	12.25"	SMITH	SDGH	1-3-5	3 x 15	88	25.5	30-55	90	126,500	7	8	1/8		4	3100	550	DRILL CMT AND FORMATION, HIGH TORQUE.
9	9	2117	12.25"	HTC	J11	4-3-7	3 x 14	69	18.7	25-45	100	112,000	7	6	1/8		2-6	3100	500	HIGH TORQUE
10	10	2186	12.25"	SMITH	F2	5-2-3	2x14 1x15	162.5	44.1	45	100	295,000	3	4	1/16		3	3150	470	POOH FOR BOP TEST.
11	11	2348.5	12.25"	SMITH	F2	5-2-3	2x14 1x15	91	29.5	45	100	195,000	1	3	IN		3	3100	560	POOH TO SET 9 5/8" CASING
12	12	2439.5	8.5"	SMITH	SDGH	1-3-5	3 x 13	4.5	1.2	28	83	129,000	1	1	IN		3	2300	380	DRILL CMT AND FORMATION
13	13	2444	8.5"	SMITH	SDGH	1-3-5	3 x 13	66	14.9	35-40	80	76,000	2	2	1/16		6	2250	400	HIGH TORQUE
14	14	2510	8.5"	SMITH	SDGH	1-3-5	3 x 12	42	7	35	80	34,500	2	6	1/16		6	2300	380	POOH TO CORE
CB1	15	2552	8.5"	CHRIST.	ROSH			10	1.8	5-14	90	10,000	5%	WEAR			5	700	260	92.5% REC.

COMPANY MOBIL EXPLORATION NORWAY INC. WELL NO. 35/11-1 PAGE NO. 2

BIT RUN	BIT NO.	DEPTH IN	SIZE	MAKE	TYPE	IADC CODE	FLOW AREA OR JETS 32 NDS.	METRE	HOURS DRLG.	WT./ 1000	AVG. R.P.M.	TOTAL REVS.	COND. T.	COND. B.	COND. G.	DEV.	M/HR AVG. ROP.	STAND PIPE PRES-SURE	AVG. MUD FLOW IN GPM	REMARKS
16	16	2563	8.5"	SMITH	SDGH	1-3-5	3 x 12	163	29.4	35	75	140,000	2	3	1/16		5.5	2720	400	FAIL TO RETRIEVE SURVEY, POOH.
17	17	2726	8.5"	SMITH	F2	5-1-7	3 x 12	126	18.9	35	75	94,000	2	3	1/16		6.6	2670	400	HIGH TORQUE.
18	18	2852	8.5"	SMITH	F2L	5-1-7	3 x 12	121	13.1	35	75	66,000	5	8	1/8		6.9	2700	400	LOCKED CONE, BROKEN TEETH.
19	19	2972.5	8.5"	SMITH	F3	5-2-7	3 x 12	4.5	1.4	35-40	65	18,000	2	3	3/16		0.9	2800	420	HIGH TORQUE.
20	20	2977	8.5"	SMITH	SDGH	1-3-5	3 x 12	0	0.75	30	60	500	1	8	1/8		0	2700	400	PINCHED BIT.
21	21	2977	8.5"	SMITH	F2L	5-1-7	3 x 12	48.5	11.5	35	75	50,000	8	4	3/8		3.6	2800	400	UNDER GAUGE, BROKEN TEETH, BADLY WORN ROLLERS.
22	22	3026	8.5"	SMITH	F2L	5-1-7	3 x 12	28	7.7	20	60	28,000	4	4	3/16		3.5	2800	420	
23	23	3054	8.5"	CHRIST.	BALLASET		0.5 IN^2	23	5.9	5-20	500	27,000 SURFACE	40% WEAR				2.3	3100	440	LOW ROP, RINGED AND WATER COURSES WASHED.
24	24	3077	8.5"	SMITH	F4G	6-1-7	3 x 12	183	39.3	35-37	50-55	132,500	6	5	3/16		4.7	2750	400	
25	25	3260	8.5"	SMITH	F4G	6-1-7	3 x 12	101	30.2	35-40	50-55	103,300	3	2	1/8		3.3	2800	400	DRILL TO T.D. 3361m

BIT RECORD

TABLE 4 - 4

4.6 BOTTOM HOLE ASSEMBLY SUMMARY

The bottom hole assemblies used to drill well 35/11-1 are summarized on the following pages. See Figures 4-7 to 4-9. The following short summary describes the bottom hole assembly selection.

17½" and 14 3/4" pilot hole

Drilling in soft formation, a pendelum type assembly was used. The stabilizer was 90 ft or more above the drilling bit and was used in combination with drill collars and jars.

17½" hole

Drilling in medium soft formation, a more massive BHA was used to keep the bit on bottom. The use of stabilizers kept the BHA stiff enough to prevent deviation problems. The drill collars gave good deviation control and a good "flywheel" effect to keep the bit turning. The BHA was a basic packed hole assembly.

12 1/4" hole

Drilling in harder formation, a basic packed hole assembly was used. The use of stabilizers and drill collars gave very good deviation control and enough weight to drill through this section.

8½" hole

Drilling in hard formation, a similar bottom hole assembly as described above was used. The BHA gave very good deviation control. A turbine in combination with a diamond bit was used to drill the last part of the 8½" hole to TD.

FIGURE 4 - 7

BOTTOM HOLE ASSEMBLY SUMMARY

BIT RUN #	B.H.A COMPOSITION
1	17 1/2" 9 1/2" X 9 1/2" JARS 9 1/2" 5 HWDP TOTAL WT. 77 KLBS TOTAL LENGTH 269.5 m
RR 1	17 1/2" 9 1/2" X 9 1/2" 8 1/2" JAR 8 1/2" 15 HWDP TOTAL WT. 53 KLBS TOTAL LENGTH 325.76 m
26" SERVO H.Q.	BULL NOSE 26" H.O. 9 1/2" X 9 1/2" 8" JARS 8" 15 HWDP TOTAL WT. 70 KLBS TOTAL LENGTH 327.94 m
36" SEC. H.Q.	26" 36" H.O. 9 1/2" X 9 1/2" 8" JARS 8" 15 HWDP TOTAL WT. 70 KLBS TOTAL LENGTH 327.16 m
2	26" 9 1/2" X 9 1/2" 8" JARS 8" 15 HWDP TOTAL WT. 72 KLBS TOTAL LENGTH 326.03 m
3	14 3/4" 9 1/2" X 9 1/2" X 9 1/2" 8" JARS 8" 15 HWDP TOTAL WT. 78 KLBS TOTAL LENGTH 336.22 m
RR 3	14 3/4" 26" U.R. 9 1/2" X 9 1/2" 8" JARS 8" TOTAL WT. 79 KLBS TOTAL LENGTH 337.5 m
4	17 1/2" 9 1/2" 15 HWDP TOTAL WT 41 KLBS TOTAL LENGTH 197.98 m
5	17 1/2" 9 1/2" X 9 1/2" X 9 1/2" X 9 1/2" 8" JARS 8" 15 HWDP TOTAL WT. 84 KLBS TOTAL LENGTH 343.31 m
6	AS FOR BIT RUN # 5 TOTAL WT. TOTAL LENGTH
7	AS FOR BIT RUN # 5 TOTAL WT. TOTAL LENGTH
8	12 1/4" X X X 8" X 8" JARS 15 HWDP TOTAL WT. 64 KLBS TOTAL LENGTH 331 m

KEY TO B.H.A DIAGRAMS

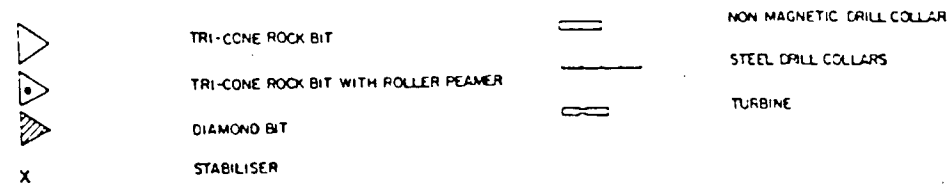
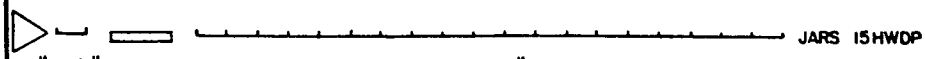
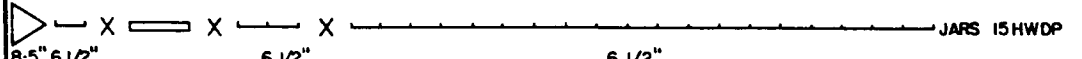


FIGURE 4 - 8

BOTTOM HOLE ASSEMBLY SUMMARY

BIT RUN #	B.H.A COMPOSITION
9	AS FOR BIT RUN # 8
	TOTAL WT. TOTAL LENGTH
10	AS FOR BIT RUN # 8
	TOTAL WT. TOTAL LENGTH
11	AS FOR BIT RUN # 8
	TOTAL WT. TOTAL LENGTH
12	 JARS 15 HWDP 8·5" 6 1/2" 6 1/2"
	TOTAL WT. TOTAL LENGTH 339·95m
13	 JARS 15 HWDP 8·5" 6 1/2" 6 1/2" 6 1/2"
	TOTAL WT. 60 KLBS TOTAL LENGTH 365·2m
14	AS FOR BIT RUN # 13
	TOTAL WT. TOTAL LENGTH
15	
	TOTAL WT. TOTAL LENGTH
16	AS FOR BIT RUN # 13
	TOTAL WT. TOTAL LENGTH
17	AS FOR BIT RUN # 13
	TOTAL WT. TOTAL LENGTH
18	AS FOR BIT RUN # 13
	TOTAL WT. TOTAL LENGTH
19	AS FOR BIT RUN # 13
	TOTAL WT. TOTAL LENGTH
20	AS FOR BIT RUN # 13
	TOTAL WT. TOTAL LENGTH

KEY TO B.H.A DIAGRAMS

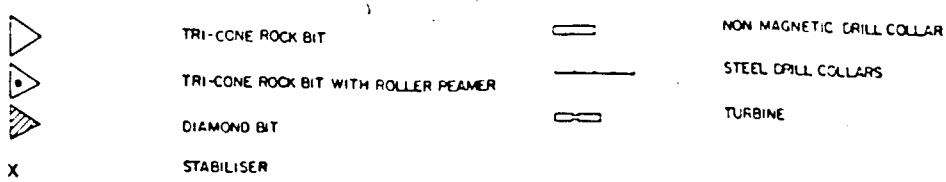
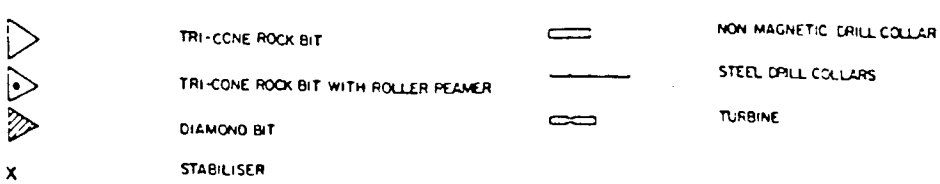


FIGURE 4 - 9

BOTTOM HOLE ASSEMBLY SUMMARY

BIT RUN #	B.H.A COMPOSITION	
21	AS FOR BIT RUN # 13	
	TOTAL WT.	TOTAL LENGTH
22	X 6 1/2" X 6 1/2" X 6 1/2" JARS 15 HWDP	
	TOTAL WT.	TOTAL LENGTH 366·19m
23	X NAVI-DRILL X X 6 1/2" JARS 15HWDP	
	TOTAL WT.	TOTAL LENGTH 367·40m
24	AS FOR BIT # 13	
	TOTAL WT.	TOTAL LENGTH
25	AS FOR BIT # 13	
	TOTAL WT.	TOTAL LENGTH
	TOTAL WT.	TOTAL LENGTH
	TOTAL WT.	TOTAL LENGTH
	TOTAL WT.	TOTAL LENGTH
	TOTAL WT.	TOTAL LENGTH
	TOTAL WT.	TOTAL LENGTH
	TOTAL WT.	TOTAL LENGTH
	TOTAL WT.	TOTAL LENGTH

KEY TO B.H.A DIAGRAMS



4.7 WELL DEVIATION AND DIRECTIONAL RECORDS

The hole was drilled as straight as practical through the use of stabilizers and drill collars. The well had to be respudded after the first attempt to drill the 17½" pilot hole because of deviation of 3.5 degrees at 417 m KB in the 17½" pilot hole. The rig was repositioned and the hole was kept to less than 1.0 degree, see Figure 4-10, and further drilled to TD without any deviation problems.

The following surveys are the source of the bottom hole position as in the attached directional survey by Scientific Drilling Controls .

- Single shot surveys/Toteo surveys in 36" hole to 510 m.
- Magnetic multishot survey from 506.5 m to 1010.9 m.
- Magnetic multishot survey from 1010.9 m to 2018.2 m.
- Gyro multishot from 2018.4 m to 2393.0 m.
- Single shot survey from 2393.0 m to 3259.4 m.

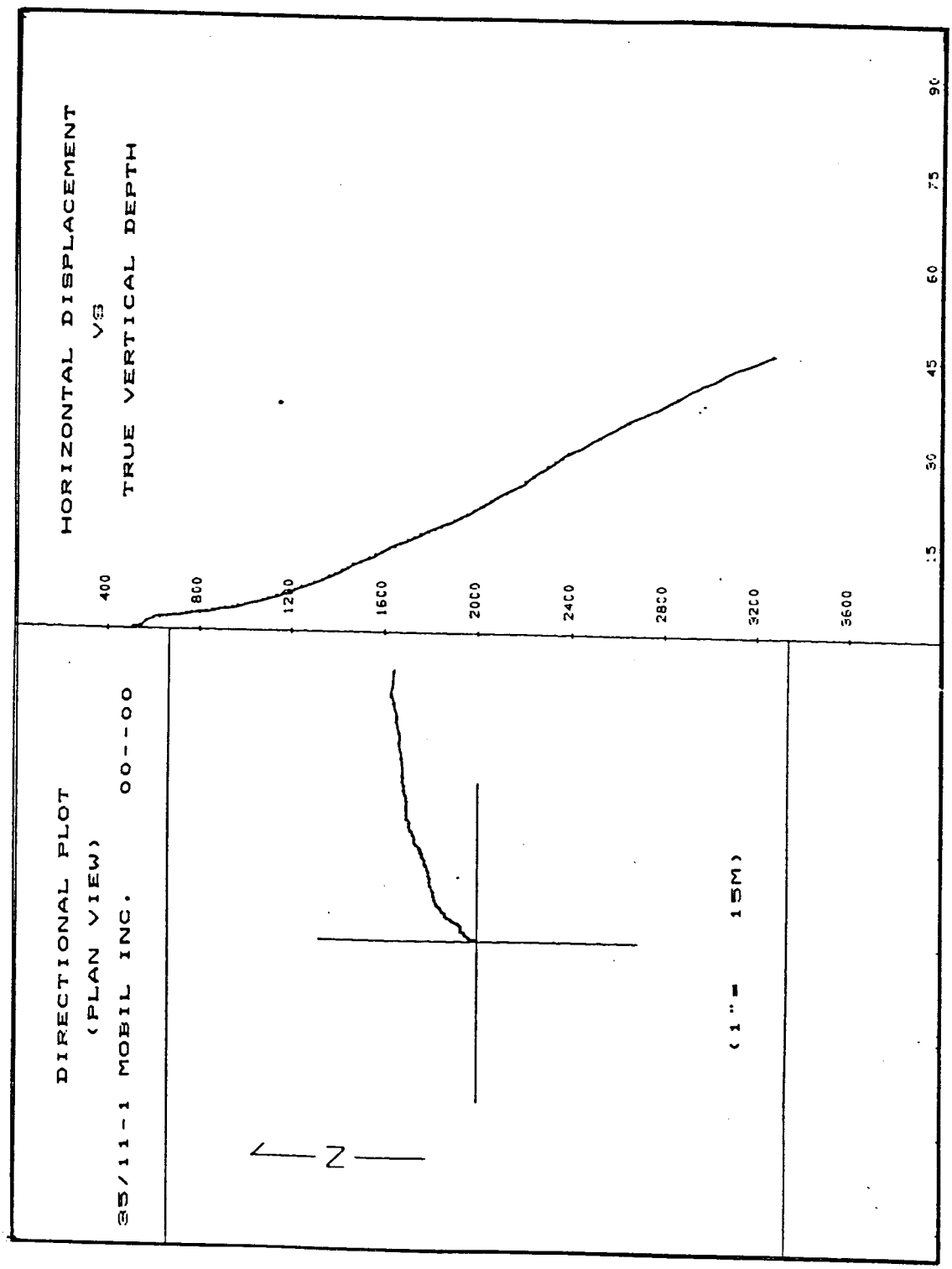
Note:

Multishot surveys are not available to total depth due to problems with the logging tool.

There were no deviation problems while drilling this well. The hole was drilled almost vertical having a maximum deviation of 1.65 degrees at 2230 m KB. The deviation while drilling the last part of the well to TD was kept to 1.0 degree or less. The general direction of the well is east in the north-east quadrant.

WELL SURVEY PLOT

FIGURE 4 - 10



(RECORD OF SURVEY - RADIUS OF CURVATURE METHOD)

SCIENTIFIC DRILLING CONTROLS
TASTA, 4000 STAVANGER, NORWAY

DIRECTIONAL SURVEY
FOR

MOBIL EXPLORATION NORWAY INC.

JOB NO: COMPLETION SURVEY
WELL: 35/11-1
LOCATION: NORTRYM
SURVEY DATE: 08/19/84
SURVEY ENGINEER: CAMPBELL

Meas. Depth	Vert. Depth	Vert. Sect.	Inc. DEG.	Direction DEG.	Coordinates Latitude	Coordinates Departure	D.Leg /30
506.45	506.45	.00	.00	.00	.00 N	.00 E	.00
511.62	511.62	.03	.90	30.18	.04 N	.02 E	5.22
539.96	539.95	.43	1.52	23.43	.57 N	.28 E	.67
568.42	568.41	.83	.95	27.18	1.13 N	.54 E	.61
596.20	596.18	1.12	.77	27.68	1.50 N	.73 E	.19
624.79	624.77	1.33	.42	26.68	1.76 N	.87 E	.37
653.06	653.04	1.46	.37	29.68	1.93 N	.96 E	.06
681.01	680.99	1.58	.23	74.68	2.03 N	1.06 E	.28
709.58	709.56	1.70	.37	124.68	1.99 N	1.19 E	.30
737.56	737.54	1.86	.48	49.68	2.01 N	1.35 E	.56
766.03	766.01	2.04	.28	60.18	2.13 N	1.50 E	.22
794.59	794.57	2.16	.32	27.68	2.23 N	1.60 E	.18
832.01	831.99	2.33	.30	73.18	2.35 N	1.74 E	.19
851.30	851.28	2.45	.42	69.43	2.39 N	1.86 E	.19
879.55	879.53	2.64	.35	69.68	2.46 N	2.04 E	.07
907.88	907.86	2.84	.50	48.68	2.57 N	2.21 E	.23
936.18	936.16	3.06	.45	64.68	2.70 N	2.40 E	.15
964.43	964.41	3.26	.38	56.93	2.80 N	2.58 E	.09
992.85	992.82	3.45	.43	46.18	2.92 N	2.74 E	.09
1010.85	1010.82	3.57	.52	39.93	3.03 N	2.84 E	.17
1042.70	1042.67	3.83	.70	27.18	3.32 N	3.02 E	.21
1071.10	1071.07	4.05	.63	26.68	3.61 N	3.17 E	.07
1099.50	1099.47	4.29	.67	33.43	3.89 N	3.33 E	.09
1127.90	1127.87	4.56	.73	36.68	4.17 N	3.53 E	.08
1156.30	1156.26	4.87	.78	43.68	4.46 N	3.77 E	.11
1184.70	1184.66	5.20	.75	43.18	4.73 N	4.03 E	.03
1213.00	1212.96	5.53	.78	45.68	5.00 N	4.30 E	.04
1241.40	1241.36	5.88	.83	47.18	5.28 N	4.59 E	.06
1269.80	1269.75	6.28	.92	52.68	5.55 N	4.92 E	.13
1298.20	1298.15	6.69	.88	53.68	5.82 N	5.28 E	.04

SCIENTIFIC DRILLING CONTROLS
TASTA, 4000 STAVANGER, NORWAY

DIRECTIONAL SURVEY
FOR

MOBIL EXPLORATION NORWAY INC.

JOB NO: COMPLETION SURVEY
WELL: 35/11-1

Meas. Depth	Vert. Depth	Vert. Sect.	Inc. DEG.	Direction DEG.	Coordinates Latitude	Coordinates Departure	D.Leg /30
1326.60	1326.55	7.12	.92	56.18	6.08 N	5.64 E	.06
1355.00	1354.94	7.58	1.00	63.18	6.32 N	6.05 E	.15
1383.40	1383.34	8.11	1.17	69.18	6.53 N	6.55 E	.22
1411.80	1411.73	8.70	1.20	71.18	6.73 N	7.10 E	.05
1440.20	1440.12	9.30	1.22	74.68	6.91 N	7.67 E	.08
1468.60	1468.52	9.88	1.15	76.18	7.05 N	8.24 E	.08
1496.90	1496.81	10.45	1.17	77.68	7.18 N	8.80 E	.03
1525.30	1525.21	11.04	1.20	74.18	7.33 N	9.37 E	.08
1553.70	1553.60	11.62	1.13	76.18	7.47 N	9.92 E	.08
1582.10	1582.00	12.16	1.08	78.68	7.59 N	10.46 E	.07
1610.50	1610.39	12.68	1.00	75.68	7.71 N	10.96 E	.10
1638.90	1638.79	13.19	1.05	75.18	7.84 N	11.45 E	.05
1667.30	1667.18	13.69	1.00	70.68	7.98 N	11.94 E	.10
1695.70	1695.58	14.19	1.00	70.18	8.15 N	12.41 E	.00
1724.10	1723.97	14.68	1.00	71.68	8.31 N	12.87 E	.00
1752.50	1752.37	15.17	.97	71.68	8.47 N	13.34 E	.03
1780.80	1780.66	15.63	.87	73.18	8.60 N	13.77 E	.11
1809.20	1809.06	16.06	.87	70.18	8.74 N	14.18 E	.05
1837.60	1837.46	16.49	.88	66.18	8.90 N	14.58 E	.07
1866.00	1865.85	16.94	.95	63.18	9.09 N	14.99 E	.09
1894.40	1894.25	17.41	1.00	59.68	9.33 N	15.42 E	.08
1922.80	1922.65	17.91	1.08	62.93	9.57 N	15.87 E	.10
1951.20	1951.04	18.47	1.22	66.68	9.81 N	16.38 E	.17
1979.60	1979.43	19.08	1.25	63.18	10.07 N	16.94 E	.08
2008.00	2007.83	19.71	1.33	68.68	10.33 N	17.52 E	.16
2018.40	2018.22	19.96	1.42	68.68	10.42 N	17.75 E	.26
2050.00	2049.81	20.71	1.30	75.55	10.66 N	18.47 E	.19
2080.00	2079.81	21.34	1.15	86.97	10.76 N	19.10 E	.29
2110.00	2109.80	21.95	1.23	88.08	10.78 N	19.72 E	.08
2140.00	2139.79	22.61	1.38	89.84	10.80 N	20.40 E	.16
2170.00	2169.78	23.32	1.42	79.72	10.86 N	21.13 E	.25
2200.00	2199.77	24.09	1.55	83.22	10.98 N	21.90 E	.16
2230.00	2229.76	24.92	1.65	82.06	11.08 N	22.73 E	.10
2260.00	2259.75	25.73	1.48	80.27	11.21 N	23.54 E	.18
2290.00	2289.74	26.54	1.63	78.99	11.36 N	24.34 E	.16

SCIENTIFIC DRILLING CONTROLS
TASTA, 4000 STAVANGER, NORWAY

DIRECTIONAL SURVEY
FOR

MOBIL EXPLORATION NORWAY INC.

JOB NO: COMPLETION SURVEY
WELL: 35/11-1

Meas. Depth	Vert. Depth	Vert. Sect.	Inc. DEG.	Direction DEG.	Coordinates Latitude	Coordinates Departure	D.Leg /30
2320.00	2319.73	27.36	1.50	80.83	11.50 N	25.14 E	.14
2350.00	2349.72	28.14	1.55	87.71	11.58 N	25.94 E	.19
2380.00	2379.71	28.85	1.30	94.49	11.57 N	26.68 E	.30
2393.00	2392.71	29.13	1.33	90.92	11.55 N	26.98 E	.20
2510.00	2509.68	31.69	1.25	84.00	11.67 N	29.61 E	.04
2639.00	2638.65	34.18	1.00	85.00	11.91 N	32.13 E	.06
2725.00	2724.64	35.66	1.00	80.00	12.11 N	33.61 E	.03
2821.00	2820.62	37.52	1.25	85.00	12.34 N	35.48 E	.08
2852.00	2851.61	38.12	1.00	80.00	12.42 N	36.09 E	.26
2972.00	2971.59	40.46	1.25	80.00	12.83 N	38.41 E	.06
3026.00	3025.58	41.52	1.00	70.00	13.09 N	39.43 E	.18
3054.00	3053.58	41.98	1.00	98.00	13.14 N	39.90 E	.52
3260.00	3259.54	45.26	1.00	98.00	12.64 N	43.46 E	.00

With reference to the slot :
Closure 45.26 AT N 73 47 E
Slot Coordinates .00 N .00 E
ASUMED VERTICAL TO 506MTS
SURVEY REFERENCED TO TRUE NORTH
VERTICAL SECTION CALCULATED ALONG CLOSURE
As at TUE, OCT 9, 1984, 5:26 PM

4.8 TIME DISTRIBUTION AND RIG UTILIZATION

The total time spent to move the semisubmersible drilling rig to location, drill the well 35/11-1 to 3361 m and to plug back and abandon well, was 78 days or 1872 hours.

The drilling operation can be devided into following activities and time break down. See also Rig Utilization Analysis Tables 4-8 to 4-13 for further time break down on daily and weekly basis.

TIME BREAK DOWN

TABLE 4 - 5

ACTIVITY	Hours	Days	Percent of total rig time %
Drilling (on bottom rotation)	563.5	23.5	30.10
Reaming	45.5	1.9	2.43
Coring	2.0	0.1	0.11
Circulate	82.5	3.4	4.41
Circ. condition mud	84.0	3.5	4.49
Tripping	299.5	12.5	16.00
Wiper trip	44.0	1.8	2.35
Flow check	3.0	0.1	0.16
Survey	27.0	1.1	1.44
Wait on weather	2.0	0.1	0.11
Cut/slip drill line	3.5	0.1	0.19
Change drill string	30.0	1.3	1.60
Fishing	6.0	0.3	0.32
Rig down time	88.0	3.7	4.70
BOP test	50.0	2.1	2.67
Run diverter/bushing	39.5	1.6	2.11
Run test tool	3.5	0.1	0.19
Leak off/Pressure test	22.5	0.9	1.20
Casing	135.0	5.6	7.21
Cementing	33.0	1.4	1.76
Rig move	13.5	0.6	0.72
Anchor handling	44.0	1.8	2.35
Failed to run casing	8.5	0.4	0.45
Under-reaming	24.0	1.0	1.28
Build mud	9.5	0.4	0.51
Run/pull riser BOP	47.5	2.0	2.54
Wait on cement	6.5	0.3	0.35
Cut/pull wellhead equipm.	25.0	1.0	1.34
Electric logging	129.5	5.4	6.92

TIME BREAK DOWN SUMMARY

TABLE 4 - 6

Activity	Hours	Days	Percent of total rig time %
Drilling	658.5	27.4	35.18
Tripping	400.5	16.7	21.39
Circulating	176.0	7.3	9.40
Casing & cementing	183.0	7.6	9.78
BOP/riser	140.5	5.9	7.51
Electric logging	129.5	5.4	6.92
Coring	2.0	0.1	0.11
Well problems	6.0	0.3	0.32
Rig down time/Rig move	93.5	3.9	4.99
Anchor handling	57.5	2.4	3.07
Plugging and abandonment	25.0	1.0	1.34

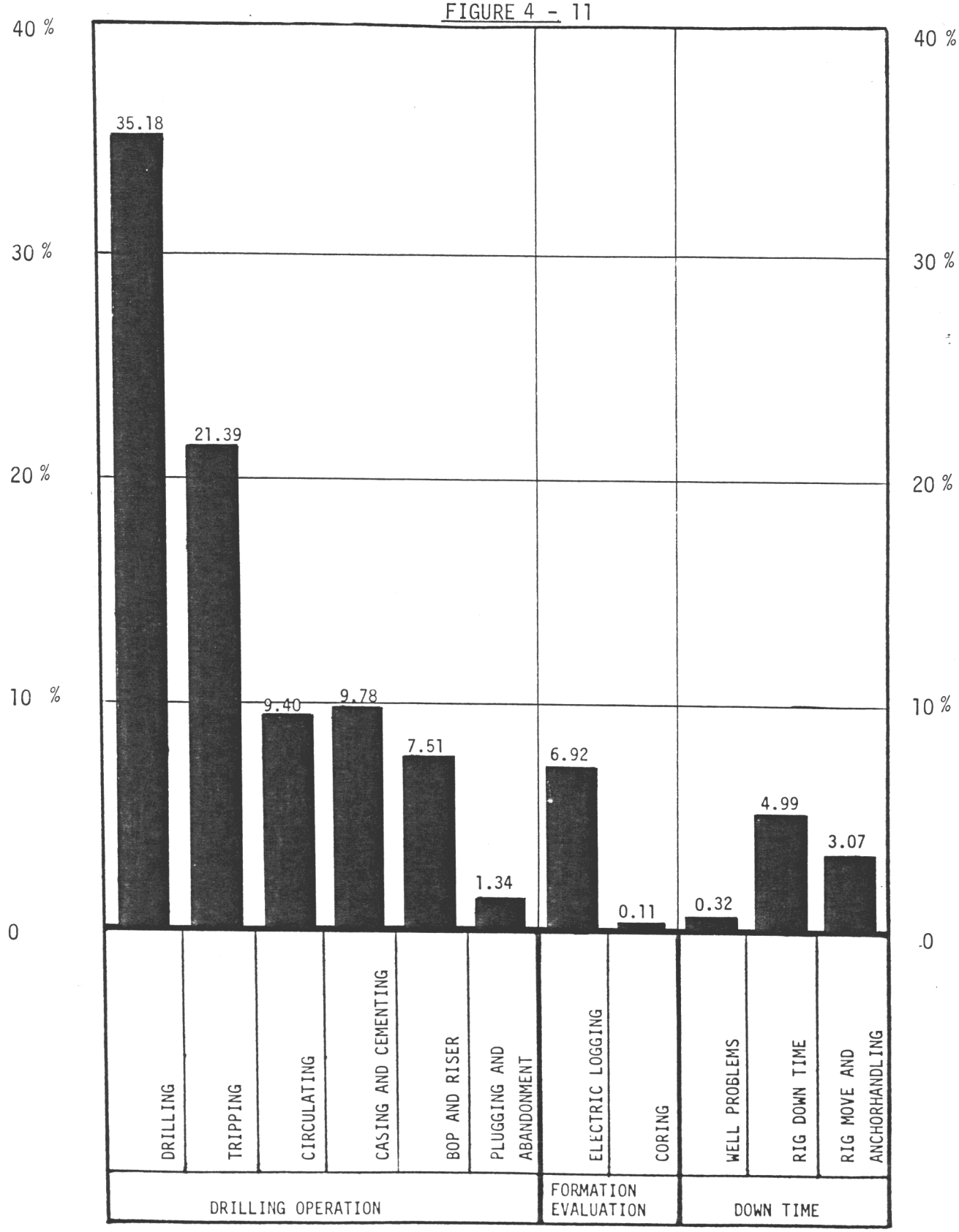
TIME DISTRIBUTION SUMMARY

TABLE 4 - 7

Activity	Hours	Days	Percent of total rig time %
Drilling Operation	1583.5	65.9	84.59
Formation Evaluation	131.5	5.5	7.02
Rig down time	157.0	6.6	8.39
	1872	78.0	100.00

RIG UTILIZATION ANALYSIS

FIGURE 4 - 11



Time distribution in percent of total rig time.

RIG UTILIZATION ANALYSIS

TABLE 4 - 8

HOURS

HOLE SIZE: 36 inch
26" inch

DATE: 21 May to 4 July 1984

Week:	21								22							
Activity: Date:	21	22	23	24	25	26	27	Total	28	29	30	31	01	02	03	Total
Drilling			6	13	13.5	12.5		45			5	3	19	8.5		35.5
Reaming				0.5				0.5	7.5	5.5						13.0
Coring																
Drilling on junk																
Circulate				2.5				2.5						4.5	0.5	5
Circ. condition mud										1			2		1.5	4.5
Tripping			4.5	2	6.5	6	2	21	6	3	8	3	3	2.5	4.5	30
Wiper trip						1.5		1.5						4		4
Flow check																
Survey			2	6	3	0.5		11.5						2		2
Wait on weather																
Cut/slip drill-line																
Change drill string					1			1								
Fishing										1						1
Rig down-time							22	22	5.5	7	5					17.5
BOP test																
Run diverter/Bushings												18				18
Run test tools																
Leak off/Pressure test																
Casing			6.5					6.5		4						4
Cementing										2.5	6					8.5
Rig move	13.5							13.5								
Anchor handling	5.5	24	5					34.5								
Failed to run casing						3.5		3.5	5							5
Under-reaming															15	15
Build mud																
Run/pull riser																
Wait on cement																
Cut and pull wellhead eqm.																
Electr.logging														2.5	2.5	5

Remarks:

RIG UTILIZATION ANALYSIS

TABLE 4 - 9

HOURS

HOLE SIZE: 26 inch
17½ inch

DATE: 4 June to 18 June 1984

Week:	23								24							
Activity: Date:	04	05	06	07	08	09	10	Total	11	12	13	14	15	16	17	Total
Drilling										1	0.5	1		5	8	15.5
Reaming			9	5				14						3.5	0.5	4
Coring																
Drilling on junk																
Circulate					1.5			1.5				4.5	2	1.5		8
Circ. condition mud	9	9	5					23	4	7	1.5	5.5	4.5	3	10	35.5
Tripping	1.5	8	5	2.5	0.5			17.5		5	3	5.5	2	2.5	4	22
Wiper trip						2		2						1.5		1.5
Flow check																
Survey															0.5	0.5
Wait on weather					2			2								
Cut/slip drill-line																
Change drill string															1	1
Fishing				5				5								
Rig down-time				2.5				2.5								
BOP test									12							12
Run diverter/Bushings																
Run test tools																
Leak off/Pressure test											1.5			1		2.5
Casing			5	9	20	7		41								
Cementing						5		5		6	17.5	5.5	15.5	6		50.5
Rig move																
Anchor handling																
Failed to run casing																
Under-reaming	9							9								
Build mud	4.5							4.5		5						5
Run/pull riser		7				7	21	35								
Wait on cement																
Cut and pull wellhead eqm.																
Electr.logging						3	3	6	8		2					10

Remarks:

RIG UTILIZATION ANALYSIS

TABLE 4 - 10

HOURS

HOLE SIZE: 17½ inch
12 1/4 inch

DATE: 18 June to 2 July 1984

Week:	25								26							
Activity: Date:	18	19	20	21	22	23	24	Total	25	26	27	28	29	30	01	Total
Drilling	16.5	18.5	2	18	14	12	17	98						3.5	12.5	16
Reaming		0.5	1.5	4	2.5			8.5	2.5							2.5
Coring																
Drilling on junk																
Circulate	3	1.5		1.5	1.5		3	10.5	1.5	2	3			3	1	10.5
Circ. condition mud														2		2
Tripping			9			12		21	3					9.5	6	18.5
Wiper trip	2.5	1.5		0.5	5		4	13.5	7	6						13
Flow check																
Survey	2	2			1			5								
Wait on weather																
Cut/slip drill-line									1							1
Change drill string												5	5			10
Fishing																
Rig down-time												16	10		0.5	26.5
BOP test			7.5					7.5					7			7
Run diverter/Bushings			2.5					2.5		2.5			2			4.5
Run test tools			1.5					1.5			1	1				2
Leak off/Pressure test											2	2		3	1	8
Casing										7.5	13					20.5
Cementing											5			3	3	11
Rig move																
Anchor handling																
Failed to run casing																
Under-reaming																
Build mud																
Run/pull riser-BOP																
Wait on cement																
Cut and pull wellhead eqm.																
Electr.logging										9	6					15

Remarks:

RIG UTILIZATION ANALYSIS

TABLE 4 - 11

HOLE SIZE: 12 1/4 inch
$8\frac{1}{2}$ inch

HOURS

DATE: 2 July to 16 July 1984

Week:	27								28							
Activity: Date:	02	03	04	05	06	07	08	Total	09	10	11	12	13	14	15	Total
Drilling	17	22	18.5	17.5	15		20	110	14					2	13	29
Reaming																
Coring																
Drilling on junk																
Circulate			0.5	4	2			6.5	4.5			4	1		2	11.5
Circ. condition mud										17.5						17.5
Tripping	6.5	1	5		3	1.5	1	18	3	6.5	1	7	2.5	3	7	30
Wiper trip				1				1								
Flow check				0.5				0.5							0.5	0.5
Survey	0.5	1		1	0.5			3	2.5				1.5			4.0
Wait on weather																
Cut/slip drill-line												1				1
Change drill string														7		7
Fishing																
Rig down-time						16.5	3	19.5								
BOP test					2	5		7						5		5
Run diverter/Bushings					1.5	1		2.5				1		1		2
Run test tools																
Leak off/Pressure test													7	3.5	1.5	12
Casing												8	4.5			12.5
Cementing													4			4
Rig move																
Anchor handling																
Failed to run casing																
Under-reaming																
Build mud																
Run/pull riser-BOP																
Wait on cement																
Cut and pull wellhead eqm.																
Electr.logging											23	3	3.5	2.5		32

Remarks:

RIG UTILIZATION ANALYSIS

TABLE 4 - 12

HOLE SIZE: 8½ inch HOURS

DATE: 16 July to 30 July 1984

Week:	29								30							
Activity: Date:	16	17	18	19	20	21	22	Total	23	24	25	26	27	28	29	Total
Drilling	15	3	22	14	20	2.5	16.5	93	5.5	15.5	8.5	9.5	21	24	6	90
Reaming												3				3
Coring		2						2								
Drilling on junk																
Circulate	2.5	1.0			2	2	0.5	8	2	1.5	2.5	0.5	2		0.5	9
Circ. condition mud																
Tripping	6	14		10		8.5	4.5	43	16.5	6	13	8			8	51.5
Wiper trip			2		2		2.5	6.5								
Flow check		0.5						0.5					1			1
Survey	0.5					0.5		1		0.5		0.5				1
Wait on weather																
Cut/slip drill-line						1		1		0.5						0.5
Change drill string		3.5						3.5								
Fishing																
Rig down-time																
BOP test						6		6							5.5	5.5
Run diverter/Bushings						3.5		3.5				2.5			4	6.5
Run test tools																
Leak off/Pressure test																
Casing																
Cementing																
Rig move																
Anchor handling																
Failed to run casing																
Under-reaming																
Build mud																
Run/pull riser																
Wait on cement																
Cut and pull wellhead eqm.																
Electr.logging																

Remarks:

RIG UTILIZATION ANALYSIS

TABLE 4 - 13

HOURS

HOLE SIZE: 8½ inch

DATE: 30 July to 7 August 1984

Week:	31								32			
Activity: Date:	30	31	01	02	03	04	05	Total	06	07		Total
Drilling	23.5	8						31.5				
Reaming												
Coring												
Drilling on junk												
Circulate		2.5			4.5	2.5		9.5				
Circ. condition mud				1.5				1.5				
Tripping		4		6	10.5	4.5		25	2			2
Wiper trip												
Flow check	0.5							0.5				
Survey												
Wait on weather												
Cut/slip drill-line												
Change drill string				0.5			3.5	4.0	3.5			3.5
Fishing												
Rig down-time												
BOP test												
Run diverter/Bushings												
Run test tools												
Leak off/Pressure test												
Casing												
Cementing				1.5	2.5	0.5		4.5				
Rig move												
Anchor handling									4.5	5		9.5
Failed to run casing												
Under-reaming												
Build mud												
Run/pull riser-BOP							12.5	12.5				
Wait on cement					6.5			6.5				
Cut and pull wellhead eqm.						8	3	11	14			14
Electr.logging		9.5	24	14.5		8.5	5	61.5				

Remarks:

4.9 DRILLING FLUID SUMMARY.

The 36" hole and 26" hole section was drilled with seawater and high viscosity slugs of prehydrated gel and spud mud.

The hole section below the 20" casing shoe was drilled with a KCl polymer mud.

The KCl polymer system resulted in generally good hole conditions and with minimal enlarged hole sections. Average hole sizes were as described below.

17 1/2" hole	-	18.5" hole with some major wash out sections up to 20.25" between 1371-1493 m and 1585 - 1737 m KB.
12 1/4" hole	-	12.3" hole in average with some minor 13" hole sections.
8 1/2" hole	-	Near gauge hole (8.58") except for enlarged sections in Triassic where 10.14" hole in major washed out sections between 3250 - 3317 m KB.

There are two significant points to be mentioned related to the mud system.

1) Tight hole problems were experienced in the washed out sections in the 17½" hole and 100,000 lbs overpull was applied seven times on the first trip through newly drilled hole.

2) On the 12 1/4" hole section, the gel strengths and yield point increased to high levels while drilling at approximately 2350 - 2440 m. These problems were mainly due to carbonate/bicarbonate contamination which was treated out with lime.

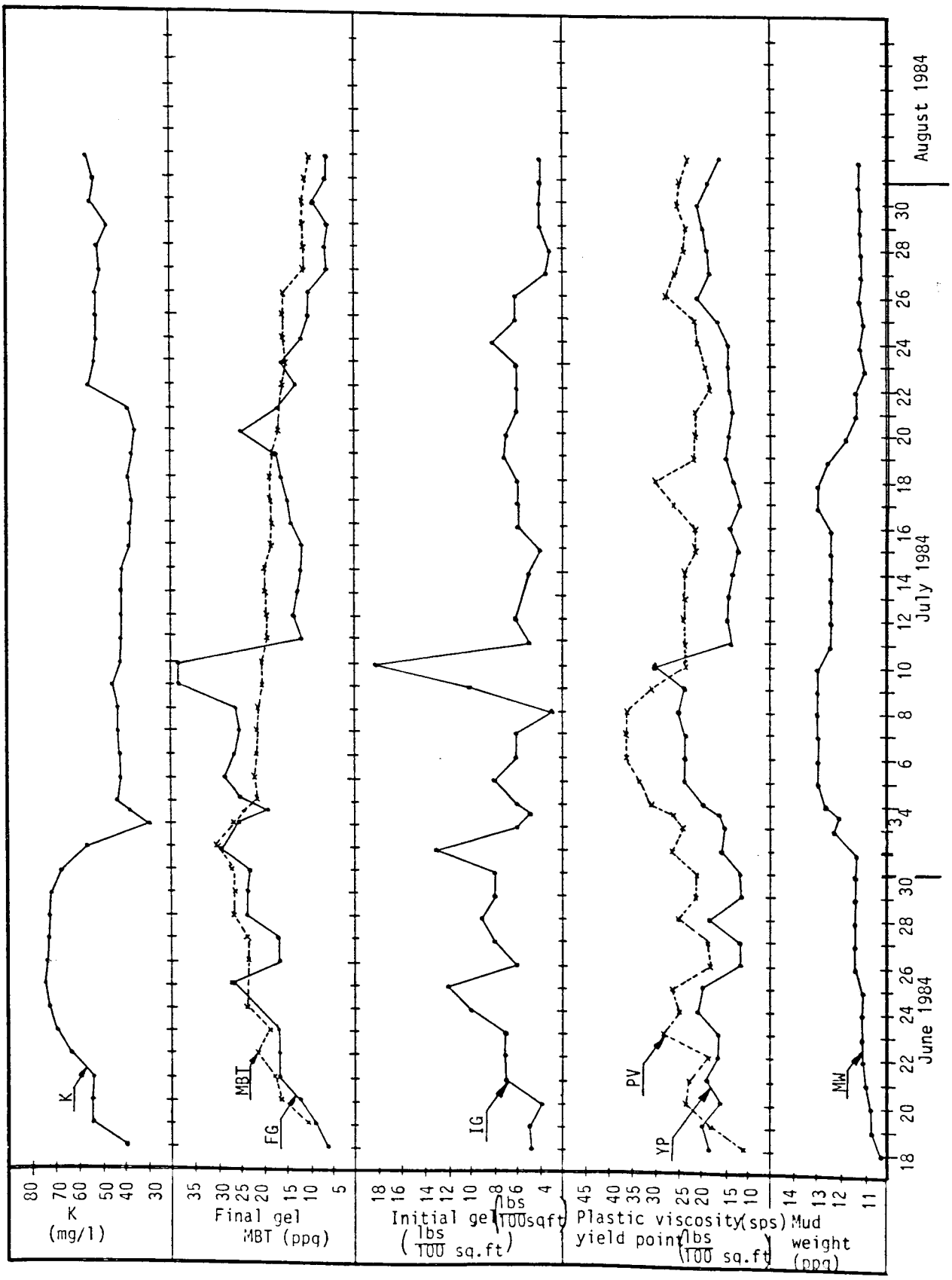
Overall the KCl polymer mud system was easy to maintain and very beneficial.

Attached is a graphical presentation of the mud properties of the well and mud property recap. See Figure 4-12 and the following Tables 4-14 to 4-17.

See also Norsk Petroleum Services A/S Daily Operation Log which are attached for detailed description on daily operations.

MUD PROPERTY PLOT

FIGURE 4 - 12



NORSK PETROLEUM SERVICES A/S
P.O. Box 143, 4056 Tananger, Norway. Telephone 04-69 65 24. Telex 40792

WELL NAME: 35/11-1

MUD PROPERTY RECAP

DATE	DEPTH	DENSITY	VISC-OSITY	FILTRATE		HT/HP filt		pH	RHEOLOGY				FILTRATE ANALYSIS					RETORT ANALYSIS			CEC	OTHER		
		PPG/			Cake	°500psi			PV	YP	10"	10'	Cl	Ca	Pf	Mf	Pm	Oil	Water	Corr. Solids	PPB			
1984	metres		secs	ccs	1"/32/mm	ccs	1"/32/mm		cp	lbs/100ft²-gms/100 cm²			mg/litre	ppm				%	%	%	Bent. Eq.			
31.5	512	9.5	100																					
1.6	518	8.8	40																					
2.6	826	9.0	36					9.2	5	23	15	25	18000						95	5				
3.6	1015	9.2	36	+35	3			8.6	5	20	15	20	14000						93	7				
4.6	1015	9.2	36	+35	3			8.6	5	20	15	20	14000						93	7				
5.6	1015	10.5	45																					
6.6	1015	10.5	40																					
7.6	1015	10.8	50																					
8.6	1015	11.1	130					12.2	30	44	16	25												
9.6	1015	11.1	47					9.0	47	12	14	18												
10.6	1015	15.0	46																					
11.6	1015	16.0	65																					
12.6	1015	16.0	61																					
13.6	1015	18.0	45					10.0	16	84	41	43							60	40	10			
14.6	1015	9.4	28					8.5	6	7	2	2												
15.6	1015	9.2	33					8.5	6	13	6	7												
16.6	1015	9.2	30					8.5	6	10	2	4												

TABLE 4 - 14

NORSK PETROLEUM SERVICES A/S
P.O. Box 143, 4056 Tananger, Norway. Telephone 04-69 65 24. Telex 40792

WELL NAME: 35/11-1

MUD PROPERTY RECAP

DATE	DEPTH	DENSITY	VISC-OSITY	FILTRATE		HT/HP filt		pH	RHEOLOGY				FILTRATE ANALYSIS					RETORT ANALYSIS			CEC	OTHER		
		PPG/			Cake	°500psi			PV	YP	10"	10'	Cl	Ca	Pf	Mf	Pm	Oil	Water	Corr. Solids	PPB			
1984	metres		secs	ccs	1"/32/mm	ccs	1"/32/mm		cp	lbs/100ft²-gms/100 cm²			mg/litre	ppm				%	%	%	Bent Eq.			
17.6	1020	M a k i n g		u p		K C l /		P o l	y m e r		S y s t e m													
18.6	1127	10.1	36	16	1			9.1	11	18	5	6	59000	40	.15	.35	65000	0	91	9	6			
19.6	1445	10.6	40	8.5	1			8.6	19	20	5	8	61000	90	.1	.3	73000	0	88	12	10			
20.6	1686	10.6	46	9.5	1			8.0	24	16	4	12	61000	160	0	.15	65000	0	87	13	16			
21.6	1696	10.8	46	10.5	1			7.9	23	19	/	17	67000	200	0	.1	74000	0	85	15	17			
22.6	1808	11.0	47	10.2	1			7.8	19	17	7	17	72000	210	.1	.4	74000	0	84	16	21			
23.6	1893	11.0	56	8.2	1			8.3	28	17	10	22	78000	160	.15	.5	82000	0	82	18	20			
24.6	1960	11.+	60	8.0	1			8.3	27	23	12	35	79000	190	.2	.5	85000	0	82	18	25			
25.6	2029	11.0	53	7.6	1			8.0	24	15	8	19	79000	200	.15	.4	85000	0	82	18	23			
26.6	2029	11.2	50	8.2	1			7.9	18	12	6	16	77000	210	.1	.4	83000	0	81	19	23			
27.6	2025	11.2	64	8.6	1			8.0	25	18	9	24	79000	230	.1	.4	83000	0	81	19	27			
28.6	2025	11.2	52	7.8	1			8.0	21	12	8	23	81000	300	.1	.4	79000	0	84	16	26			
29.6	2025	11.2	52	7.8	1			8.0	21	12	8	23	81000	300	.1	.4	79000	0	84	16	26			
30.6	2035	11.2	50	9.8	1			8.5	27	16	13	30	85000	200	.5	1.5	68000	0	82	18	30			
1.7	2063	12.1	55	10	1	34		10.5	24	15	6	27	79000	120	2	3.5	40000	0	81	19	25			
2.7	2121	12.0	56	5.4	1	17		10.5	27	16	5	19	75000	80	1.3	2.7	49000	0	81	19	24			
3.7	2186	12.6	58	5.0	1	16		10.5	32	20	6	24	80000	100	.9	2.3	54000	0	78	22	22			
4.7	2236	13.0	60	5.0	1	16		10.4	34	24	8	28	77000	80	.8	2.0	51000	0	75	25	22			
5.7	2300	13.1	64	4.6	1	15		10.3	36	23	6	26	78000	80	.6	1.5	52000	0	74	26	22			

NORSK PETROLEUM SERVICES A/S
P.O. Box 143, 4056 Tananger, Norway. Telephone 04-69 65 24. Telex 40792

WELL NAME: 35/11-1

MUD PROPERTY RECAP

DATE	DEPTH	DENSITY	VISC-OSITY	FILTRATE		HT/HP filt		pH	RHEOLOGY				FILTRATE ANALYSIS					RETORT ANALYSIS			CEC	OTHER		
		PPG/			Cake	°500psi			PV	YP	10"	10'	Cl	Ca	Pf	Mf	Pm	Oil	Water	Corr. Solids	PPB			
1984	metres		secs	ccs	1"/32/mm	ccs	1"/32/mm		cp	lbs/100ft²-gms/100 cm²			mg/litre	ppm				%	%	%	Bent Eq.			
6.7	2348	13	62	4.6	1	15		10.3	37	24	6	25	79000	80	.4	1.2	53000	0	77	23	22			
7.7	Pit	13	60	4.6	1	15		10.3	37	25	6	26	78000	80	.4	1.2	52000	0	77	23	22			
8.7	2406	13+	70	4.9	1	16		10.2	32	24	10	38	82000	120	.3	.9	56000	0	75	25	20			
9.7	Pit	13	78	5.0	1	16		10.2	30	26	16	29	78000	120	.1	.4	52000	0	75	25	20			
10.7	2440	12.5	53	3.6	1	10		11.0	24	14	4	12	78000	240	.2	.7	52000	0	78	22	19			
11.7	Pit	12.5+	60	3.6	1	10		11.0	24	15	6	13	78000	200	.2	.7	52000	0	78	22	19			
12.7	Pit	12.5	57	3.4	1	10		11.0	26	13	5	12	78000	180	.2	.6	52000	0	78	22	20			
13.7	Pit	12.5	57	3.4	1	-		10.7	24	13	5	12	77000	180	.2	.7	51000	0	78	22	20			
14.7	Pit	12.5	52	3.6	1	11.4		10.4	22	12	4	18	75000	160	.3	.8	48000	0	77	23	20			
15.7	2486	12.5	55	4.2	1	11		11.2	21	14	6	14	76000	280	13	1.0	49000	0	77	23	18			
16.7	2552	13.0	57	3.6	1	11		11.1	26	12	6	15	75000	200	.3	1.1	48000	0	77	23	18			
17.7	2577	13.0	63	3.2	1	10		11.0	30	13	6	16	76000	120	.3	1.3	49000	0	78	22	18			
18.7	2660	12.1	45	3.6	1	11		10.1	22	15	7	21	74000	240	.15	.9	47000	0	79	21	17			
19.7	2737	11.8	44	4.4	1	13		10.2	21	14	7	25	74000	160	.15	1.0	47000	0	79	21	17			
20.7	2851	11.3	43	3.0	1	10		10.2	21	13	6	17	76000	200	.1	.9	50000	0	83	17	16			
21.7	2856	11.3	43	3.0	1	11		10.3	18	14	6	13	77000	240	.15	.8	56000	0	82	18	16			
22.7	2972	11.0	43	3.0	1	10		10.1	19	14	6	16	75000	120	.1	.6	53000	0	84	16	15			
23.7	2977	11.1	44	2.8	1	10		10.2	21	14	8	12	77000	120	.3	1.1	52000	0	84	16	16			
24.7	3026	11.0	48	3.0	1	10		10.8	22	17	6	10	78000	120	.25	1.1	51000	0	84	16	16			

NORSK PETROLEUM SERVICES A/S
P.O. Box 143, 4056 Tananger, Norway. Telephone 04-69 65 24. Telex 40792

WELL NAME: 35/11-1

MUD PROPERTY RECAP

DATE	DEPTH	DENSITY	VISC-OSITY	FILTRATE		HT/HP filt		pH	RHEOLOGY				FILTRATE ANALYSIS					RETORT ANALYSIS			CEC	OTHER		
	feet	PPG/ Spcf/			Cake	°500psi			PV	YP	10"	10'	Cl	Ca	Pf	Mf	Pm	Oil	Water	Corr. Solids	PPB			
1984	metres	SG	secs	ccs	1"/32/mm	ccs	1"/32/mm		cp	lbs/100ft²-gms/100 cm²			mg/litre	ppm				%	%	%	Bent. Eq.			
25.7	3054	11.1	52	3	1	9		10.2	28	21	6	8	83000	120	.3	.9	62000	0	84	16	16			
26.7	3081	11.1	54	2.8	1	9		10.2	26	18	3	7	81000	160	.3	.9	60000	0	85	15	12			
27.7	3166	11.1+	50	3.0	1	9		10.4	24	19	3	7	82000	180	.3	.9	61000	0	84	16	12			
28.7	3256	11.1	50	3.0	1	9		10.2	24	20	4	6	79000	200	.3	.8	58000	0	84	16	12			
29.7	3268	11.1	60	3.0	1	9		10.4	25	21	4	9	85000	200	.3	1.0	65000	0	84	16	11			
30.7	3344	11.1+	49	3.0	1	9		10.2	25	18	4	6	84000	160	.3	.9	62000	0	84	16	11			
31.7	3361	11.1	47	3.0	1	9		10.0	23	16	4	6	82000	160	.3	.9	66000	0	84	16	11			
1.8	3361	11.1	45		No other check made																	Logging		
2.8	2700	11.1																				P & A		

NORSK PETROLEUM SERVICES A/S.

OPERATING AREA Mobil Exploration Norway Inc.
35/11-1

1984

DAILY OPERATIONS LOG

22 May
Made up 675 bbl of prehydrated Bentonite to be cut back with seawater to 100+ vis and pumped as viscous pills to ensure hole cleaning.

23 May
Run to seabed and spud. Drilled 17 1/2" hole to 417 m. Survey showed 3^{o}. Moving rig to respud.

24 May
Respud and drilled 17 1/2" hole to 478 m. Pumping viscous pill on each connection.

25 May
Finished drilling 17 1/2" hole. Trip for 26" hole - opener. Reamed out hole to 26". Used 180 bbls viscous mud to displace 17 1/2" hole. Used 130 bbls viscous mud to displace 26" hole.

26 May
Opened hole to 36", pumped 650 bbls viscous mud and made wiper trip. Displaced hole with 700 bbl viscous mud and pulled out to run 30" casing. 30" casing stood up at 480 m. Unable to pass, pulled casing and run in with 36" hole opener. Rig shut down to repair anchorwinch.

27 May
Rig repair.

28 May
Run in hole with 36" hole opener and reamed out tight spot 480-484 m (10 m fill). Pumped 650 bbl hi vis mud, made wiper trip and displaced hole with 700 bbls hi vis mud. Attempted to run 30" casing but unable to get past 487 m. Pulled 30" casing, run back in hole and reamed on tight spot (granite) for 8 hrs.

NORSK PETROLEUM SERVICES A/S.

OPERATING AREA Mobil Exploration Norway Inc.
35/11-1

DAILY OPERATIONS LOG

29 May

Displaced hole with 700 bbl 9.5 ppg mud and pulled out. One cone missing from hole opener. Made one magnet run trying to fish cone. No success. Run 30" casing to bottom and cemented.

30 May

WOC. M/U 26" BHA and RIH. Drilled cement and shoe + 2 m new formation. POOH. Repair guide wire. RIH with magnet to locate fish.

31 May

POOH with magnet. No fish. P/U 26" bit and RIH. Drill to 518 m. Pump hi vis pill. Displace hole with seawater. POOH. R/U and run pin connection and riser.

1 June

P/U 14 3/4" bit and RIH. Displace hole with mud. Drill pilot hole to 562 m. Mud weight up to 9.3 ppg. Circulate and reduce weight from 9.3 to 9.0 ppg. Drill to 600 m. Survey. Drill to 618 m. Circulate and reduce mud weight from 9.4 to 9.0 ppg. All increases in mud weight due to drilling 100% sand. Drill to 826 m.

2 June

Drill to 873 m. Survey. Drill to 1015 m. Circulate hole clean. POH to shoe. Tight spots from 978 m to 874 m. Maximum overpull 20,000 lbs. RIH. Made wiper trip. POOH. Rig up and run Schlumberger. Tool unable to pass 720 m. POOH. RIH with bit for wiper trip to TD. Circulate hole clean. POOH to log.

3 June

Run E-logs. Rig down Schlumberger. Make up 26" underreamer and RIH. Ream from 518 to 554 m. Circulate to reduce mud weight from 9.4 ppg to 9.2 ppg. Continue underreaming 26" hole to 876 m without problems.

NORSK PETROLEUM SERVICES A/S.

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DAILY OPERATIONS LOG

4 June

Underream 26" hole to 970 m. Mud weight increase to 9.4 ppg - circulate to reduce. Underream to 1014 m. Circulate hole clean. Displace hole with 450 bbls 10.5 ppg mud. POOH to well head and displace riser to seawater. Flow check well flowing. Displace riser back to 9.2 ppg mud. Flow check OK. RIH to 830 m. Mud level in riser dropped 15 m. Mud lost at rate of one bbl/minute at slow pump rate. Stop pump and observe well - losses of 5 bbl/hour. Mixed up new volume of mud at 10.5 ppg to displace hole.

5 June

Pump 600 bbls 10.5 ppg mud. Observe well. Pump 400 bbls 10.5 ppg mud. Observe well. POOH to wellhead. Displace riser with seawater. Well flowing. RIH to 506 m. Pump 270 bbls 10.5 ppg mud. Observe well - OK. POOH. Unlatch and pull riser. Make up 26" bit and RIH for wiper trip, well flowing water.

6 June

Ream from 715 m to 728 m. RIH to 855 m. Ream without circulating to 870 m. Pump 1000 bbls 10.5 ppg mud. Flow check - OK. Ream and work pipe form 870 m to 929 m. Unable to pass 929 m. POOH to 30" shoe. Worked tight spot at 600 m - maximum overpull 150,000 lbs. Well flowing. Mixed 1400 bbls 10.8 ppg mud. RIH. Ream tight spot 580-600 m. Pump 270 bbls mud. Continue RIH to TD. No fill. Tight at 929 m. Pump 250 bbls mud. POOH, work tight spot from 725-700 m. Continue POOH to shoe. Flow check - well flowing. POOH. Rig up to run 20" casing.

7 June

Run 20" casing to 582 m. Tight hole. Attempt to work casing through same - casing parted at wellhead. POOH 33 joints 20" casing. Make up 20" casing spear. Stab. into casing, pull 5 m. No overpull. POOH and lay down 17 joints casing. RIH with 26" bit, wash wellhead. Continue RIH to 570 m. Ream bridge from 570-595 m. Continue RIH to 715 m. Ream from 715-722 m and 729-748 m. Continue RIH to TD - 1 m fill. Pumped 520 bbls of 11.1 ppg mud while reaming.

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DAILY OPERATIONS LOG

7 June cont'd.
POOH to 606 m. Pump 700 bbls 11.1 ppg mud. POOH to 30" shoe.

8 June
POOH to 30" shoe. 100,000 lbs overpull at 580 m. Work pipe through same. Pump 270 bbl 11.1 ppg hi-vis mud at shoe. Continue POOH. Flow check - stable for one hour, then flow. Rig up and run 20" casing. Tight spot at 570 m. Attempt to work casing - no good. Make up circulating head and circulate casing down, to 618 m. Pumped total of 1250 bbls mud, then seawater when no mud left. Work pipe and circulate through all tight spots to TD.

9 June
Continue RIH with casing on landing string. Land casing and circulate with 120 bbls mud. Mix and pump cement and displace with 57 bbls mud. Well still flowing in 30" - 20" annulus. POOH with stinger to wash wellhead. Rig up Schlumberger and run temperature log. Rig up and run BOP and riser. Mixing 600 bbls 16.0 ppg mud and 500 bbls 11.7 ppg mud.

10 June
Finished running BOP and riser. Run temperature log. Test BOP.

11 June
Test BOP. RIH with 5" drill pipe. Tag float collar. Pump 491 bbls 16.0 ppg mud. POOH to 540 m and pump 179 bbls 11.7 ppg mud. POOH to 380 m. Circulate riser clean with seawater. POOH. Run perforating gun and perforate at 541 m. Observe riser - OK.

12 June
Run in open ended to 520 m. Pump 225 bbls 11.7 ppg mud. Pump cement and WOC. Back flow. POOH. Make up 17 1/2" bit. RIH and tag cement at 536 m. Displace hole with seawater then with 9.0 ppg mud. Drill cement from 536-547 m. Circulate and condition mud and reduce mud weight to 9.2 ppg. Attempt to test 20" casing. Pump 290 bbl 12.8 ppg mud into 20" casing and observe well. POOH.

NORSK PETROLEUM SERVICES A/S.

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DAILY OPERATIONS LOG

12 June cont'd.
RIH open ended to 520 m. Mix 300 bbls 18.0 ppg mud. Pump 100 bbls 9.2 ppg mud into annulus followed by 200+ bbls 18.0 ppg mud.

13 June
Pumped 217 bbl cement followed by 10 bbl seawater and 32 bbl 9.2 ppg mud. WOC. Run in hole with bit and drilled cement from 534-542 m. Circulate and condition mud. Attempted to test 20" casing. Max. pressure 150 psi. Pull out of hole with bit and run in open ended. Pumped new cement plug and attempted to squeeze. WOC. Made up 150 bbl 18 ppg mud.

14 June
Cut hole and surface volume to 9.2 ppg and adjusted YP to carry weight material. Circulate and condition mud while running wash-pipe to seabed through mousehole. Drilled out cement from 538 m - 552 m and circulated bottoms up. Pressured up on perforations to 250 psi. Perforations boke down. Run Schlumberger and perforated at 546 m. Pumping 18 ppg mud through perforations.

15 June
Pressure increased to 1500 psi during injection of 18 ppg mud. Stopped pumping. Pressure bled back to 900 psi by itself and held. Bled off pressure and run in hole to 558 m. Circulate and reduce mud weight to 9.2 ppg. Mix and pump 40 bbls of cement as balanced plug. Pulled out of plug and applied squeeze pressure. Final squeeze pressure 900 psi. WOC. Pull out of hole and run back with bi. Tag top of cement at 537 m. Drilled 2 m of soft cement. Circulate and wait on cement to harden.

16 June
Drill out cement plug and test perforations to 13 ppg equivalent mud weight. OK. Run in hole and circulate out heavy mud (15.6 ppg) in 3 stages. Drilled out cement and shoe and new formation to 1020 m. Displaced hole below perforations to 11.5 ppg. Pressured up to 12 ppg equivalent mud weight at casing shoe.

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DAILY OPERATIONS LOG

16 June cont'd.
(Leak off occurred at 11.5 ppg). Cleaning pits for KCl Brine.

17 June
Made up 2755 bbl of KCl/Polymer mud at 10 ppg. Displaced hole and started drilling, maintaining slow drilling rate due to only one pump running. Lost 50 bbls of mud as interface during displacement. Lost 200 bbls of brine while mixing up system.

18 June
Drilled to 1307 m. Dropped survey and made wiper trip into shoe. Hole tight from 1138 m to 1125 m. Max. overpull 90 klb. Picked up kelly and reamed tight spots. Run in hole. Reamed tight hole from 1033 m to 1043 m. Continue running to bottom and drill. Mud loss 191 bbls or .56 bbl/bbl of new hole. Increased mud weight to 10.6 ppg.

19 June
Drilled to 1484 m. Circulated bottoms up and made wiper trip to shoe. OK. Run in hole to 1446 m. Reamed and washed to bottom. Continued drilling. Sand content build up to 2 1/2 % in mud system due to 40% sand returns. 178 bbl of mud lost last 24 hours. (.80 bbl/bbl of new hole.)

20 June
Drilled to 1686 m. Pulled out of hole. Worked pipe through tight hole to 1480 m. Max. overpull 90,000 lbs. Test BOP. Run in hole to 1450 m. Reamed and washed to bottom. Continue drilling. Made up 300 bbl of brine. Weight up to 11.0 ppg.

21 June
Drilled to 1808 m. Hole got sticky after survey at 1751 m. Made wiper trip. Hole tight and was reamed on trip out from 1680 m to 1480 m. Run in hole to 1680 m. Reamed out tight spot and continue to run in hole.

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DAILY OPERATIONS LOG

22 June

Drilled to 1856 m. Dropped survey and made wiper trip. Tight hole on trip out from 1800 m to 1745 m and from 1592 m to 1439 m. Max. overpull 100,000 lbs. Run back to bottom and continued drilling. Cuttings on shaker very sticky from last trip at 1808 m. Made up 570 bbls new mud for dilution purposes. High speed shaker out of order.

23 June

Drilled to 1929 m. Circulated bottoms up dropped survey and pulled out of hole for new bit. Hole was very tight on 3 first stands. Run in hole and drilled ahead. Run desilter in shaker house as desilter while high speed shaker out of order.

24 June

Drilled to casing depth at 2029 m. Had drilling break at 2018 m. Circulated 3 hours on bottom prior to pulling out. Max. gas reading during circulation 7.5%. Experienced possible mud rings down hole prior to drilling break. but no evidence of same at surface. Tight hole on first 7 stands out. Necessary to pump out. After that hole was OK. Made up 180 bbls of new mud.

25 June

Continued to pull out of hole. Clean off stabilizers and run back in. Reamed tight hole from 1760 m to 1799 m. Reamed and washed last 5 m to bottom logging. (Caliper averaged 18" hole size.) Hole taking 0.5 bbl/hr in static condition.

26 June

Finished logging. Run in hole with bit and circulate one full cycle. POOH. No hole problems. Run 13 3/8" casing.

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DAILY OPERATIONS LOG

27 June
Run 13 3/8" casing to 2025 m. Circulate casing volume. Cement casing without any problems. Lost returns when displaced cement. Lost approx. 120 bbl.

28 June
Repair rig. Circulate surface system over VSM120 to remove drill solids. Dump 101 bbl mud to prepare to make up "riser margin" kill mud.

29 June
Repair rig. Test BOPs. Change out BHA make up 400 bbl "riser margin" kill mud. Pretreat surface system with bicarb. Start corrosion treatment.

30 June
Make up 12 1/4 BHA. RIH and tag cement at 2013 m. Drill out 6 m new hole. Run leak off test. Unsatisfactory. Trip to squeeze. Attempt to squeeze. Make up 150 bbl dilution fluid.

1 July
WOC. POOH. RIH tag cement at 1984 m. Drill cement to 2035 m. Drill 5 m new hole. Do leak off to 15 ppg. Drill 12 1/4 hole to 2063 m. Dump cement contaminated mud. Treat system due to heavy cement contamination - weight up to 12 ppg.

2 July
Drill to 2117 m. Trip for bit. Drill to 2121 m. Make up dilution fluid.

3 July
Drill 12 1/4" hole to 2186 m. Raise mud weight on operator's order to 12.6 ppg.

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DAILY OPERATIONS LOG

4 July
Trip for bit. RIH bit to 2170 m. Ream to TD at 2186 m. Drill to 2236 m. Circulate sample.

5 July
Drill 12 1/4" hole. Circulate samples on drilling breaks survey at 2273 m. POOH to shoe. Tight spots from 2235 to 2149 m. Maximum overpull 25,000 lbs. RIH no fill. Drill to 2300 m.

6 July
Drill 12 1/4" hole to 2348 m. POOH. Tight spots from 2320 to 2215 m. Maximum overpull 30,000. Prepare to test BOPS.

7 July
Test BOP's. Work on same. No circulation last 24 hours.

8 July
Complete rig repair and test. RIH to shoe. Break circulation. RIH to TD. No fill. Drill to 2405 m.

9 July
Drill to 2435 m. Survey. Attempt to retrieve survey. No success. POOH to shoe. Attempt to retrieve survey. No success. Pump 50 bbl 13.3 ppg, 44 vis mud into drill pipe. Retrieve survey. RIH to TD. Drill to 2439 m. Lost circulation. POOH to shoe. Attempt to circulate. No success. POOH to 1543 m. Attempt to circulate. No success. POOH to 1040 m. Circulate with slight returns.

10 July
POOH to above BOP. Close shear rams circulated and reduce mud weight to 12.5 ppg. Stage in hole stopping to circulate and reduce mud weight to 12.5 ppg at 512 m, 795 m, 1448 m, 2232 m, and 2440 m. No fill at TD. Add mica on last circulation. POOH to log.

11 July
POOH. Log. No hole problems.

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DAILY OPERATIONS LOG

12 July
Rig up and run 9 5/8" casing.

13 July
Finish run and cement, 9 5/8" casing. Run seal assembly, run gyro survey.

14 July
RIH with 6 1/2" drill collars. Drill cement to 2426 m. Made up 100 bbl KCl brine.

15 July
Drill 8 1/2" hole.

16 July
Drill to 2510 m. Trip for bit. Weight up to 13.0 and drill to 2552 m. POOH to core.

17 July
Cut core no. 1 from 2553 to 2562 m. 100% recovery. Trip, drill to 2577 m.

18 July
Drill 8 1/2" hole. Reduce mud weight to 12.0 ppg.

19 July
Drill to 2725 m. Survey. POOH to retrieve survey. RIH with bit no 16. Reduced mud weight to 11.8 ppg.

20 July
Drill 8 1/2" hole. Reduce mud weight to 11.3 ppg by dilution.

21 July
Drill to 2851 m, trip for bit no. 17. Test BOP. RIH, no fill.

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DAILY OPERATIONS LOG

22 July
Drill 8 1/2" hole to 2972 m. Trip for bit no. 18.

23 July
Ream from 2955 to 2972 m. Drill to 2977 m. Trip for bit.

25 July
RIH to 2983 m. Ream to TD at 3026 m. Drill 8 1/2 to 3043 m. Survey. POOH. Lay down roller reamer. Pick up turbine. RIH to 2994 m. Tight hole. Reaming.

26 July
Ream to 3054 m. Drill to 3077 m. Survey. POOH. Lay out turbine. Pick up roller reamer. RIH with bit no. 23 to 3039 m. Ream and wash to 3077 m. Drill to 3078 m.

27 July
Drill 8 1/2 hole to 3086 m. Flow check. No flow. Circulate bottoms up. No gas. Drill to 3156 m. Make up 175 bbl premix dilution fluid.

28 July
Drill 8 1/2 hole to 3256 m.

29 July
Drill to 3260 m. Survey (1^{o}) POOH. Test BOP's. RIH bit no. 24 to 3230 m. Ream and wash to 3260 m. Drill to 3269 m.

30 July
Drill 8 1/2 hole to 3344 m. Mix 50 bbl dilution fluid.

31 July
Drill 8 1/2 hole to 3361 m. Circulate bottoms up. POOH to log. Logging to bottom with no hole problems.

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DAILY OPERATIONS LOG

1 August

Logging. No hole problems.

2 August

Complete logging. Prepare to P & A.

3 August

P & A.

4 August

P & A.

5 August

P & A. Engineer off rig today.

4.10 DRILLING FLUID MATERIAL USAGE AND CONSUMPTION BY INTERVAL

The following pages contains the drilling fluid material usage and cost prepared by Norsk petroleum Services A/S.

NORSK PETROLEUM SERVICE A/S

Daily Material Usage

Operator MOBIL EXPLORATION NORWAY INC Well 35/11-1 36" Hole 30" Casing

Date	Depth meters	Barite M/T	Bentonite M/T	Caustic 25 kg	Soda Ash 50 kg	Bicarb. 50 kg	DEXTRID 50 lb	KCl 50 kg	Polyacr. 25 kg	Staflo 25 kg	XC Pol. 50 lb	KCl brine			Volume made	Volume made/lost	Total volume	Cost Daily	Cost Cumulative	Remarks
22.05.			15	6	2										675		675	3462.28	3462.28	
23.05.																50	625		3462.28	
24.05.	478		5	4	1										300	105	820	1179.19	4641.47	
25.05.	510		9	6	1										400	660	560	2100.29	6741.76	Opened hole to 26"
26.05.	510		9	10	3										1940	1650	850	2166.47	8908.23	Open TD 36" at 30" casing at no 1.
27.05.	510		14	4	1										0	0	850	3204.19	12112.42	Rig-repair
28.05.	510		22	14	3										1850	1450	1250	5133.67	17246.09	Attempt 30" csg no 2.
29.05.	510	55	3	2	1										800		600	6070.59	23316.68	
Totals		55	77	46	12										5965				23316.68	
																		bbl	$ Cost	
																		5965	23316.68	= $ 3.91/bbl
									Transfer to 26" hole interval									600		
									Dumped/used this section									5365		

NORSK PETROLEUM SERVICES A/S.

OPERATING AREA MOBIL EXPLORATION NORWAY INC
35/11-1

MATERIALS USED PER CASING INTERVAL

36" Hole 30" Casing

MATERIAL	PACKAGING	QUANTITY
Baryte	M/T	55
Bentonite	M/T	77
Caustic Soda	25 kg	46
Soda Ash	50 kg	12

NORSK PETROLEUM SERVICE A/S

Daily Material Usage

Operator MOBIL EXPLORATION NORWAY INC Well 35/11-1 26" Hole 20" Casing

Date	Depth meters	Barite M/T	Bent. M/T	Caustic 25 kg	Soda Ash 50 kg						Premix mud bbl				Volume made	Volume used/lost	Total volume	Cost Daily	Cost Cumulative	Remarks
																				20,970.68 brought forward
MAY																	600			
30.05.	518		5	2											0	60	540	1146.10	1146.10	
31.05.	826		6	5	2										842	0	1382	1426.73	2572.83	Run riser and pin connector
01.06.	1015		11	10	2										974	731	1625	2604.48	5177.31	
02.06.	1015	3													624	150	2099	292.50	5469.81	
03.06.	1015	2	8	6	2										750	620	2229	2082.28	7552.09	
04.06.	1015	35	10	2											700	-	2938	5683.60	13255.69	Wt up to 10.5 ppg
05.06.	1015	34	1	1											651	164	3425	3550.55	16786.22	
06.06.	1015	75	13	2											1450	2669	2206	10258.60	27044.82	Mix 1400 bbl 10.8 min
07.06.	1015	62	6								1600				1645	1990	1861	7395.00	34439.82	1600 bbl mud from ccb
08.06.	1015	82	21												470	1220	2389	12720.00	47159.82	
09.06.	1015	79	8												961	1520	1830	9502.50	56662.32	
10.06.	1015	103													732	666	1896	10042.50	66704.82	Wt up to 16 ppg+11.5 ppg
11.06.	1015														151	657	1324	-	66704.82	
12.06.	1015	97	8												742	500	1566	11257.50	77962.32	
13.06.	1015														-	-	1566	-	77962.32	
14.06.	1015	55	10	2											476	-	2042	7633.60	85595.92	Made up 18 ppg mud
15.06.	1015														508	-	2550	-	85595.92	Dilute with water
Totals		627	107	30	6						1600				11676					
															- 1600			bbl	$ Cost	
															10076			10076.00	85595.94	
								Transferred in from CCB										1600	20828.28	
								Transferred from 30" Casing										600		

NORSK PETROLEUM SERVICE A/S

Daily Material Usage

Operator MOBIL EXPLORATION NORWAY INC Well 35/11-1 26" Hole 20" Casing

Date	Cost		Remarks
	Daily	Cumulative	
	bbl	$ Cost	
	11676	106424.22	= $ 9.11/bbl
Transferred to 17 1/2 interval	2550		
Dumpes/used this interval	9726		

NORSK PETROLEUM SERVICES A/S.

OPERATING AREA MOBIL EXPLORATION NORWAY INC
35/11-1

MATERIALS USED PER CASING INTERVAL

26" Hole 20" Casing

MATERIAL	PACKAGING	QUANTITY
Baryte	M/T	627
Bentonite	M/T	107
Caustic Soda	25 kg	30
Soda Ash	50 kg	6
Premixed Mud	bbl	1600

NORSK PETROLEUM SERVICE A/S

Daily Material Usage

Operator MOBIL EXPLORATION NORWAY INC Well 35/11-1 17 1/2" Hole 13 3/8" Casing

Date	Depth meters	Barite M/T	Bentonite M/T	Caustic 25 kg	Soda Ash 50 kg	Bicarb. 50 kg	DEXRID 50 lb	KCl 50 kg	Polyacr. 25 kg	Staflo 25 kg	XC Pol. 50 lb	KCl brine	Torq Trim 55 gal		Volume made	Volume made/lost	Total volume	Cost Daily	Cost Section Cumulative	Remarks
JUNE		97.50			11.99	12.75	21.48	11.50	78.75		213.06		642.73				2550			
16.06.	1020	17																1657.50	1657.50	
17.06.	1127	54					10	22	19		55	1520*			205	250	2505	18947.35	20604.85	* Not charged yet
18.06.	1445	1					86	103	19		12				308	191	2622	7182.25	27787.10	
19.06.	1686	18					33	368	12						36	178	2480	7640.84	35427.94	
20.06.	1696	3					5	212			8				307	73	2714	4542.38	39970.32	
21.06.	1808	12				15	86	57	18						20	160	2574	5281.53	45251.85	
22.06.	1893	7			24		154	477	23		6		8		570	55	3089	17995.13	63246.98	
23.06.	1960						51	56	7						22	91	3020	2290.73	65537.71	
24.06.	2029	3					57	205	14		2		4		180	48	3152	7973.80	73511.51	
25.06.	2029	11													18	105	3065	1072.50	74584.01	
26.06.	2029						10									10	3055	214.80	74798.81	
27.06.	2029	2			4		7									284	2761	393.32	75192.13	
Totals		128			28	15	499	1500	112		83	1520	12		1666	1445				

	bbl	$ Cost
	1666	75192.13
Transferred from 20" casing interval	2550	
KCl brine transferred from CCB	1520	19980.31
	5736.	95172.44 = $ 16.59/bbl
Transferred to 12 1/4" interval	2761.	
Used this interval	2975.	

NORSK PETROLEUM SERVICES A/S.

OPERATING AREA MOBIL EXPLORATION NORWAY INC
35/11-1

MATERIALS USED PER CASING INTERVAL

17 1/2" Hole 13 3/8" Casing

MATERIAL	PACKAGING	QUANTITY
Baryte	M/T	128
Soda Ash	50 kg	28
Bicarbonate	50 kg	15
DEXTRID	50 lb	499
KCl	50 kg	1500
Polyacrylamide	25 kg	112
XC Polymer	50 lb	83
Torq Trim	55 gal	12
KCl Brine	bbl	1520

NORSK PETROLEUM SERVICE A/S

Daily Material Usage

Operator MOBIL EXPLORATION NORWAY INC Well 35/11-1 12 1/2" Hole

Date	Depth meters	Barite M/T	Mica 25 kg	Caustic 25 kg	Soda Ash 50 kg	Bicarb. 50 kg	DEXTRID 50 lb	KCl 50 kg	Lime 40 kg	Staflo 25 kg	XC Pol 50 lb	Q-Broxin 25 kg	COAT 129 25 kg	COAT H35 55 gal	Volume made	Volume used/lost	Total volume	Cost Daily	Cost Cumulative	Remarks
																	2761			Transferred forward
28.06.	2025															101	2660	-		
29.06.	2025	63				4					3		3	1	95	0	2755	2796.16	7696.16	Make up kill mud
30.06	2035	5		4	14	16	12						3		150	162	2743	1294.36	8990.52	
01.07.	2065	40		4	15	17	12	40		20	4				69	235	2577	7685.00	16675.52	
02.07.	2121	15		4	1		48	60		22	4		3		154	25	2706	6178.99	22854.51	
03.07.	2186	23					10	40		6	6				40	9	2737	4728.52	27583.03	
04.07.	2236	35					5			6			2		51	66	2722	4172.76	31755.79	
05.07.	2300	3			1		20	80		19			1		143	191	2674	3386.48	35142.27	
06.07.	2348	3					9	60					2		157	85	2746	1265.82	36408.09	
07.07.	2348															10	2736	0	36408.09	
08.07.	2405	15		3			12	80	2	6					178	164	2750	3204.77	39612.86	
09.07.	2439	13		4	5		34	100		5			3		274	466	2558	3853.60	43466.46	
10.07.	2440		80				11	40	11	5		15			112	19	2651	2719.42	46185.88	
11.07.	2440																2651	0		
12.07.	2440															150	2501	-		
13.07.	2440																	-		
Totals		215	80	19	36	37	173	500	13	89	17	15	17	1	1423			bbl	$ Cost	
								Transferred from 17 1/2 section							2761			4184	46185.88	= $ 11.04/bbl
								Transferred to 8 1/2 section							2501					
								Dumped/used this section							1683					

NORSK PETROLEUM SERVICES A/S.

OPERATING AREA MOBIL EXPLORATION NORWAY INC
35/11-1

MATERIALS USED PER CASING INTERVAL

12 1/4" Hole 9 5/8" Casing

MATERIAL	PACKAGING	QUANTITY
Baryte	M/T	215
Caustic Soda	25 kg	19
DEXTRID	50 lb	173
Lime	25 kg	13
Mica Fine	25 kg	80
KCl	50 kg	500
Q-Broxin	25 kg	15
Soda Ash	50 kg	36
Staflo SL	25 kg	89
XC Polymer	25 kg	17
Bicarbonate of Soda	50 kg	37
Coat 129	25 kg	17
Surflo H35	55 gal	1

NORSK PETROLEUM SERVICE A/S

Daily Material Usage

Operator MOBIL EXPLORATION NORWAY INC Well 35/11-1 8 1/2" Hole

Date	Depth Meters	Barite M/T	Caustic 25 kg	Soda Ash 50 kg	Bicarb. 50 kg	DEXTRID 50 lb	KCl 50 kg	Staflo SL 25 kg	Staflo Reg 25 kg	Q-Broxin 25 kg	XC Pol. 50 lb	COAT 129 25 kg	COAT H55 55 gal	Lime 40 kg	Volume made	Volume lost	Total volume	Cost Daily	Cost Cumulative	Remarks
		97.50	10.55	11.99	12.75	21.48	11.50	88.81	88.16	14.20	213.06	45.00	728.48	12.19			2501			
14.07.	2426			1	8	10	40								100	12	2589	788.79	788.79	
15.07.	2486	8				18	20	8							19	165	2443	2107.12	2895.91	
16.07.	2552	17		3		10						2			26	47	2422	1998.27	4894.18	
17.07.	2577	10		3		2		1				2			0	53	2369	1232.74	6126.92	
18.07.	2660	1		2		20	100								205	190	2384	1701.08	7828.00	
19.07.	2737		4	2		35	80								106	65	2425	1737.98	9565.98	
20.07.	2851	3	4	1		20	110	14	10	8					221	298	2348	4279.83	13845.81	
21.07.	2856		4			10	52		5		2				116	0	2464	1721.92	15567.73	
22.07.	2972		5	1		10	90		11		2	2			5	44	2425	2800.42	18368.15	
23.07.	2977						38	4				2	1		106	151	2380	1610.72	19978.87	
24.07.	3026		4	1		10	92		8			2			14	9	2385	2122.27	22101.14	
25.07.	3054	2	2				9					3			5	23	2367	454.60	22555.74	
26.07.	3081	2	2				9					2			0	30	2337	409.60	22965.34	
27.07.	3166		5	1		15	80	6			3	3			187	9	2515	2613.98	25579.32	
28.07.	3256	3	3									3		3	5	76	2444	495.72	26075.04	
29.07.	3268		5			6	4	8				8			6	7	2443	1298.11	27373.15	
30.07.	3344					5	20	6				6			52	58	2437	1140.26	28513.41	
31.07.	3361					10	40		3						106	17	2526	939.28	29452.69	
01.08.	3361															11	2515	0	29452.69	
02.08.	2700										2					289	2226	426.12	29878.81	1st plug P + A
Totals		46	38	15	8	181	784	47	37	8	9	35	1	3	2063					

NORSK PETROLEUM SERVICE A/S

Daily Material Usage

Operator MOBIL EXPLORATION NORWAY INC Well 35/11-1 8 1/2" Hole

Date	Cost		Remarks
	Daily	Cumulative	
	BBL	$ COST	
Made this interval	2063		
Transferred in from 12 1/4	2501		
	4564	29878.81	= $ 6.55/bbl
Pits dumped at end of well			
Total dumped and used this section	4564		

NORSK PETROLEUM SERVICES A/S.

OPERATING AREA MOBIL EXPLORATION NORWAY INC
35/11-1

MATERIALS USED PER CASING INTERVAL

8 1/2" Hole Interval

MATERIAL	PACKAGING	QUANTITY
Barite	M/T	46
Caustic	25 kg	38
Soda Ash	50 kg	15
Bicarbonate of Soda	50 kg	8
DEXTRID	50 lb	181
KCl	50 kg	784
Staflo SL	25 kg	47
Staflo Reg	25 kg	37
Q-Broxin	25 kg	8
XC Polymer	50 lb	9
Coat 129	25 kg	35
Surflo H35	55 gal	1
Lime	40 kg	3

NORSK PETROLEUM SERVICES A/S.

OPERATING AREA MOBIL EXPLORATION NORWAY INC
35/11-1

TOTAL MATERIAL CONSUMPTION

MATERIAL	QUANTITY	PKG	$ COST	% OF TOTAL COST
Barite	1071	M/T	104,422.50	34.74
Bentonite	184	M/T	41,400.00	13.77
KCl	2784	sx	32,016.00	10.65
DEXTRID	853	sx	18,322.44	6.09
Polyacrylamide	112	cans	8,820.00	2.93
Staflo SL	136	sx	12,078.16	4.02
Staflo Reg	37	sx	3,261.92	1.09
XC Polymer	109	sx	23,223.54	7.73
Caustic Soda	133	sx	1,403.15	0.47
Soda Ash	97	sx	1,163.03	0.39
Bicarbonate of Soda	60	sx	765.00	0.25
Lime	16	sx	195.04	0.06
Mica Fine	80	sx	1,232.00	0.41
Coat 129	52	sx	2,340.00	0.78
Surflo H35	2	dr	1,456.96	0.48
Torq Trim	12	dr	7,712.76	2.57
Premixed Mud	1600	bbl	20,828.78	6.93
KCl Brine	1520	bbl	19,980.31	6.65
Total			$ 300,978.03	100 %

4.11 CASING STRING AND CEMENTING SUMMARY

The casing and cementing operation is summarized as below. The drilling rig utilized a Halliburton liquid additive system for cementing. The halliburton system operated very efficiently and no two stage cement jobs were done. See Table 4-18, Cement summary.

4.11.1 30" Conductor casing

Size (inch)	Weight (lb/ft)	Grade	Tread Type
30	310	"B"	Vetco ADT.

Setting depth: 506.5 m KB.

Casing length: 125.66 m

Number of joints: 10 including 30" housing joint.

Cementing: 2255 sacks Norcem Class "G" cement + 0.54 gps liquid calcium chloride + 4.82 gps seawater and was mixed to a 15.8 ppg cement slurry. Yield 1.195 t^3/sack. Used 200% excess slurry.

Description:
Ran the 30" conductor on hevi-vate drill pipe through permanent grade base (PGB). While running in the hole the casing hit minor ledge at 480 m and took 10,000 lbf weight before it passed through and successfully landed at bottom of the hole. Observed PGB having 3/4 degree tilt to North-east direction. Cemented the casing with the above slurry. Displaced with 50 bbls of seawater (8 m above shoe) and checked for backflow.

Observed cement returns to surface. No grouting necessary around the PGB.

4.11.2 20" Surface casing

Size (inch)	Weight (lb/ft)	Grade	Tread Type
20	133	X56	Vetco LS connectors and ALT2 connector to 18 3/4" wellhead.

Setting depth: 1003 m KB.

Casing length: 622 m including wellhead.

Number of joints: 49 joints, float shoe joint, float collar joint, X-over joint to wellhead.

Centralizers: 5 as per casing tally.

Two key problems:
Rope slings tied to centralizer broke making it difficult to stab into the 30" casing. For the next well, it is suggested using breakaway guide arms and pads. It was extremely difficult to release the Cameron 18 3/4" running tool after the cement job and it could very easily have been stuck permanently.

Cementing: Primary cementing.

Lead slurry: 2480 sacks Norcem Class "G" cement + 0.4 gal/sack liquid econolite + 12.29 gal/sak seawater mixed to a 12.5 ppg cement slurry. Yield 2.17 ft^3/sack.

Tail slurry: 1050 sacks Norcem Class "G" cement + 5.17 gal/sack seawater mixed to a 15.8 ppg cement slurry. Yield 1.19 ft^3/sack.

Cementing was performed using a 5" drill stinger run below the 18 3/4" running tool.

Due to the water flow that started after pulling the marine riser, the 20" casing was run while the well was constantly flowing.

The 20" casing was run to 590 m KB where it took weight. Set 80 000 lbf down on the casing and pulled 30 000 lbf over the string weight and the casing parted leaving 17 joints in the well. The attached special report, Section 4.14.1 gives details of the failure and concludes that the casing parted due to bending at the wellhead where there was no wall support. The casing was retrieved without any problems.

The well was observed to stop flowing after the primary cement job. However, after 1/2 hour the flow was again observed and required the following operations:

1) Ran BOP.

2) Temperature log indicated flow from 550 m.

3) Perforated 20" casing from 540.9 - 541.5 m with 9 shots.

4) Filled 20" annulus with 11.7 ppg mud.

5) Perform Remedial Job No. 1.

   1000 sacks Norcem Class "G" cement + 2% $CaCl_2$ in seawater mixed to 15.8 ppg cement slurry and was circulated into place. The well stopped flowing but was observed to start flowing again 15 minutes later.

6) Pumped 290 bbls of 12.8 ppg mud to kill the well. The well started surging after 30 minutes.

7) Killed the well with 100 bbls of 9.2 ppg mud and 200 bbls of 18 ppg mud. No visible flow after 3 hours.

8) Perform Remedial Cement Job No. 2.

   Cement was circulated into place. 470 sacks Norcem Class "G" cement + 0.54 gal/sack $CaCl_2$ in seawater mixed to 15.8 ppg cement slurry, followed by 560 sacks of Norcem Class "G" neat cement in seawater, mixed to 15.8 ppg was circulated into place.

9) Ater WOC and drilling out the cement, the perforation would not pressure test.

10) Perform Remedial Cement Job No. 3.

274 sacks Norcem Class "G" cement + 0.75 gal/sack CFR2L in seawater mixed to a 15.8 ppg cement slurry and was squeezed into the perforations.

Squeezed 14 1/2 bbls at 1100 psi. Formation broke down while displacing cement out of drill pipe. Squeezed an additional 34 bbls of cement slurry into formation with a final squeeze pressure of 420 psi. WOC.

11) Drill cement. Tested perforations. Perforation would not pressure test and broke down.

12) Perforated the 20" casing at 548 m with 9 shots.

13) Pumped 100 bbls of 9.2 ppg mud followed by 192 bbls of 18 ppg mud inside casing. Pressure built to 1500 psi and dropped back to 900 psi. Well observed to stop flowing. Bleed off pressure.

14) Perform Remedial Cement Job No. 4.

189 sacks Norcem Class "G" cement + 0.54 gal/sacks CaCl + 0.22 gal/sack CFR2L in seawater mixed to 15.8 ppg cement slurry. Pump 20 bbls of cement into perforations at 400 psi. After one hour, squeezed an additional 2.5 bbls to 900 psi squeeze pressure. Held pressure for 9 hours.

15) Pressure tested perforations to 13.0 ppg EMW. Pressure test 20" casing.

No further flow from the 20" x 30" annulus was observed.

4.11.3 13 3/8" Intermediate casing

Size (inch)	Weight (lb/ft)	Grade	Tread Type
13 3/8	72	N80	BTC.

Setting depth: 2026.5 m KB.

Casing length: 1643.9 m.

Number of joints: 140 including shoe joint and hanger joint.

Centralizers: 10 as per attached tally.

Cementing: preflushed 75 bbls of mud flush.
Lead slurry: 2001 sacks Norcem Class "G" cement + 0.36 gal/sack Econolite + 0.05 gal/sack HR6L + 8.74 gal/sack freshwater mixed to a 13.5 ppg cement slurry. Yield 1.70 ft^3/sack.

Tail slurry: 305 sacks Norcem Class "G" cement + 0.15 gal/sack CFR2L + 0.40 gal/sack Halad 10L + 8.69 gal/sack freshwater mixed to a 15.8 ppg cement slurry.

- Temperature log indicated cement top at 775 m KB, which is 227 m inside 20" casing shoe.

- Lost 120 bbls of mud during cement displacement.

- The reason for setting the 13 3/8" casing at this depth was due to a weak 20" shoe integrity test and the occurence of a drilling break at 2029 m. High gas readings indicated the borehole to be near top of Jurassic.

- The 13 3/8" casing was run on 5" HWDP and cemented using subsea release plugs. After the initial leak-off test fractured the formation below the 13 3/8" shoe, a cement squeeze of the shoe was attempted. No cement was squeezed into the wellbore. The surface pressure resulted in a 15.0 ppg EMW at the shoe.

Cementing: 164 sack Norcem Class "G" cement + 0.15 gps CFR2L + 0.40 gps Halad 10L in fresh water mixed to a 15.8 ppg cement slurry.

4.11.4 9 5/8" Intermediate casing:

Size (inch)	Weight (lb/ft)	Grade	Tread Type
9 5/8	53.5	C-95	BTC.

Setting depth: 2425.73 m KB.

Casing length. 2044.0 m.

Number of joints: 153 joints including hanger joint.

Centralized: 16 as per drilling program.

Cementing: Preflushed 30 bbls of mud flush.
1017 sacks Norcem Class "G" cement + 0.22 gps CFR2L + 0.60 gps Halad 10L in fresh water mixed to a 15.8 ppg cement slurry.

The 9 5/8" casing was run on 5" HWDP and cemented using subsea release plugs. No lost circulation during cement job.

Temperature log indicated cement top to be at 1420 m KB, which is 606 m inside 13 3/8" shoe.

Ran 9 5/8" casing due to lost circulation which occurred while drilling at 2439.5 m KB.

HOLE, CASING AND CEMENT DATA SUMMARY

WELL 35/11-1

TABLE 4-18

Hole Size (inch)	Casing Depth (m KB)	Casing Size (inch)	Casing Length (m)	Casing Weight (ppf)	Grade	Connection	Cement Type	Slurry Weight (ppg)	Sacks (no.)	Remarks
36	506.5	30	125.7	310	"B"	Vetco ADT	Class "G" cement + 0.54 gps $CaCl_2$ + 4.82 gps sea-water.	15.8	2255	Displaced cement w/seawater. Observed cement returns to surfce. No grouting necessary around the PGB.
26	1003.0	20	622	133	X56	Vetco LS and ALT 2 connector to 18 3/4" wellhead.	Lead slurry Class "G" cement + 0.4 gps Econo-econolite in sea-water.	12.5	2480	The well was observed to stop flowing after the primary cmt. job. After 30 min. the flow was again observed.
							Tail slurry Class "G" cement in seawater.	15.8	1050	
							Squeeze job no. 1 Class "G" cement + 2% $CaCl_2$ in seawater.	15.8	1000	No visible flow before after 3 hours.
							Squeeze job no. 2 Class "G" cement + 0.54 gs $CaCl_2$ in seawater followed by	15.8	470	After drilled out cement the perforations would not pressure test.
							Class "G" cement in seawater.	15.8	560	
							Squeeze job no. 3 Class "G" cement + 0.75 gps CFR-2L in seawater.	15.8	274	Formation broke down while displacing cement and squeeze pressure of 1100 psi. Final squeeze press. 920 psi.
							Squeeze job no. 4 Class "G" cement + 0.54 gps $CaCl_2$ + 0.22 gps CFR-2L in seawater.	15.8	189	Squeeze cement hold pressure for 9 hrs. No flow from the well was observed.
17½	2026.0	13 3/8	1643.9	72	N80	BTC	Lead Slurry Class "G" cement + 0.36 gps Econolite +0.05 gps HR6L in fresh water.	13.5	2001	Temperature log indicated cement. Top at 775 mKB. Lost 12.0 bbls of mud during displacment of cement.
							Lead Slurry Class "G" cement + 0.15 gps CFR2L + 0.40 gps Halad 10L in fresh water			
12¼	2425.7	9 5/8	2044.0	53.5	C95	BTC	Class "G" cement + 0.22 gps CFR2L + 0.60 gps Halad 10L in fresh water	15.8	1017	Preflush 30 bbs of mud flush. No losses during cement job. Cement top found at 1420 mKB.

4.12 WEATHER AND RIG RESPONSE

No rig downtime was reported due to weather conditions except for 2 hours reported 8 June 1984. See Table 4-9. This was mainly because the well was drilled in the summer season.

The maximum windspeed measured was in the range of 55-60 knots and occurred only once. The wind was coming from the north-east direction. The main wind throughout the summertime was from the north and was variable in strength.

Wave heights were measured in the range of 2-8 m. The predominant wave height was in the range of 2-3 m.

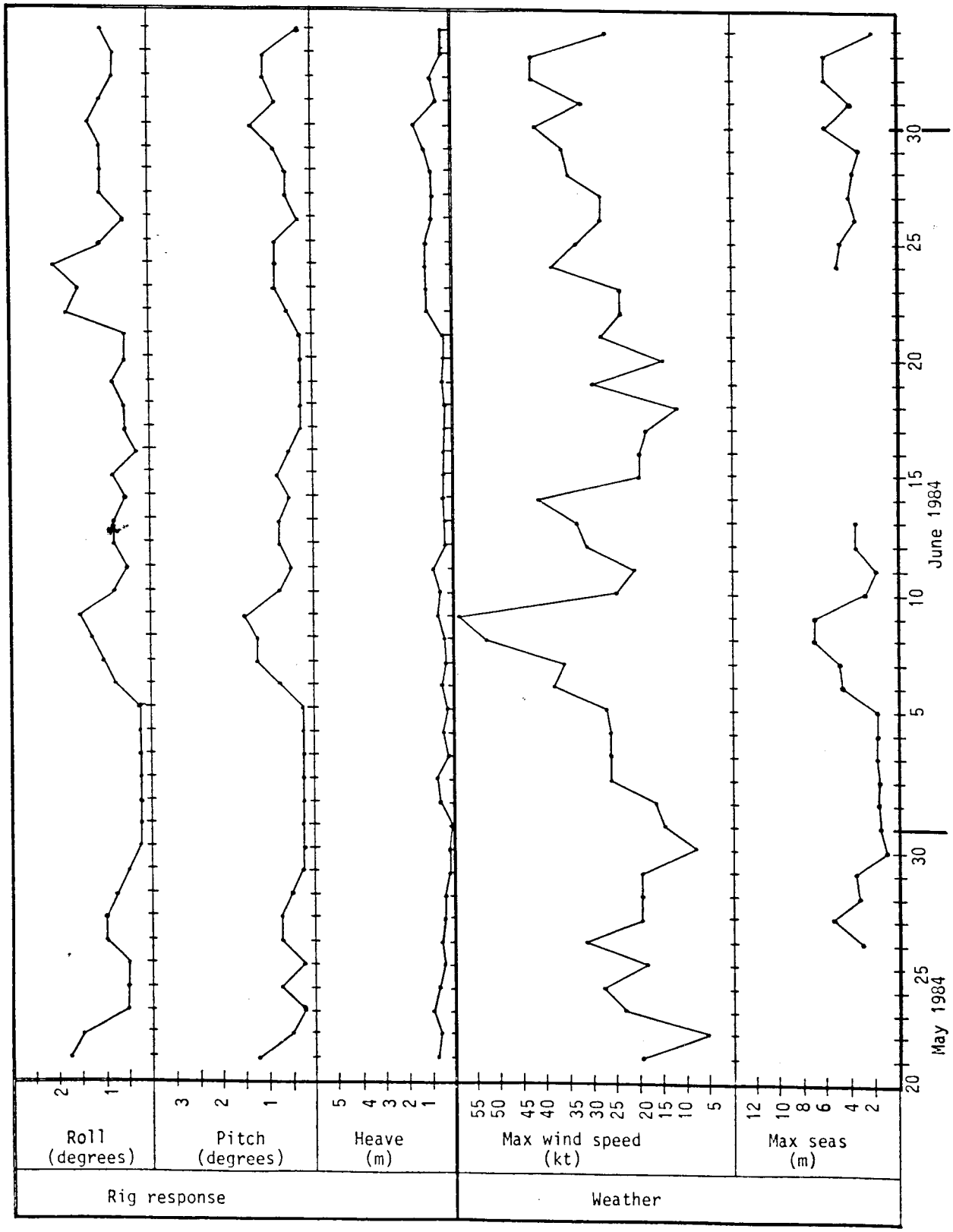
See the following pages where the weather and rig response are plotted. Figure 4-13 and 4-14.

WEATHER AND RIG RESPONSE

SEMISUBMERSIBLE DRILLING RIG NORTRYM

LOCATION 35/11-1

FIGURE 4 - 13

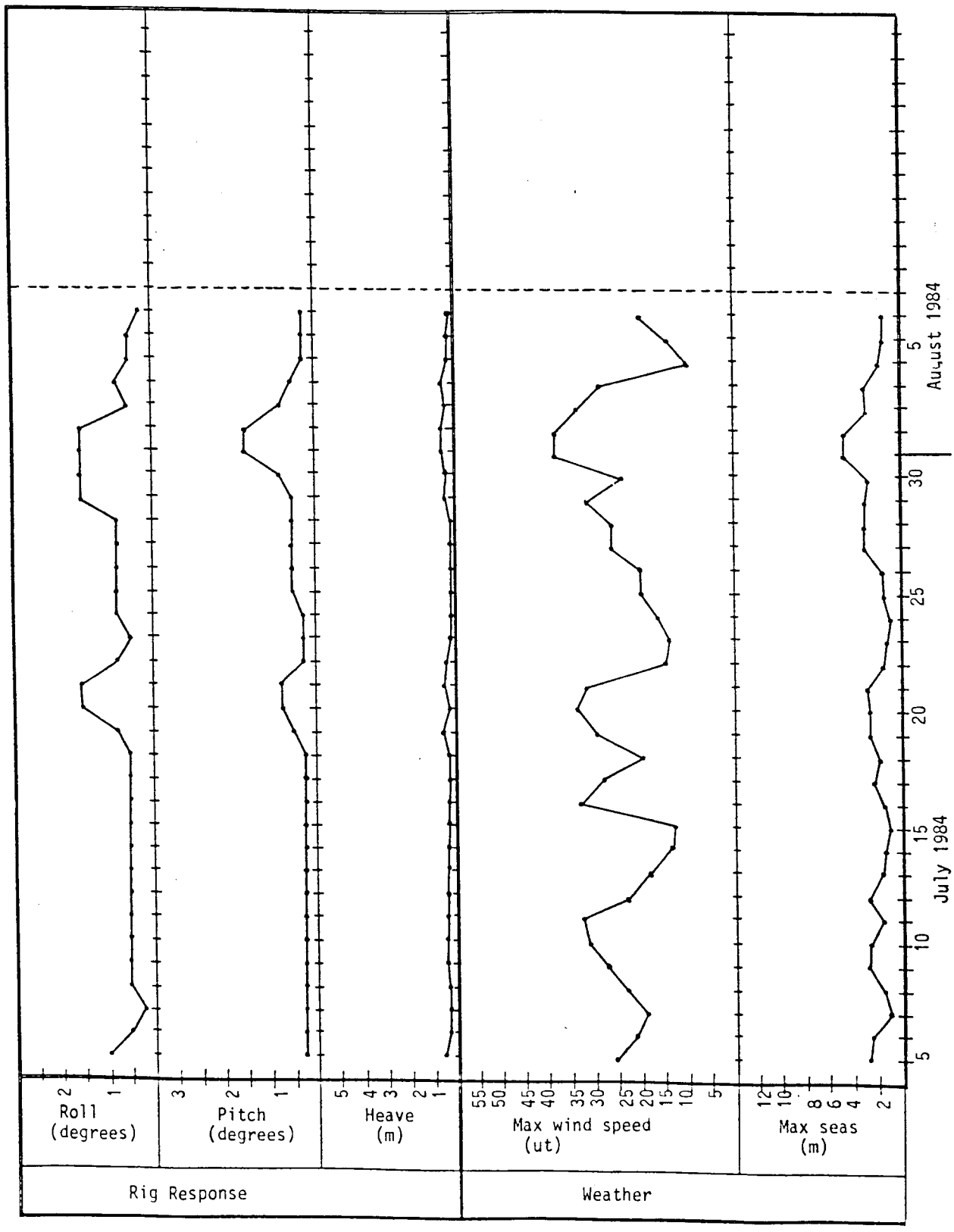


WEATHER AND RIG RESPONSE

SEMISUBMERSIBLE DRILLING RIG NORTRYM

LOCATION 35/11-1

FIGURE 4 - 14



4.13 35/11-1 COST SUMMARY

TABLE 4-19

AFE 84300 - "NORTRYM"

	ACCUMULATED WELL COST PER JANUARY 1985. JOINT INTEREST REPORT US $
DRILLING CONTRACTOR	4.306.801
OTHER DRILL COST	6.500
CORING	34.776
LOGGING AND TESTING	743.723
FUEL	305.187
MUD AND CHEMICALS	486.799
CEMENT AND CEMENTING SERVICES	279.468
TRANSPORTATION SERVICES	1.081.349
BITS, REAMERS AND STABILIZES	287.678
EQUIPMENT RENTAL	240.969
DAY WORK COST, MISCELLANEOUS	720.830
CASING	753.570
WELLHEAD SYSTEM AND CONNECTIONS	43.162
OTHER EQUIPMENT	167.260
PREDRILL	310.471
OTHER COSTS	385.822
TOTAL COST	10.154.365

4.14 SPECIAL REPORTS

These reports cover the events leading to the 20" casing failure and action taken during influx of formation fluid to well bore of well 35/11-1 and subsequent remedial action taken in order to stabilize the well.

It is apparent from the following report that a lot of background data has been collected. The intention of the report is therefore to highlight all information available into an explanation as to how and why the uncontrolled shallow waterflow occurred.

4.14.1 20" Casing Failure

The subject casing was run to a depth of 582m (49jts) with no difficulties. The 50th joint was picked up and at 583m the casing string started to hang up and take weight. The driller slacked off 80 000 lbs at this time and the pipe appeared to be moving slowly down to 590m with no further slacking of weight. The string was then raised back to its original hookload. The string was again lowered to 584m where it took 80 000 lbs weight and was again raised. During this final raising, the string parted.

Result

The casing parted at the Vetco LS connector between the 17th and 18th joint from bottom. At time of failure the connection was at 381.2m the top of the housing is at 380.2 mKB.

Reason For Failure

While attempting to work through the bridge at 584m the casing was put into compression at the seafloor. The neutral point was approx. at the wellhead with no wall support above the wellhead. The casing bowed during the attempt to get through the bridge. The side loading force resulted in the squashing and breaking of threads as the pin jumped threads. When the casing was pulled up the final time, the threads did not have sufficient strenght to hold the load below them and let loose. The damage to the connection appears to have been done by bending at the connection and then it failed in tension.

Damage To Connector

- Pin of 18th joint-shoulder of pin pulled back (flared) for 12" around circumference of shoulder. The crests of the 3 middle threads of pin were broken off on opposite side from where shoulder was flared.
- Box of 17th joint-crests of first 4 threads are squashed or flattened around half the circumference of the inside of box.
- Tube Body-noticeably bent.

There is no apparent damage to any other joints.

It would appear that the compressive (and resulting bending) load on the connector at the seafloor where there was no wall support caused the failure. This type of loading should be avoided if similar circumstances reoccur.

4.14.2 Problems Encountered with Uncontrolled Shallow Water Flow

Geology

The well prognosis for 35/11-1 predicted clay with minor sand stringers below the 30" casing to 800 mKB. A major sand section, the Utsira formation was expected to be from 800 m to 950 mKB. Below this would be claystone to the 20" setting depth (1000 mKB).

On well 35/8-1 below the 30" casing at 565 mKB (162.8 mSF), was a 565 m sand section. The sand was fine, silty and loosely consolidated. The Utsira sand came in at 818 mKB. The sands did not cause any problems according to the the well history. This section was drilled with a 9.3 ppg mud. The 20" casing was set at 877 mKB.

The 30" casing on well 35/8-2 was set at 578 mKB (171 mSF). From this point to 791 mKB, clay was encountered. The Utsira sand started at 791 mKB and went to 969 MKB. The 20" shoe was set at 830 mKB. Lost circulation was a problem in cementing the 30" casing but few problems were encountered in drilling the 26" hole and setting the 20" casing. This section was drilled with 9.2 ppg mud.

On well 31/2-5, claystone was encountered below the 30", set at 443 mKB (78 mSF). One sand stringer came in at 507 m to 517 mKB. The 20" casing was set at 810 mKB in a siltstone section.

In Mobil's 35/11-1, well the 30" casing was set at 507 mKB (122 m SF). Claystone was drilled below the 30" shoe to 542 mRKB. Below this the sand content increased to clear coarse sand at 550 m to 680 mRKB. Below 680 m the lithology changes gradually to siltsone, then to claystone at 730 mKB. The 20" casing shoe was set in claysone at 1003 mKB. The sand between 550 m to 680 mKB is the Utsira formation. See attached litholgy log Figure 4-15 and 4-16. This formation as mentioned earlier was expected to come in at 800 mKB.

Operational Sequence

01/06/84 0500 Hrs

Drill 14 3/4" hole from 519 m to 563 mKB. Circulate and dilute to cut back mud wt. to 9.1 ppg.

02/06/84 0500 Hrs

Drilled to 931 mKB. Mud wt. increased to 9.4 maximum at one point. Reduced weight to 9.1 by dilution. This problem was evident through the sand section. The drilling rate was about 6.5 m/hr on the average. As dilution volumes were large, it is not possible to determine if the formation was flowing or taking fluid. Large losses or gains however, would have been noticed.

03/06/84 0500 Hrs

Drilled to 1015 mKB. Rigged to log hole. No losses or gains.

04/06/84 0500 Hrs

Underreamed 14 3/4" hole from 519 m to 970 mKB. Found it necessary to dilute mud again. No losses or gains noted.

05/06/84 0500 Hrs

Underream hole to 1014 mKB. Pump 100 bbl of 10.5 ppg mud or bottom. Open dump valves on pin connector to equal riser level with sea level. Pump additional 330 bbls of 10.5 ppg mud with returns through dump valves. The top of the 10.5 mud was about 814 mKB. The dump valves were closed and the riser displaced to seawater. The dump valves were then opened and the well was observed with the TV. The well was observed to be flowing at this point.

The dump valves were closed again and the riser displaced to 9.2 ppg mud. Checked for flow - no flow. Ran in to the top of the 10.5 mud at 830 m. Circulated slow rate with 9.2 ppg mud. Lost 1 bbl/min. Minimum mud wt in returns 8.7 ppg. Stop pumping. Lost 5 bbl of mud per hour. Maximum gas from returns 4.590 or 22.5 units. Background gas was 1wo during drilling. Pumped 600 bbl of 10.5 ppg mud. Open dump valves and pumped additional 400 bbl of 10.5 ppg mud. Observe dump valves - no flow. Pull up to wellhead. Close dump valves and displace riser to sea water. Level holding. Open dump valves and observe well for flow.

Calculate bottom hole pressures at 550 mKB.

a) While drilling 9.1 ppg mud 854 psi

b) With 9.1 ppg mud to 30" wellhead and seawater to sealevel (with dump valves open)

9.1 x 0.52 x 5.55' = 263 psi 783 psi or 8.34 ppg from KB
8.56 x 0.52 x 11.67' = 520 psi

c) With 10.5 ppg mud to 30" wellhead and seawater to seawater to sealevel

10.5 x 0.52 x 555' = 303 psi
+ 520 psi
823 psi

06/06/84 0500 Hrs

Well observed flowing. RIH to 506 mKB. Pump 272 bbl of 10.5 ppg mud. Observe well - no flow. Pull riser. RIH with 26" bit. Well flowing. Run in to 715 m. Ream to 820 mKB. Pump 1000 bbl of 10.5 ppg mud. Observe well - no flow. Work string to 929 mKB.

07/07/84 0500 Hrs

Tight spot at 600 mKB. Ream tight spot. Pumped 250 bbl of 10.8 ppg mud. Pull up to shoe. Observe well - flowing. POOH to run 20" casing. Run 20" casing. Casing took weight at 594 mKB. Tight spot. Parted casing leaving 17 joints in hole.

08/06/84 0500 Hrs

Retrieved fish. Ran in hole with 26" bit. Wash and reamed to bottom. Pull up to 606 mKB and pumped 700 bbl of 11.1 ppg mud. Observe well - static. Worked through tite spot at 600 - 580 mKB. Well flowed after working through. Pull up to 30" shoe and pumped 270 bbl of 11.1 ppg. Hr. vis. mud. Well static for 1 hr. POOH.

09/06/84 0500 Hrs

Ran 20" casing. Tag bridge at 606 mKB. Pumped 2000 bbl of 11.1 ppg and seawater. After landing casing the well was still flowing with some strong bursts. The wellhead was not visible.

10/06/84 0500 Hrs

Cement 20" casing with:

Lead Slurry: 2480 sks Class G cement - 959 bbl of 12.5 ppg slurry with 12.2 gps seawater + 0.40 gps liquid econolite. Pumped at 5.4 bpm.

Tail Slurry: 1050 sks. Class b cement - 208 bbls of 15.8 ppg 5.19 gps at seawater.

Observed returns of cement at wellhead. Visibility cleared up and hillowing subsided. Well appeared to be dead. Checked wellhead 5 hrs later and well was flowing. Flow was clear and was observed to be between the 18 3/4" and 30" housings. Ran a temperature survey to 970 mKB. Water zone is apparent at 550 mKB. There appears to be a large volume of cement. Large hole through the major sand between 550 and 650 mRT.

11/06/84 0500 Hrs

Ran BOP and viser. Reran temperature log. Both logs indicate water flow from 550 mKB. Pressure test BOP. Observed lightly flow from between the 30" housing and 18 3/4" wellhead.

12/06/84 0500 Hrs

Ran in hole and tag cement at 974 mKB 20" shoe at 1003 mKB. Displaced hole from 975 to 540 m to 16 ppg mud. Displace hole from 540 to 380 m to 11.7 ppg mud. Circulated seawater in riser. Perforated 20" casing at 540.9 to 541.5 mKB with 9 shots. Observed wellhead prior to perforating and noticed a slight increase in cloudiness after perforating. Lost 1 bbl of mud. Take feedrate into perforations with seawater: 0.5 bpm - 150 psi/1 bpm - 175 psi/2 bpm - 350 psi. Displaces 20" x 30" annulus to 11.7 ppg mud to surface. Cement 20" annulus throught perforations with 1000 sks. Class "G" cement - 211 bbl cement slurry, 15.8 ppg with 5.19 gps seawater and 2 % $CaCl_2$. Pressure while pumping 5 bpm to 1400 psi. No back pressure after the job.

13/06/84 0500 Hrs

About 15 minutes after the cement was displaced and the cementing line shut in the RCV observed that the well was flowing strongly. The cement was drilled out. The well was displaced to 9.2 ppg mud. The attempt to pressure test the 20" casing failed. Performed an injection rate with the 9.2 ppg mud: 3.6 bpm - 150 psi/6 bpm - 650 psi/12 bpm - 2000 psi. Pumped 80 bbl of 9.2 ppg mud. Pumped 290 bbls of 12.8 ppg mud. Mud return at seabed after 45 bbl pumped. Observe well initially nearly dead. Well started to flow again after 1/2 hr. Checked wellhead after 3 1/2 hrs - no visable flow. Pumped 100 bbl of 9.2 ppg mud at 12 bpm and 1250 psi into perforations followed by 200 bbl of 18.0 ppg mud at 8.3 bpm and 1400 psi/3.0 bpm and 200 psi. There was no visual return to the seabed and no flow after the job. Cemented the 20" x 30" annulus as follows:

Pumped: 75 bbl of 18.0 ppg mud at 3 bpm + 150 psi.
100 bbl of 15 ppg cement with 0.54 gps $CaCl_2$ and 4.82 gps seawater.
117 bbl of 15.8 ppg cement with 5.19 gps seawater.

Injection rate was 1 to 2 rpm. The final shut in pressure was 50 psi.

14/06/84 0500 Hrs

The cement plug was drilled after 6 hrs with 8000 to 14000 lbs weight. The perforations were pressure tested to 150 psi before breaking down. Ran in hole and pumped 58 bbls at 15.8 ppg slurry with seawater and 0.75 gps. CFR-2L. Closed choke after 42 bbls pumped. Squeezed 14 1/2 bbls of slurry at 1100 psi behind the pipe. The pipe was pulled up 5 m. The pressure dropped to 50 psi from either the stripping action of formation breakdown. Displacement rate was bbl/min. Displaced a further 29.5 bbls at bbl/min and a maximum pressure of 350 psi. When squeeze completed pressure dropped to 0 psi. After 15 min and additional 6 bbls for a total of 46 bbls was squeezed at 1 bbl/min and 225 psi. Final pumping pressure was 150 psi. Pressure bled to 0 once pumping stopped. After 2 hrs on additional 2 1/2 bbls was squeezed at 420 psi. Pressure held. Kept pressure on the cement for 6 hrs.

The well was noticed to be flowing lightly. The perforations were pressure tested after the cement job on 13/06/84.

15/06/84 0500 Hrs

The cement plug was drilled out after 18 hrs after squeezing. The perts were pressure tested to 250 psi before breaking down and bleeding back to 0 psi. The casing was perforated at 548 m with 2 ft of guns and 4 shots/ft. Pumped 100 bbl of 9.2 ppg through the perts followed by 192 bbl of 18 ppg mud. Pressure built up to 700 psi after pumping about 120 bbl. Once pumping stopped the pressure bled to 0. The barite in the 18 ppg mud seemed to be dropping out and bridging off. This was possibly induced by the formation water. The 18 ppg mud was pumped at 10 spm and 850 psi. The pressure increased to 1500 psi and pumping was stopped. The pressure dropped. Pumping continued at low strokes up to 900 psi. Pumping was stopped and the pressure held. After the pressure was held off the wellbore was circulated with 9.2 ppg mud. The well was observed with the RCV and was not flowing.

16/06/84 0500 Hrs

Mixed and pumped 40 bbl of 15.8 ppg cement with 290 $CaCl_2$ and 22 gps. CF4-2L at 549 mKB. Pumped 20 bbls of cement into the formation with 400 psi maximum pressure. After 1 hr squeezed 2 1/2 bbls with 900 psi maximum pumping pressure. Held 900 psi on cement for 9 hrs. Wait on cement on additional 8 hrs. The well had not been flowing since 18 ppg mud was circulated and cement was pumped. The flow at wellhead started when cement was being displaced and stopped again during the cement job.

17/06/84 0500 Hrs

The cement plug was drilled out and the perforations was successfully tested to 350 psi. As the mud in the hole was circulated the flow at the wellhead started again. It seemed to stop when the pumps stopped. The perforations were tested again to 300 psi with 9.2 ppg and held. Based on this information it was desided that the well was not actually flowing.

Pore Pressure Calculations

As shown earlier, if the zone is assumed to have a pore pressure of 8.8 ppg EMW in 35/11-1 or 826 psi, the well would flow when the riser was removed. The hydrostatic pressure was only 78.8 psi with 9.1 ppg mud in the hole. Even 10.5 ppg mud from the 30" wellhead housing and down should only provided a hydrostatic pressure of 823 psi on the Utsira sand. As noted the well flowed as expected with the 10.5 ppg mud in the 30" casing with the riser removed.

The well 35/8-2 set the 20" casing in the Utsira sand without any problems. Assuming the sand was connected the reason they did not find any problems is as follows.

Mud weight in the hole 9.2 ppg.

Top of Utsira 2510 m.

Pore pressure:
826 psi (from 35/11-1) + 8.56 x 0.52 (2510-1722) = 1177 psi

Hydrostatic Pressure with Riser Removed:
(1235 x 8.56 x .052) + (2510 - 1235) x 9.2 x .052)= 1160 psi

If the formation fluid density is less than seawater e.g. 8.4 ppg this difference of 17 psi would be less in any case the sand would have to overcome the solids invasion with a very small pressure differental. As the well did not flow the damage with the 9.2 ppg mud was too great. In our case the higher pressure differental of 43 psi and cleaner sand allowed the formation to clean up and flow.

SUMMARY OF CEMENT JOBS

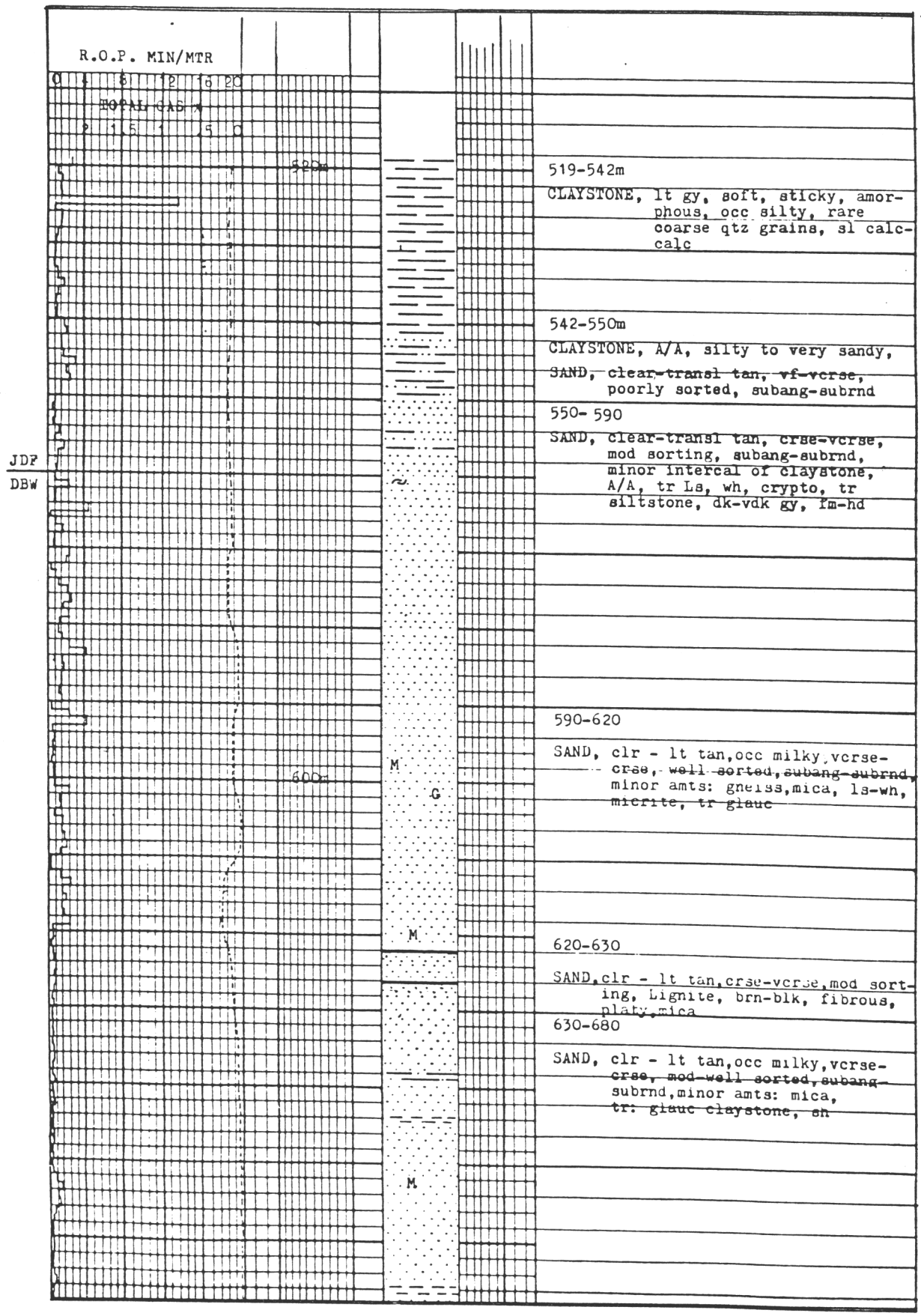
TABLE 4-19

	Type	Slurry Volume	Slurry Weight	Additives
1.	Primary	959 bbl	12.5 ppg	2480 sks Class "G" cement + 12.2 gps seawater + 4 gps liquid econolite
		208 bbl	15.8 ppg	1050 sks Class "G" cement + 5.19 gps seawater
2.	Remedial	211 bbl	15.8 ppg	1000 sks Class "G" cement + 4.82 gps seawater + .54 gps $CaCl_2$
3.	Cement Squeeze No. 1	100 bbl	15.8 ppg	470 sks Class "G" cement + 4.82 gps seawater + .54 $CaCl_2$
		117 bbl	15.8 ppg	560 sks Class "G" cement + 5.19 gps seawater
4.	Cement Squeeze No. 2	58 bbl	15.8 ppg	274 sks Class "G" cement + 4.7 gps seawater + .75 gps CFR-2L
5.	Cement Squeeze No. 3	40 bbl	15.8 ppg	189 sks Class "G" cement + 4.82 gps seawater + .54 gps $CaCl_2$ + .22 gps CFR-2 l

35/11-1 LITH LOG

INTERVAL 510 - 660 M

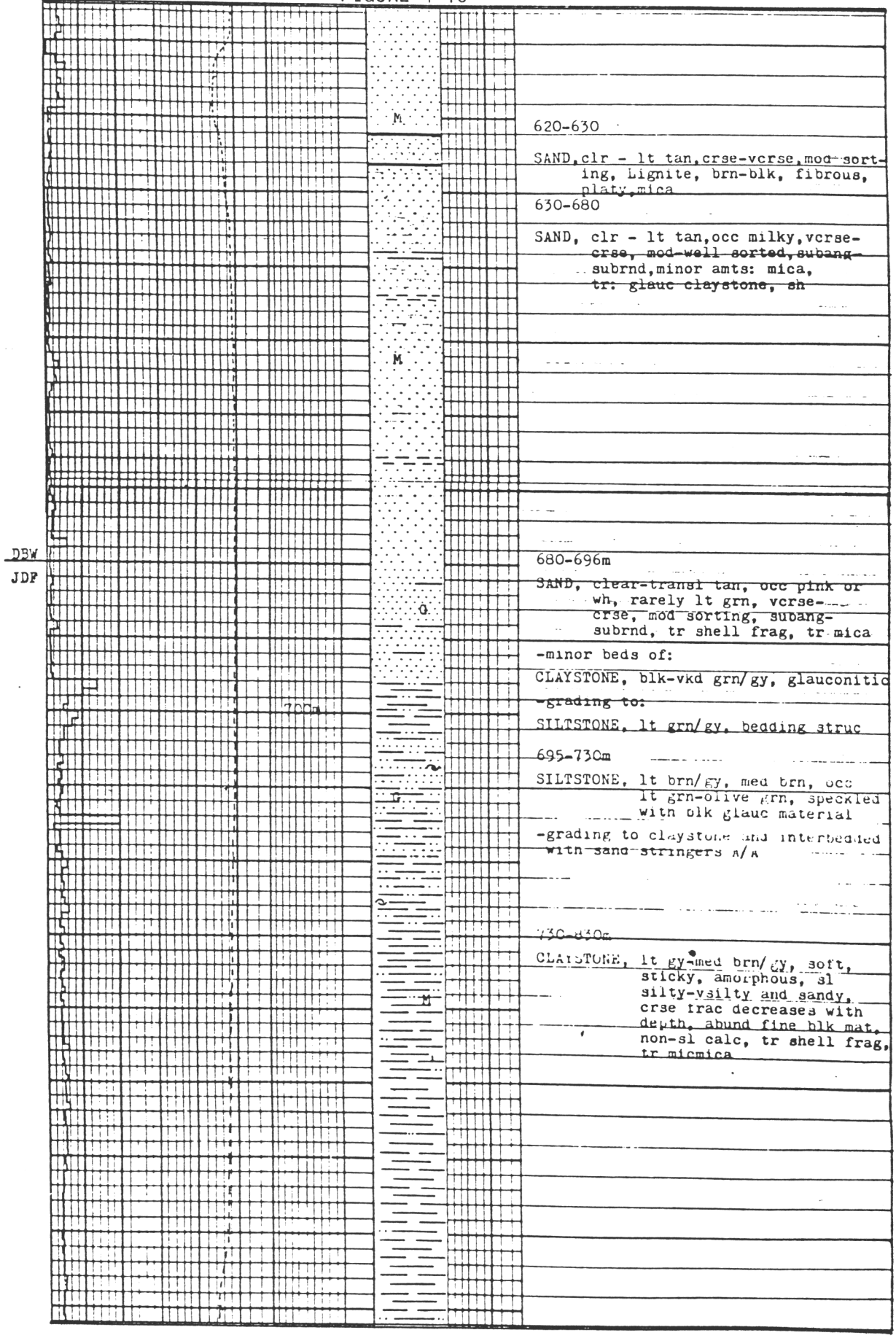
FIGURE 4-15



35/11-1 LITH LOG

INTERVAL 610 - 780 M

FIGURE 4-16



620-630

SAND, clr - lt tan, crse-vcrse, mod sorting, Lignite, brn-blk, fibrous, platy, mica

630-680

SAND, clr - lt tan, occ milky, vcrse-crse, mod-well sorted, subang-subrnd, minor amts: mica, tr: glauc claystone, sh

680-696m

SAND, clear-transl tan, occ pink or wh, rarely lt grn, vcrse-crse, mod sorting, subang-subrnd, tr shell frag, tr mica

-minor beds of:

CLAYSTONE, blk-vkd grn/gy, glauconitic

-grading to:

SILTSTONE, lt grn/gy, bedding struc

695-730m

SILTSTONE, lt brn/gy, med brn, occ lt grn-olive grn, speckled with blk glauc material

-grading to claystone and interbedded with sand stringers a/a

730-830m

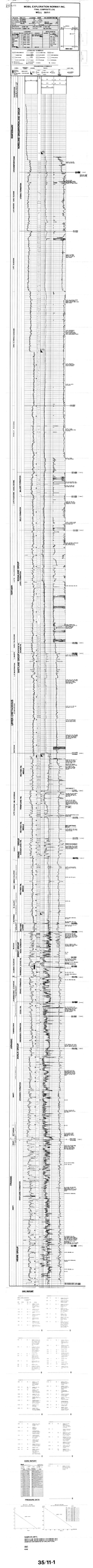
CLAYSTONE, lt gy-med brn/gy, soft, sticky, amorphous, sl silty-vsilty and sandy, crse frac decreases with depth, abund fine blk mat, non-sl calc, tr shell frag, tr micmica

SECTION 5

COMPLETION LOG

GLOSSARY OF ABREVIATION

BHA	-	Bottom hole assembly
BHT	-	Bottom hole temperature
BHLT	-	Bottom hole logging temperature
BOP	-	Blow out preventer
CMT	-	Cement
CSG	-	Casing
CST	-	Core sample test
DST	-	Drill stem test
EMW	-	Equivalent mud weight
HWDP	-	Hevi wate drill pipe
ID	-	Internal diameter
FIT	-	Formation integrity test
KB	-	Kelly bushing (ref. depth 0 m.)
Kt	-	Knop (wind speed)
LOT	-	Leak off test
LCM	-	Lost circulation material
L/D	-	Lay down
MBT	-	Methylene blue test
MSL	-	Mean sea level
MW	-	Mud weight
M/V	-	Mount vp
OD	-	Outside diameter
PGB	-	Permanent guide base
PV	-	Plastic viscosity
PPS	-	Pounds per sack
RFT	-	Repeat formation test
ROP	-	Rate of penetration
ROV	-	Remote operated vessel
SF	-	Sea floor
SL	-	Sea level (MSL)
SS	-	Sub sea level
TD	-	Total depth
TBG	-	Temperary guide base
RIH	-	Run in hole
P/U	-	Pick up
POOH	-	Pull out of hole
VSP	-	Velocity survey profile
WP	-	Working pressure
WOC	-	Wait on cement
YP	-	Yield point


MODEL EXPLORATION NORWAY INC.
FINAL COMPOSITE LOG
WELL: 35/11-1
DRILLING FLUID
DRILLING DATA
LITHOLOGY
GAMMA RAY
RESISTIVITY
POROSITY
DENSITY
SONIC
FORMATION
NORDLAND GROUP
HORDALAND GROUP
ROGALAND GROUP
SHETLAND GROUP
CROMER KNOLL GROUP
VIKING GROUP
DUNLIN GROUP
BRENT GROUP
STATFJORD GROUP
HEGRE GROUP
TRIASSIC
PERMIAN
CARBONIFEROUS
DEVONIAN
DEVIATION SURVEY
DST
CORE
PRESSURE DATA
SONIC REPORT

35/11-1