

Karrat Gold and Diamond Project 2007
Technical Summary
02-04-07

Introduction

Avannaa Exploration Ltd (a 100% owned subsidiary of Avannaa Resources Ltd) has obtained for a licence covering 470 square kilometres in West Greenland between latitudes 71° 15' N and 72° N (Figure 1). The licence, which consists of five sub areas within the Karrat Group metasediments, gives Avannaa exclusive rights to explore for all minerals excluding hydrocarbons and radioactive materials.

This report summarises the geology, previous exploration history and aims of the exploration project, which will begin in 2007 and initially last for two years. Avannaa aims to maintain 100% ownership of the property and cover all the first year exploration expenses.

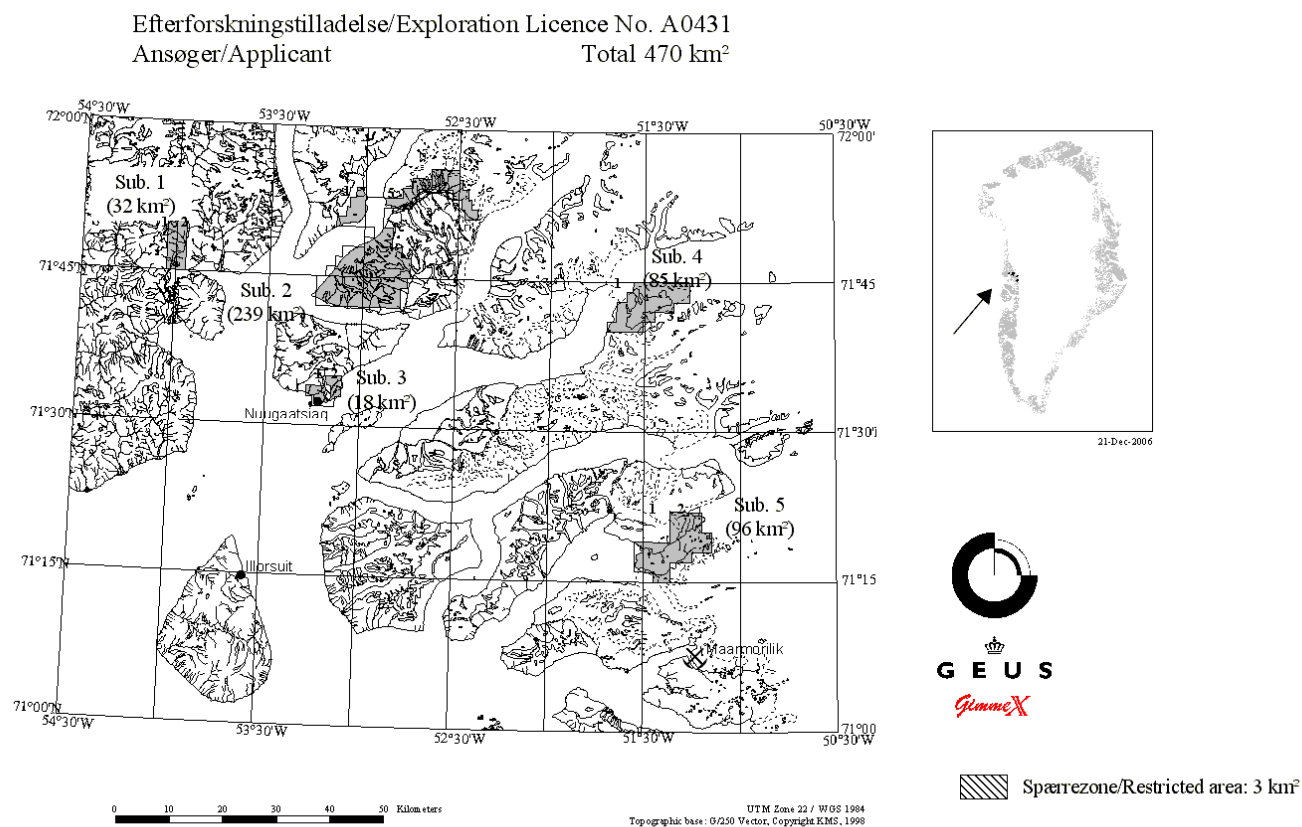


Figure 1. Official map of the licence area (Bureau of Minerals and Petroleum / GEUS). The Licence consists of five sub-areas: Sub.1 – Sub. 5.

Property Status

Avannaa Resources submitted a licence application in November 2006 to the Bureau of Minerals and Petroleum (BMP) which acts as Secretariat for the Greenlandic/Danish Joint Committee on Mineral Resources in Greenland. The application was finally approved as licence no. 2007/08 in April 2007 by the Greenlandic Government and the Danish Minister of Environment and Energy.

The licence lasts for five years. The spending commitments in Danish kroner are as follows (£1 = 11 kr.): 33,653 kr. in fixed payment at the granting of the licence, and during each of the first two years: 134,610 kr. in fixed exploration expenditures and 1,346 kr. per square kilometre in exploration expenditure. A total of 784,056 kr. (£71,278) must thus be expended on the exploration project during each of the first two years. All or parts of the licence, however, may be relinquished after year 1 with a corresponding decrease in commitment for that year.

During years 3 to 5 the exploration commitments will increase to a fixed yearly amount of 269,220 kr. and 6,730 kr. per square kilometre.

These figures are, however, subject to a yearly adjustment based on the Danish Consumer Price Index.

Geological summary

Palaeoproterozoic metasediments of the Karrat Group overly Archaean gneiss complex in a 500 km belt stretching between two prominent peninsulas at Nugssuaq in the south (~71° N) and Redhead in the North (~75° N). These rocks have been affected by a series of deformation and metamorphic events that comprise the locally named Rinkian Fold belt, which is continuous with the Nagsoqtoqidian Fold belt south of 70°N in West Greenland, and with the Foxe belt that extends through Baffin Land into Northeast Canada. These fold belts correlate with a broader group of mountain building events that were active over broad parts of Greenland and the North America during the early Proterozoic known as the Trans-Hudsonian Orogeny.

The Karrat Group is divided into a Northern and Southern zone (each with an outcrop area of ~5,000 square kilometres) by the intervening 1.87 Ga Prøven Igneous Complex that occupies a 150 km zone between 72° N and 73° N. The current project focuses on the Southern zone. Rocks of the Karrat Group and Prøven complex correlate very closely with their equivalents on Baffin Island, respectively the Piling Group and the Cumberland Igneous Complex (Thrane et al., 2005).

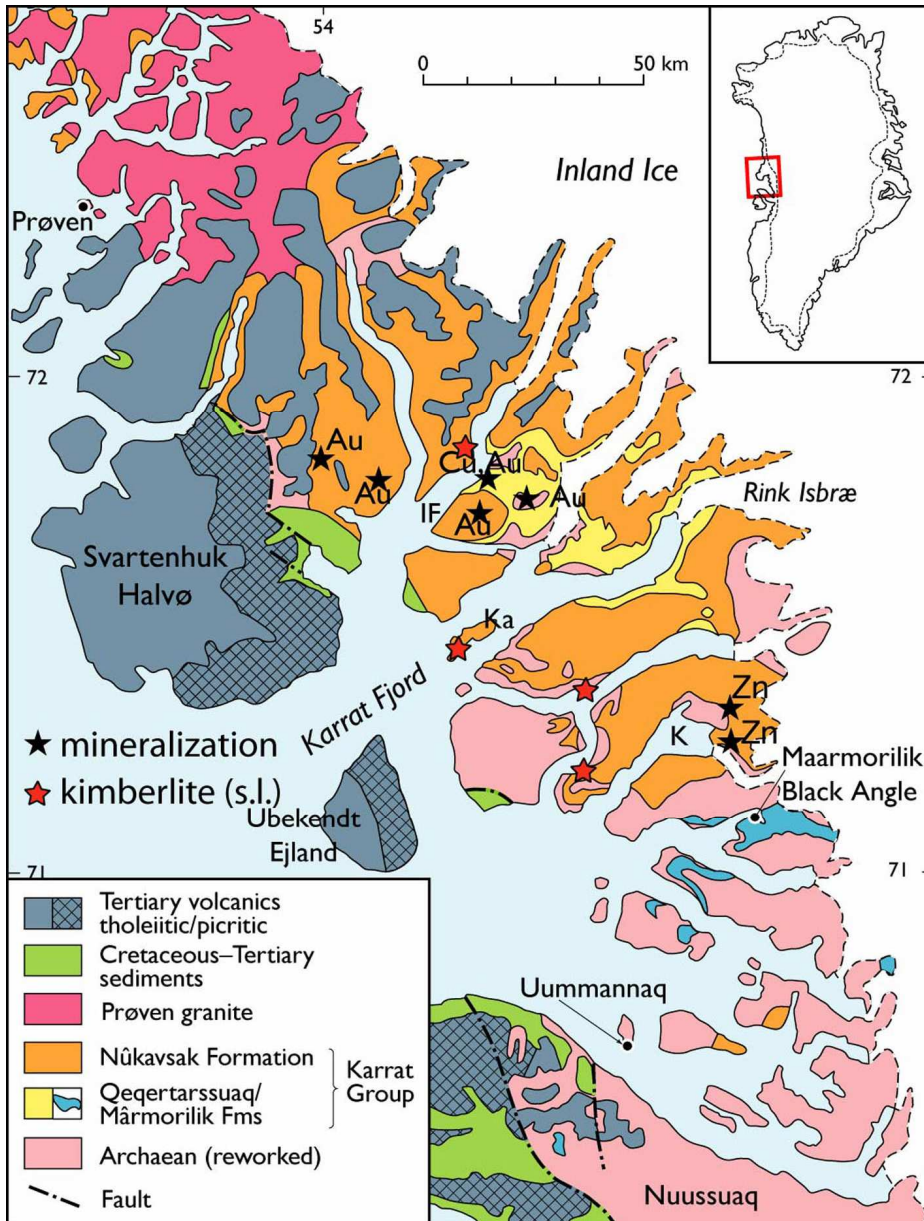


Figure 2. Summary geology of the Karrat Fjord region showing the extent of the Nûkavsak Formation and locations of known gold and base metal mineralizations and kimberlite samples (modified after Steenfelt et al. 1998).

The Karrat Group (depositional age is around 2.0 Ga; Kalsbeek et al., 1998) consists of two basal formations that unconformably overly the Archaean basement gneisses, and which are capped by a thick flysch deposit, the Nûkavsak Fm (Figure 2). The two basal formations are: to the south of Upernivik Island the Marmorilik Fm, consisting mainly of dolomite and calcitic marble, with thicknesses up to 1500m, and to the north of Upernivik Island, the Qeqertarsuaq Fm, consisting of quartzites, graphitic quartzites, calc-silicates and rare marbles, in places overlain by a series of basaltic lavas and pyroclastic deposits (Henderson and Pulvertaft, 1987; Grocott & Pulvertaft, 1990). These two formations are both overlain by the Nûkavsak Fm flysch/turbidite sequence, which has a structural thickness of at least 5 km, although the original thickness is unknown due to intense deformation. Sandwiched between the Qeqertarsuaq and Nûkavsak Formations is a variable but up to 650 thick belt of amphibolites and ultramafic layers (possibly komatiitic flows), that indicate a period of crustal weakening prior to the later phase of basin deepening and turbidite sedimentation

The base of the Nûkavsak Fm is marked by a graphite-rich pelite, which is taken to represent shales deposited in a starved basin, prior to the inpouring of vast amounts of arenaceous sediments making up the alternating pelites and meta-greywacke sequences, typical of the Nûkavsak Fm. The tectonic setting during deposition was probably either a stable continental margin or an epicontinental back-arc basin lying to the north of a destructive plate margin that was positioned south of the present day Disko Bay region.

The Karrat Group has undergone a complex series of metamorphic and deformational events that were analysed by Grocott and Pulvertaft (1990). Seven phases of deformation and metamorphism are identified. The early phases were primarily extensional and included basin development with concurrent sediment deposition followed by a phase of compression and thrusting before the peak high temperature – low pressure metamorphism during which the crust was extensively thinned along low angle décollements. This peak metamorphism can be compared to the events that shaped the basin and range province of Nevada, Western North America. Post-peak metamorphism was followed by at least three compressional phases that caused folding and thrusting that account for the presently observed structural thickness of the Karrat group.

The metamorphic grade varies from greenschist through amphibolite to granulite facies and local anatexis near the gneiss-sediment contact and close to the Prøven Igneous Complex. The distribution of metamorphic zones at the present time can be expected to be complex due to presence in the past of high geothermal gradients giving tight isograds followed by the many deformation events causing local reversals of metamorphic zones. Broadly speaking there is a shift from greenschist facies in the south to lower amphibolite facies in the northern regions around Ingia Fjord, in addition metamorphic grade increases locally wherever the sediments are in contact with basement gneiss. A later overprint is seen caused by the thermal effect of the Prøven Igneous Complex. Granulite facies metamorphism and partial melting is common in areas around the contacts with both basement gneiss and the Prøven Complex. Around Svartenhuk Halvø the Nûkavsak Fm rocks are in biotite-andalusite zone, which indicates high T, low P metamorphism. The regional metamorphism accompanied tectonical crustal shortening caused by the Rinkian orogeny (equivalent to the Nagsoqtuqidian orogeny to the south of Nuussuaq Halvø), and the emplacement of the Prøven Igneous Complex marks a syntectonic event towards the end of the orogeny (Thrane et al., 2005).

Exploration focus and objectives

The primary commodity targeted in this project is gold with secondary focus on diamonds. The Karrat Group, however, is also well known for its lead-zinc potential (the historical Black Angel mining is located in the southern part of the region) and has also been considered prospective for Ni-Cu hosted in high magnesium rocks of possible komatiitic origin. The region has been targeted based on research and evaluation comprising examination of open file reports of the Geological Survey of Denmark and Greenland (GEUS), reports of former commercial exploration projects archived at GEUS, scientific literature and direct discussions with GEUS staff.

Regional geochemical studies and reconnaissance bedrock surveys by GEUS staff (discussed in next section) has shown that the potential for locating gold mineralization in the Karrat Group is very high, in addition the Karrat extension into Baffin Island (Piling Formation) is being actively explored for gold with projects at early drill stage returning very encouraging numbers (Commander Resources TSX-V).

The goal of the 2007 field season is to bring exploration activity in the Karrat Group to a new level by locating the bedrock expression of the existing anomalies and by defining the style of and constraints on in-situ gold mineralization. Determining the nature of this mineralisation will enable a comprehensive exploration project to be planned for years 2 and forwards. The project will focus on the Nûkavsak and Qeqertarsuaq Formations between Prøven and Ummannaq, where a possible mineralization model is that of turbidite-hosted gold of the kind known from the Lachlan Fold belt in Victoria, Australia, Meguma Sequence of Nova Scotia and elsewhere.

Base metal potential in the licence area is high, the southernmost subarea being on-strike with a number of high grade zinc showings discovered by RTZ in 1991 and 1992.

Gold Potential

Geochemical surveys (stream sediment, pan separates and rock prospecting) conducted by GEUS geologists since 1990 have confirmed that the Karrat group is anomalous in gold and its pathfinder elements arsenic and antimony. On a regional scale this fact is well demonstrated by geochemical maps of West Greenland published by Steenfelt (2001) and reproduced in Figure 3. At the local scale anomalies are evident from the surveys published by Thomassen (1991, 1993) and Steenfelt et al. (1998). Furthermore, hand samples from boulders confirm the presence of gold and arsenopyrite associated with quartz veins (Figure 4; Thomassen and Lindh, 1998).

The earlier work focused on the Ingia Fjord region where many drainages were sampled both by panning and by stream sediment sampling. Several places in the Ingia region proved to contain Au anomalies, with up to 18.8 ppm Au in pan samples (associated with arsenic and antimony) and 33 ppb Au in stream sediments. Boulders containing visible arsenopyrite were found to contain up to 1.4 ppm Au. These maximum values are all from an east-facing, steep valley, about 12 km north from the mouth of the Uvkusissat Fjord (Thomassen, 1993).

The later geochemical work (Thomassen and Lindh, 1998 and Steenfelt et. al. 1998) extended Thomassen's earlier work to a much larger region. Interestingly this indicated that the geochemical anomalies are widespread throughout the Karrat metasediments suggesting that the whole province should be regarded as having gold potential, possibly with many recurring individual mineralizations. Steenfelt's gold analyses seem furthermore to suggest the rough delineation of two northwest-southeast trending belts (Figure 5).

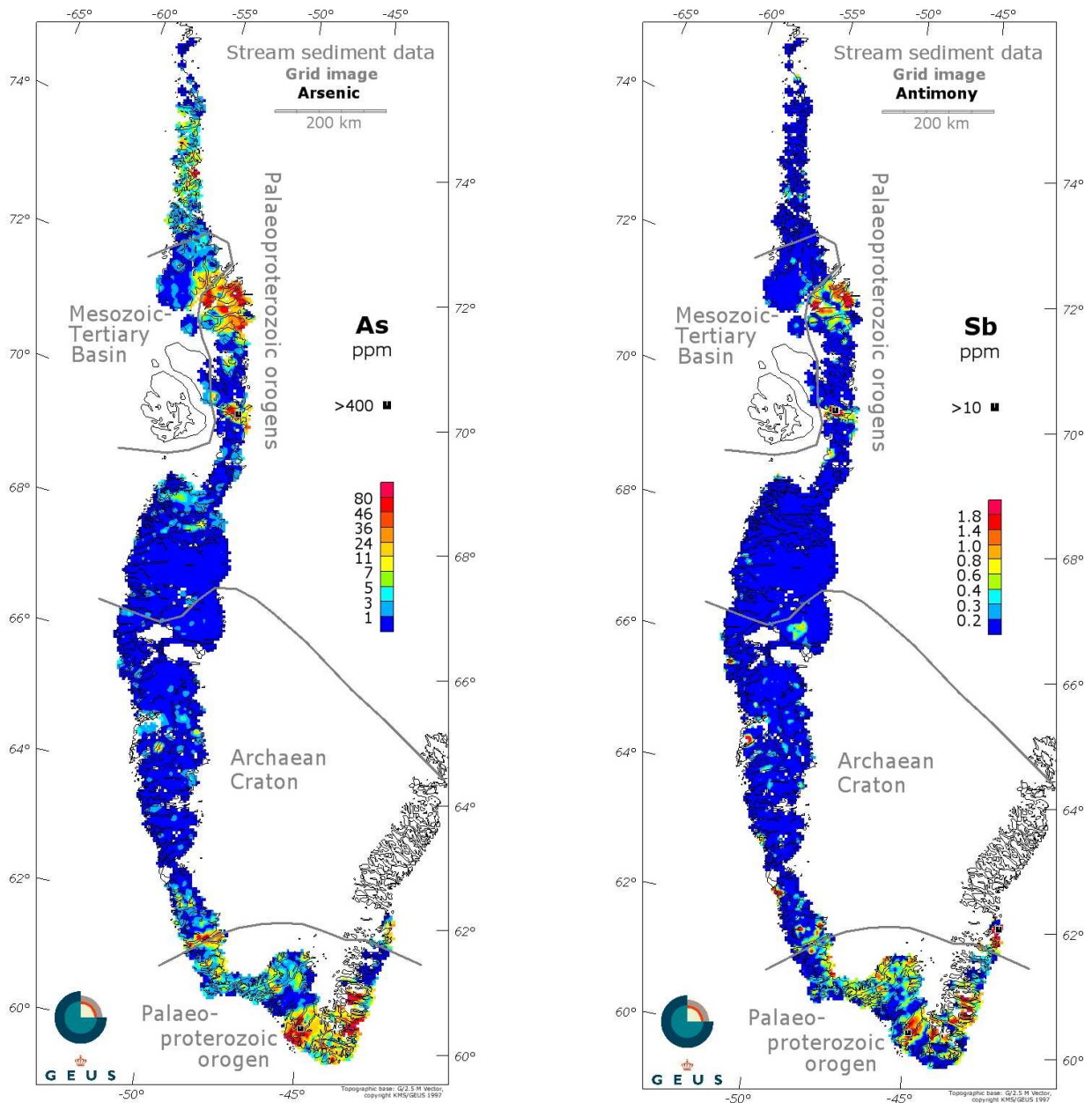


Figure 3. Concentrations of arsenic (As) and antimony (Sb) in stream sediments from South and West Greenland from Steenfelt (2001). High concentrations in South Greenland reflect the Ketilidean belt which represents a destructive plate margin with many similarities to modern central California. Localised highs on the West coast below latitude 70° N are Greenstone belts in the Precambrian basement. The last area – stretching from latitude 71° to 72° 30' and again from 73° 30' to 74° 30' is the Karrat Group (the hiatus in elevated values in the Karrat Group represents the Proven Granite).

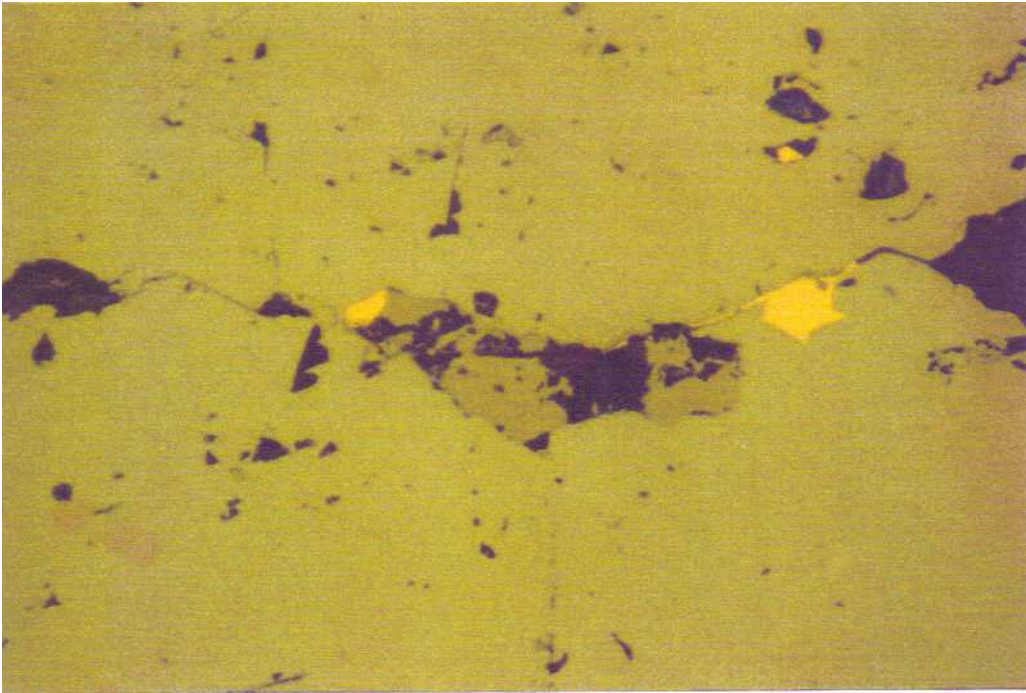


Figure 4. A photomicrograph from Thomassen and Lindh (1998) showing grains of native gold up to 30 microns in diameter embedded in arsenopyrite.

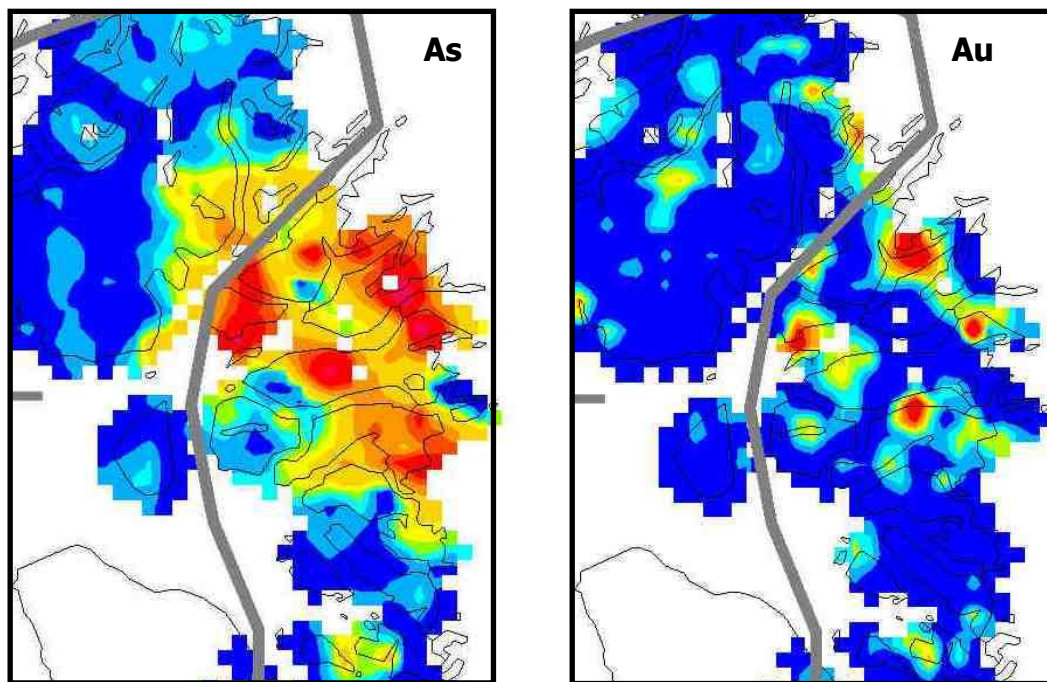


Figure 5. Arsenic (left) and Gold (right) anomalies in the Karrat Group (modified after Steenfelt 2001; original data collection from Steenfelt et al. 1998) showing concentrations in two northwest-southeast trending belts.

Despite many anomalies in the region, to date no economic mineralizations have been found in situ. However, the search for in situ mineralization has concentrated on a few locations in the Ingia region in difficult terrain with emphasis on visible sulphide mineralization. Furthermore at the time of these investigations the full results of the geochemical surveys carried out in 1998, which indicated the much

broader regional nature of gold mineralization, were unknown. Both Nûkavsak and Qeqertarsuaq Fm yield Au anomalies in drainage and boulder, and are thus potential targets for further exploration.

Base Metal Potential

Pb-Zn is known mainly from the Black Angle mine in Marmorilik, which from 1973 to 1990 produced app. 11 mio. tonnes of ore with 12.3% Zn, 4% Pb and 29 ppm Ag. The mine is currently undergoing a feasibility study for reopening. Smaller (epigenetic?) Cu mineralizations have been found mainly in the Qeqertarsuaq Fm (Thomassen, 1991a,b, 1992, 1993, 1998). Cominco prospected for a potential Ni mineralization in the ultramafic rocks of the Qeqertarsuaq Fm (mentioned in Thomassen, 1998) but did not find any of interest during 1994 field work, however the field program was extremely limited, consisting of three persons over 8 days.

Fe-sulphide horizons of probable sedimentary-exhalative origin are known throughout the Karrat group and several notable mineralizations with enhanced base-metal content are located within the current Licence Area. Therefore Base-Metal potential should still be considered to be medium to high in the area.

Subarea 5 of the licence area contains a number of base metal showings with grab samples ranging 8-12 % Zn and is on-strike with Rio Tinto Zincs 'Discovery Zone' from 1992 (45% Zn over 40 cm, 24% Zn over 60 cm). The Discovery Zone itself lies within licence area 2005/05 (Angus and Ross plc).

Previous Exploration

1979 A reconnaissance project by Cominco [9] – sampled drainage outlets along the sides of fjords. This important report sparked off the interest in the Karrat region as a gold target.

1989 Bjørn Thomassen (GEUS) located Au anomalies and mineralization.

1992 Bjørn Thomassen confirmed and expanded his 1989 fieldwork

1992 Intergeo [7] (a private Swiss based company) ran a small project consisting of 2 men over 25 days with 1 camp move. The project confirmed Thomassen's Au anomalies without finding the sources. But the coverage was VERY limited

1991-1992 RTZ explored for and located stratiform Zn/Pb mineralizations in the Karrat metasediments proposed as being are distal correlations of the Black Angel mineralization [4,5,6]. The objective of the program was to locate Sullivan type deposits. Although failing in its primary objective this project confirmed additional potential for base metals in regions that overlap with the current licence area.

1995 Cominco [8] 3 men (2 geologists) over 8 days, helicopter born reconnaissance
Objective was Thompson Nickel Belt (TNB) and Kambalda/Cape Smith type Ni/Cu deposits. Focusing on contact between Qeqertarsuaq and Nûkavsak formation where ultramafic (flows ?) are recorded.

1997 Bjørn Thomassen, Mogens Lind, and Agnete Steinfeld (GEUS) expanded Thomassen's work from the earlier 1990's. The results indicated that the gold anomalies were widespread throughout the Karrat group – providing an exploration target of around 5,000 square kilometres.

Since 1997 exploration in the region has focused primarily on new feasibility studies of the Black Angel Mine with satellite studies aimed at looking for new Zn/Pb deposits in the surrounding area. These studies have been carried out by the UK company Angus and Ross PLC.

Logistics

The licence area is between is between 10 and 100 km Northwest of Marmorilik/Black Angel Mine – i.e. 5 to 30 min. by helicopter, and about between 30 to 130 km from Uummannaq, which is served by scheduled flights from Søndre Stromfjord and Nuuk.

Steep alpine topography is dissected by a number of deep fjords. Rock exposure is close to 100% over much of the area.

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Articles and GEUS reports

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Thomassen, B. 1993 Open File Series GGU 93/7

Thomassen, B. & Lind, M. 1998 GEUS rapport 1998/62

Thrane, K., Baker, J.A., Connelly, J., and Nutman, A., 2005, Age, petrogenesis and metamorphism of the syn-collisional Prøven Igneous Complex, West Greenland: Contributions to Mineralogy and Petrology, v. 149, p. 541-555.

Company reports

The most relevant company reports are given here and referred to in the text by number in square parentheses.

Charter Consolidated diamond prospecting:

[1] nr. 20190 "Report on the investigation of western Greenland. 1979. Internal report, Charter Consolidated Limited, 16 pp., 8 plates, 15 photos."

[2] nr. 20191 "Report on the laboratory investigation of rock samples from western Greenland. 1981. Internal report, Charter Consolidated Limited, 13 pp."

[3] nr. 20192 "Report on the geochemistry of garnets and ilmenites from western Greenland. 1983. Internal report, Charter Consolidated Limited, 3 pp., 2 plates."

RTZ/Platinova JV

[4] nr. 21085 "Karrat concession year end report. Internal report, RTZ Mining and Exploration Limited, 19 pp., 7 app."

[5] nr. 21297 "Karrat exclusive exploration licence 1992 year end report. Internal report, RTZ Mining and Exploration Ltd., 19 pp., 8 app., 3 plates."

[6] nr. 21360 "Comments on RTZ report ""Karrat exclusive exploration licence - 1992 year end report"". Internal report, RTZ Mining & Exploration Ltd., 11 pp."

Intergeo

[7] nr. 21110 "Geological report on the 1990 precious and base metals exploration program in the Karrat Group, West Greenland. Internal report, Intergeo-Exploration, 26 pp., 4 photos."

Cominco

[8] nr. 21401 "Karrat Ni Greenland project geology and prospecting assessment report. Latitude: 70°30' - 71°54'N Longitude: 51°3 0' - 51°40'W. Internal report, Cominco Ltd., 17 pp., 8 app., 1 plate."

[9] nr. 20435 "Year end report. 1979. Karrat group reconnaissance programme Marmorilik area, West Greenland. (Period: May 1979 - May 1980). Internal report, Cominco Ltd. & Greenex A/S, 34 pp., [analytical results], 11 plates, 14 photos."

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