



Licensing round offshore West Greenland to be announced in April 2002

- Final political approval during spring 2002
- Opening meetings on 11 April in Copenhagen and 15 April in Houston
- Competitive terms to be announced at opening meetings
- Reduced corporate tax: 30%
- One-door application procedure handled by the Bureau of Minerals and Petroleum

It is expected that the announcement of a licensing round offshore West Greenland will be approved politically during the spring and that the licensing round will open officially in April 2002, with an application deadline of a minimum of 90 days.

The opening of the licensing round has been delayed from late 2001, first awaiting a political decision to reduce the rate of corporate tax in Greenland and subsequently due to political reorganisations following the Danish general election in November. The rate of corporate tax was reduced from 35% to 30% by the Greenland Government in November 2001. The terms of the licensing round were recommended for final political decision by the Greenland and Danish governments by the Joint Committee on Mineral Resources in Greenland in February 2002.

The licensing round will be announced in the beginning of April 2002 by a letter of invitation to the many companies that previously have shown their interest in Greenland exploration. A press release will be issued and more information will be available on the BMP website and on the GHEXIS website.

BMP invites the petroleum industry to opening meetings in Copenhagen (11 April 2002) and Houston (15 April 2002). BMP, GEUS and Nunaoil will give presentations on the licensing round and terms and conditions, the petroleum geology and exploration potential, and on operational conditions and the economics of selected prospects. Furthermore, all data owners have been invited to exhibit data of relevance for Greenland exploration. [Please check the News Desk on the BMP website \(www.bmp.gl\) for information on registration.](#)

In the days following the meetings in Copenhagen and Houston, it will be possible for individual companies to discuss various matters related to the licensing round with BMP, Nunaoil or GEUS. Please make the

necessary arrangements with BMP in advance or during the meeting.

New data – new opportunities

As in previous years, the summer of 2001 was very active. Three seismic surveys were acquired: a regional survey, GreenCan2001, as a joint venture between BMP and TGS-NOPEC; a survey in the northern open-door area, Green2001, by TGS-NOPEC; and a survey, Fylla2001-W, in the western part of the now relinquished Fylla licence area by the Statoil group. These new data have revealed many interesting features that may lead to completely new exploration models. [Read more below.](#)

Knowledge database growing

Not only the geophysical database offshore West Greenland is growing. Several studies relevant to petroleum exploration have recently been published or initiated. [Read more below.](#)

GhexisOnline – exploration information on the web

All relevant information relating to petroleum exploration in West Greenland has been made available on the internet on a newly developed portal: GhexisOnline (www.geus.dk/ghexis). On this site, information on the West Greenland licensing round, geology (including prospectivity, source rocks and maturity, and play types), available data types (well data, seismic data, source rock data, cultural data etc.), operational conditions, exploration history, relevant literature etc. can be found together with online versions of the Ghexis Newsletter. [Bookmark now for future information.](#)

Seismic acquisition during summer 2001 – the search for deep basins

In the summer of 2000, TGS-NOPEC acquired a few high-quality seismic lines along the Ungava Fault Zone in the vicinity of the Greenland–Canada border. These data, in combination with reprocessed satellite gravity data, indicated that deep sedimentary basins are more extensive than those previously known from the Sisimiut Basin. It is expected that better mapping of the distribution and internal features of these sedimentary basins will have a significant influence on petroleum exploration concepts in the region. Older source rocks than the already known Paleocene and the inferred mid-Cretaceous source rocks may be present in the system of deep basins along the boundary zone between Greenland and Canada. Completely new exploration models may be developed, both within the deep basins themselves and, due to the possibility of long-distance migration, in the surrounding shallower basin areas (see summary paper in the November 2001 issue of *Offshore*).

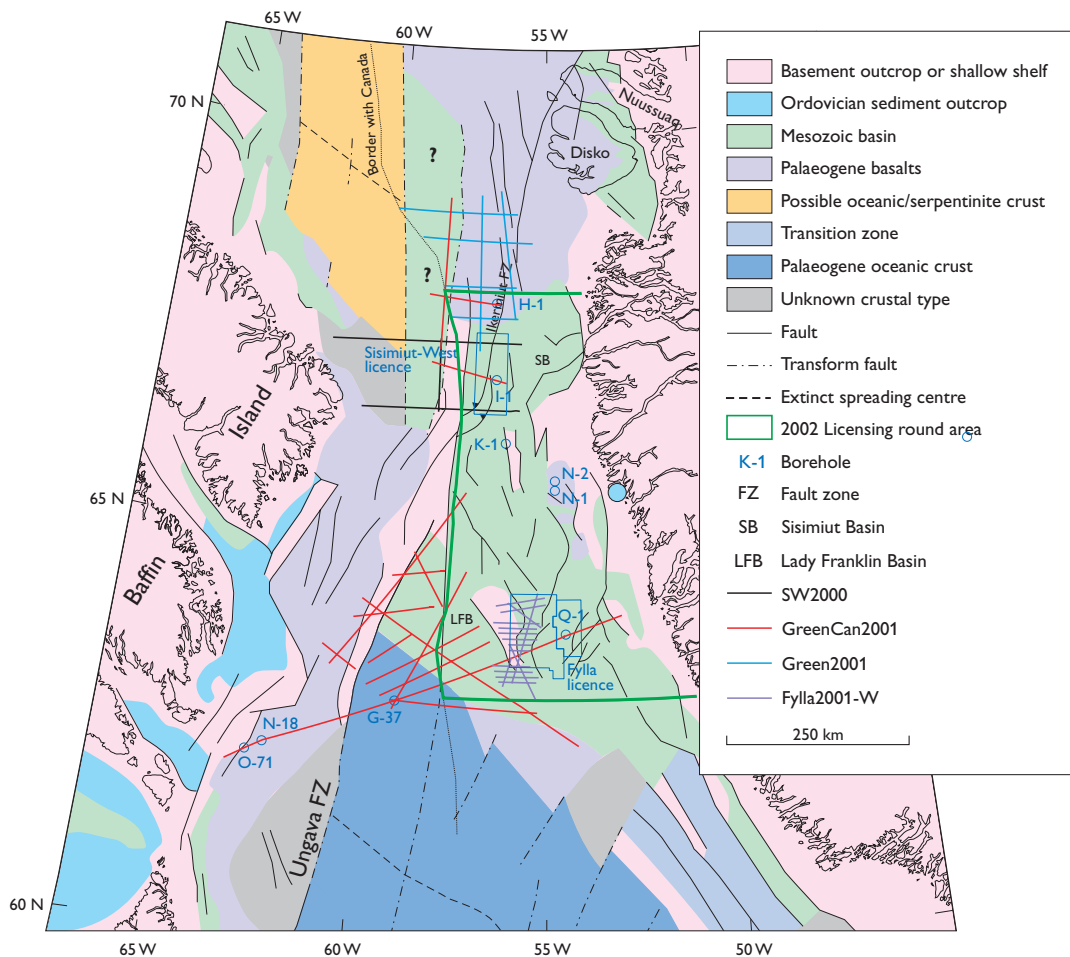
In order to follow the deep basins along the Ungava Fault Zone towards the north and to outline and study potential kitchens for petroleum generation in the Lady Franklin Basin, the GreenCan2001 survey was acquired during summer 2001. Furthermore, a tie-line connecting

the Greenland Qulleq-1 well and the Canadian Gjoa G-37, Raleigh N-18 and Hekja O-71 wells was acquired. This line has shown that sediments are thicker and much more widespread in the region than previously anticipated. Thus, these new data are important both for tectonic reconstructions and for biostratigraphic/organic geochemical correlations. The survey, which is a regional joint venture project between TGS-NOPEC and the Greenland Bureau of Minerals and Petroleum with GEUS as technical advisor, resulted in a total of 2829 km seismic data; of these, 1213 km were acquired in Greenland waters and 1616 in Canadian waters (see map).

In addition, TGS-NOPEC acquired the Green2001 survey (904 km) in the northern open-door area. This survey was designed to follow possible deep basinal trends from the Ungava Fault Zone towards the oil seep region of Disko–Nuussuaq.

Fylla licence relinquished – new data show new possibilities

In order to fulfil the remaining work obligations in the Fylla licence, the Statoil group acquired 948 km of seismic data, mainly in the western part of the licence (Fylla2001-W survey; see map). Although there are some problems in correlating the Cretaceous seismic



units across the main Fylla fault, there are good indications from maturity modelling that the inferred Cenomanian–Turonian source rock is thermally mature in this area. The survey was mainly designed to map leads and prospects comparable either to the Santonian reservoir sandstones known from the Qulleq-1 well, or to contemporaneous or younger hanging-wall and basin floor fans just west of the main Fylla fault. A preliminary inspection of data demonstrates closures at several levels in the Cretaceous succession, primarily as roll-overs formed by later compression along the main Fylla fault.

The Fylla licence was relinquished as of 31 December 2001; therefore this area is open for licensing in the coming round. A large and modern database is now available with good possibilities of mapping very large leads and prospects. The results from the Qulleq-1 well demonstrate the presence of good seals and reservoir and a significant untested up-dip potential (see also GHEXIS 19 and paper in Report of Greenland Activities 2000, both available from GhexisOnline).

Sisimiut-West licence relinquished – new emerging exploration models

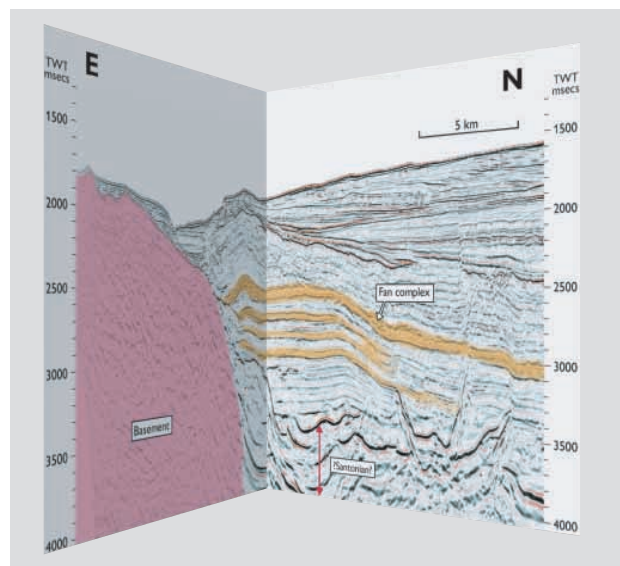
At the same time as the Fylla licence was relinquished, the Phillips Group decided to relinquish the Sisimiut-West licence since a continuation into the next phase of exploration called for a firm commitment well.

It must, however, be emphasised that the Sisimiut-West license has resulted in a lot of new data and exploration ideas. The structural complexity of this area along a transpressional part of the Ungava Fault zone is obvious, but new models based on both seismic and gravity data suggest a significant amount of old deformed sediments on highs that were previously expected mainly to be basement. Improved resolution of some of the most recent seismic data is encouraging. Furthermore, recent seismic data from the vicinity of the relinquished license area show deep possible kitchens and large structures (contact Jens Christian Olsen at TGS-NOPEC, e-mail: jenschristian.olsen@tgsnopec.no). A recent study on fluid inclusions made by the Phillips Group suggests the presence of liquid hydrocarbons in some intervals. For further information on available data, contact Christian Marcussen, e-mail: cma@geus.dk.

Recently completed studies at GEUS

Several GEUS projects relevant to petroleum exploration in West Greenland were finalised in 2001.

A study of the Palaeogene succession throughout central West Greenland, combining seismic sequence stratigraphy, sedimentological interpretation of petrophysical logs, biostratigraphy and facies analysis in



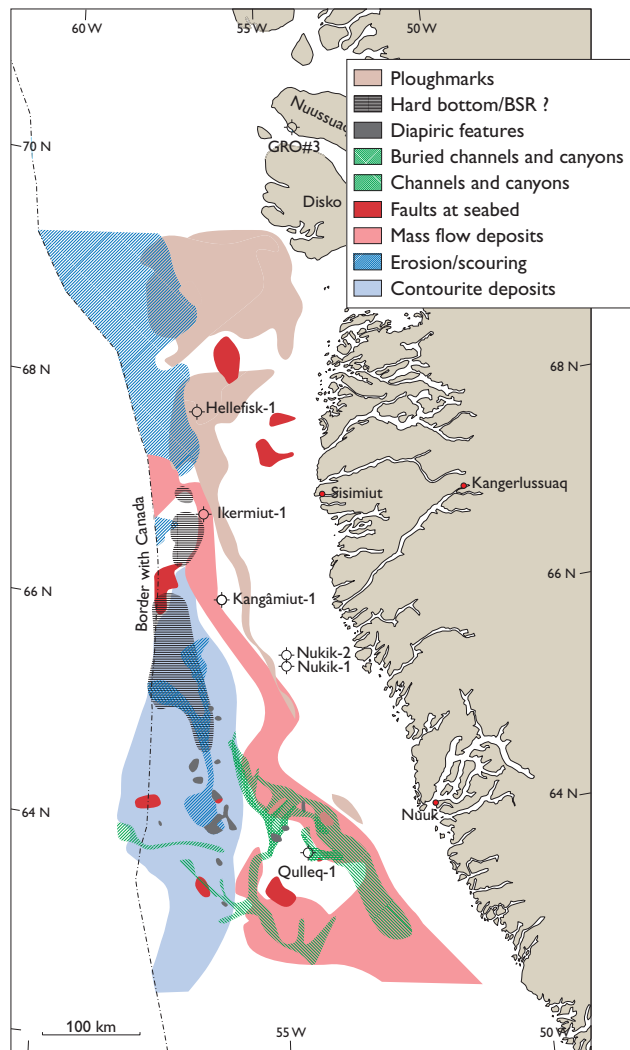
Hanging-wall fans along the main Fylla fault

a sequence stratigraphic framework has recently been completed. The results include a number of interesting features such as mounds, possible basin-floor fans, syn-tectonic wedges, and turbidite channel complexes. These features are particularly common in the northern part of the licensing round area. For further information, contact Finn Dalhoff, e-mail: fd@geus.dk.

During 2001, a study of possible geohazards offshore West Greenland was completed. Apart from mapping seabed and sub-seabed geohazard features, the post mid-Eocene succession was mapped for the first time using the most important seismic units on a regional to semi-regional scale. The mapped seabed features include bathymetry, seabed gradient, channels, canyons and iceberg ploughmarks, seabed reflector amplitude anomalies, hard bottom and possible 'bottom simulating reflectors' (BSRs), mass flow deposits and current-related features etc. Sub-seabed features include buried channels and canyons, buried mass flow deposits, diapiric features and de-watering fractures. Results have been summarised in maps easily accessible for companies evaluating West Greenland (see example on next page). For further information, contact Tove Nielsen, e-mail: tn@geus.dk.

New stratigraphic and organic geochemical studies at GEUS

A compilation of geochemical data on mid-Cretaceous source rocks and oils throughout the United States, Canada and West Greenland has not been carried out at present although it would be very useful for the development of predictive source rock models. However, a project that aims to analyse and describe the marine oil-prone source rocks deposited during the Cenomanian–Turonian anoxic event and other periods in the Cretaceous and Palaeogene (especially in the Aptian–Albian and in the Paleocene) was initiated at GEUS in 2001. The project focuses on a comparison of



source rocks and oils in West Greenland with the Arctic Basins in Canada and Alaska, the east-coast basins of Canada and the United States and basins from the Cretaceous Western Interior Seaway (central Canada and the United States). The provincialism of the fauna and flora of the source rock units will also be addressed in order to test palaeogeographic, palaeo-oceanographic and palaeoclimatic models for the region. In particular,

possible seaway connections in Cretaceous time from central West Greenland towards the north (Sverdrup Basin and other Arctic basins), west (Canadian Interior) and south (Atlantic basins) are important for source rock models. Most of the sample material has been selected and analysed and interpretation and additional work is in progress. For further information, contact: Jørgen A. Bojesen-Koefoed, e-mail: jbk@geus.dk

A biostratigraphic correlation study between West Greenland and Canada was also initiated in 2001. The aim this project is to present a biostratigraphic correlation of the West Greenland wells, especially Ikermiut-1 and Qulleq-1 where Cretaceous sediments are present, with selected Canadian wells on the Baffin Island and Labrador Shelf (Gjoa G-37, Raleigh N-18, Hekja O-71, Skolp E-07 and Ogmund E-72). Material has been collected and prepared from all of the wells and the palynological dating is in progress. For further information, contact Henrik Nøhr-Hansen, e-mail: hnh@geus.dk.

Geophysical Atlas of West Greenland

An integrated Seismic-Gravity-Magnetic interpretation report has been prepared by TGS-NOPEC and Volcanic Basin Petroleum Research (VBPR) in co-operation with GEUS. The report contains regional potential fields maps, and a description of petroleum systems, deep basin structures and volcanic features. For further information, contact Jens Christian Olsen at TGS-NOPEC, e-mail: jenschristian.olsen@tgsnopec.no.

Satellite seep detection study offshore West Greenland

A satellite seep detection study is presently being carried out by the NPA-Group for Nunaoil. The study covers most of the areas off Central and North-West Greenland and parts of the Labrador Sea. For further information contact, Arne Rosenkrands Larsen at Nunaoil, e-mail: arl@nunaoil.gl.

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