PALEOSERVICES

STATOIL

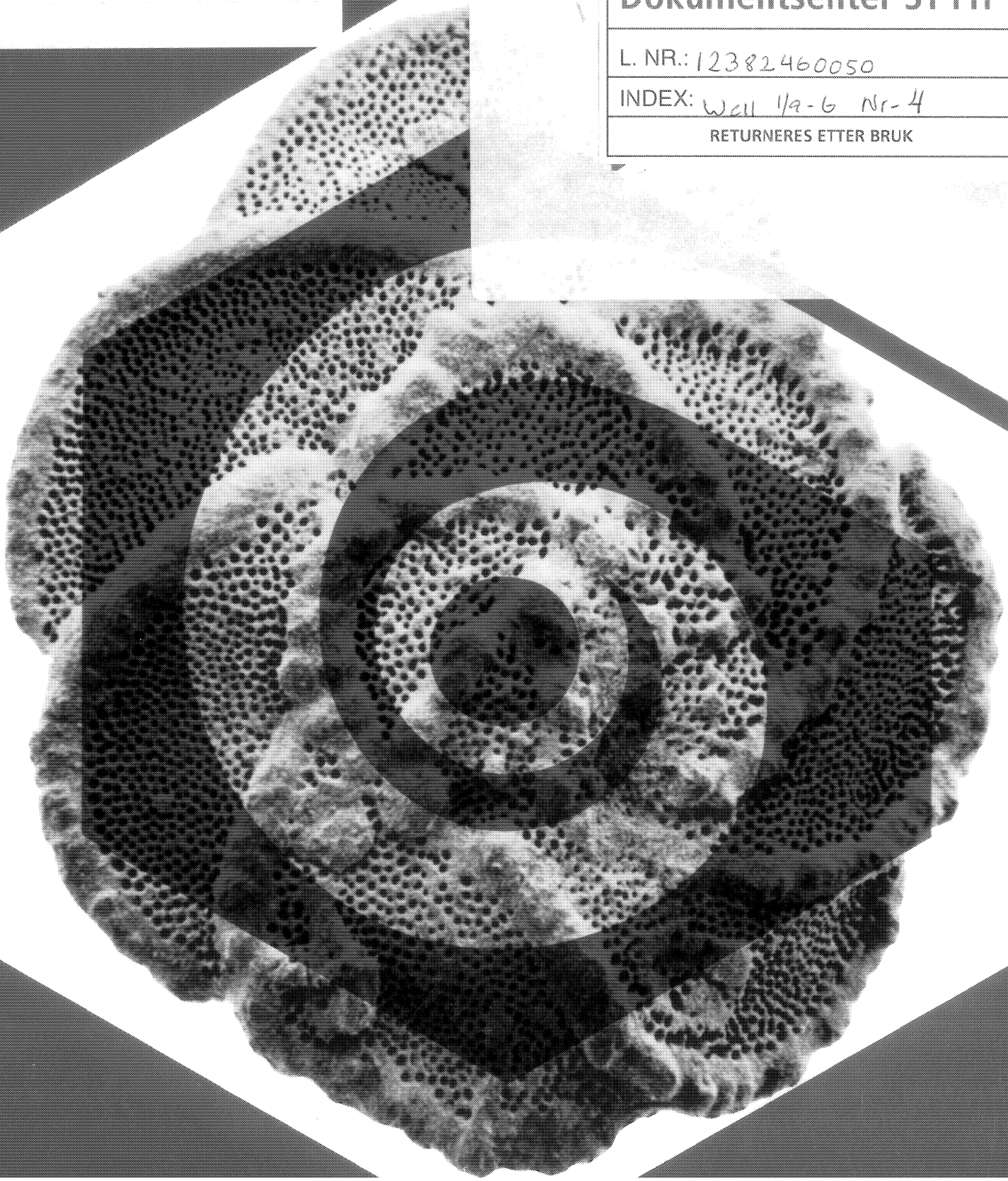
PALEONTOLOGICAL/
STRATIGRAPHICAL FINAL REPORT.

WELL 1/9–6

(Interval 2,500m–3,880m)

ikke fortrolig

Dette utlån lagret hos:
STATOIL
Dokumentsenter ST-FH
L. NR.: 12382460050
INDEX: Well 1/9-6 Nr-4
RETURNERES ETTER BRUK



OMRÅDE: 1/9-6

Nr.	Til	Dato	Nr.	Til	Dato
1	Sjulsen / Res	nov.82			
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3	Max Eicn / LAB	"			
4	UNO ARKIV	"			
5	PHILLIPS	"			
6	AGIP	"			
7	PETROFINA	"			
8	O. D.	"			
9	LET/SVG, ARKIV	"			

GEOLOGI & STRATIC ES

Stratigraphy
Micropaleontology
Palynology/Palynofacies
Kerogen
Analysis/Maturation
Petrography/Petrology
Sedimentology
Mineralogy

During the past fifty years micropaleontology has made a very important contribution to the oil industry's exploration programmes throughout the world. It is certain that this will continue into the future, since the oil industry requires the specialised knowledge that only expert studies on microfossils such as foraminiferids and ostracods, together with palynomorphs and nannoplankton can provide.

Paleoservices studies are carried out by competent, well trained, experienced individuals and are directed by people who are aware of the problems and who are intimately involved in their solution, ensuring that clients obtain accurate, pertinent results.

The Company was founded in December 1964 by Dr. V. L. Roveda and has expanded its activities in recent years with additional qualified staff, to satisfy the demand for services. The present **Paleoservices** office and laboratory address is.

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STRATIGRAPHICAL CONSULTANTS

Client Company

STATOIL

Title

PALEONTOLOGICAL/STRATIGRAPHICAL FINAL REPORT.

WELL 1/9–6

(Interval 2,500m–3,880m)

Project No.

981

Stratigraphers

H.W. BAILEY.

MANAGING DIRECTOR: DR. V. L. ROVEDA (IT.)

Date

November, 1982.

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Appendix 1: Brief Lithological description of core chips.

Fig.1. Sedimentary history diagram.

Encl.1. Stratigraphic Log, Scale 1:500 (2,500m-3,880m).

1. INTRODUCTION.

This report presents the results obtained from the study of samples from the Well 1/9-6, drilled during 1982 in the Norwegian sector of the North Sea. The study was carried out at the request of Statoil.

Samples were received and examined at 10 metre intervals from 2,500 metres to 3,150 metres; below 3,150m samples were collected at 3 metre intervals but at the request of the client were only examined at 9 metre intervals.

Fifty two core chips from cores 1 to 14 (cut through the interval 3,415.80 metres to 3,618.70 metres) were examined, and brief lithological descriptions of these are included in Appendix 1. Thin sections were made for microfaunal examination from each of the samples as the hardness of the chalk in this section precluded processing by normal methods.

Nannoplankton analyses were carried out on 66 samples at approximately 10 metre intervals, between 3,229 metres and 3,878 metres. This work was carried out for Paleoservices Limited by Dr. K. Perch-Nielsen, and her results were integrated with the other stratigraphic data by Paleoservices Ltd.

The whole of this study (with the exception of the nannoplankton analyses) was carried out by Paleoservices Ltd. staff; no external data (well site geologists logs, electric logs etc.) have been examined. A provisional stratigraphy has previously been provided by telex (12/10/82).

SEDIMENTARY HISTORY©

CLIENT: STATOIL

WELL NO: 1/9-6

FIGURE: 1

DATE: NOV. 1982

PROJECT NO: 981

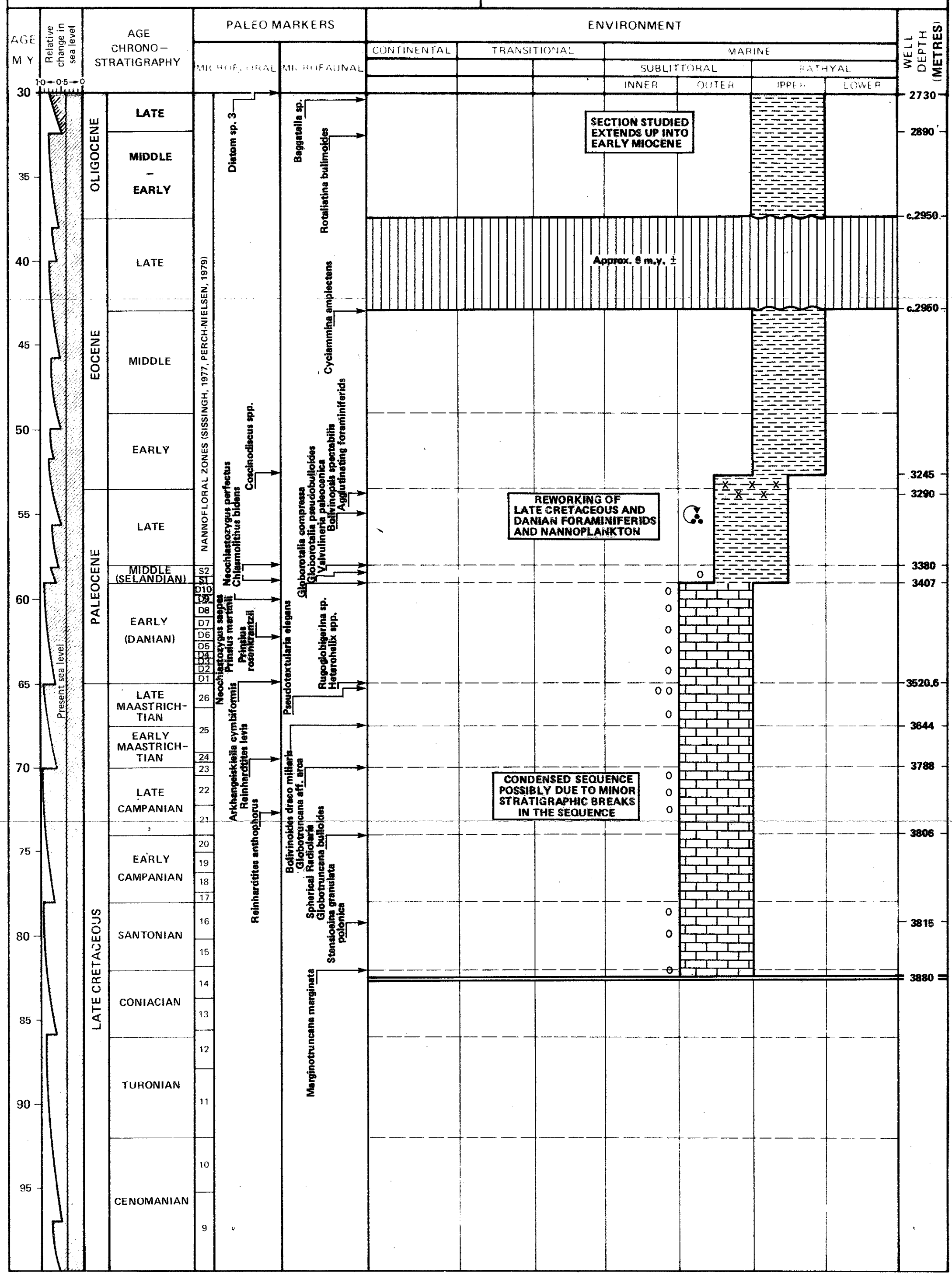
ANALYST: H.W.B.

PALEOSERVICES

KEY:

- Missing section
- Open marine circulation
- Restricted circulation
- Mainly coarse clastics (sand)
- Mainly fine clastics (silt, clay)
- Carbonates
- Evaporites
- Volcanics
- Reworked Late Cretaceous foraminiferids

* Vail et al 1980



2. CONCLUSIONS

1. The highest interval studied in this well (2,500m-2,730m) comprises brown claystones of Early Miocene-?Late Oligocene age, containing a predominantly agglutinating foraminiferid fauna and diatom flora, which indicate marine deposition at upper bathyal depths.

2. The Oligocene (2,730m-ca.2,950m) is represented by claystones deposited in a similar environment to that recorded for the overlying section. The microfauna comprises mainly agglutinating foraminiferids, with occasional occurrences of age-diagnostic calcareous species.

3. Oligocene claystones rest directly on Middle-Early Eocene claystones at ca.2,950m; there is no paleontological evidence for strata of Late Eocene age and an unconformity is indicated at this depth.

4. Middle-Early Eocene claystones are present from ca.2,950m to 3,245m and were deposited in a marine, upper bathyal environment. These rest on tuffaceous claystones (3,245m-3,290m) representing the Balder and Sele Formations. The period of volcanic activity which these Formations represent is known to span the Eocene/Paleocene Boundary.

5. Claystones dated as Late Paleocene and "middle" Paleocene (Selandian) represent the Lista Formation and Maureen Formation equivalent respectively (3,290m-3,407m). Both were deposited in a marine, outer sublittoral to upper bathyal environment. Reworking of Late Cretaceous and Danian chalk took place locally during Late Paleocene times.

6. Early Paleocene (Danian) chalk of the Ekofisk Formation is present from 3,407m to 3,520.60m. This contains an age-diagnostic planktic foraminiferid fauna and nannoplankton flora which indicate that the depositional environment was an open marine, outer sublittoral carbonate shelf, affected by oceanic current circulation. Local intra-Danian reworking of the chalk, producing the nodular "griotte" texture, was seen in the cores examined.

7. The Danian chalk rests directly on the Late Maastrichtian chalk and there is no paleontological evidence to indicate a significant stratigraphic break between the two.

8. There is a thick Maastrichtian chalk sequence (from 3,520.6m to 3,788m) representing the Tor Formation and part of the Hod Formation.

9. A fossiliferous red-stained chalk defines the top of a relatively thin Late Campanian interval, present from 3,788m to 3,806m. This rests on an equally thin Early Campanian-Late Santonian section (3,806m-3,815m) defined on both planktic and benthic foraminiferids.

10. Chalk of Middle Santonian-Coniacian age is present between 3,815m and 3,880m, containing a poorly preserved but age-diagnostic foraminiferid fauna.

11. The whole of the Late Cretaceous chalk sequence was deposited in an open marine, outer sublittoral carbonate-rich shelf environment, affected by oceanic current circulation.

3. STRATIGRAPHICAL SUMMARY.

3.1 Biostratigraphy:

Interval			Age	Thickness
2,500m	-	2,730m	Early Miocene-?Late Oligocene	230m
2,730m	-	2,890m	Late Oligocene	160m
2,890m	-ca.	2,950m	Middle-Early Oligocene	ca. 60m
---------- UNCONFORMITY ----------				
ca.2,950m	-	3,245m	Middle-Early Eocene	ca.295m
3,245m	-	3,290m	Early Eocene-Late Paleocene	45m
3,290m	-	3,380m	Late Paleocene	90m
3,380m	-	3,407m	"Middle" Paleocene (Selandian)	27m
3,407m	-	3,520.60m	Early Paleocene (Danian)	113.60m
3,520.60m	-	3,644m	Late Cretaceous (Late Maastrichtian)	123.40m
3,644m	-	3,788m	Late Cretaceous (Early Maastrichtian	144m
3,788m	-	3,806m	Late Cretaceous (Late Campanian)	18m
3,806m	-	3,815m	Late Cretaceous (Early Campanian-Late Santonian)	9m
3,815m	-	3,880m T.D.	Late Cretaceous (Middle Santonian-Coniacian)	65m

3.2 Lithostratigraphy:

The lithostratigraphic nomenclature used in this report is that defined by Deegan and Scull (1977), with modifications of the classification of the Tor Formation as made by Svendsen (1979).

Interval			Lithostratigraphic Unit	Thickness
2,800m	-	3,245m	Hordaland Group	745m
3,245m	-	3,290m	Rogaland Group: Balder/ Sele Formations	45m
3,290m	-	3,380m	Rogaland Group: Lista Formation	90m

Interval			Lithostratigraphic Unit	Thickness
3,380m	-	3,407m	Rogaland Group: Maureen Formation equivalent	27m
3,407m	-	3,520.60m	Chalk Group: Ekofisk Formation	113.60m
3,502.60m	-	3,635m	Chalk Group: Tor Formation (Gorm Member)	114.40m
3,635m	-	3,697m	Chalk Group: Tor Formation (Skjold Member)	62m
3,697m	-	3,880m	Chalk Group: Hod Formation	183m

4. EARLY MIOCENE-OLIGOCENE (2,500m-ca.2,950m)

Lithostratigraphy:

Hordaland Group (Part)

2,500m-2,660m Claystone, dark brown, occasionally silty, micromicaceous, subfissile, with rare beds of dark brown dolomitised limestone between 2,570m and 2,600m.

2,660m-2,720m Claystone, grey/brown, shaly, pyritic, with rare beds of light brown crystalline ?dolomitised limestone.

2,720m-2,950m Claystone, light grey, occasionally brown, shaly, pyritic, with frequent beds of light brown crystalline limestone.

Biostratigraphy:

2,500m-2,730m Early Miocene-?Late Oligocene

The microfauna through this interval is dominated by long-ranging Paleogene agglutinating foraminiferids, with only rare occurrences of stratigraphically restricted taxa. The presence of the calcareous benthic foraminiferid Turrilina alsatica below 2,540m provides a useful marker, as this species is particularly common in the Oligocene, but is known to range up into the Early Miocene in the Central North Sea. Rare centric diatoms, including the short-ranging taxa Diatom sp.4 and 5 (int.sp.), are present at 2,630m, suggesting an Early Miocene dating at this depth.

In view of the above data an Early Miocene age is most likely for this interval; however, as the section above 2,500m has not been examined, it is not possible to judge the amount of caved taxa

present. These would bias the dating towards a younger age, therefore the possible penetration of Late Oligocene strata cannot be omitted.

2,730m-2,890m Late Oligocene

The top of this interval is defined on the highest occurrence of Diatom sp.3 (int.sp.), which is known to be confined to the Oligocene in the North Sea region. The general aspect of the microfauna is still dominated by agglutinating taxa, with few calcareous benthic species. These latter include the characteristic Oligocene forms 'Baggatella' sp. (below 2,750m) and Asterigerina gurichi and Gyroidina soldanii mammillata below 2,840m.

2,890m-ca.2,950m Middle-Early Oligocene

The highest occurrence of the benthic foraminiferid Rotaliatina bulimoides at 2,890m indicates the penetration of Middle-Early Oligocene claystones. This index species occurs rarely, associated with common agglutinating taxa.

Environment:

Marine, upper bathyal.

Note:

The absence of Late Eocene microfossils below the base of the Oligocene section, suggests an unconformity at ca.2,950m, with Middle-Early Oligocene claystone resting directly on Middle-Early Eocene claystone.

5. EOCENE (ca.2,950m-3,245m)

Lithostratigraphy:

Hordaland Group (part)

ca.2,950m-2,990m Claystone, grey/brown, shaly, with rare grey/brown, dolomitic limestone.

2,990m-3,209m Claystone, grey to grey/green, shaly, blocky, pyritic throughout, with limestone, grey, microcrystalline, present, particularly between 3,020m and 3,080m and from 3,164m to 3,209m.

3,209m-3,245m Claystone, light grey, with common to abundant orange/brown sideritic spheres. Limestone, grey, microcrystalline, occurs rarely throughout.

Biostratigraphy:

ca.2,950m-3,245m Middle-Early Eocene

The occurrence of dark green specimens of Cyclammina amplectens at 2,950m is characteristic of the Middle Eocene in this area, and in the absence of any typical Late Eocene taxa an unconformity is indicated at this depth. The assemblage comprises mainly long-ranging agglutinating foraminiferids, although the occurrence of Bolivinopsis spectabilis at 3,030m is significant, as this species ranges up into the Middle Eocene, but not usually higher. Spherical Radiolaria, which occur below 3,010m in this well, are frequently found in Early Eocene sections elsewhere in the area; they are particularly characteristic of the Early Eocene when they occur commonly, as here below 3,100m.

Environment:

Marine, bathyal, low energy deposition.

6. EARLY EOCENE-LATE PALEOCENE (3,245m-3,290m)

Lithostratigraphy:

Rogaland Group: Balder-Sele Formations

3,245m-3,272m Claystone, grey/green, speckled white, tuffaceous, shaly.

3,272m-3,280m Claystone, laminated light/dark grey, tuffaceous.

3,280m-3,290m Siltstone, grey/green, argillaceous, shaly, with fine grained glauconite and pyrite present.

Biostratigraphy:

3,245m-3,290m Early Eocene-Late Paleocene

Pyritised centric diatoms (Coscinodiscus sp.1) occur commonly at 3,245m, associated with the tuffaceous claystones. They provide a distinctive marker horizon for this interval which occurs throughout the North Sea region, and is known to span the Eocene/Paleocene boundary.

Environment:

Marine, upper bathyal, with contemporaneous volcanic activity.

7. PALEOCENE (3,290m-3,520.60m)

Lithostratigraphy:

Rogaland Group

3,290m-3,380m Lista Formation

3,290m-3,308m Siltstone, grey, with discrete grains of quartz, glauconite and common pyrite.

3,308m-3,353m Claystone, grey, silty, pyritic, with occasional small fragments of reworked chalk.

3,353m-3,380m Claystone, red/grey, mottled, shaly, with occasional brown limestone horizons and sphaerosiderite grains.

3,380m-3,407m Maureen Formation equivalent

3,380m-3,407m Claystone, light grey, with dark grey laminae, shaly, calcareous.

3,407m-3,520.60m Chalk Group : Ekofisk Formation

3,407m-3,467.1m Chalk, hard, light brown-grey, very fine grained (micritic), occasionally with flaser-bedded argillaceous horizons ("griotte texture"), bioturbated, (Zoophycus burrow present at 3,415.82m).

3,467.1m-3,520.6m Chalk/limestone, grey-cream, fine grained, micritic. Common argillaceous flaser-bedded horizons ("griotte texture"),with ovoid chalk nodules enclosed within grey argillaceous "matrix", bioturbated (Zoophycus). Pyrite present, particularly at the base of the unit.

Biostratigraphy:

3,290m-3,380m Late Paleocene

Microfauna: The top of the interval is taken at the distinctive incoming downhole of common agglutinating foraminiferids, a horizon regionally indicating a level within the Late Paleocene. The indigenous microfauna in this unit is accompanied, below 3,326m, by reworked Late Cretaceous and Early Paleocene (Danian) foraminiferids, occurring within the chalk fragments noted above. The agglutinating foraminiferid normally characteristic of this interval, Bolivinopsis spectabilis, was not found until 3,340m.

Nannoflora: The only nannoplankton encountered are in the ditch samples between 3,335m and 3,353m. These are all Early Paleocene (Danian) and Late Cretaceous taxa, which are believed to be reworked from the underlying chalk, and derived from the chalk fragments noted above.

3,380m-3,407m "Middle" Paleocene (Selandian)

Microfauna: The highest occurrence of calcareous foraminiferids at 3,380m provides a distinctive top for this interval. The foraminiferid fauna present in these calcareous claystones includes the benthics Valvulineria paleocenica, Pullenia sp., Osangularia lens and Eponides lunata, and (below 3,389m) the planktics Globorotalia pseudobulloides, G.cf. compressa and Globigerina triloculinoides. G. pseudobulloides and G. cf. compressa do not range above the "middle" Paleocene.

Nannoflora: The presence in the sample at 3,380m of Neochiastozygus perfectus, together with Chiasmolithus bidens and Prinsius bisulcus at 3,386m, indicates a definite "middle" Paleocene (Selandian) age (Subzone S2 of Perch-Nielsen, 1979). Other forms present range up from the Early Paleocene (Danian) into the Late Paleocene.

3,407m-3,520.60m Early Paleocene (Danian)

Microfauna: The microfauna is similar to that seen in the overlying claystone, but, its occurrence here in chalk facies is used to define the top of the Early Paleocene (Danian). Planktic foraminiferids, (G. pseudobulloides and G. triloculinoides) are common to abundant throughout the interval, and the occurrence of Globorotalia compressa at 3,407m is also stratigraphically significant, as this species is only found in the Selandian and Danian.

Benthic foraminiferids were not observed commonly in the thin sections made from the core chips through this interval, although calcispheres occur below 3,441.37m. There is also a distinctive level in the argillaceous chalks below 3,483.2m where sponge spicules occur consistently.

Nannoflora: There appears to be a continuous sequence of nannoplankton through from the Selandian to the latest Danian, with Subzones S2, S1, D10 and D9 of Perch-Nielsen (1979) all recognisable.

The only occurrence of Neochiastozygus saepes (in the core at 3,454.7m), together with the basal occurrence of Prinsius martinii at the same depth suggests that this is probably the base of Subzone D9. Subzones D7/8 were not recognised, although they may occur between the samples examined.

The section from 3,467.1m to 3,490.8m contains good assemblages typical of Subzone D6, including Prinsius rosenkrantzii, which does not range below Subzone D6.

Below this, the sparse nannoflora is difficult to interpret; rare nannoplankton present at 3,510.78m suggest a tentative dating of Subzone D1.

Environment:

3,290m-3,407m Marine, outer sublittoral to upper bathyal, with occasional influxes of reworked chalk debris.

3,407m-3,520.60m Marine, outer sublittoral, carbonate rich shelf deposition, with open oceanic current circulation.

Some intra-Danian chalk reworking is suggested by the presence of the "griotte" textures noted below 3,467.1m.

8. LATE CRETACEOUS (3,520.6m-3,880m)

Lithostratigraphy:

Chalk Group

3,520.6m-3,635m Tor Formation: Gorm Member

3,520.6m-3,635m Chalk, cream, occasionally light grey, hard, fine, micritic, with common stylolites and occasional discrete dark grey claystone dissolution seams.

3,635m-3,698m Tor Formation: Skjold Member

3,635m-3,698m Chalk, cream light/grey, hard, fine, biomicritic; with common to abundant calcispheres throughout.

3,698m-3,880m Hod Formation

3,698m-3,788m Chalk, cream/light grey, hard, fine, micritic, with occasional stylolite development at the top of the unit, and crystalline pyrite present between 3,707m and 3,764m.

3,788m-3,797m Chalk, pink/red stained, fine, biomicritic.

3,797m-3,824m Chalk, creamy white, fine, micritic.

3,824m-3,880m Chalk, grey/white, "gritty" texture in places, argillaceous, occasionally pyritic.

Biostratigraphy:

3,520.6m-3,644m Late Maastrichian

Microfauna: The top of the Late Cretaceous succession is defined on the highest occurrence of the planktics Globigerinelloides spp., Heterohelix sp. and Rugoglobigerina sp., in the core sample at 3,520.6m.

The diagnostic Late Maastrichtian marker Pseudotextularia elegans occurs in the sample at 3,523.95m, and continues to occur in the cored section down to 3,618.7m.

Nannoflora: It is difficult to define a precise Late Maastrichtian interval on the basis of the nannoflora, as the zonal index (Nephrolithus frequens) is only encountered as reworked specimens in the Late Paleocene and as caved specimens at 3,716m. The nannoflora is composed of taxa which range through the Maastrichtian, including Arkhangelskiella cymbiformis, Lucianorhabdus cayeuxii and Kamptnerius magnificus.

3,644m-3,788m Early Maastrichtian

Microfauna: The highest occurrence of the benthic foraminiferid Bolivinoides draco miliaris is used in this area to define the top of the Early Maastrichtian. In this well this subspecies is associated with Bolivina incrassata, and below 3,653m with Stensioeina pommerana and the planktic Globotruncanella havanensis.

This fauna is also associated with abundant calcispheres, which are known to be characteristic of the Early Maastrichtian of the Danish North Sea (Svendsen 1979).

Below 3,700m the microfauna is very poor, probably due to the induration of the chalk below this depth.

Nannoflora: The nannoflora throughout this interval is typical of the nannofossil Zone 25 (Arkhangelskiella cymbiformis Zone) of Sissingh (1977). This Zone is characterised by numerous long-ranging Late Cretaceous taxa including L. cayeuxii, K. magnificus, Stradneria crenulata and Praediscosphaea cretacea, as well as the zonal index A. cymbiformis.
The basal Maastrichtian index species (Zones 23/24 Sissingh1977) Reinhardtites levis, is encountered at the base of this interval (below 3,785m).

3,788m-3,806m Late Campanian

Microfauna: The red-stained chalk at 3,788m contains an age-diagnostic foraminiferid fauna, including Globotruncana aff. arca, which is considered regionally to be of Late Campanian age. The agglutinating species Pseudogaudryinella capitosa, which occurs at the same level, is also characteristic of the latest Campanian in the North Sea area.

Nannoflora: The only nannoplankton encountered are Maastrichtian forms including R. levis. This minor discrepancy between the foraminiferid dating and that given by the nannoflora is probably due to caving and, in the interest of regional consistency it is thought better to use the foraminiferid marker for the top of the Campanian.

3,806m-3,815m Early Campanian-Late Santonian

Microfauna: This relatively condensed unit contains a microfauna known regionally from other Early Campanian-Late Santonian sections. This comprises common spherical Radiolaria, associated with the planktic foraminiferid Globotruncana bulloides.

The basal Campanian benthic foraminiferid Stensioeina granulata ?incondita was recorded below 3,806m.

Nannoflora: The oldest nannofossils recorded in this interval are Eiffellithus eximus, Glaukolithus disgregatus and Reinhardtites anthophorus, which all occur below 3,812m. These three species do not range up above the Campanian.

3,815m-3,880m Middle Santonian-Coniacian

Microfauna: The highest occurrence of the benthic foraminiferid Stensioeina granulata polonica is within the Middle Santonian. It occurs in this well at 3,815m, associated with rare specimens of Globotruncana bulloides, Globigerinelloides asperus and Whiteinella baltica, which all range through the Santonian and Coniacian. The common occurrence of the planktic foraminiferid Marginotruncana marginata in the lowest sample examined (3,878m-80m) is more consistent with a Coniacian age for the base of the interval, but in the absence of other evidence it is thought that there is not sufficient data to define a separate Coniacian interval.

Nannoflora: The oldest nannoplankton encountered in this well all range through the Campanian and Santonian. These include Tranolithus orionatus (below 3,839m) and Lithastrinus sp. (below 3,866m).

No species restricted to the Santonian or older stages were recorded during this study.

Environment:

Open marine, outer sublittoral, carbonate-rich shelf deposition, occasionally affected by oceanic current circulation.

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APPENDIX 1. - Brief lithological description of core chips

CORE NO.1	3,415.80-.82m	Chalk, light brown/buff, very fine grained micrite, hard, small Zoophycus burrow visible.
	3,417.10-.12m	Chalk, as above.
	3,420.15-.17m	Chalk, as above.
	3,422.20-.22m	Chalk, as above.
CORE NO.2	3,426.10-.12m	Chalk, as above.
	3,430.40-.42m	Chalk, light grey, very fine grained, micritic, hard.
	3,434.90-.97m	Chalk,light/grey, with "griotte texture" of whispy clay seams, also burrow horizons visible.
	3,441.35-.37m	Chalk, light grey/cream fine grained, micritic, hard.
CORE NO.3	3,448.45-.47m	Chalk, as above.
	3,454.70-.72m	Chalk, as above.
CORE NO.4	3,467.10-.12m	Chalk, as above, cream/brown, "griotte texture".
	3,475.50-.52m	Chalk, creamy, fine grained, micrite.
CORE NO.5	3,483.20-.22m	Chalk, cream/grey, flaser bedded "griotte texture," with small ovoid fragments of cream chalk within grey claystone bedding.
	3,490.40-.42m	Chalk, creamy, massive, fine grained micrite.
	3,499.30-.32m	Chalk, creamy/brown, fine, micrite.
CORE NO.6	3,501.35-.40m	Chalk, cream, with whisps of grey claystone throughout.
	3,502.48-.55m	Chalk, grey/cream,bioturbated, Zoophycus burrows present, "griotte texture".

	3,504.45-.50m	Chalk, grey/white, fine grained, micrite.
	3,507.9-.93m	Chalk, grey, very argillaceous, bioturbated, "griotte" texture with distinct shaly claystone seam.
	3,510.78-.80m	Chalk, creamy/grey mottled, bioturbated, very fine micritic.
	3,514.35-.70m	Chalk, grey, very argillaceous, bioturbated, "griotte texture", with clay seams.
	3,516.00-.05m	Limestone, dark grey, argillaceous with cream chalk in claystone matrix shaly, pyritic.
CORE NO.7	3,520.60-.65m	Chalk, cream, fine, micritic,hard.
	3,523.95-.00m	Chalk, as above, with possible stylolite development.
	3,528.05-.10m	Chalk, as above, cream/light grey, some bioturbation.
CORE NO.8	3,531.35-.40m	Chalk, cream/light grey, hard, with distinct stylolite through core.
	3,534.15	Chalk, as above.
CORE NO.9	3,541.07-.12m	Chalk, buff/cream, hard, slightly argillaceous.
	3,544.40-.45m	Chalk, as above.
	3,550.38-.46m	Chalk, as above, with possible stylolite development.
	3,552.80-.88m	Chalk, as above.
	3,555.60-.64m	Chalk, as above with possible stylolite development.
CORE NO.10	3,557.28-.35m	Chalk, cream, hard, fine grained micritic, with 6mm thick seam of claystone, black very irregular bedded, stylolitic.
	3,560.80-.85m	Chalk, as above, with possible stylolite development.

	3,564.60-.65m	Chalk, as above, with possible stylolite development.
	3,566.35-.40m	Chalk, as above, with possible stylolite development, thickened up to 5mm by claystone.
	ca.3,570.60m	Chalk, as above, with thick 1-2mm claystone seam, black, stylolite present 2cm below claystone.
	3,573.05-.10m	Chalk, as above, with claystone seam and stylolite.
CORE NO.11	3,576.74-.86m	Chalk, creamy light brown, fine, micritic, hard, stylolitic.
	3,578.64-.72m	Chalk, cream, fine, micritic, hard.
	3,583.96-.84m	Chalk, as above.
CORE NO.12	3,585.55-.62m	Chalk, as above.
	3,589.79-.85m	Chalk, as above, stylolitic
	3,593.70-.79m	Chalk, as above.
	3,595.83-.90m	Chalk, as above.
CORE NO.13	3,598.35-.43m	Chalk, grey/white, fine micritic, hard, stylolitic.
	3,603.23-.29m	Chalk, as above with irregular bifurcating clay seam (1mm thick) cutting across, associated with stylolites.
	3,607.50-.55m	Chalk, as above, stylolitic.
	3,614.10-.16m	Chalk, as above.
	3,615.65-.72m	Chalk, as above, stylolitic.
CORE No.14	3,618.4-.7m	Chalk, as above.

STATOIL	ANALYSTS	PROJECT No	DATE	PLOT SHEET No
	H.W.B.	981	NOV. 1982	1

WELL 1/9-6

INTERVAL 2500m.-3880m.

STRATIGRAPHIC LOG

SCALE 1:500

(Metric)

PREPARED BY
PALEOSERVICES
UNIT 15, SANDOWN ROAD, WATFORD WD2 4UB ENGLAND.

LEGEND

CLAY/CLAYSTONE
SHALE
MARL-CALCAREOUS SHALE
SILTSTONE/SILT
F M C SAND
MEGAFOSSILS
CHERT
PYRITE
STYLOLITES
F M C SANDSTONE
CONGLOMERATE
VOLCANICS LAVAS/TUFFS
UNDIFFERENTIATED BASEMENT
NO SAMPLES
G GLAUCONITE
S SIDERITE
LIGNITE/COAL
LIMESTONE
CHALK
DOLOMITE
SALT
ANHYDRITE/GYPSUM
MICA
CORES
NANNOPLANKTON ANALYSES FROM CORE SAMPLES

Boundary
Unconformity
T.D. (Total depth)
Partial or interrupted sequence
F.S.R. First sample received
L.S.R. Last sample received

FOSSILS AND ACCESSORY MINERALS
Abundant
Common
Rare
FOSSILS IN SIDEWALL CORES: Abundant, Common, Rare
PETROGRAPHICAL ANALYSIS

DEPTH	Lithology	Core/Side wall cores	Minerals	Nannoplankton	Main Fossils	Depths	Significant faunal/floral events	Significant lithological horizons	Environment	Lithostratigraphic Units	Nannoplankton Zone	Age
METRES												