

BOX 68 NO 4119

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ENTREPRISE DE RECHERCHES ET D'ACTIVITES PETROLIERES



reg.

3/7-1 WELL

SEDIMENTOLOGICAL STUDY OF THE PALEOCENE-EOCENE SERIES

WELL FILE

DIRECTION EXPLORATION
LABORATOIRES

FICHE DE DIFFUSION

REF. : 2035 n° 4/942 R

TITRE : 3/7-1 Well
Sedimentological study of the Paleocene - Eocene series

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- 2 - Lithological analysis of 3/7-1 well (scale 1/2000°)
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(scale 1/2000°)
- 4 - Sedimentological evolution between 3/7-1 and Froya (scale 1/500°)

I - ANALYTICAL RESULTS1 - CHARACTERIZATION OF LITHOSTRATIGRAPHIC UNITS* (Plate n° 2)

- Grey shales with intrabreccia and extraclastic material : 2280 (top of the study) to 2400 m.
Slightly micaceous, pyritic, micronodular grey shales ; abundant breccia and slump marks seem to indicate turbidity ; extraclasts of mudstone, numerous pyritic concretions, occasional microsilicified structures. (2400 to 2500 lack of analysis).
- Buff-grey shales : 2510 to 2605 m
Buff-grey, micronodular shales with occasional calcitic or silicified tubular microstructures.
- Grey-green shales : 2605 to 2682 m
Grey-green, micronodular shales with traces of pyrite and micas.
- Red-brown shales : 2682 to 2690 m
Red-brown oxydized shales.
- Tuffa and argillaceous tuffa : 2690 to 2726 m
Tuffa ; argillaceous, pyritic laminated tuffa and argillaceous, irregularly mottled tuffa.
- Black shales : 2726 to 2761 m
Black to grey, slightly pyritic shales, with occasional Ostracoda : locally numerous microsilicified structures.
- Sideritic concretions at 2762 m
At 2762 m we observe a sample made up of sideritic concretions with a carbonate mosaic-sparitic infilling in the central part.
- Light grey-green shales : 2762 to 2775 m
Light grey-green shales with local traces of Globigerinidae ; traces of fine quartz.
- Mudstone - wackestone with Globigerinidae : 2775 to 2800 (base of the study)
White to white-buff mudstone with frequent to abundant Globigerinidae, Globorotalidae, other microforaminifera ; traces of pyrite.

2 - RESULTS OF X RAY ANALYSIS OF CLAY MINERALS (Plate n° 1)

From a comparison between lithofacies and clay minerals content we can divide the serie into three assemblages :

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* Lithological analysis made with FOSSAT

- Shaly zone at the top and above the part studied (2100 - 2400 m)
 with a content of 15-40 % kaolinite predominant
 2-10 % illite + montmorillonite
 1- 2 % chlorite

There is a break in clay mineral components between 2400 and 2500 m and it probably coincides with the electrical break at 2423 m (which seems to be a limit between Oligocene and Eocene).

- Shaly zone above tuffa (2500 - 2680 m)
 With a very low content of non-montmorillonitic material.

Illite + Chlorite + Kaolinite \leq 10 %

except for rare samples which are richer in illite
 (up to 10 %)

- Tuffa and underlain shale (2680 - 2770 m)

In this zone, the content in clay minerals strongly depends on the facies :

shale \longrightarrow illite 10 - 20 % + chlorite 5 %

tuffa \longrightarrow illite 20 % + chlorite 20 %

pyrite at the top of the tuffa has a high content of
 kaolinite (24 %)

II - SEDIMENTOLOGICAL INTERPRETATION (Plate n° 3)

The deposits of Paleocene - Eocene overlie calcareous mudstone - wackestone with Globigerinidae of the nt Ia age = open marine deposits and are covered with Oligocene in which even in cuttings, marks of slumps and the presence of extraclasts can be observed = probable turbidite deposits.

It is more difficult to determine the type of environment in Paleocene - Eocene series because these deposits are always formed in very low energy conditions with no clear sedimentological features and the microfauna content in thin sections is very poor and not characteristic.

We can ascertain that these are marine sediments from :

- microfauna content
- presence of silicified microstructures
- presence of glauconite
- appearance of shales
- lack of continental deposition features.

and these arguments seem more favourable to an open marine origin rather than a restricted marine origin but we have no decisive proof.

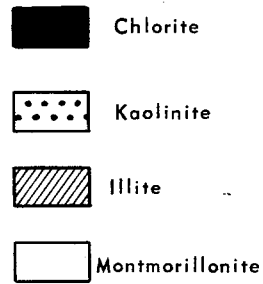
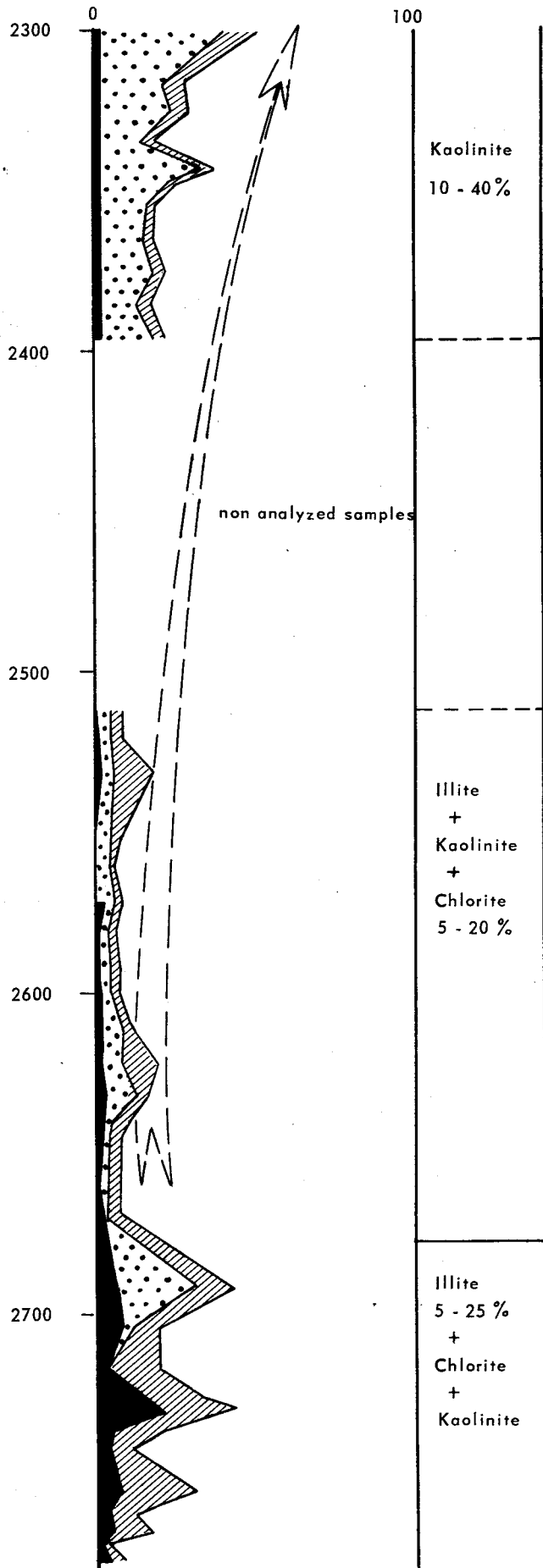
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These sediments do not seem very different from FROYA, apart from the abundance of siltstone and fine glauconitic sandstone in FROYA (see plate n° 4).

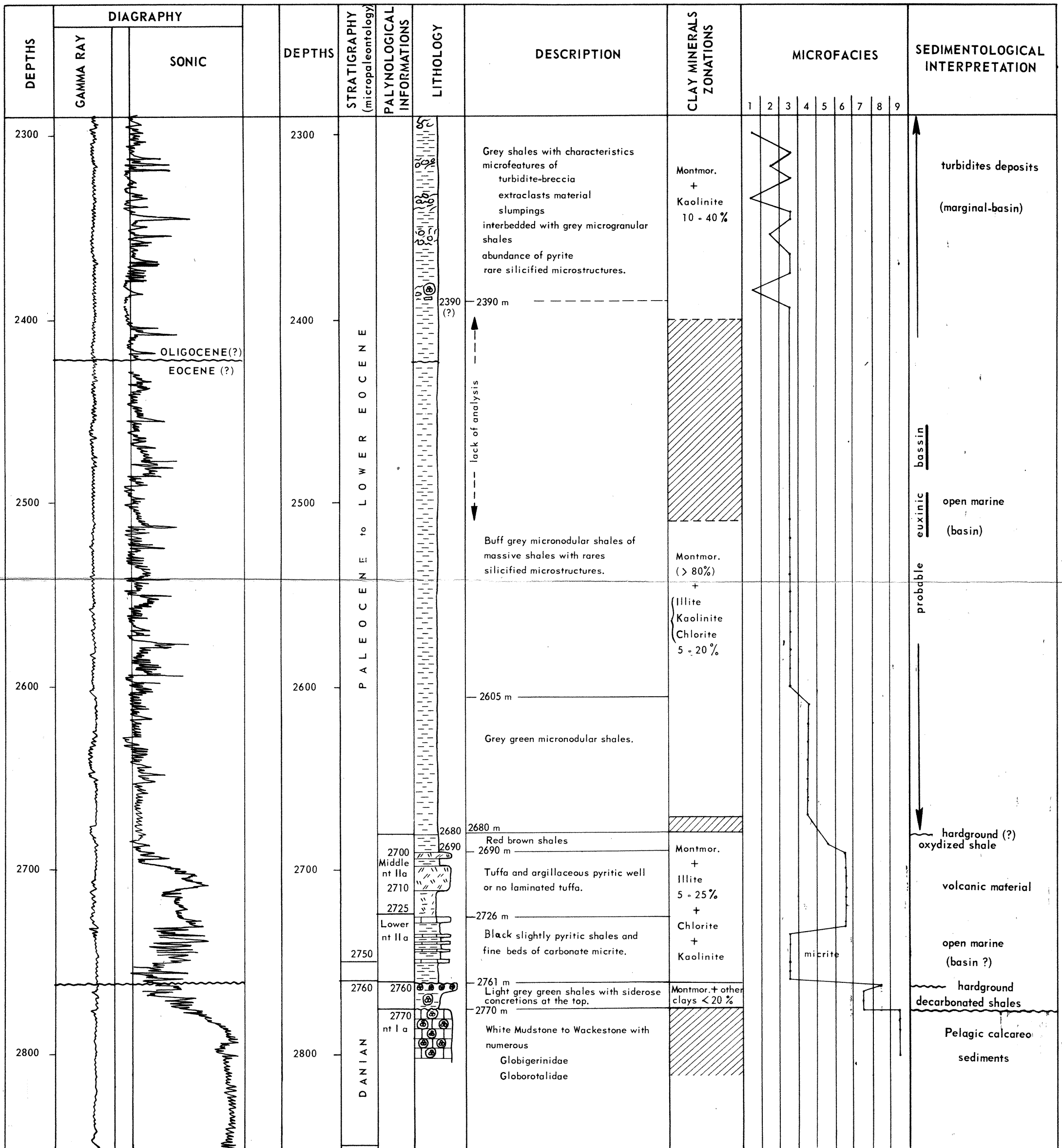
In conclusion, the environment in well 3/7-1 is more likely open marine ; it is not very different from the FROYA deposits but farther away from the sand origin.

We need further information about ecology and regional environment to reinforce this hypothesis.

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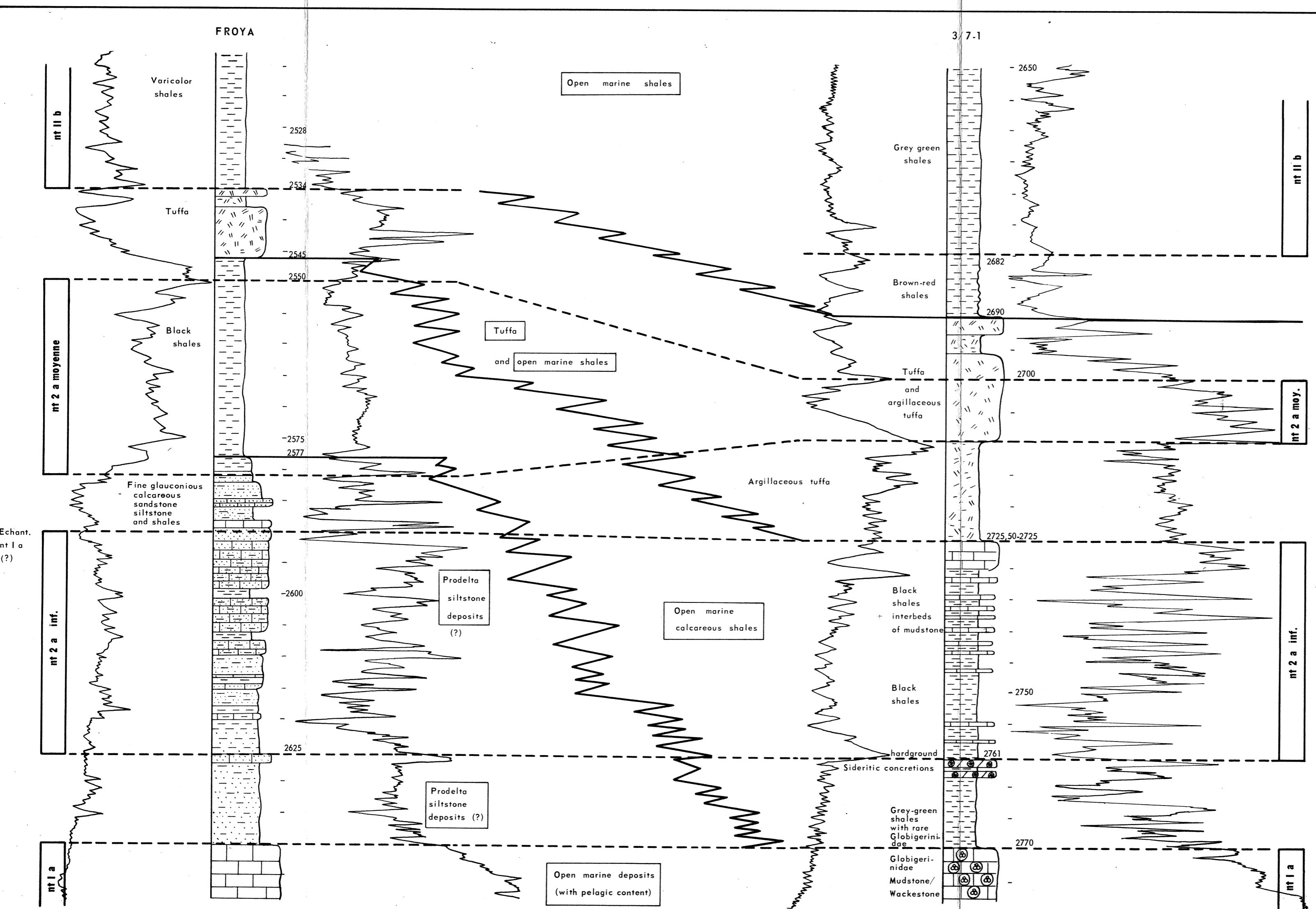
	Secteur Mer du Nord	
	Opérateur elf Norge	
Permis de Concession Zone norvégienne 2 ^e attribution		
WELL 3/7-1 CLAY MINERALS CONTENT BY X RAY ANALYSIS		
Echelle 1/2000		
ENTREPRISE DE RECHERCHES ET D'ACTIVITES PÉTROLIÈRES		Date Mai 1974
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- Breccia/slumps/extraclasts
- Shale
- Globigerinidae
- Tuffa - argillaceous tuffa
- Siderolitic concretion
- Carbonates

- MICROFACIES**
- ① Grey shale with slump/breccia
 - ② Grey shale with extraclasts
 - ③ Massive or micromodular shales
 - ④ Grey green shale
 - ⑤ Red brown shale
 - ⑥ Tuffa and argillaceous tuffa
 - ⑦ Light grey green shale
 - ⑧ Siderolitic facies
 - ⑨ White mudstone/wackestone with Globigerinidae

	Secteur Mer du Nord	
	Opérateur elf Norge	
	Permis ou Concession Zone norvégienne 2 g attributio	
WELL 3/7-1		
SEDIMENTOLOGICAL INTERPRETATION OF THE BASE OF THE TERTIARY		
Echelle : 1/2000		
SIF ENTREPRISE DE RECHERCHES ET D'ACTIVITES PETROLIERES	PL. 3	Date Mai 1974
DIRECTION EXPLORATION		Auteur GUSSEY
LABORATOIRE		N°classé 7463 RE



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Permis de Zone norvégienne 28 attribution		Date Mai 1974 Auteur CUSSEY N°classé 7464RE
elf ENTREPRISE DE RECHERCHES ET D'ACTIVITES PETROLIERS		
SEDIMENTOLOGICAL EVOLUTION BETWEEN 3/7-1 AND FROYA		
BASED ON PALYNOLOGICAL CORRELATIONS Echelle: 1/500		
DIRECTION EXPLORATION LABORATOIRE		PL.4