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A R C O N O R W A Y M I N E R A L E R A / S

THE GRINDER GOLD PROJECT, SOUTH-EAST NORWAY

A Participation offer

Geologiske
Jenester a.s.

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Boye Flood

Oslo, June 14, 1989

LIST OF CONTENTS:

	<u>Page</u>
Introduction	1
Grinder - Why and How	1
Previous work	2
Geology and mineralization	3
Infrastructure	5
Expenditure to date	5
Exploration Agreement terms	5
Perusal of technical data	6
Gold in Norway and the Nordic countries	6
Conclusion	7

LIST OF FIGURES:

	<u>Fig. no.</u>
Location map 1:1.8 mill	1
Land position map 1:75.000	2
Geological map, Skurven 1:25.000	3
" " Grinder 1:17.000	4

APPENDICES:

Exploration Agreement	Appendix 1
Gold in Norway, Sweden and Finland	" 2
Gold bearing blocks, Skurven locality	" 3

ARCO NORWAY MINERALER A/S

THE GRINDER GOLD PROJECT, SOUTHEAST NORWAY

A Participation offer

Introduction:

The Grinder gold project is situated in Grue kommune around 100 km NE of Oslo, see fig. 1. It is related to Middle Proterozoic "greenstone belts" and surrounding granitic gneisses. Gold values up to 0,43 ppm occur in bedrock samples, and up to 4,27 ppm of gold have been encountered in glacial floaters.

Arco Norway Mineraler A/S is a subsidiary company of ARCO Norway Inc. which in turn is wholly owned by the oil giant Atlantic Richfield Company of U.S.A.

The following presentation is made on behalf of ARCO Norway Mineraler A/S (ARCO) who is seeking a partner for the Grinder project, on terms which are further specified below.

Grinder - Why and How:

During the period 1983-84 ARCO conducted an extensive mineral exploration program in Norway; the Grinder project being the result of the Southeast Norway reconnaissance program, 1984. This program outlined three areas of interest based on geology and stream sediment geochemistry, while additional rock sampling rendered Grinder the most promising of the three areas.

In 1985 The Atlantic Richfield Company closed down its mining and mineral exploration activities world wide allowing for no further funding of the Grinder project. ARCO, however, decided to maintain the mineral rights (Norwegian "mutinger") on its two best properties, which was Rombaken in North Norway, and Grinder. The intention was to find a partner(s) willing to continue funding of the exploration program.

In 1987 the US based East West Minerals Inc., a subsidiary of East West Minerals N.L. of Sydney, signed an Exploration Agreement with ARCO. During 1988 further work was carried out on the property with East West Minerals Norway A/S as operator. A continuation of this program was due to start in May this year when East West suddenly terminated the agreement because of a heavy commitment in Canada.

Previous work:

This region has not earlier been subject to mineral exploration.

NGU: Earlier work has been carried out by The Geological Survey of Norway (NGU) and has resulted in:

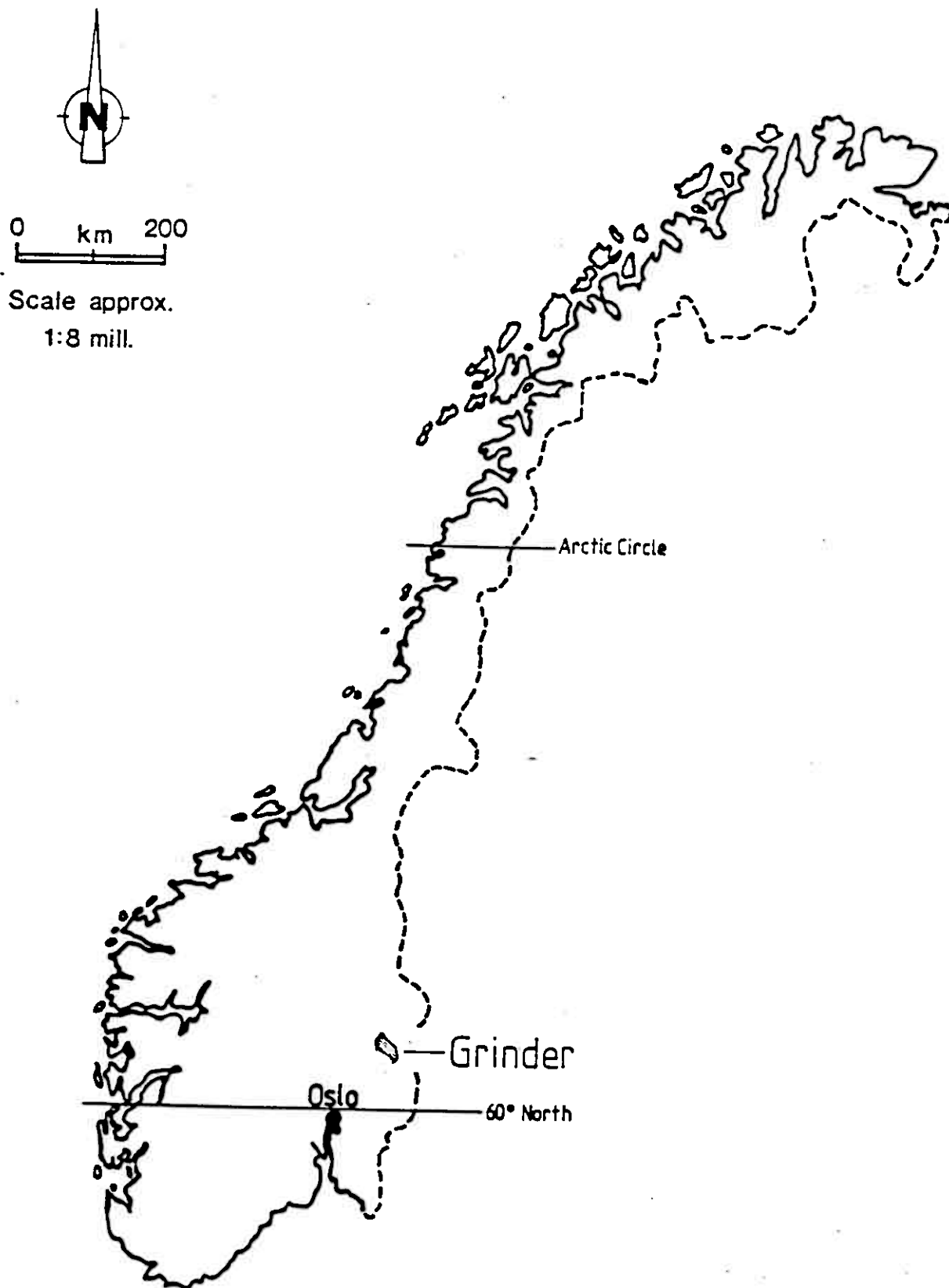
- Geological maps 1:250.000
- Geological maps (preliminary) 1:50.000
- Aeromag maps 1 : 50.000 Flown at 100-150m altitude with 500m linespacing.
- Regional stream sediment geochem., 1 sample/30 km² (gold assays on this material by East West gave values up to 434 ppb)

ARCO: The following work was conducted in the Grinder area:

- Geological mapping in scale 1:50.000
- Geochemical stream sediment sampling, approx. 1 sample/km²
- Rock chipsampling across altered and mineralized units, mainly distinguished through the presence of pyrite, sericite, chlorite and carbonate.
- IP, mag. and VLF orientation survey in the Grinder I area, see fig. 4.

East West: The field work in 1988 was a follow up of previous results by ARCO, and included:

- Quarternary geological mapping with emphasis on ice transport, distance and direction.
- Geological mapping scale 1:10.000 of claim areas, fig. 3 and 4.
- Block tracing and sampling of mineralized blocks and outcrops.
- Geochemical heavy fraction sampling of moraine materiale.
- Trenching, blasting and sampling.



NORWAY
Location Map

Geology and mineralization:

Suprahumid

The Grinder area is underlain by a proterozoic rock package, striking NW-SE and consisting of "greenstone belt" lenses up to 5x2 km, surrounded by granitic gneisses. The "greenstone belt" lenses which are demonstrated in fig. 3-4, are dominated by felsic porphyries, mainly intrusive (sub-volcanics), meta-rhyolites, greenstones and tuffs; the latter often strongly sheared and altered. This package is intruded by granites and hyperites.

The oldest metamorphic age is around 1650 Ma. and the youngest intrusive age 900 Ma. Shearing, fracturing and mylonitization are prominent in a number of places.

Mineralization: Mineralization in the Grinder area is invariably observed due to pyrite, which may vary between 1 and 5 %. The pyrite is generally associated with one or several of the following minerals in decreasing order:

- Sericite (often in an almost pure white pyritic quartz-sericite schist)
- Chlorite
- Carb~~o~~onate
- Green mica and fuchsite
- Quartz
- Kaolinite and talc

Below we will demonstrate what has been found and the potential, by focusing upon the claim areas Skurven to the NW and Grinder I to the SE, see fig. 2.

Skurven: The main difference between the Skurven and Grinder I areas is a scarcity of the highly altered quartz-sericite-pyrite schists on the former locality, and where observed and sampled to date, they have not revealed any gold values.

The large attraction of this area is the block concentration in the central part, see fig. 3, where a number of blocks from 1 dm³ to 1 m³ assay between:

0,36 ppm and 4,2 ppm gold

Two hand specimens from these blocks, one pyrite rich and one pyrite poor were grinded and panned on a Goldhound concentrating wheel. The latter did not reveal any free gold, the former showed 24 grains of gold < 50 micron in size, see Appendix 3.

The blocks consists of a pinkish quartzo-feldspatic rock, medium to coarse grained and in the microscope revealing a porphyritic texture with partly cataclastic phenocrysts. The blocks are pyritic with quartz veining and minor sericite. Chemically they are anomalous in lead, but does not show any significant elevation of other elements.

Among these homogeneous blocks was also found a pyritic augengneiss block, highly anomalous in gold, assaying:

0,136 ppm

The East West program included a quaternary geological assessment of this area conducted by the consulting company Geoteam A/S. They concluded that the blocks were transported from the N with a maximum transport distance of 1-2 km.

Subsequent work concentrated within the volcanics, based on the assumption that the blocks could have been eroded from a subvolcanic plug. Progressing work, revealing similar rocktypes along sheared gneiss/porphyry contacts to the S and the find of the anomalous augengneiss block, indicate that the source for the blocks could also be found within the gneisses.

Hence the aborted 1989 program included an IP reconnaissance survey extending from the block locality and 3 km to the N, encompassing a large portion of the surrounding gneiss country.

Grinder I: Strongly rusty and pyritic quartz sericite schists in a road cut, led to the find of the Grinder project area. Visually it was a striking resemblance between some of the Grinder lithologies and those found at Mine Doyen (gold mine) in Quebec.

Subsequent stream sediment sampling gave gold values up to 77 ppb, but gold in outcrop was first encountered in a quarry in the northern part of fig. 4 where strongly pyritic shears assayed:

0,32 ppm - 0,43 ppm gold

and four samples chipped in a creek bed representing from 5 to 12 m just below the trenches, assayed between:

0,038 ppm and 0,115 ppm gold

During trenching last season, an around 5 m wide portion of the altered schists in the northernmost trench, fig. 4 gave an average content of:

0.150 ppm gold

confirming the highly gold anomalous pattern of the north-eastern

and generally covered part of this alteration zone (unit).

Hence the plans for this season included IP along the whole zone, followed by extensive trenching and sampling.

Other areas: A general and interesting feature from the Grinder alteration zones is the high content of Al_2O_3 which vary between 20 and 22 %. Although aluminum silicate minerals are not observed here, kyanite is known from other localities in the region, associated with similar lithologies. The association between the aluminum silicates and gold is well known from various gold fields in Australia and Canada, as well as the Enåsen gold mine in Sweden, see below.

During the work by ARCO in 1984 gold-arsenic stream sediment anomalies were found associated with pyrite-kyanite bearing rocks. Minor rock sampling concurrent with mapping did not give any gold values, and subsequent claiming was restricted to the Grinder area. A follow up program, however, was planned for the 1989 season.

All geological and geochemical data from these other areas will be included in an exploration agreement.

Infrastructure:

As seen from fig. 2 the Grinder claims are located on both side of the river Glåma, which occupies one of the major valleys in Norway. Railway and main roads follow the river, and the surrounding hills have a good pattern of forestry roads. Most of the jobs in the area are related to farming, forestry and some industry. All necessary facilities are found in Kirkenær, the kommune centre.

Expenditure to date:

The reconnaissance which located Grinder and the subsequent work by ARCO in 1984 had a total cost of around: Nkr. 750.000.-

The exploration program carried out by East West Minerals Norway A/S during 1988 had a cost of round: Nkr. 470.000.-

Exploration Agreement terms:

Any company who wants to earn an interest in the Grinder property will have to negotiate an Exploration Agreement with ARCO Norway Mineraler A/S. ARCO wants a similar agreement as they had with East West implying that a new company will have to spend:

Nkr. 650.000 to earn a 50% interest

Part of the former Agreement with Cost Contribution Table is found in Appendix 1, and a complete copy can be studied in our office.

Perusal of technical data:

Any party seriously considering such an agreement will, after signing a letter of confidentiality, have full access to all maps and reports related to the project and on file in this office.

Gold in Norway and the Nordic countries:

Gold production in this part of the world has been small by international standards and mainly related to basemetal mines as a biproduct. Gold exploration, particularly in Norway, has with minor exceptions been none existing.

One of the few old goldprospects in South Norway is Eidsvoll, situated between Oslo and Grind, and within the same geological province as Grind, see Appendix 2 (1).

Due to the high and fairly stable gold prices and the more international climate within the exploration industry, the last decade has experienced the find of several new gold prospects as well as opening of new gold mines in Scandinavia. Most of these are related to the Proterozoic, Appendix 2 (1).

In Norway the Bidjovagge coppermine was reopened in 85 with gold as the main product (Appendix 2 (2)), and the year before the first Swedish gold mine Enåsen was opened by Boliden (Appendix 2 (3)). Only four years later the second Swedish gold deposit was in production when Terra Mining opened the Hebersfors mine (Appendix 2 (4 & 5)), and still an other gold deposit is coming close to production in Northern Sweden, near Kiruna (Appendix 2 (6)).

In Finland there has also been a high activity level with several interesting results as shown in Appendix 2 (1, 7 - 9)

Reconnaissance work by NGU and Nord-Trøndelag county 160 km NE of Trondheim last year, located an area of quartz-sulphide veins in Proterozoic gneisses assaying up to around 20 ppm of gold. Follow up work will continue this season.

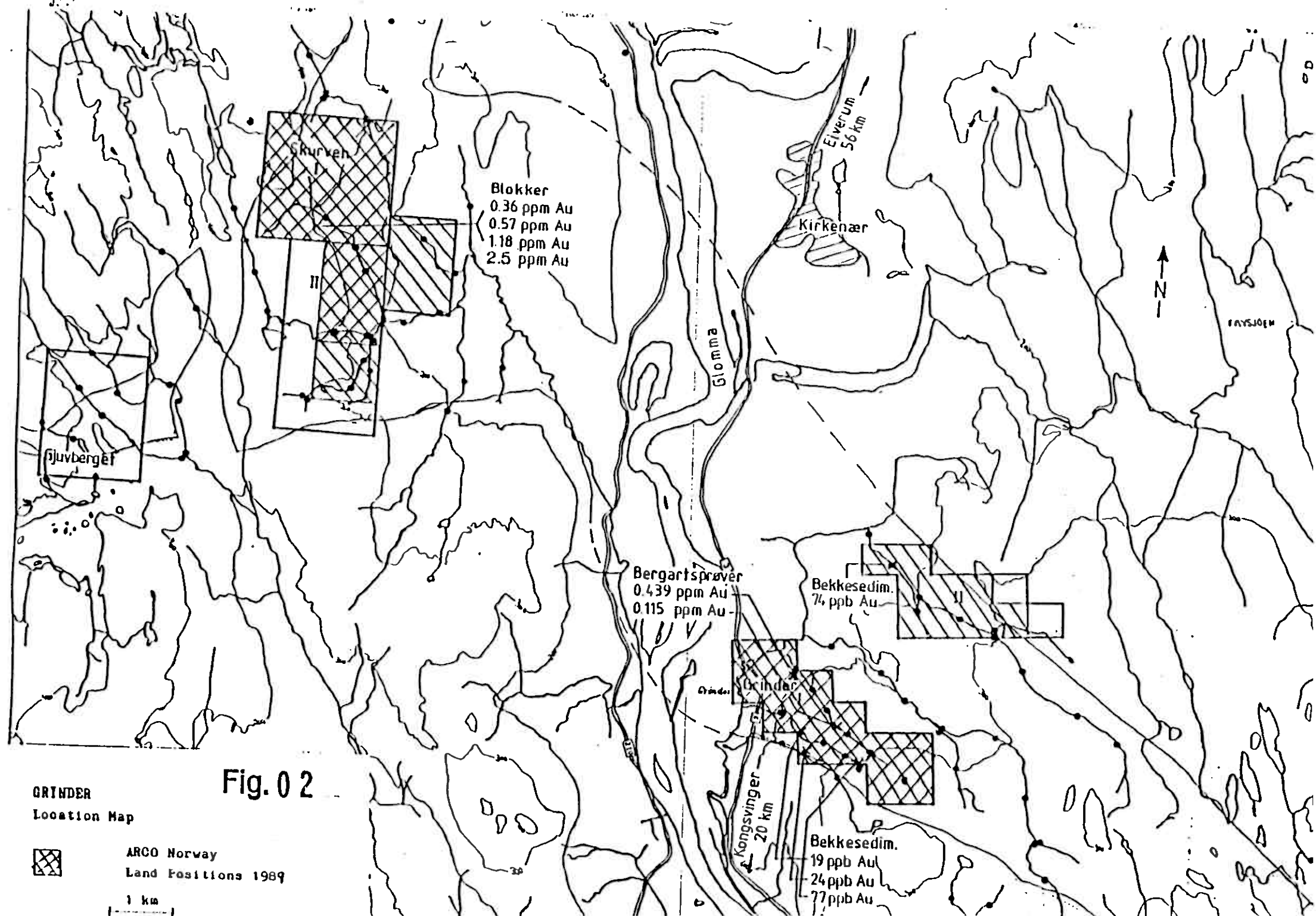
Conclusion:

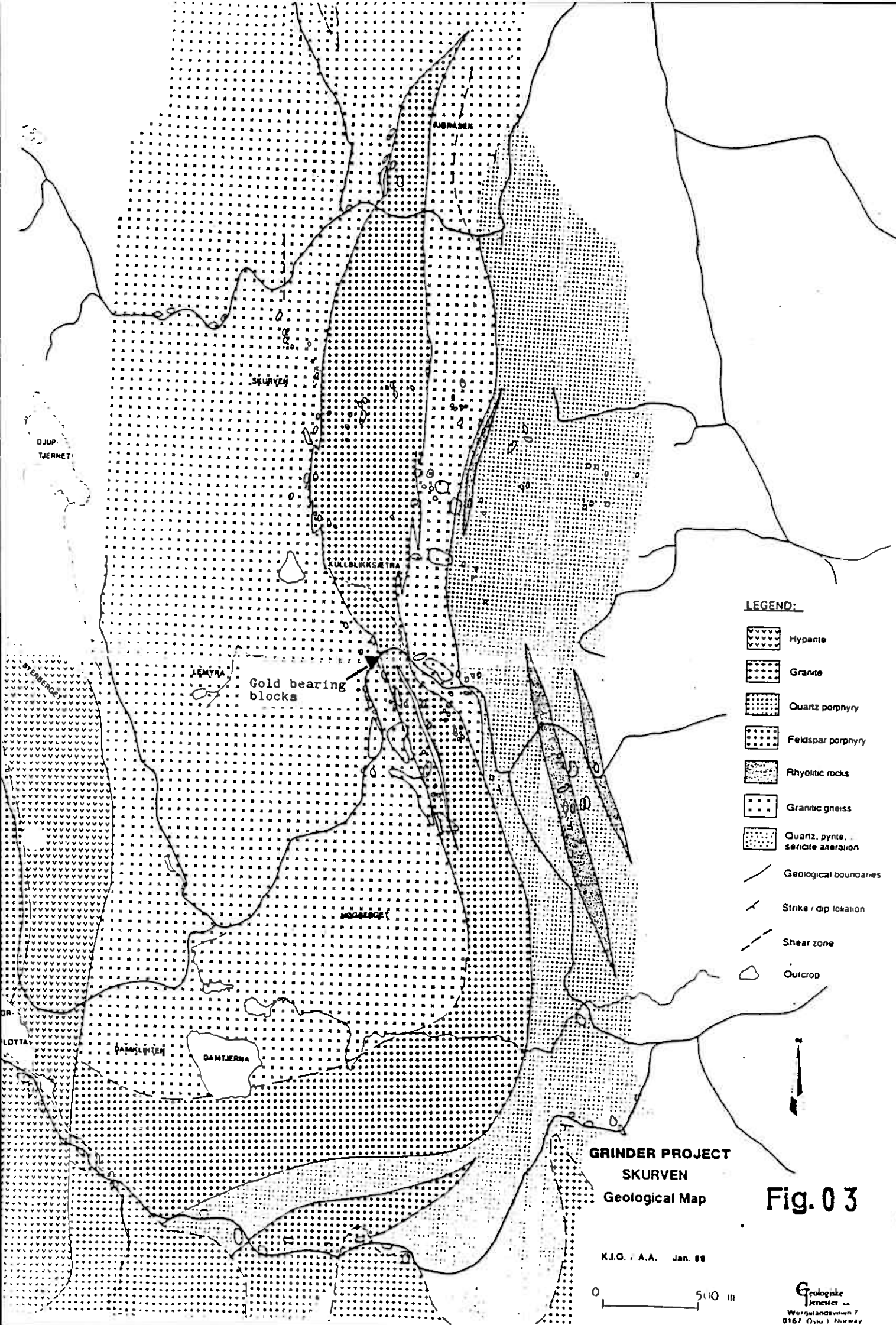
It is concluded that also the Fennoscandian shield still has much to offer regarding goldfinds, but active and modern exploration is required. A short reconnaissance program as the one conducted by ARCO in 1984 quickly indicated a target area like Grinder, and in spite of limited work to date several encouraging results have been produced.

It is our firm belief that further exploration in this area is warranted.












Boye Flood

Dis.1/Grinder.89





LEGEND:

-  Hypenite
-  Granite
-  Quartz porphyry
-  Feldspar porphyry
-  Rhyolitic rocks
-  Granitic gneiss
-  Quartz, pyrite, sericite alteration
-  Geological boundaries
-  Strike / dip location
-  Shear zone
-  Outcrop

GRINDER PROJECT
SKURVEN
 Geological Map

Fig. 03

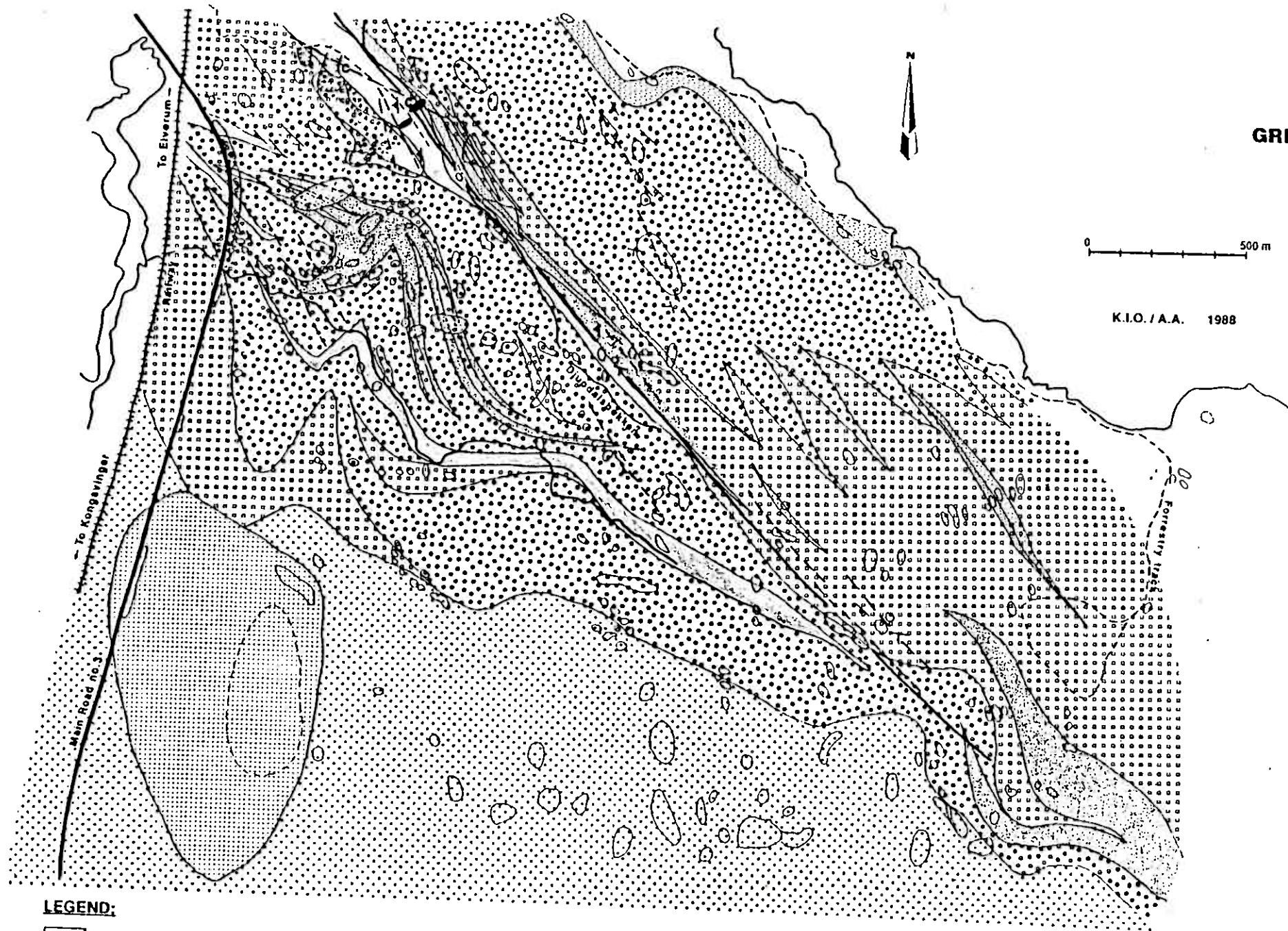
K.I.O. / A.A. Jan. 88

0 500 m

GRINDER PROJECT GRINDER Geological Map

0 500 m

K.I.O. / A.A. 1988



LEGEND:

	Hyperite		Quartz porphyry		Homogeneous, interm rock
	Diabase/greenst.		Feldspar porphyry (Dacke/diorite)		Granitic gneiss
	Q-ser.py all		Finegrained, banded, interbedded		Pyrite/carbonate

○ Exposure

— Strike/dip F₁ fol.

--- Strike/dip F₂ fol.

--- Shears

○ Quarry

— Trench

— Zone with strong development of F₂

○ Hydrocarbons

Fig. 0 4