ELF AQUITAINE NORGE A/S
Exploration Division
311D/78/107/JMM/kh

GEOLOGICAL COMPLETION REPORT

WELL 25/1-6

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I PERTINENT DATA

I.1 General Data

Area:	Block 25/1
Licence:	024
Owner:	Petronord
Operator:	Elf Aquitaine Norge A/S
Rig:	Pentagone 84
Contractors:	Mud Logging: Geoservices
Location:	Geographic: 02° 05' 42,25 E
	59° 46' 57,8" N
	Seismic: SP 150 - Line 680 301
Wather depth:	105 m
RKB - Sea bottom:	129 m
Total depth:	D.D. 2900 m
Well spudded on:	16.1.78
Started drilling:	27.1.78
End of drilling:	12.3.78
End of operation:	18.3.78

I.2 Status

Dry well

Plugged and abandoned

II GEOLOGICAL DATA AND RESULTS

II.1 Objectives

The well was located 12 km southwards of the 25/1-1 well and 6 km southwards of the Frigg Field boundary. The main objective was a Paleocene seismic structure underlined by a strong discontinuous flat seismic event.

Geological correlations and geophysical studies allowed to expect a detritic sand body belonging to the Heimdal Formation.

The Cod or Heimdal clay layer could be the closure of this structure. The structurally closed Frigg, Cod and Danian Sands, and upper Cretaceous chalk could be secondary objectives.

In the Frigg Field environment, the convergence of these features made this structure highly attractive.

On the other hand, Petronord intended to drill the 25/1-6 well in order to evaluate the last possibilities of the Tertiary sand bodies of block 25/1 before the next relinquishments.

II.2 Stratigraphical and lithological Results

Stratigraphy

See enclosed composite log and log 1/5000 as well as the table on page 3.

STRATIGRAPHICAL UNIT	PALYNOLOGY	TOP(RKB)	TOP(MSL)	THICKNESS (m)
Miocene to Pleistocene		129	- 105	560
Oligocene		698	- 674	
Eocene Upper to middle				
Eocene Lower		2107	-2083	
Paleocene	nt II a Upper	2126?	-2102?	24?
Paleocene	nt II a Middle	2150	-2126	45
Paleocene	nt II a Lower	2195	-2171	46
Paleocene	nt 1 b	2249	-2225	316
Danian		2563	-2539	236
Maestrichtian		2799	-2775	102
TD		2900	-2876	

NB. These results are still provisional, as we are still waiting for the last laboratory results.

Lithology

Miocene to Pleistocene (129 m to 698 m)

- Sand translucent, very coarse to very fine, angular to subrounded with some occurences of sandstones grey to light grey, fine to medium grained, well sorted and with argillaceous or calcareous cement.

- Clay light grey and silty, slightly micaceous. With lignite stringers and a lot of shell fragments (Eshinoderms and Gastropods).

Middle Eocene to Oligocene (698 m to 2107 m)

- Siltstone to silty clay, grey to light grey, very glauconitic, micaceous, locally consolidated, traces of carbonaceous material, layer of calcareous sandstone, grey white, fine, very glauconitic (calcareous cement about 40%). The most important bed is from 829 m to 841 m (RKB depth).

- Stringers of light brown, dolomitic limestone.

- Traces of lignite and pyrite (pyritised burrows).

- Some Foraminifers.

It is notable that there is no lithological change between Oligocene and Eocene levels. Only a palynological study can indicate the boundary between these different stages.

Lower Eocene (2107 m to 2126 m)

The top of this level is indicated by alternations of thin carbonated sandstone, white to milky white, medium grained and well sorted and of laminated shales grey to dark grey, carbonaceous, more or less silty.

From 2120 m to 2123 m a level of friable sand translucent very fine to fine and subangular occurs, which overlays a level of shale grey blue, locally pigmented and microconglomeratic.

Paleocene

- Ypresian to Thanetian
  Upper nt II a (lower Frigg member equivalent) (2126 m to 2150 m). One core was taken from 2127 m to 2136 m (see description sheets in annex)

  Some layers of red brown, slightly micaceous shale appear at the top of this unit. It is interbedded with grey blue, soapy shales with some slumping figures and some sandstones levels, medium to fine grained, and very locally cemented with calcareous or argillaceous material.

  nt II a middle (Tuff Member equivalent) (2150 m to 2195 m). This unit is mainly argillaceous: The main component is a shale grey, silty, micaceous, pyritised. It is interbedded with sand layers, grey white, very fine to medium grained, subangular, glauconitic and micaceous, which are mostly friable and rarely cemented with clay or carbonate.

  A very few traces of tuff (light grey) are seen in the cuttings.

- Thanetian

nt_II_a_lower (Cod Member equivalent) (2190 m to 2249 m)
Shale mainly grey blue to dark grey, slightly micaceous and soapy.

These shales are interbedded with thin layers of sandstone light grey, silty to very fine, subangular, glauconitic, micaceous and poorly cemented and with some stringers of dolomite microcristalline, brown to tan, medium hard to hard.

The lithology of these formations has been established from the continuous mud logging and from the clab. The quality of the electrical log was not good enough due to the washing of the hole during the drilling of the 12 1/2 phase.

- Thanetian to Montian

nt_I_b (Heimdal Formation) (2249 m to 2567 m)
This formation is a very thick (318 m) sand unit. The main component is sand grey to light grey, very fine to medium grained (rarely slightly silty), well sorted, subangular to subrounded, argillaceous to micaceous and slightly glauconitic. It is mostly friable, rarely cemented by argillaceous material.

This formation can be divided into four units. From 2249 m to 2330 m is a massive sand layer with two metric stringers of grey limestone at the bottom.

From 2330 m to 2431 m are intercalations of shale grey to dark grey,soapy and indurated, of shale light grey, slightly calcareous and of sandstone becoming more argillaceous with the increasing depth.

From 2431 m to 2462 m is another thick sand unit with the same characteristics as the first one, and with a thin limestone stringer at 2454 m.

From 2462 m to 2563 m are intercalations of sand (as above), argillaceous layers (shale grey, silty, micaceous, more or less dolomitic and with some traces of carbonaceous material) and a few limestone stringers.

- Danian - nt I a (2567 m to 2799 m)

Two main lithological units compose this stage. The upper one is mainly argillaceous (2567 m to 2678 m), shale dark grey to grey blue, slightly silty and soapy with some interbeds of light brown limestone, medium hard and a little argillaceous.

The lower one is mainly sandy; its top is indicated by very hard stringers of sandstones. They are white, fine to medium grained, subangular, poorly sorted and have a siliceous cement which made them very hard.
They are alternating with shale and clay grey to light grey and very soft and with some carbonated stringers (light brown limestone and carbonated sandstones). The clay levels may contain traces of lignite (with amber in the cuttings).

Cretaceous

Maestrichtian (2799 m to 2900 m, T.D.)
The top of the Maestrichtian is indicated by a very thin level of rusty marl as in the 25/1-1 well. It overlays mainly marly layer (light grey marl) with some intercalations of chalky limestone, milky white, soft to hard when silicified and of light brown marl.

The thickness of the limestone stringers increases with the depth and from 2870 m the chalky levels are the most important.

The well has been stopped in this stage at 2900 m.

III STRUCTURAL RESULTS

The main objective was to explore a paleocene anomaly on the SW part of block 25/1.

The 1976 seismic data show an anomaly between the C1 horizon (Tuff), which is structured, and the top of C2 horizon (top of Maestrichtian), which is rather flat. However, we noted an amplitude anomaly more or less flat just above the C2.

From seismic correlations (synthetic seismogram) this anomaly could be equivalent to Heimdal sands (confirmed by regional geological studies).

The following table compares the prognosis and the results.

	PROGNOSIS		RESULTS
	Section time OWT - ms	Depth MSL (m)	
Top of Frigg sands	1017,5	-2085	-2084
Top of Tuff (C1)	1037,5	-2146	-2126
Top of anomaly	1137,5	-2457	(-2225*)
Flat event	1195	-2620	-2654
Top of Creataceous (C2)	1260	-2833	-2775

* - This depth corresponds to the top of Heimdal sands located more than 200 m above the picked anomaly.

The considered "flat event" is due to a velocity contrast between the shales and hard sandstone beds which marked a lithological change within the Danian formations.

These results are displayed on the two enclosed seismic sections.
(See plates 4 - 5)

IV PETROLEUM PROBLEMS

IV.1 Lower Tertiary Reservoirs

Frigg Formation

The first reservoir layers of this formation are very thin carbonated sandstone levels from 2107 m to 2120 m. They are fluorescent (yellow pale) and the extraction in yellow too. There is no gas indication on the chromatograph.

The more important sand level occurs from 2120 m to 2123 m MSL. There are some fluorescences in the cuttings which are extractible. A very weak gas indication was registered on the chromatograph (but too weak to have a good accuracy)

C1 = 0,5
C2 = 0,154
C3 = 0,011

In the lower part of the Frigg Formation (palynozone upper nt II a) a core was taken with four thin interbeds of sandstones medium to fine grained and with a very little cement. These sandstones are fluorescent (light yellow) and give a fluorescent, light yellow extraction.

Because of their very little thickness (decimetric beds) these layers are of no interest.

Tuff Member Equivalent

Some sandy beds have been drilled in this unit. Some shot clabs show grey white sand, fine to medium grained, subangular glauconitic and micaceous and not cemented. These samples are fluorescent and their extraction show light yellow fluorescence.

There was no gas indication on the chromatograph during the drilling and the very thin thickness of these levels make them of no interest.

Cod member Equivalent

There are also very thin beds of sandstone whitish, silty to fine grained, subangular and glauconitic. There are no fluorescence neither on cutting nor on clabs and no gas indication on the chromatograph. The petrophysical characteristics are good: porosity reaches 30% at 2131 m. This level is of no interest.

Heimdal Formation

This massive sand unit has good reservoir characteristics: The sand is translucent fine to coarse, subrounded to subangular, and mostly well sorted. The porosity of the sandy levels varies from 20 to 25%.

The total thickness of this unit is 316 m and its net thickness is about 226 m.

No shows have been encountered neither during the drilling nor on the clab. This unit is water bearing.

Danian

The lower part (2678 m to 2799 m) of the Danian stage is composed of many intercalations of sandy levels and shaly beds. The sandy intervals have no good porosity except from 2752 m to 2758 m and from 2786 m to 2799 m where it reaches 15%.

The total thickness of these levels is 120 m and its net thickness less than 30 m.

No shows were encountered in this unit except for some weak fluorescences.

IV.2 Cretaceous Reservoirs

Maestrichtian Chalk

The first thick beds of chalky limestones have been drilled at 2846 m. They are tight (porosity about 5%) and without any show, and so are the following chalky levels. The Maestrichtian chalk is of no petroleum interest.

V PALYNOLOGICAL CORRELATIONS - INTEGRATION IN THE FRIGG ENVIRONMENT

Two correlation sheets of the lower Tertiary have been drawn based on the Palynological datations. (plates No 6 - 7)

The first one is a NNW - SSE cross section through wells 25/1-2, 25/1-1 (both on Frigg Field), 25/1-6 and 25/4-4 (Heimdal Field).

The second one is a W - E cross section through wells 10/1-1, 25/1-6 and 25/2-2-3.

The Frigg and Cod formation are argillaceous in this area which confirms Le Fournier's interpretation ("Tertiaire inférieur de la zone de Frigg synthèse et interprétation des données sedimentologiques: Proposition d'un modèle architectural", J. Le Fournier, Décembre 1977).

The important developement of the Heimdal formation and the existence of the detrital Danian formation could àlso confirm the hypothesis of the same author:

"The W-E orientated Danian deposition axis continued to be active at the Thanetian to Montian."

VI CONCLUSIONS

The 25/1-6 well was drilled in the southern part of the 25/1 block, 6 km south of the Frigg Field boundary.

Its main objective was a Paleocene anomaly which could be equivalent to a Heimdal sand Fan deposit and which was underlined by a strong discontinuous flat seismic event.

Water bearing Heimdal sands were encountered at 2249 m (RKB depth).

The seismic anomaly was due to the density and velocity contrasts between the clay and the siliceous sandstones of the Danian formation.

The well was bottomed in Maestrichtian chalk at 2900 m (RKB depth).

No significant hydrocarbon shows were registered. The well has been plugged and abandoned as a dry well.

SIDE WALL CORES DESCRIPTION

WELL : 25/1-6	RUN N° : 1	SERVICE COMPANY: Schlum.
LICENCE :	PAGE N°: 1	ASKED: 30
	DATE : 1 - 3 - 78	RECOVERED : 27
		SHOT : 27
		LOST : 3
		FULL BULLET : 27

tr : trace - M : medium - G : good

N°	DEPTHS	REC	LITHOLOGY	Fluorescence	CUT
1	2540		LOST		
2	2533.5	50	Sandstone light grey, silty to medium grained, subangular, no carbonated cement, friable, slightly micaceous		
3	2518.5	30	Sandstone light grey, silty to medium grained, poorly sorted, subangular, cement argillaceous slightly calcareous rare, friable		
4	2513	10	Sandstone light grey, whittish, fine, grained, well sorted, subangular, no carbonated cement, sl, glauc. and micac.		
5	2508	40	Shale grey, silty, dolomitic, micaceous	X	
6	2502.8	50	Sandstone grey, argillaceous, fine to medium grained, subangular to subrounded, micaceous, no carbonated cement rare.	X	
7	2500.5	70	Shale grey, silty, micaceous, traces of lignite	X	
8	2493.5	60	Sandstone very argillaceous, grey, light grey, fine to medium, subangular to subrounded, no carbonated cmt , tr. of H.C.		
9	2487.5	100	Shale grey, dark grey, lignitic, micaceous		
10	2483.7	50	Shale grey, dark grey, lignitic, micaceous		
11	2467	80	Siltstone grey, argillaceous micaceous		
12	2450	20	Sandstone grey, fine to medium grained, poorly sorted, subangular to subrounded, micaceous, friable	X	
13	2430	100	Sandstone, grey, very fine to fine, locally coarse, well sorted, subangular, micaceous, friable		
14	2426	80	Sandstone argillaceous grey, very fine to medium, poorly sorted, subrounded, micaceous, friable, no carbonated cement		
15	2420.6	60	Sandstone argillaceous, grey, very fine to fine, well sorted subrounded, friable, no carbonated cement		
16	2413	80	Sandstone grey, fine to medium, poorly sorted, subrounded friable, micaceous, no carbonated cement		
17	2410.6	70	Sandstone grey, light grey, very fine to fine, locally coarse, well sorted, subrnd, micac., glauconitic, carbonated cmt		
18	2386.5	70	Sandstone light grey, argillaceous, very fine to fine, well sorted subrounded, micaceous, slightly glauconitic, carbonated cmt.		

SIDE WALL CORES DESCRIPTION

WELL : 25/1-6	RUN N° : 1	SERVICE COMPANY: Schlum	
LICENCE :	PAGE N°: 2	ASKED: 30	
	DATE : 1/3-78	RECOVERED: 27	
		SHOT : 30	
		LOST : 3	
		FULL BULLET : 27	

tr : trace - M : medium - G : good

N°	DEPTHS	REC	LITHOLOGY	Fluorescence	CUT
19	2377.5	100	Shale grey, dark-grey, soapy, indurated Shale light-grey, slightly calcareous		
20	2368	70	Sandstone grey, argillaceous, very fine to fine, well sorted, subrounded, micaceous, friable		
21	2363	70	Sandstone grey, argillaceous, very fine to fine, well sorted, subrounded, micaceous, slightly glauconitic		
22	2357.5	90	Sandstone grey, light grey, slightly argillaceous, silty to fine subrounded, micaceous, friable, carbonated cmt		
23	2352	70	A/A		
24	2348.5		LOST		
25	2342	60	A/A, glauconitic		
26	2335.6		LOST		
27	2330.5	100	A/A		
28	2328	60	Sandstone grey, light grey, fine to medium, subangular to subrounded, slightly silty, glauconitic, sl. micaceous, friable, cement rare		
29	2325	40	Sandstone grey, fine to very fine, slightly silty, well sorted, subangular to subrounded, friable		
30	2251	50	Sandstone light grey, fine grained, subrounded, slightly argillaceous, micaceous, friable		

SIDE WALL CORES DESCRIPTION

WELL : 25/1-6
LICENCE :

RUN N° : 2
PAGE N°: 1
DATE : 1/3-78

SERVICE COMPANY:	Schlum
ASKED:	30
RECOVERED:	30
SHOT :	5
LOST :	0
FULL BULLET :	5
MISFIRED	25

tr : trace - M : medium - G : good

N°	DEPTHS	REC	LITHOLOGY	Fluorescence	CUT
1	2224	100	Shale grey, slightly micaceous, soapy, indurated		
2	2239	40	Sandstone whittish, silty to fine grained, subangular, non carbonated, cement-white, glauconitic		
3	2334.8		MISFIRED		
4	2228	100	Shale dark-grey, micaceous, indurated		
5	2216	5	Shale grey, soapy, indurated		
6	2195	15	Sandstone, light grey, very fine, subangular, micaceous, glauconitic, carbonated cement		
7	2190		MISFIRED		
8	2185		"		
9	2183		"		
10	2189		"		
11	2178		"		
12	2175.5		"		
13	2172		"		
14	2168		"		
15	2163.8		"		
16	2160		"		
17	2156.4		"		
18	2153		"		

SIDE WALL CORES DESCRIPTION

WELL : 25/1-6	RUN N° : 2
LICENCE :	PAGE N°: 2
	DATE : 1/3-78

SERVICE COMPANY:	Schlum
ASKED:	30
RECOVERED:	30
SHOT :	5
LOST :	0
FULL BULLET :	5

tr : trace - M : medium - G : good

N°	DEPTHS	REC	LITHOLOGY	Fluorescence tr M G	CUT
19	2151		MISFIRED		
20	2141.8		"		
21	2123		"		
22	2119		"		
23	2114		"		
24	2109		"		
25	2107.5		"		
26	2100		"		
27	2050		"		
28	1850		"		
29	1650		"		
30	1450		"		

SIDE WALL CORES DESCRIPTION

WELL : 25/1-6
LICENCE :

RUN N° : 3
PAGE N°: 1
DATE : 1/3-78

SERVICE COMPANY:	Schlum
ASKED:	30
RECOVERED :	24
SHOT :	30
LOST :	6
FULL BULLET :	24

tr : trace - M : medium - G : good

N°	DEPTHS	REC	LITHOLOGY	Fluorescence CUT
1	2190	100	Shale dark-grey, silty, micaceous, indurated	
2	2185	60	A/A	
3	2183		LOST	
4	2181	80	Shale dark-grey, soapy, slightly micaceous, lignitic, indurated	
5	2178	60	Shale grey, silty, indurated	
6	2175.2		LOST	
7	2172	80	Shale grey, micaceous, pyritic, indurated	
8	2168	80	Shale grey, silty, indurated	
9	2163.8	100	Shale A/A w/tr. of: 1) sandy shale light grey 2) brown limestone hard 3) shale light grey very micaceous	
10	2160	40	Shale grey-blue, slightly sandy	
11	2156.4	70	Sandstone grey white fine to medium, subangular, glauconitic, micaceous, no carbonated cement, (traces of HC?)	X
12	2153	20	A/A	X
13	2151	80	Shale dark-grey, silty, indurated	
14	2141.8	100	Shale grey-blue soapy	
15	2123	100	Siltstone argillaceous, glauconitic, micaceous, slightly calcareous	X
16	2119	80	Shale dark-grey, silty, micaceous	
17	2114	100	Shale grey-blue, silty, slightly micaceous	
18	2109		LOST	

SIDE WALL CORES DESCRIPTION

WELL :	25/1-6
LICENCE :	
RUN N° :	3
PAGE N°:	2
DATE :	1/3-78

SERVICE COMPANY:	Schlum
ASKED:	30
RECOVERED:	24
SHOT :	20
LOST :	6
FULL BULLET :	24

tr : trace - M : medium - G : good

N°	DEPTHS	REC	LITHOLOGY	Fluorescence	CUT
19	2107.5	100	Shale grey-blue very silty and micaceous		
20	2103	100	Shale dark-grey silty		
21	2100	100	a/a		
22	2097.6		LOST		
23	2050	100	A/A		
24	1950		LOST		
25	1850	100	Shale dark-grey		
26	1750	90	Shale grey-brown, silty, soft		
27	1650	70	A/A		
28	1550		LOST		
29	1450	100	Shale grey, silty		
30	1350	20	Shale grey, kaki soft		

SIDE WALL CORES DESCRIPTION

WELL : 25/1-6	RUN N° : 4
LICENCE :	PAGE N°: 1
	DATE : 1/3-78

SERVICE COMPANY:	Schlum
ASKED:	30
RECOVERED:	29
SHOT :	30
LOST :	1
FULL BULLET :	29

tr : trace - M : medium - G : good

N°	DEPTHS	REC	LITHOLOGY	Fluorescence	CUT
1	2244.6	60	Shale grey-blue soapy		
2	2236	90	A/A		
3	2234.8	10	Sandstone light-grey, silty to very fine, subangular, glauconitic, micaceous, no carbonated cement rare		
4	2231.2		LOST		
5	2222	90	Shale dark-grey, slightly silty, soapy		
6	2208.5	80	A/A		
7	2202.5	80	A/A		
8	2192	70	Shale dark-grey, laminated, micaceous, locally sandy		
9	2187	10	Sandstone idem 2234.8		
10	2184	50	Shale idem 2222		
11	2182	80	A/A		
12	2179	80	Shale grey, soapy		
13	2177	50	Sandstone light grey, fine to very fine, well sorted, subrounded, carbonated cement		
14	2175	5	Mud		
15	2173.2	50	Shale dark grey, slightly silty		
16	2169	80	A/A		
17	2166.6	60	A/A		
18	2161.5	70	Marl grey-blue soapy		

SIDE WALL CORES DESCRIPTION

WELL : 25/1-6	RUN N° : 4
LICENCE :	PAGE N° : 2
	DATE : 1/3-78

SERVICE COMPANY:	Schlum
ASKED:	30
RECOVERED:	29
SHOT :	30
LOST :	1
FULL BULLET :	29

tr : trace - M : medium - G : good

N°	DEPTHS	REC	LITHOLOGY	Fluorescence CUT
19	2157	90	Sandstone light grey, fine grained, well sorted, subangular, no carbonated cement rare, traces of HC.	X
20	2154.8	70	Shale dark, dark grey	
21	2152	70	Sandstone idem 2157	X
22	2150	90	Shale grey	
23	2148	70	Marl grey-blue, oolitic spherules of huntite	
24	2145	90	Shale brown soapy	
25	2138.5	90	Shale red-brown, slightly silty	
26	2121.6	100	Shale dark-grey, silty, micaceous	
27	2117	100	A/A	
28	2111.5	20	Siltstone argillaceous, light grey, carbonated cement	X
29	2105.5	90	Shale dark, dark grey, very slightly silty	
30	1999	100	A/A	

SIDE WALL CORES DESCRIPTION

WELL :	25/1-6	RUN N° :	5
LICENCE :		PAGE N° :	1
		DATE :	14-3-78

SERVICE COMPANY :	
ASKED :	30
RECOVERED :	22
SHOT :	30
LOST :	8
FULL BULLET :	22

tr : trace - M : medium - G : good

N°	DEPTHS	REC	LITHOLOGY	Fluorescence CaCO3	Fluorescence CUT
1	2890	1	Shale dark grey	0	
2	2884	80	Marl, light grey to grey, slightly silty and micaceous	20	
3	2865	80	Marl, light grey to grey, slightly micaceous	16	
4	2848		Lost		
5	2840	50	Marl, grey, argillaceous, slightly micaceous	24	
6	2814,5		Lost		
7	2802,3	100	Marl, light red brown with white traces, silty	50	
8	2799,5		Lost		
9	2792	50	Sandstone, greyish to milky white, medium subangular, well sorted, no cement, good porosity	2	
10	2783,5	90	Marl grey to greenish grey	21	
11	2775	100	Sandstone greyish, coarse to fine, poorly sorted, no cement, subangular	3	
12	2766	100	Sandstone, grey, coarse to fine, subangular, poorly sorted, no cement, good porosity	1	
13	2755	100	Sandstone grey, coarse to fine, subangular, poorly sorted, good porosity	ε	
14	2743	100	Sandstone grey, coarse to fine, subangular, poorly sorted, with few argillaceous cement, good porosity	2	
15	2724	50	Shale dark grey, laminated, consolidated	ε	
16	2714	100	Sand light grey, fine to medium, subangular, well sorted, unconsolidated	0	
17	2705,5		Lost		
18	2691,5	60	Sand light grey, fine to coarse, subangular, poorly sorted, argillaceous cement	ε	

SIDE WALL CORES DESCRIPTION

WELL : 25/1-6	RUN N° : 5
LICENCE :	PAGE N°: 2
	DATE : 14-3-78

SERVICE COMPANY:	
ASKED:	30
RECOVERED :	22
SHOT :	30
LOST :	8
FULL BULLET :	22

tr : trace - M : medium - G : good

N°	DEPTHS	REC	LITHOLOGY	Fluorescence	CUT
19	2681		Shaly sand (silt) very fine grained, grey to light grey, argillaceous cement	5	
20	2674		Lost		
21	2665		Lost		
22	2650		Shale dark grey, soapy	E	
23	2635		Shale dark grey, soapy, slightly silty	0	
24	2615		Shale, grey blue, slightly silty	0	
25	2602		Silty shale, light grey, consolidated, slightly micaceous	0	
26	2586		Shale dark grey, soapy	0	
27	2579		Shale dark grey, soapy, slightly silty	0	
28	2565		Lost		
29	2547,5		Sandstone, light grey, fine to medium, well sorted, no cement	0	
30	2540		Lost		

CORE DESCRIPTION

CUT: 9m
RECOVERED: 9m — 100 %
LOSS: 0m

COMPANY: ELF-NORGE
WELL N°: 25/1-6
CORE N°: 1

DATE: 15-2-78
DEPTHS: 2127-2136m

DEPTHS	% $CaCO_3$	PERM	POROS	SHOWS	DIPS	LOG	DESCIPTION
2127							SHALES RED BROWN, SLIGHTLY MICACEOUS, VERY FINELY SILTY SOME JOINTS OF SHALES GREY BLUE TRACES OF SLIPPINGS
2128							
2128.5							SHALES GREY-BLUE, SOAPY, LOCALLY RED-BROWN VERY LOCALLY GREY-WHITE SANDSTONES MEDIUM-GRAINED TO MICROCON- GLOMERATIC WITH ANGULAR PEBBLES OF SHALES GREY-BLUE
2128.7				☼			
							SHALES GREY-BLUE AND RED-BROWN A/A TRACES OF SLIPPINGS
2129							

CORE DESCRIPTION

CUT: 9m
RECOVERED: 9m 100%
LOSS: 0m

COMPANY: ELF-NORGE
WELL N°: 25/1-6
CORE N°: 1

DATE: 15-2-78
DEPTHS: 2127-2136m

DEPTHS	% $Ca^{3}Co$	PERM	POROS	SHOWS	DIPS	LOG	DESCIPTION
29							SHALES GREY-BLUE A/A LOCALLY RED-BROWN OR GREY-WHITE
2129,7				☼			SANDSTONE MEDIUM TO FINE, A LITTLE NON CALCAREOUS CEMENT
							SHALES GREY BLUE — FLUO: YELLOW CLEAR EXTRACTION: LIGHT COGNAC FLUO EXTRACTION: YELLOW PALE
2130							
	4			☼			SANDSTONES GREY-BEIGE FINE TO VERY FINE CARBONATED CEMENT RARE, LITTLE DARK PUNCTUATIONS
							FLUO: A/A
0,35							
							SHALES RED BROWN SLIGHTLY MICACEOUS NOT OR LITTLE CALCAREOUS VERY FINE NET OF CALCITE BETWEEN 2130,35 AND 2130,65
0,65							
	4						
2130,9							MICACEOUS JOINT
2131							

CORE DESCRIPTION

3

CUT: 9m
RECOVERED: 9m 100 %
LOSS: 0m

COMPANY: ELF-NORGE
WELL N°: 25/1-6
CORE N°: 1

DATE: 15-2-78
DEPTHS: 2127-2136m

DEPTHS	% $CaCO_3$	PERM	POROS	SHOWS	DIPS	LOG	DESCIPTION
2131							SHALES RED-BROWN SLIGHTLY MICACEOUS NOT OR LITTLE CALCAREOUS STRINGERS OF SHALES GREY-BLUE
2132							
2133							

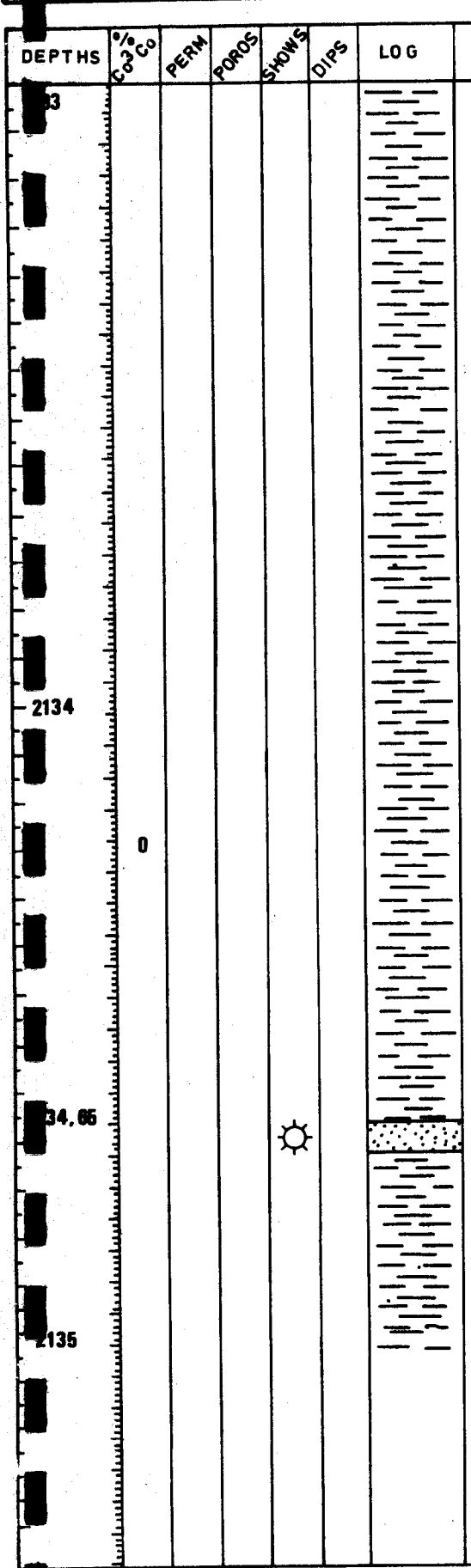
4

CORE DESCRIPTION

CUT: 9m
RECOVERED: 9m 100 %
LOSS: 0m

COMPANY: ELF-NORGE
WELL N°: 25/1-6
CORE N°: 1

DATE: 15-2-78
DEPTHS: 2127-2136m



DESCIPTION

SHALES RED-BROWN A/A

SANDSTONES VERY FINE, CEMENT RARE

FLUO: YELLOW CLEAR

SHALES A/A
FINELY SILTY

EXTRACTION: LIGHT COGNAC

FLUO EXTRACTION: YELLOW PALE

5

CORE DESCRIPTION

CUT: 9m
RECOVERED: 9m _____%
LOSS: 0m

COMPANY: ELF-NORGE
WELL N°: 25/1-6
CORE N°: 1

DATE: 15-2-78
DEPTHS: 2127-2136m

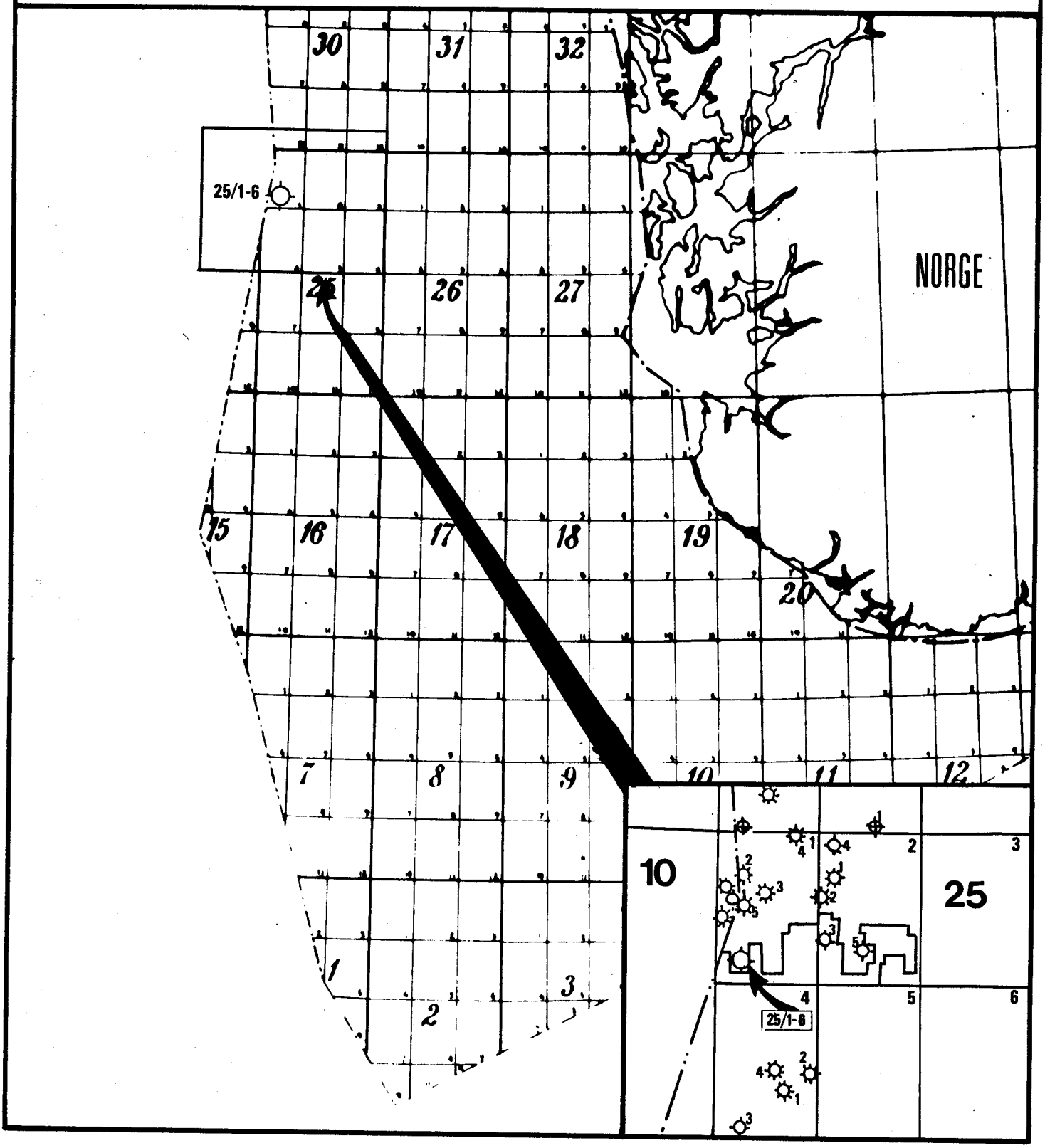
DEPTHS	% $CaCO_3$	PERM	POROS	SHOWS	DIPS	LOG	DESCIPTION
2135							SHALES RED-BROWN, SLIGHTLY MICACEOUS, FINELY SILTY, LOCALLY GREY-BLUE, NOT OR LITTLE CALCAREOUS
2136	4						

LIST OF PLATES

1. Position map
2. 1/5000 Sheet
3. Composite log 1/500
4. Log results 1/5000
5. Seismic section 680 301 - Prognosis
6. Seismic section 680 301 - Results
7. Palynological correlations in the lower tertiary wells 10/1-1 - 25/1-6 - 25/2-3
8. Palynological correlations in the lower tertiary wells 25/1-2 - 25/1-1 - 25/1-6 - 25/4-4

Position Map

25/1-6



PL. 1

Coord X: 2° 5' 42" 25 Z ground: -105m
Y: 59° 46' 577 Z RKB: 24m
Line 680301 SP: 150
Depths datum: RKB
Rig: PENTAGONE 84
Stopped in: MAESTRICHTIAN

Spudded: 16-1-78
Started drilling: 27-1-78
At T.D: 12-3-78
Completed: 18-3-78
T D Driller: 2900m T.D. Logger: 2895m

Well **25/1-6**

Country NORWAY

OPERATOR **Elf Aquitaine Norge a.s.**

LICENCE **024** OWNED BY **Petronord**

TARGETS

LOWER TERTIARY SANDS

RESULTS

DRY WELL
PLUGGED AND ABANDONNED.

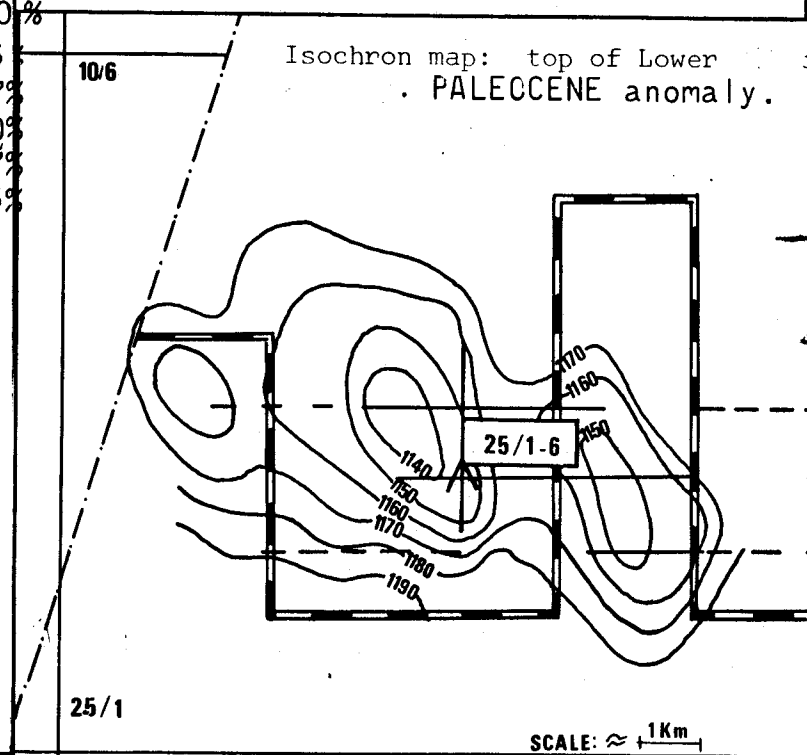
CASINGS

30" at 192 m
20" at 462 m
13 3/8 at 1314 m
9 5/8 at 2520 m

CORES

K1	2127	2136	100 %
SW1	2251	2540	93 %
SW2	1450	2334	17 %
SW3	1350	2190	80 %
SW4	1999	2244	97 %
SW5	2549	2890	73 %

SHOWS



LOGS

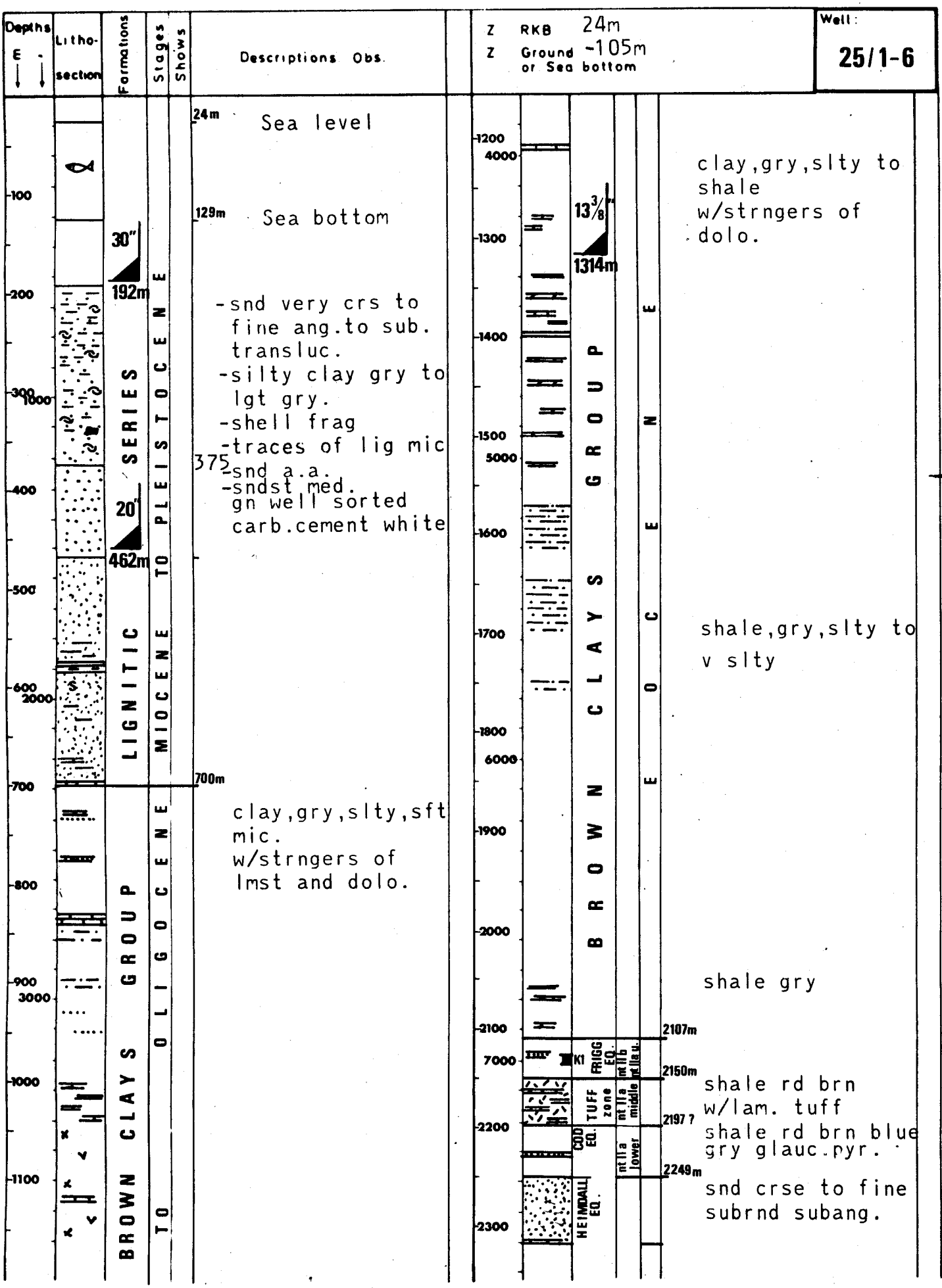
1	ISF-BHC-GR PS=192-468m	5	ISF-SL-GR-SP 2550-2399
	FDC-CNL-CAL-GR-192-468m		FDC-CNL-GR-CAL 2550-2399
			HDT 2550-2000
2	ISF-BHC-GR PS=457-1322		BGT 2550-1314
	FDC-CNL-CAL GR=457-1322		ISF-SL-GR-SP 2895-2523
3	ISF-BHC-GR PS 1314-2098		FDC-CNL-GR-CAL 2895-2523
			HDT 2895-2523
4	ISF-BHC-GR-PS 2400-1998		
	FDC-GR-CAL-CNL 2400-1314		
	FDC-GR-CAL CNL 2550-2399		

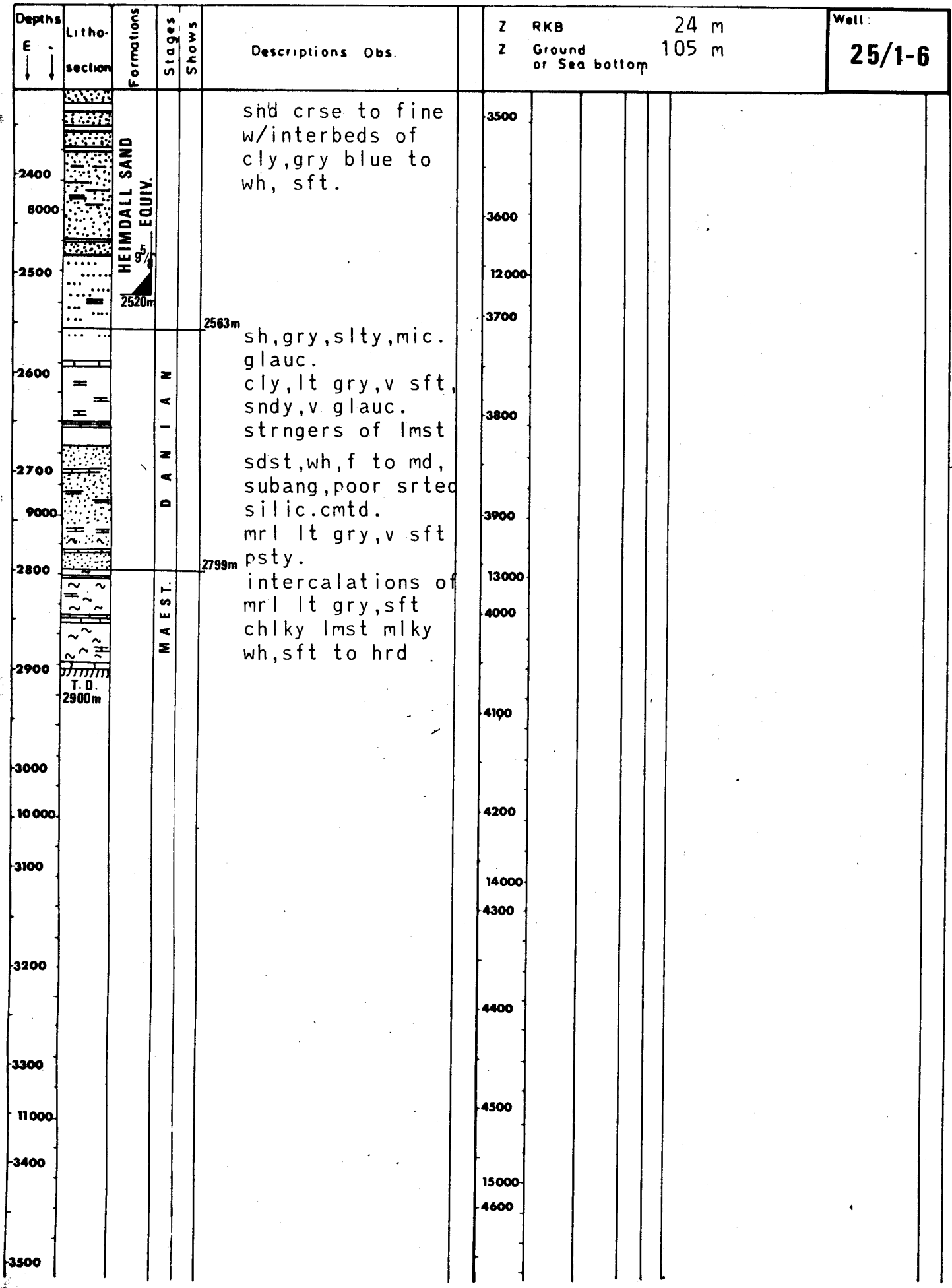
TESTS

NONE

Checked **MASSET**

Date **20.03.78.**


Depths
Litho-section
Formations
Stages
Shows
Descriptions Obs.
Z RKB 24m
Z Ground or Sea bottom -105m
Well: 25/1-6
24m
Sea level
129m
Sea bottom
30"
192m
20"
462m
700m
-snd very crs to fine ang.to sub. transluc.
-silty clay gry to lgt gry.
-shell frag
-traces of lig mic
375
-snd a.a.
-sndst med. gn well sorted carb.cement white
clay,gry,slty,sft mic. w/strngers of lmst and dolo.
BROWN CLAYS GROUP
LIGNITIC SERIES
TO OLIGOCENE MIOCENE TO PLEISTOCENE
BROWN CLAYS GROUP
EOCENE
13 3/8"
1314m
clay,gry,slty to shale w/strngers of dolo.
shale,gry,slty to v slty
shale gry
2107m
2150m
2197 ?
2249m
K1
FRIGG EQ.
TUFF zone
COD EQ.
HEIMDALL EQ.
nt IIb
nt IIa middle
nt IIa lower
nt IIa u.
shale rd brn w/lam. tuff
shale rd brn blue gry glauc.pyr.
snd crse to fine subrnd subang.


Depths
E
Litho-section
Formations
Stages
Shows
Descriptions Obs.
Z RKB 24 m
Z Ground or Sea bottom 105 m
Well
25/1-6
snd crse to fine w/interbeds of cly,gry blue to wh, sft.
HEIMDALL SAND EQUIV.
9 5/8"
2520m
2563m
sh,gry,slty,mic. glauc.
cly,lt gry,v sft, sndy,v glauc.
strngers of lmst
sdst,wh,f to md, subang,poor srted silic.cmtd.
mrl lt gry,v sft psty.
2799m
intercalations of mrl lt gry,sft chlky lmst mlky wh,sft to hrd
DANIAN
MAEST.
T.D. 2900m
2400
8000
2500
2600
2700
9000
2800
2900
3000
10000
3100
3200
3300
11000
3400
3500
3500
3600
12000
3700
3800
3900
13000
4000
4100
4200
14000
4300
4400
4500
15000
4600

NOPEC | FPD | FAX | Telex | Telex | FR/DS

NOTHEGG | 25/1-6 | EAN A.2

COMPOSITE LOG

WELL NAME: NEDBRØT
WELL TYPE: ETT-GREIN

NEW WELL | REENTRY | SIDETRACK

scale 1/500

LAT	58°00'00" N
LONG	02°00'00" E
NORTHING	6426000.00 m
EASTING	500000.00 m
ZONE	31
DATUM	ED50
SURVEY REFERENCE	MSL
SEABED	70.00 m
KB	118.00 m
RT	118.00 m
WATER DEPTH	188.00 m

FIELD / UNKNOWN

OPR: STATOIL A.S.A.

LEGEND

CASING	SHALE
CEMENT	SILTSTONE
LOST CIRC.	SANDSTONE
CORE	LIMESTONE
DST	MARL
OIL SHOW	COAL
GAS SHOW	CHERT
	ANHYDRITE
	SALT

CASING SETTING DEPTHS
20" @ 1000 m
13 3/8" @ 1500 m
9 5/8" @ 2000 m
7" @ 2500 m

MUDLOG
GENERAL LITHOLOGY
CUTTINGS GAS
TOTAL GAS
CHROMATOGRAPHY (WET GAS)
C1 C2 C3 C4 C5

CORING INTERVAL
1000 - 1500 m
1500 - 2000 m
2000 - 2500 m

DRILLING MUD
1000 - 1500 m: WATER BASED MUD
1500 - 2000 m: WATER BASED MUD
2000 - 2500 m: WATER BASED MUD

DRILLING TIME / WT / PRESSURE
PENETRATION RATE (min/m)
WEIGHT ON BIT (kN)
MUD PRESSURE (SPP)

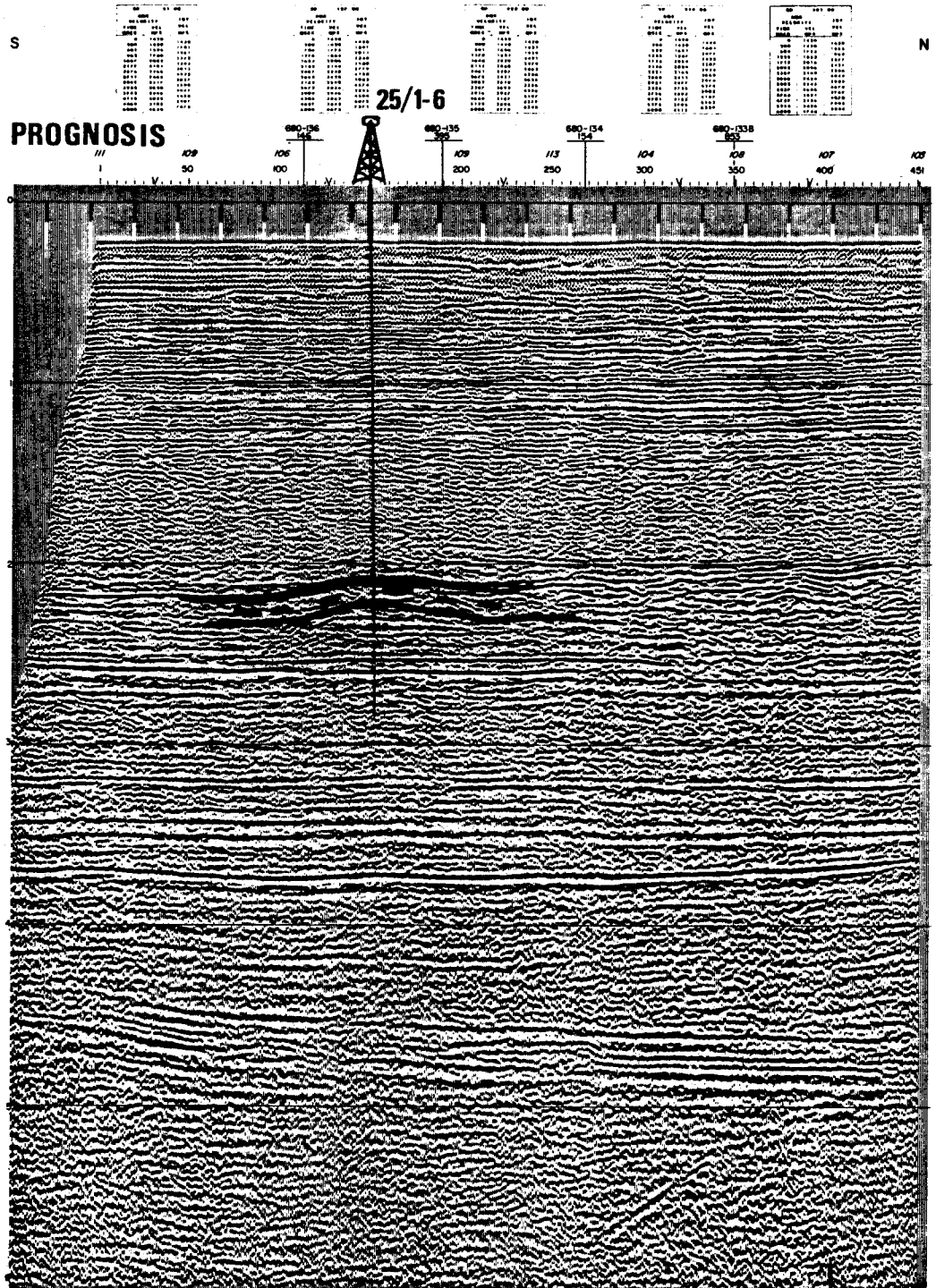
DEVIATION
INCLINATION
AZIMUTH

25/1-6

Results

1:5000

DEPTH	Shows	STAGE	GROUP	Lithology	DESCRIPTION
					24m Sea level
					129m Sea bottom
					30"
					192m
		MIOCENE to PLEISTOCENE	LIGNITIC SERIES		Sand translucent - fine to coarse-subrounded Interbeds of CLAY light grey - silty LIGNITE SHELL FRAGMENTS
					20"
					460m
500					698 m
					CLAY TO SILT grey soft micaceous with stringers of dolomitic limestone brown beige party sandy.
1000			UP		
					13⅜"
					1314m
1500		EOCENE to OLIGOCENE	CLAYS		CLAY TO SILTSTONE grey soft glauconitic with stringers of dolomitic limestone.
2000		EOCENE	BROWN		
			FRIGG EQ.		2107m
					SHALE calc. SDST levels
					2126m
			TUF EQ.		SHALE grey beige silty-pyriteous laminations stringers of sandstone white glauconitic micaceous, partly calcareous cemented.
			COD EQ.		SHALE grey to dark grey-micaceous-glauconitic.
		PALEOCENE	HEIMDALL SAND		SAND grey very fine to fine, subrounded well sorted, unconsolidated slightly glauconitic slightly micaceous stringers of limestone grey and SHALE grey-soft-micaceous
2500					9⅝"
					2520m
		DANIAN			2563 m
					SHALE dark grey to grey blue slightly silty and soapy with interbeds of light brown LIMESTONE, medium hard partly argillaceous SANDSTONE fine to medium grained siliceous cement at the top Interbeds of SHALE and LIMESTONE A/A
		MAEST.			2799m
					MARL light grey Interbeds of CHALKY LIMESTONE soft to hard (stringers gets thicker with the depth).
					T.D. 2900m
3000					



AREA BLOCK 25/1-2

LINE 680-301

S P 1 - 451 → N

statex as

FILTERED STACK

elf

RECORDING DATA

SHOT BY GSI — Boat J E Jonsson — DATE RECORDED July 1976

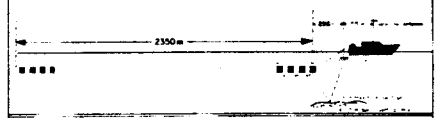
POSITIONING — Geodec / Decca

SOURCE — Airgun — CABLE TI sc — Length 2400 m

Gun depth	6 m	Source to near group	296 m
Volume	1450 cu in	Receivers per group	30
Pop interval	25 m	Groups	48
		Group interval	50 m
		Cable depth	12 m

RECORDING SYSTEM

Record length	6 sec
Sample rate	4 ms
Format	9 Track seg B
Filter	8 - 62 Hz



PROCESSING PARAMETERS

PROCESSED BY Statex a s — DATE PROCESSED Oct / Dec 1976

DECONVOLUTION	DBS	DAS
Prediction distance	100 ms	28 ms
Length of operator	236 ms	196 ms
No of autocorr windows	1	3
Design gate, near group	200 - 5500 ms	200 - 5500 ms
Start of deconvolution near group	0	0
Overlap		50 %
Special feature		

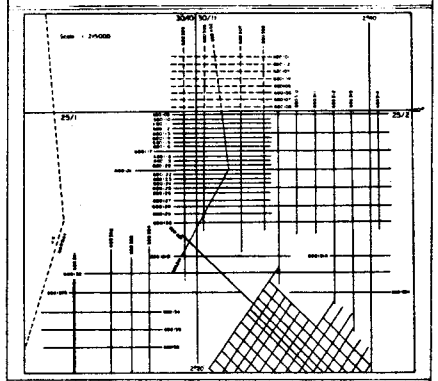
STATIC CORRECTIONS — Shot 4 ms — Receiver 8 ms

CDP STACK — 2 fold vertical stack of adjacent fold records
24 fold common depth point stack

TIME VARIANT SCALING — 4 gates of 1300 ms — 1 gate of 5000 ms

TIME VARIANT FILTER

Sec	Hz
2 0	18 - 50
2 5	10 - 47
3 3	10 - 40
4 5	8 - 30

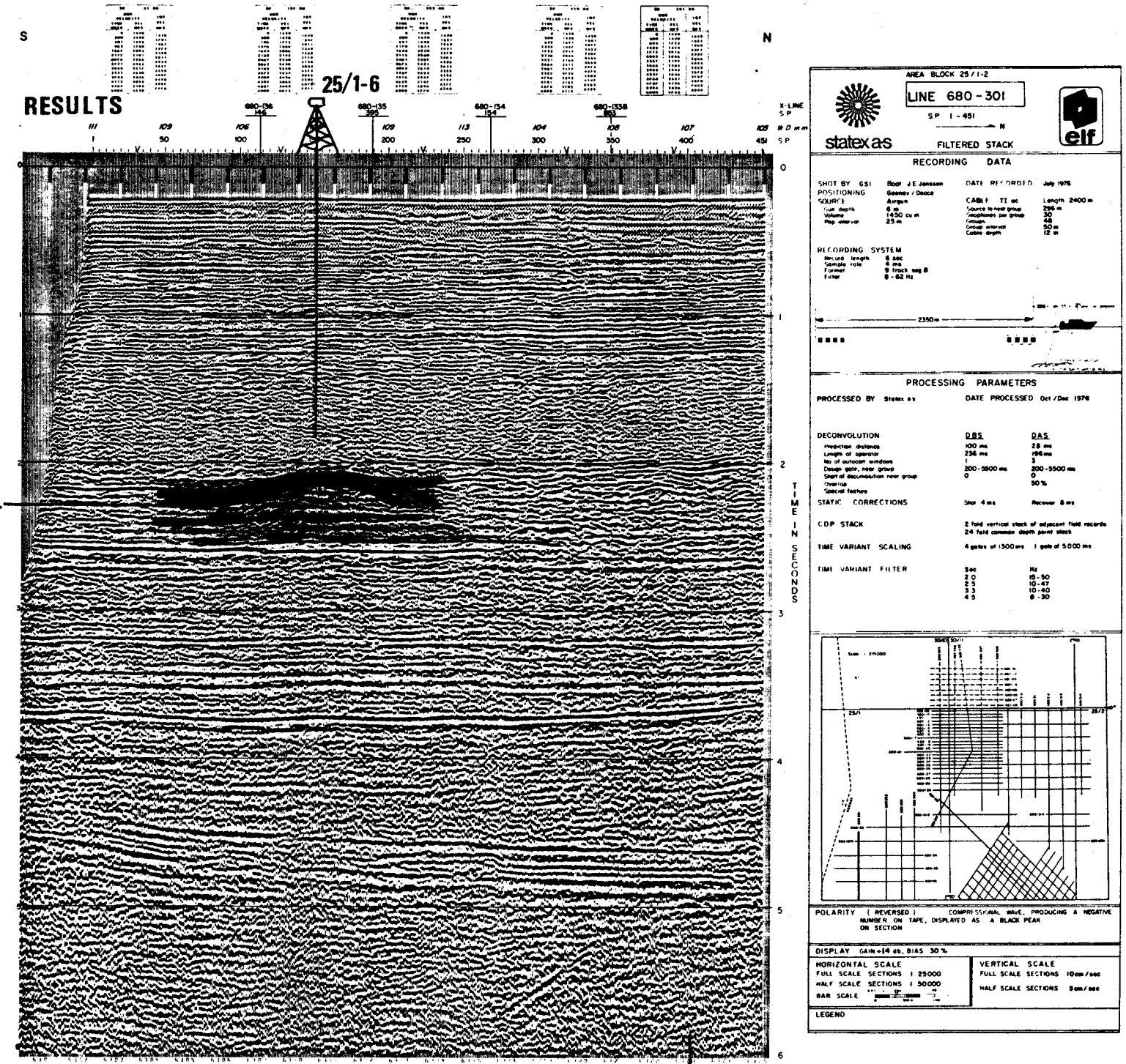


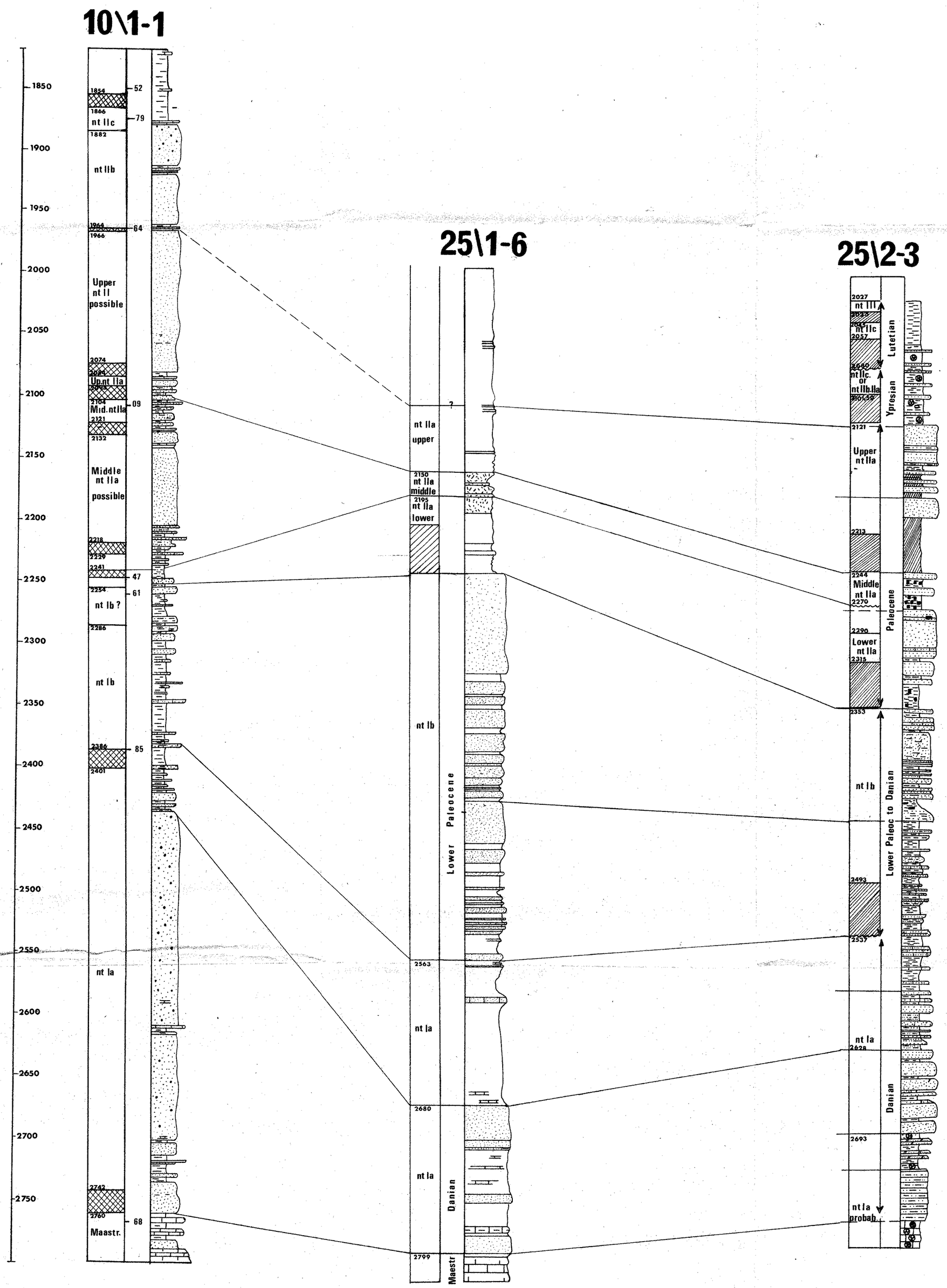
POLARITY (REVERSED) COMPRESSIONAL WAVE, PRODUCING A NEGATIVE NUMBER ON TAPE, DISPLAYED AS A BLACK PEAK ON SECTION

DISPLAY GAIN +14 db, BIAS 30 %

HORIZONTAL SCALE	VERTICAL SCALE
FULL SCALE SECTIONS 1 : 25000	FULL SCALE SECTIONS 10cm / sec
HALF SCALE SECTIONS 1 : 50000	HALF SCALE SECTIONS 5cm / sec
BAR SCALE	

LEGEND


S
N
25/1-6
RESULTS
COD
sandy or
shaly
TIME IN SECONDS
0
1
2
3
4
5
6
AREA BLOCK 25/1-2
LINE 680-301
SP 1-451
statex as
FILTERED STACK
elf
RECORDING DATA
PROCESSING PARAMETERS
POLARITY (REVERSED) COMPRESSIONAL WAVE, PRODUCING A NEGATIVE NUMBER ON TAPE, DISPLAYED AS A BLACK PEAK ON SECTION
DISPLAY GAIN +14 db, BIAS 30 %
HORIZONTAL SCALE
FULL SCALE SECTIONS 1 25000
HALF SCALE SECTIONS 1 50000
VERTICAL SCALE
FULL SCALE SECTIONS 10cm/sec
HALF SCALE SECTIONS 5cm/sec
LEGEND



elf	Secteur NORVEGE Opérateur elf NORGE Permis ou Concession FRIGG	elf NORGE A/S

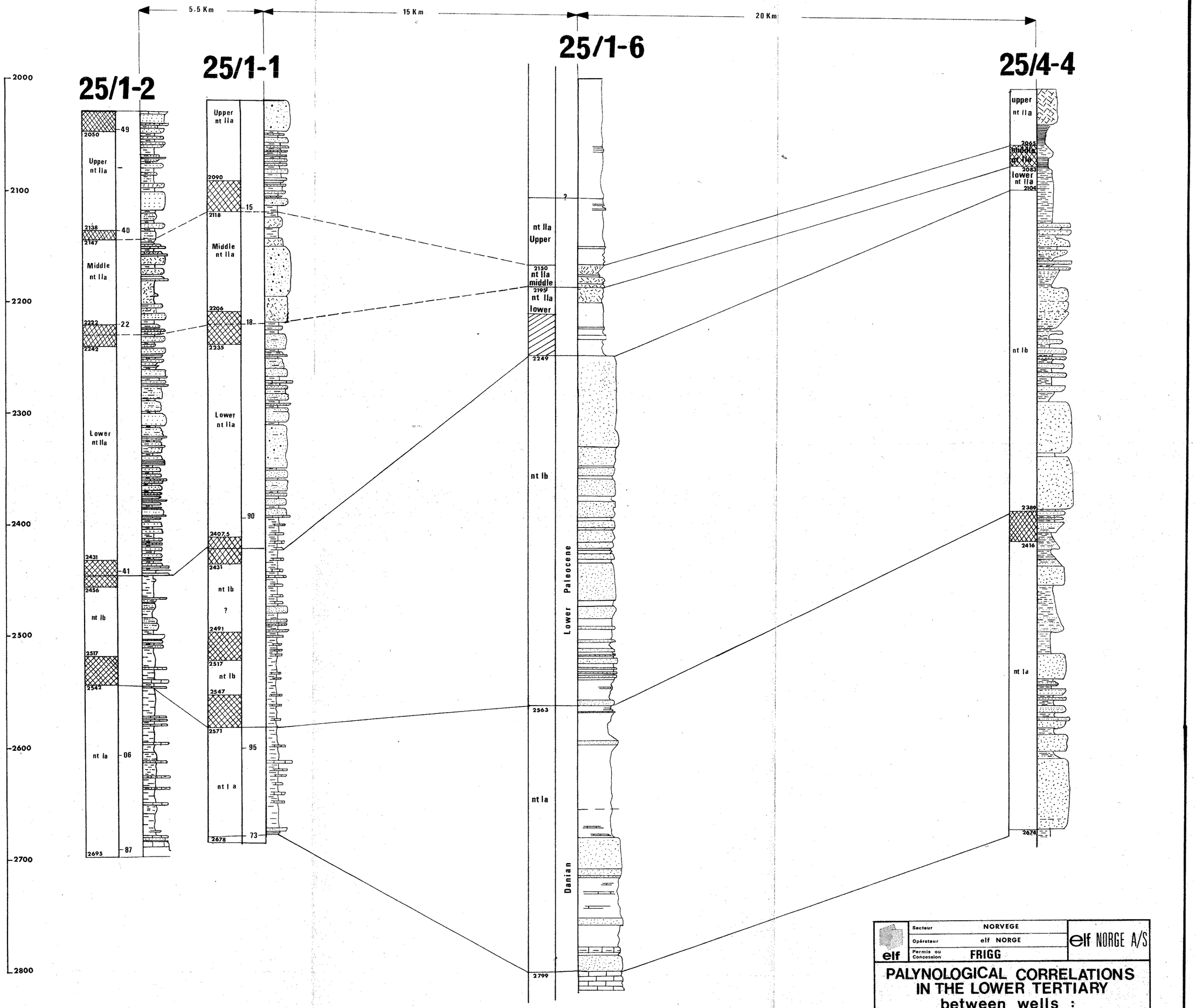
PALYNOLOGICAL CORRELATIONS IN THE LOWER TERTIARY

between wells

10/1-1, 25/1-6, 25/2-3

Vert. Scale : 1/2000

elf NORGE	7	Date JUNE 78 Auteur Masset. N°classt F 78031



elf	Secteur: NORVEGE	elf NORGE A/S
	Opérateur: elf NORGE	
	Permis ou Concession: FRIGG	

PALYNOLOGICAL CORRELATIONS IN THE LOWER TERTIARY between wells :

25/1-2, 25/1-1, 25/1-6, 25/4-4 Vert scale: 1/2000

elf NORGE	8	Date JUNE 78
		Auteur Masset
		N°class' F 78032