

GREENLAND

MINEX News

GREENLAND MINERAL EXPLORATION NEWSLETTER

Greenland MINEX News No. 4

February 1994

Cominco joins Platinova in the Far North

1993 drilling review - 1994 plans

The last issue of MINEX (July 1993) was being finalised just as Platinova announced the discovery of a major deposit of massive sulphides in the Palaeozoic Franklinian Basin (83°N). By release date of the newsletter Cominco Resources International Ltd. had joined the search for base metals in Greenland's far north. (Cominco is well known to Greenland through its involvement in the Black Angel lead-zinc mine in West Greenland). This company has acquired an exploration licence bordering Platinova's Citronen Fjord prospect to the east.

The promise of Platinova's initial report of shale-hosted bedded zinc, lead and iron sulphides at Citronen Fjord was confirmed by a swiftly marshalled follow-up programme in late summer that involved diamond drilling, and electromagnetic and gravity surveys. The geophysical data define a large target at depth open beyond the limits of the geophysical survey and extending the prospect over several kilometres. Drill holes through both exposed and concealed parts of the deposit intersected intervals of zinc-bearing massive sulphides. These include 30.6 m grading 3.3% Zn and 0.7% Pb, 11.3 m grading 4.3% Zn and 1.3% Pb including 2.2 m of 12.6% Zn and 5.4% Pb, and 8 m grading 5% Zn and 0.3 Pb including 2.7 m of 10.9% Zn and 0.5% Pb.

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It is no surprise that Platinova and Cominco are to carry out with large-scale operations in the far north in 1994.

Other drilling programmes in 1993 took place in West and South-West Greenland. On

MINERAL RESOURCES ADMINISTRATION FOR GREENLAND (MRA)
Ministry of Energy · Slotsholmsgade 1, 4th floor · DK-1216 Copenhagen K · Denmark
Tel. (+45) 33 92 75 00 · Fax (+45) 33 13 30 17

GEOLOGICAL SURVEY OF GREENLAND (GGU)
Øster Voldgade 10 · DK-1350 Copenhagen K · Denmark
Tel. (+45) 33 11 88 66 · Fax (+45) 33 93 53 52

the island of Disko, Falconbridge Greenland A/S (partnering with Platinova) continued exploration and drilled shallow Tertiary intrusions where copper-nickel mineralisation of Norilsk type is the target. Technical problems determined that drilling of the main target was postponed until 1994.

Farther south at Sermiligaarsuk, Nunaoil A/S drilled Precambrian metavolcanics for gold and base metals. At one locality two holes showed intersection with an interval of massive sulphides returning 1 ppm Au over 5 m. Near Nanortalik, the Cyprus-Nunaoil two-rig drilling programme on the Nalunaq prospect failed to confirm the down-dip continuation of the highly encouraging surface chip sampling that had returned grades of up to 235 g/t over 1 m. Nunaoil's interest in both regions continues.

1994 will see increased activity in the north-east corner of Greenland. For years a region with seldom visitors, now a region to be manned by record numbers. Main groups planning geological work in the period May to August are: Platinova and Cominco (as mentioned earlier), and GGU with two large German geoscientific institutes, the Alfred-Wegener-Institute for Polar and Marine Research (AWI) and the Federal Institute for Geosciences and Natural Resources (BGR). Logistic costs such as freight of fuel from Svalbard (or Thule), as well as field transport

and communications, are areas where arrangements are going ahead to combine costs. Platinova are planning more geophysical work at their Citronen Fjord prospect, as well as diamond drilling with two rigs and a target of at least 8 km of core: at the time of writing the scope of Cominco's work plans is unknown. The GGU-AWI-BGR group, numbering about 50 persons, will be involved in regional mapping, geochemical sampling, aeromagnetic surveying and glaciological studies.



MINEX and GHEXIS

your guide to exploration in Greenland

What are MINEX and GHEXIS ?

In 1990 GGU launched GHEXIS (Greenland Hydrocarbon EXploration Information Service) – a newsletter aimed at informing oil companies and their affiliates of new data and studies relevant for the exploration of hydrocarbons in Greenland.

MINEX, issued for the first time in 1992, is a companion newsletter seeking to play a

similar role to industry with respect to minerals by providing a wide range of exploration-relevant information. Mineral and hydrocarbon exploration in Greenland are covered by the same legislation, and at time there will be some overlap of material between the two newsletters.

Back numbers of MINEX and GHEXIS can be obtained from GGU.

International promotion

The promotion of Greenland's mineral resource potential has gathered momentum in the last five years. Previous issues of MINEX have reported on various ways in which Greenland has been brought more into focus as a promising investment target for industry. The sound geoscientific database provided by traditional services such as geological maps and reports, supplemented by communication to international audiences at geological symposia, have been augmented by activities that provide a wide range of general information to the commercial sector. Apart from summaries of mineral potential, these include material dealing with licensing terms, regulatory information and administrative procedures to elucidate the new Mineral Resources Act from 1991.

MINEX newsletter itself is one recently-introduced item aimed at providing the mining industry with an up-to-date information service. Exhibitions, field excursions and a video film are all part of the promotion campaign.

Exhibitions

For the period January to April 1994, a Greenland information centre providing general information, geological briefs and insight into mineral resources administration, will be set up at three main venues. The meetings in Canada at Vancouver and Toronto are repeat venues of 1993; the congress at Berlin will be the first appearance in Germany of the Greenland exhibition providing an opportunity to provide a review of the range of industrial minerals in Greenland.

- **January:** 11th Annual Cordilleran Geology and Exploration Roundup, British Columbia & Yukon Chamber of Mines, Vancouver.
- **March:** Annual Convention and Exhibition, Prospectors & Developers Association of Canada, Toronto.
- **April:** 11th Industrial Minerals International Congress, Berlin.

Field excursion

A mineral exploration excursion to the southern part of Greenland is offered in late August 1994. This 3-day field trip will provide an introduction to the Precambrian geology and mineralisations of a region containing the celebrated alkaline rocks of the Gardar province. Apart from visits to a range of mineralised localities, including an area with active gold exploration, the excursion should provide good insight into logistics and working conditions in Greenland.

Preliminary registration for the excursion is 22nd March. For details, see folder enclosed with this issue of MINEX.

Greenland video film

A new video film "Greenland - A Wealth of Opportunities" is available from February 1994. The 12-minute film, produced by Mining Journal Services, provides general information about Greenland and mineral exploration. The film is available from MRA free of charge to mining companies; for others a fee of DKK 150 (or \$US 25 or £15) is applicable. Please use the order form in the enclosed brochure.

Geological & exploration briefs

Five-year airborne geophysics project

company participation is solicited

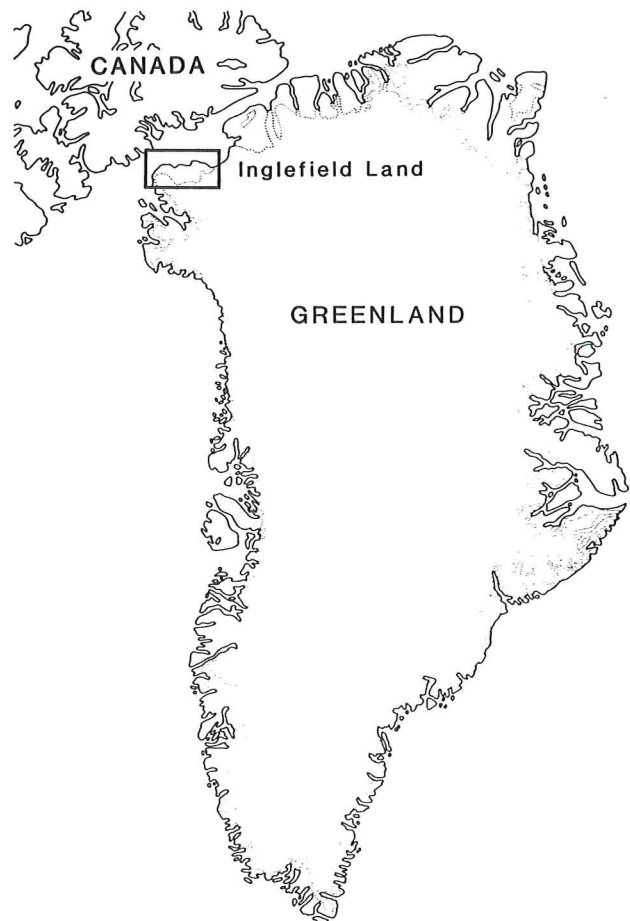
The Greenland Home Rule Government has recently announced the funding of an airborne geophysical project (AEM Greenland 1994-98) with 5 million Danish kroner annually (\$US 715 000) over a period of 5 years. The principle objectives of this initiative are to stimulate mining exploration activity in the short term and to provide data that will be of lasting value in the geological interpretation and modelling of selected regions. Electro-magnetic and magnetic methods are favoured but other survey types may be considered. Data collection, interpretation and distribution will be supervised by GGU.

The geophysical project is designed for the benefit of industry. Thus, all holders of prospecting and exploration licenses in Greenland were contacted at the end of last year to solicit views on possible target areas for the five year period.

Selection of the initial target for the 1994 survey has fallen on Inglefield Land in North-West Greenland (78°-79°20'N, 65°-73°20'W). This region of about 7000 km² exposes the Greenland shield overlain by thin coastal outliers of two sedimentary basins: the Proterozoic Thule Basin and the Palaeozoic Franklinian Basin. The shield, composed of a variety of gneisses and metasedimentary and meta-igneous rocks, is known for the occurrence of regional gossans.

In January a request for proposals is being sent to geophysical contractors on file capable of carrying out this type of survey. Suggestions for commercial participation in AEM Greenland 1994-98 at all levels are solicited, including ideas for joint (public/private) funding.

*North-West Greenland
in focus in opening season*



*Interested companies
should contact GGU*

West Greenland geochemical mapping

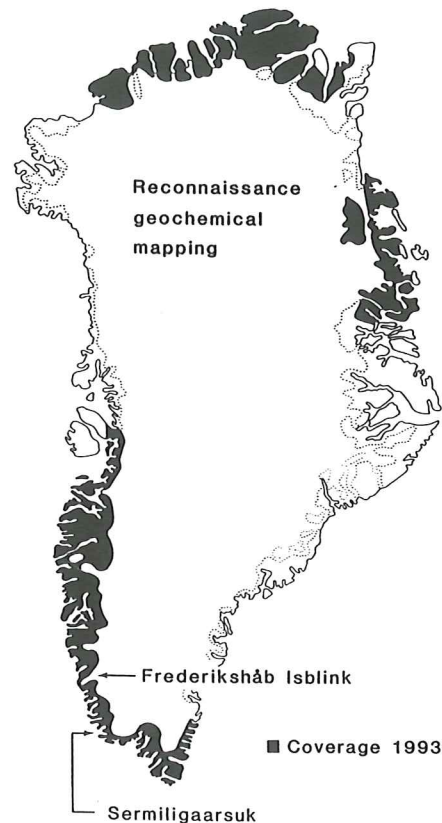
new gold exploration target

GGU's reconnaissance geochemical mapping programme (RGMP) is aimed at providing systematic regional coverage of the ice-free areas of Greenland. It is based on stream sediment and water sampled at a density of one sample per 20–30 km².

As reported in the last issue of MINEX (July 1993) summer 1993 was to see the completion of the geochemical mapping of West Greenland between Kap Farvel (60°N) and Uummannaq (70°30'N). Field work took place in three regions. Final results are about to be released in Open File reports.

In focus in this note is the 3-week sampling programme that took place in the Paamiut region between Sermiligaarsuk (61°25'N) and Frederikshåb Isblink (62°45'N) during which 276 stream sediments were collected. As well as confirming the mineral potential of supracrustal rocks that have seen some exploration, e.g. Ni and Au in ultramafics of the Kvanefjord Group and Au and base metals in the Tartoq Group, a new gold exploration target is indicated. This is defined by anomalies of Au, Sb, U, Mo and Pb which appear to be associated with faults of Proterozoic and younger age.

status February 1994



Kimberlite indicator minerals

stream sediment project

The pilot project on kimberlite exploration noted in the last number of MINEX was carried out during the summer.

• **The target:** the northern border of the Archaean block of West Greenland (see map next page). The Sarfartoq region, south of Søndre Strømfjord, houses the largest concentration of kimberlites in Greenland and

microdiamonds have been recovered.

• **The aim:** insight into the indicator mineral content and dispersion pattern in stream sediments – as a guide for kimberlite exploration.

Twenty-eight sediment samples (20 litres each) were collected from streams draining known kimberlite occurrences. Of the three



sieved fractions, the finest (-20 mesh) yielded the indicator minerals, chrome diopside, picroilmenite and pyrope garnets; the coarser fractions (+12 and -12 to +20 mesh) were barren. Following the garnet chemical classification system of Dawson and Stephens published in 1975, G1 and G9 group garnets are represented; those of the latter type, significant in diamond/kimberlite research for their supposed derivation from lherzolites and inclusions in diamonds, were determined in three of the samples.

Work is continuing, and two 300 kg stream sediment samples and one 500 kg kimberlite sample are being processed.

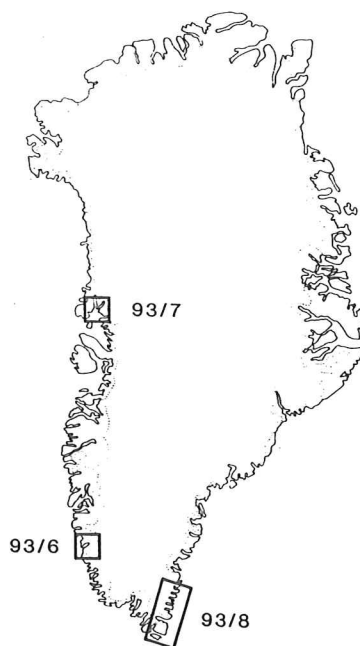
Latest Open File reports

*on gold and platinum group elements
gold and base metals
remote sensing*

Raw data from field work and analytical results acquired by GGU and industry are presented in reports in the Open File Series. As background to a specific mineral occurrence or to the geological province in focus, reports generally include short summaries of regional geology and reference to key papers.

Two of the latest reports from the Precambrian shield of West Greenland deal with precious metals: gold and platinum group elements in the Fiskenæsset area (Report 93/6), and gold and base metals in the Ingia area (93/7). Report 93/8, also covering shield rocks, presents final results of a satellite imagery project over the southern tip of Greenland; a project featured in a previous issue of MINEX (January 1993).

(continued next page)



Open File Series 93/6: Gold and platinum-group element anomalies in the Fiskenæsset stratiform anorthosite complex, West Greenland by Peter W. U. Appel, 1993. 24 pp., incl. 6 figs.

Price: DKK 100.00.

This report deals with recent sampling and analysis of ultramafics, chromatites and sulphur-bearing parts of the Archaean Fiskenæsset anorthosite complex of southern West Greenland, as a follow-up to promising results obtained by industry. Previous exploration by A/S Platinomino in 1969-71 revealed grades in a chromitebanded bronzitite of 3 ppm Au, 0.6 ppm Pt, 3 ppm Pd and 57 ppb Ag. The recent channel sampling of the same horizon yielded 59 ppb Au, 74 ppb Pt, 115 ppb Pd and <5 ppm Ag. Channel sampling of ultrabasic rocks elsewhere in the anorthosite complex revealed grades of 1.37 ppm Au, 4.6 ppm Ag and 0.27% Cu over a width of 2 m.

Open File Series 93/7: Update on the gold and base metal potential of the Ingia area, central West Greenland by Bjørn Thomassen, 1993. 66 pp., incl. 35 maps, 8 tables.

Price: DKK 155.00

As its title indicates this report provides new data to confirm the promising potential for especially precious metals in the supracrustal rocks of the Ingia area, Uummanaq. The geochemical results discussed pertain to the early Proterozoic Karrat Group; supracrustal strata well known to the mining industry from the Black Angel lead-zinc mine at Maarmorilik.

The report contains raw data from the 1992 field season to supplement previous investigations by GGU carried out in 1989-90. A total of 133 stream sediment samples and 135 panned heavy mineral concentrates covering about 1300 km² have been analysed for 36 elements. Results show high values for gold (max. 19 ppm in pan samples), arsenic,

tungsten and zinc. There is marked association between gold and arsenic (the gold being probably hosted in arsenopyrite), and between zinc, lead and copper. Thirty maps showing the distribution of 13 selected elements define anomalous areas. Two maps summarise gold-arsenic-tungsten and copper-zinc-lead-barium anomalous areas. These have potential for quartz vein or shear-zone hosted gold deposits, and for shale hosted base metal deposits, respectively.

Open File Series 93/8: Project to assess the application of SPOT and Landsat TM images to geological reconnaissance, South-East Greenland by T. Tukiainen, P. Erfurt & L. Thorning, 1993. 32 pp., incl. 2 figs, 5 tables, 8 plates, plus appendix.

Price: DKK 520.00.

This is the final report of the remote sensing project GIRS (Geological Information from Remote Sensing) carried out in connection with the mineral resource reconnaissance programme SUPRASYS in South Greenland (see MINEX January 1993). Based on the Spot multispectral data two sets of orthoscopic satellite image maps were produced at 1:100 000 over part of South-East Greenland (south of 62°N). The standard colour composite set constitutes a good base map for much of the represented region; the other set with extracted geological information produced by spatial enhancement of the IHS-transformed Spot data gave disappointing results with respect to lithological discrimination. Landsat TM with its better spectral range proved far superior than the Spot system for an effective enhancement of lithology.

Further reading

GGU Open File series: a review of reports related to Greenland mineral exploration by H. K. Schönwandt, 1993. *Rapp. Grønlands geol. Unders.* **159**, 22-24.

GGU's publication and data service

Many of the companies receiving Greenland MINEX News will not have been engaged in exploration in Greenland. Thus a brief review is provided of the main types of geological information pertinent to the field of mineral exploration available at the Geological Survey of Greenland (GGU). All the material and services described are available at GGU's headquarters in Copenhagen and all queries should be addressed hereto. In addition, a complete set of GGU publications (both reports and maps) is available for consultation at the Home Rule Government offices in Nuuk, Greenland (Ministry of Trade and Industry). Latest addition to the data base in Nuuk is a microfiche file of mineral assessment reports by the mineral industry (see "Mining industry reports" below).

Specifications on all GGU published material are contained in the *List of Publications* (30 pages), that is available free of charge on request. This list contains a "key to selected topics" that includes sections on "Prospecting" and "Mineralisation". The main publication language is English.

• **Bulletins and Reports**

These publication series, now numbering more than 320 volumes, provide edited accounts of all aspects of Greenland geology. Maps at various scales accompany many of these reports.

• **Map sheets and descriptions**

The national map sheet coverage is at scales of 1:100 000 and 1:500 000. These coloured, geological maps are issued as separate sheets, or where available, together with a map sheet description.

• **Other maps**

Included here are a variety of maps of various scales covering both onshore and offshore regions, including geological, aeromagnetic and aeroradiometric anomaly

maps, bathymetric and topographic maps, and geochemical maps.

• **Thematic Map Series**

A computerised map series launched in 1990 at scale 1:1 000 000 contains plots of geological, geophysical and geochemical data as well as mineral occurrences. The maps are up-dated as soon as new data are available.

• **Open File Series**

An unedited series of reports and maps in limited numbers enables new data to be made quickly available to the public. The series is a key in the field of mineral exploration and research, containing reports based on data from both GGU and the commercial sector.

• **Mineralisation Data Bank or GREENMIN**

A computerised data base with potential for incorporating all known economic mineral localities in Greenland. GREENMIN aims to provide mineralisation data in a systematic and accessible form for easy use by industry and for GGU's own resource evaluation programmes and applied research.

• **Drill Core Library**

The library contains rock cores from a number of prospected and mined deposits. Present status is nearly 75 000 m of core from 1050 drill holes. All core material is available on request for inspection in Copenhagen.

• **Mining industry reports**

GGU holds copies of exploration reports submitted by companies holding mineral licences – at present over 1100 reports. The list of these reports, available on request, is continuously expanding as confidentiality expires. Microfiche copies of the non-confidential reports are available, both in Copenhagen and in Nuuk, Greenland.

• **Map, photo and satellite image archive**

The library contains a large number of unpublished geological maps (over 5000), annotated aerial photographs and satellite images from all regions of Greenland, including detailed field maps used in the compilation of the national map sheets. Material is available for inspection at GGU on request.

• **Rock sample archive**

Out of more than 300 000 registered rock samples, 100 000 hand samples, 11 000 thin sections and 1500 polished sections make up

the accessible collection. The material comes from many areas of Greenland and includes material collected by mining companies.

• **Digital data**

A variety of data is available from GGU in digital form, e.g. data used in the production of the thematic, aeromagnetic and geochemical maps, as well as some geological maps, seismic and navigational data and photogrammetrical data. Most data sets can be purchased at low prices corresponding essentially to the cost of processing and handling.

Meddelelser om Grønland

scientific series back to 1878

Any list of geological source material on Greenland would be incomplete without mention of the journal *Meddelelser om Grønland* which has been published since 1878. Published in Denmark by the Commission for Scientific Research in Greenland, the series contains a comprehensive collection of geological papers in English on Greenland geology and mineralogy.

Information on this publication can be obtained from:

Danish Polar Center
Strandgade 100H
DK-1401 Copenhagen K
Denmark
Telephone: (+45) 32 88 01 00
Fax: (+45) 32 88 01 01

Three new monographs

lithostratigraphy & basin analysis in focus

Three recent monographs (GGU Bulletins 165, 167 and 168) published towards the end of 1993 deal with one of the classic geological regions of Greenland – the central fjord complex of the East Greenland Caledonian fold belt (72°– 76°N). The topics featured are: lithostratigraphy of the Late Proterozoic Eleonore Bay Supergroup (167) and the continental Devonian sediments (165), and sedimentary analysis of the continental Devonian basin (168).

Although not dealing specifically with

mineral occurrences the monographs give the stratigraphic framework and geological setting of major sedimentary tracts in a region well known for many mineralised occurrences from Precambrian to Tertiary in age. A previous issue of MINEX (January 1993) drew attention to the publication of a 1:250 000 geological map featuring Upper Proterozoic (Eleonore Bay Supergroup) to Devonian geology of the same region, as well as to new results pointing to a potential for auriferous placer-type deposits in the Devonian fluvial system.

Regulatory & licensing information

Amendment of the Greenland Mineral Resources Act

The Greenland Mineral Resources Act was amended by the Danish Parliament in December 1993. The amendments concern the transfer of jurisdiction regarding hydropower resources in Greenland from the Danish

Government to the Greenland Home Rule Authorities as of January 1st, 1994.

All stipulations regarding mineral resources (minerals and hydrocarbons) are unchanged.

New licences

During the second half year 1993 the following new exploration licences were granted :

- Licence no. 18/93 to Arling Holdings Pty. Ltd. (Australia) for 5 subareas near Maniitsoq totalling 500 km².

- Licence no. 19/93 to Platinova A/S for 2 subareas in Kronprins Christian Land in North East Greenland totalling 1025 km².

Also a number of prospecting licences were granted.

Amendments of existing exploration licences

By relinquishment the following exploration licence areas were reduced at the end of 1993:

- Licence no. 02/92 was reduced from 181 to 83 km².
- Licence no. 05/92 was reduced from 324 to 175 km².
- Licence no. 08/92 was reduced from 44 to 29 km².
- Licence no. 10/92 was reduced from 45 to 34 km².
- Licence no. 15/92 was reduced from 1,489 to 123 km².

For the following exploration licences the licence areas were increased by the granting of additional area:

- Licence no. 07/93 was increased from 1,340 to 1,929 km².
- Licence no. 16/93 was increased by adding new area and reduced by area relinquishment. By coincidence the amended licence area is still 1,072 km².

Other amendments have occurred for the following exploration licences:

- In licence nos. 01/92 and 27/92, the interests of Cyprus Greenland Corporation were transferred to Nunaoil A/S.
- In licence no. 10/92 the interest of Calkas A/S was transferred to Highwood Resources Ltd. and Platinova A/S.
- In licence no. 12/93 the interest of Atlas Corporation was transferred to Nunaoil A/S.

Exploration licences

status January 1994

Licences	Area	Licences	Area
02/91: Falconbridge Greenland A/S	1075 km ²	15/92: RTZ Mining and Exploration Ltd.	123 km ²
03/91: Falconbridge Greenland A/S	1153 km ²	27/92: Nunaoil A/S	368 km ²
01/92: Nunaoil A/S	376 km ²	01/93: Nunaoil A/S	178 km ²
02/92: Nunaoil A/S	83 km ²	02/93: Nunaoil A/S	123 km ²
03/92: Nunaoil A/S	21 km ²	07/93: Platinova A/S	1929 km ²
05/92: Nunaoil A/S	175 km ²	10/93: Quadrant Resources Pty. Ltd.	216 km ²
08/92: Platinova A/S	29 km ²	11/93: Quadrant Resources Pty. Ltd.	1884 km ²
09/92: Platinova A/S	85 km ²	12/93: Nunaoil A/S	703 km ²
10/92: Highwood Resources Ltd.	34 km ²	13/93: Laurel Point Pty. Ltd.	168 km ²
11/92: Municipality of Ivittuut	5 km ²	16/93: Cominco Resources International Ltd.	1072 km ²
12/92: Mineral Development International A/S	58 km ²	18/93: Arling Holdings Pty. Ltd.	500 km ²
13/92: Platinova A/S	616 km ²	19/93: Platinova A/S	1025 km ²
14/92: Platinova A/S	905 km ²		

Exploration licences, January 1994

