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INTERN RAPPORT

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RAPPORT VEDRØRENDE:

Geochemical survey in the
Dal'ljadas area, Kautokeino.

FORDELING

OSLO:

KIRKENES:

ANDRE:

RESYMÉ:

Summary

A pyroxene amphibolite with a low grade copper mineralization has been investigated by soil sampling.

A strike length of 7 km of the amphibolite is indicated by airborne magnetics.

Analyses of the soil samples on the elements Cu, Ni and Zn show anomalous values in the southern part of the area.

Further work including soil sampling and ground geophysics is recommended in this area.

A poisoned area in the northern part should also be examined more closely, as this was not explained by this survey.

KOMMENTAR:

GEOCHEMICAL SURVEY IN THE DÆL'LJADAS AREA, KAUTOKEINO, FINNMARK COUNTY

The sampled areas are situated in the Dæl'ljadas area, 15 km west of Kautokeino, on map sheet Raisjav'ri 1833 III. The location of the areas is shown on the map, fig. 1, together with geological features.

General geology of the Dæl'ljadas area

The area consists of metabasic rocks with some metasediments intruded by granitic rocks and pegmatites. Most of the area is covered by thick moraine.

The Caskias group in the east consists of layered amphibolites (metatuffites) and homogenous coarse- to middlegrained amphibolites (metagabbros). Hornblende and plagioclase (oligoclase - albite) are most common. Other minerals are quartz, clorite, biotite, actinolite, ilmenite, magnetite and sphene. The carbonate rock consists of calcite or dolomite with some amphiboles (actinolite- . tremolite) and mica (muscovite, phlogopite)

The Raisædno group consists of pyroxene amphibolites (metamorphic basic intrusives and/or extrusives) with some thinner zones of meta-sediments (quartz- feldspar- micagneiss, garnet-mica shists and graphitic shists). The pyroxeneamphibolites are usually well foliated, dark green-grey or light green (pyroxene-rich) with thin lenses and stripes of white feldspar and quartz. Common minerals are hornblende, clinopyroxene, plagioclase (andesine), biotite, garnet and quartz.

The intrusive granites and pegmatites are pink coarsegrained (pegmatites) or mediumgrained massive and homogenous to weakly foliated. Some remnants of possible older gneisses are observed. The composition is granitic to granodioritic or quartzdioritic.

Mineralizations

Several lokalities with Cu-mineralizations are observed in the pyroxene amphibolites in a zone about 1 km west of the border to the Caskias rocks. Some of the mineralizations are registrated by NGU (Norwegian geological Survey) in 1959 (Æppergielas mineralization). The mineralizations have been further investigated during the regional mapping in 1982 and -83.

This mineralization is a dissemination of chalcopyrite (cp) or bornite (bn) in the pyroxene amphibolite. Biotite and some magnetite are often present. Some less deformed samples show thin veins of quartz and pink feldspars with mineralizations.

Many boulders and 3-4 outcrops with mineralizations are observed in the Æbberjokka area. At locality 654 613 an outcrop in a length of more than 50 metres is disseminated with some bornite and malachite. A small grain of erythrite is also observed. In the outcrops 100-150 m S-SSE some weak mineralizations of cp is registrated. Cp-mineralizations in boulders are not uncommon in the area about 1 km to the south.

The "copper flower" (viscaria alpina) is observed at several places. Three analyses from outcrops and a boulder show 0,65%, 0,54% and 0,39% Cu (GM report 254 A, NGU 1959).

East of the northern top of Dæl'ljadas, loc. 643 658, there is a greater Cu-poisoned area. A small outcrop of biotite-rich pyroxene amphibolite and boulder with cp-mineralizations in thin veins are observed. An analysed boulder gave 0,4% Cu and 0,015 ppm Au.

Stream sediments

The regional stream sediment analyses (Raisjouri map, NGU 1980) show anomalous values in the Æbberjokka area, Cu 110-129 ppm, Zn 60-198 ppm, Pb 15-35ppm and Co 25-32 ppm. Other elements as Ni, Mn, V, Cr, are not quite anomalous.

Geophysics

The geophysical material consists of NGU survey measurements from 1981 reprocessed by Dighem Ltd. 1983. Fig. 1 A.

The pyroxene amphibolite in which the copper mineralization occurs, is marked by a zone of high magnetics. This zone continues along the strike direction throughout the surveyed area.

The only EM-conductor that can be connected with the possibly mineralized area, lies near area no. 6. With this exception, the pyroxene amphibolite has no distinctive conductors.

A strong conductor lies along the border to the carbonate rocks towards the east. In the Caskias Group rock further east, there are both conductors and magnetic zones, that follow the strike direction.

The granites and pegmatites west of the mineralized rock unit, are shown by their lack of both good conductors or magnetic zones.

Soil samples

The number of samples totals 177, taken in profiles at intervals of 25 m with length varying from 200-400 m.
The sampled horizon is the C-horizon. The average sample depth is 0.5 m.

There are six profile areas, covering 7 km in NNW direction (the strike direction of the rocks).

The bedrock in this zone consists exclusively of the magnetic pyroxene amphibolite, which has mineralized outcrops in the southern part (See fig. 1).

The samples are analysed with respect to the elements Cu, Ni and Zn. The results are shown on figures 2-6.

Remarks on the analyses

Nickel: The highest nickel value is 185 ppm, found in area no. 5. Seven samples, from areas no. 3, 5 and 6, contain more than 100 ppm, which is anomalous compared to the 3-30 ppm common in most of the samples.

Zinc: One sample in area no. 5 contains 62 ppm Zn, and one in area no. 6 has 60 ppm. The majority of the samples has less than 30 ppm, while from areas no. 1, 4, 5 and 6 have Zn values between 30 and 60 ppm.

Copper: Moving average values have been computed for this element in the following manner: The mean value of three neighbouring samples along the profile is computed and represented on the middle sample point. The values are represented on figures 7-11 with contours drawn at increasing intervals. As shown in the figures, the main anomalies are found in areas no. 5 and 6. The maximum real value is 2932 ppm Cu, found in profile ON, area no. 5.

Correlations:

Some correlation seems to exist between the elements.
High values will tend to occur in all three elements, but there are exeptions. In area no. 3, there are fairly high nickel values in several samples, while the zink and copper content is low. In area 4, slightly highes values of all three elements occur apparently as random.
In the western part of the ON profile in area no. 5, there are high nickel and zinc values in samples with low copper content.

The samples with high copper content in areas no. 5 and 6, however, also have high values for nickel and zinc.

Conclusions

A zone of high magnetism is related to a copper-bearing pyroxene amphibolite belonging to the Raisædno Group.

The analyses of samples from area no. 1 give no explanation of the poisoned zone in this area. Further sampling is required to get more information on the cause of the poising.

Anomalous values occur in the southernmost part of the investigated area. In this part there is also copper mineralization in outcrops and one possible EM-anomaly. This area should be examinated more closely by soil sampling and ground geophysics.

LEGEND:

- gr. Granites, pegmatites

Caskias group.

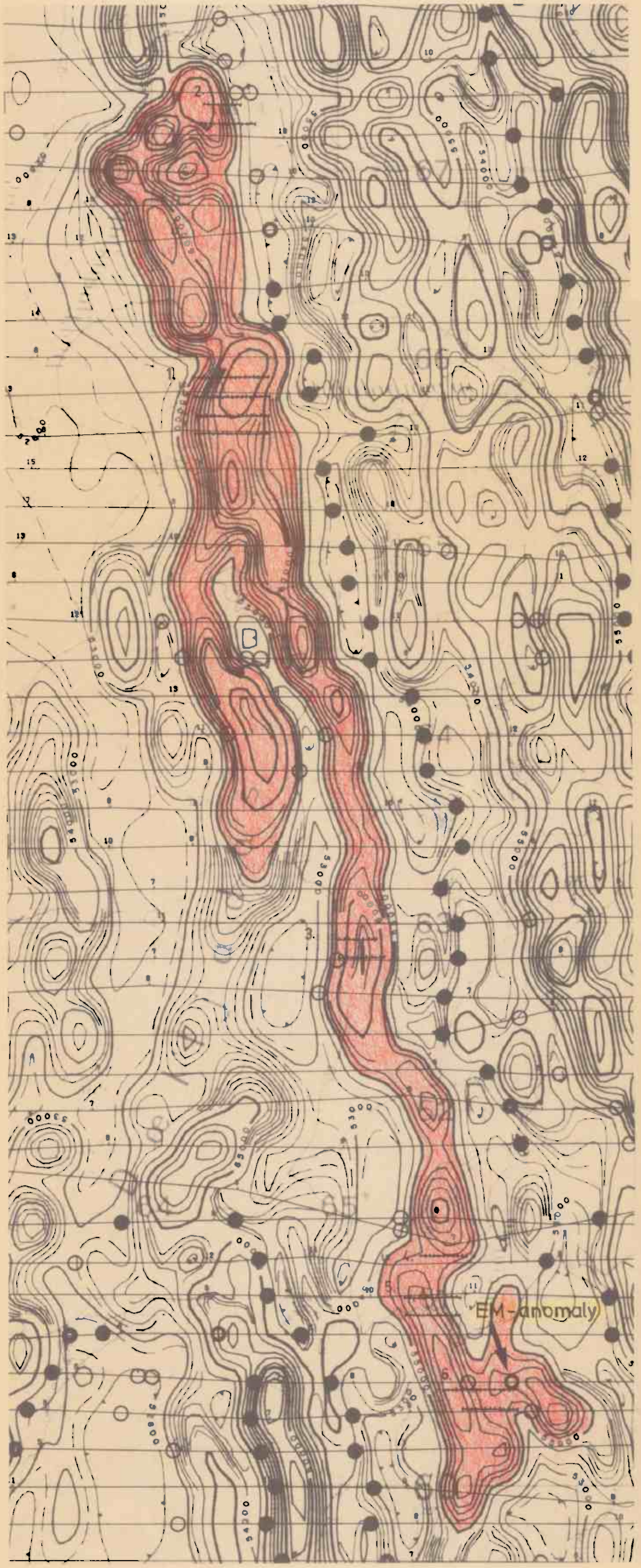
- la. Layered amphibolites
- ha. Homogenous amphibolites
- cr. Carbonate rocks

Raisædno group.

- pa. Pyroxene amphibolites
- ms. Metasediments

- Soil sampling profile
- bn Copper showing
- Poisoned area
- Outcrop
- Rock boundary certain/uncertain
- Strike (360° division) and dip (90° division)
- Boulder

Dæl'ljadas area Geology Soil sampling	Scale 1:20000
	Obs. KS.N.
	Draw. K.B. 11/83
	Trac. H.B. 11/83
PROSPEKTERING A/S	Fig.1



LEGEND

Soil Sample Profile

Electromagnetics

EM anomalies are graded as to the probability that they reflect bedrock conductors. There are four grades as follows:

Symbol	Probability Grade	Probability Rating
●	4	> 90
◉	3	75 - 90%
◎	2	60 - 75 %
○	1	40 - 60 %

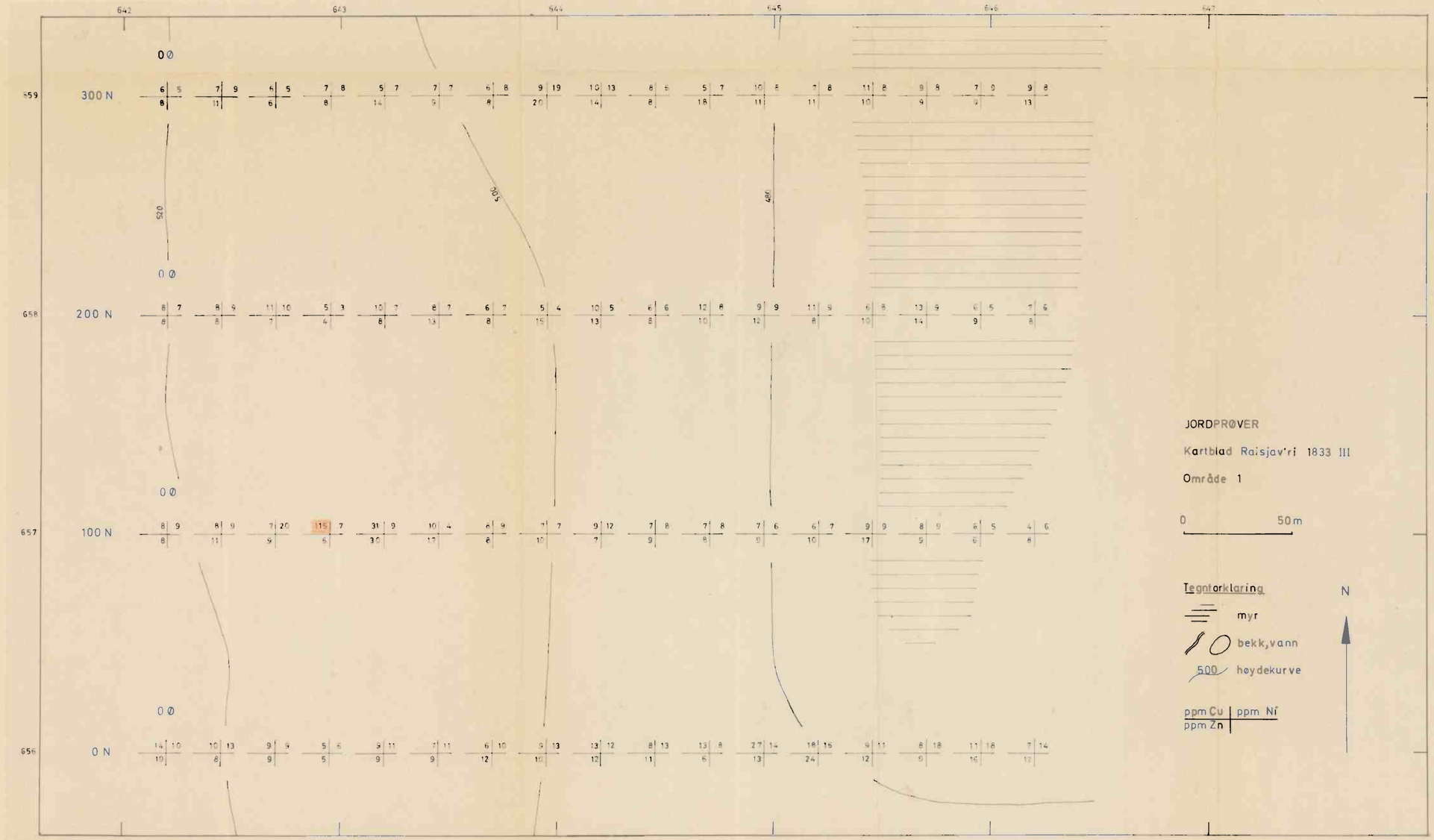
Magnetics

Isomagnetic lines (enhanced field)

5000	5000	nT
1000	1000	nT
200	200	nT
	100	nT

magnetic depression

DÆL'LJADAS Electromagnetics and enhanced magnetics Survey flown by NGU 1981. Reprocessed by Dighem Ltd. 1983.	Scale 1: 20 000
PROSPEKTERING A/S	Fig. 1A



LEGEND

Bog

Stream, lake

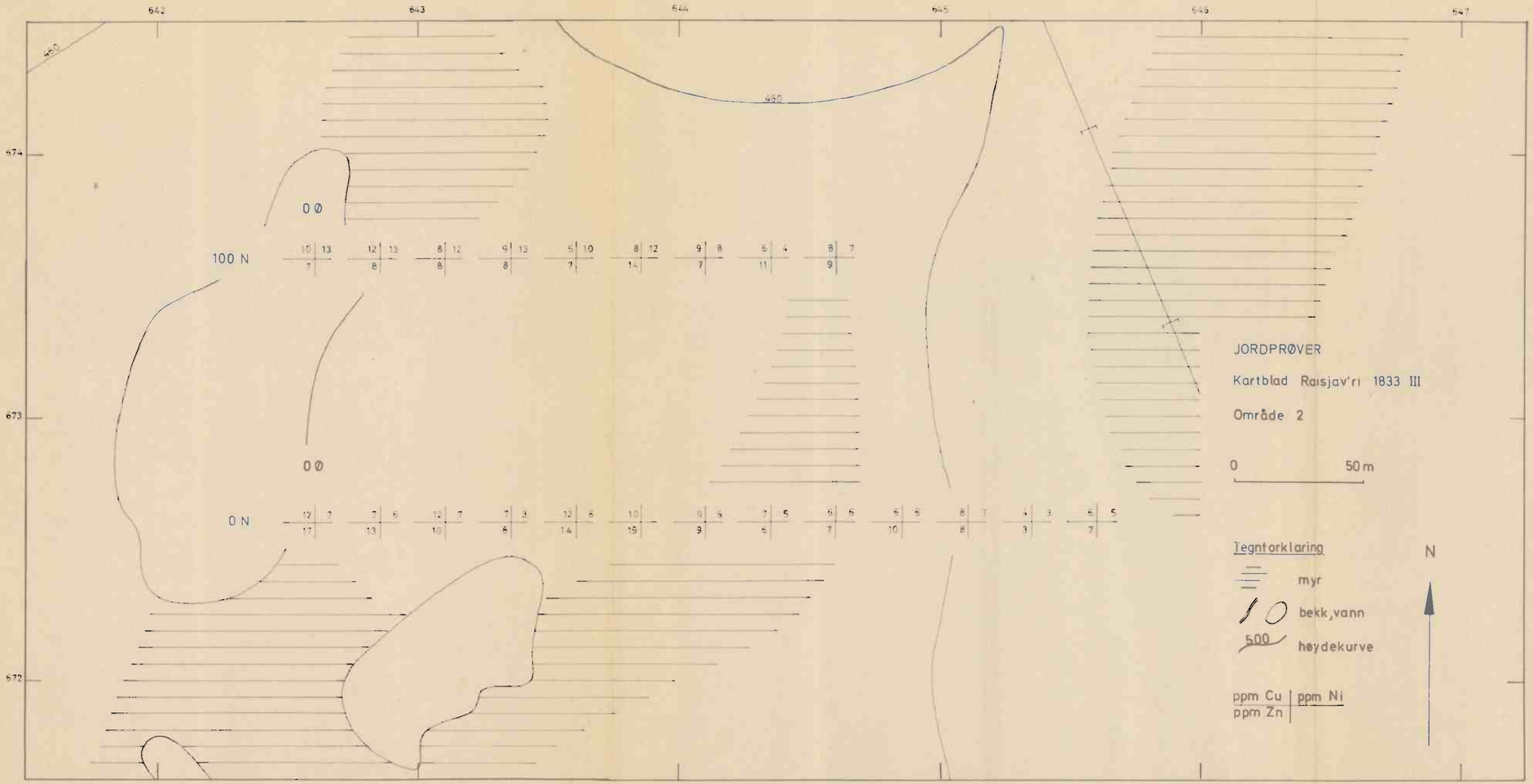
500 Elevation contour

ppm Cu | ppm Ni
ppm Zn

0 50m

N

Soil samples Area number 1. Dæl'ljadas	Scale 1:1250
	Obs.
	Draw. K.B. 11/83
	Trac. H.B. 11/83
PROSPEKTERING A/S	Fig 2.



LEGEND

Bog

Stream, lake

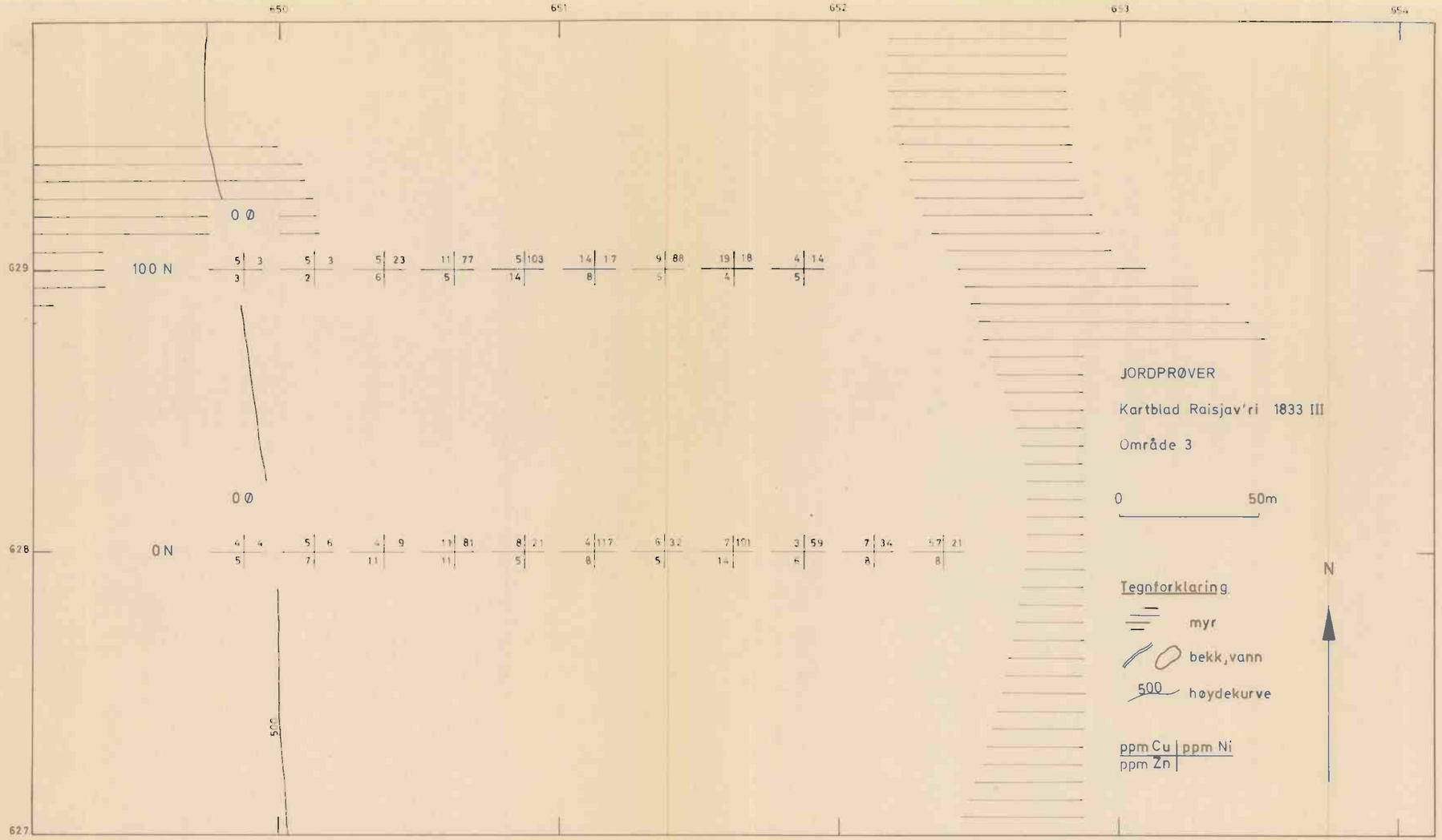
Elevation contour

ppm Cu | ppm Ni
ppm Zn

0 50 m

N

Soil samples Area number 2 Dæl'ljadas	Scale 1:1250
	Obs.
	Draw. K.B. 11/83
	Trac. H.B. 11/83
PROSPEKTERING A/S	Fig. 3.



LEGEND:

Bog

Stream, lake

500 Elevation contour

ppm Cu | ppm Ni
ppm Zn

0 50m

N

Soil samples Area number 3. Dæl'ljadas	Scale 1:1250
	Obs.
	Draw. K.B. 11/83
	Trac H.B. 11/83
PROSPEKTERING A/S	Fig. 4.

653 654 655 656 657

612 611 610 609 608

Område 4

50 Ø

0 N

147	19	63	20	22	5	42	13	40	33	11	5	27	12	21	52	12	8	12	8	215	11
31		12		7		13		19		7		10		35		8		8		7	

Område 5

0 Ø

100 N

30	17	22	12	13	22	55	22	5	2	6	2	13	12	37	15	310	52	873	29	74	7	100	21	1286	55
13		13		11		15		3		3		16		8		17		20		7		9		20	

500

0 Ø

0 N

23	161	57	46	14	52	3	185	11	8	48	7	29	4	11	4	7480	52	78	13	398	123	2932	78	51	27
62		36		15		33		7		5		1		5		10		11		33		20		24	

JORDPRØVER

Kartblad Raisjav'ri 1833 III

Område 4 og 5

0 50 m

Tegnforklaring

myr

bekk, vann

500 høydekurve

ppm Cu | ppm Ni
ppm Zn |

N

LEGEND

Bog

Stream, lake

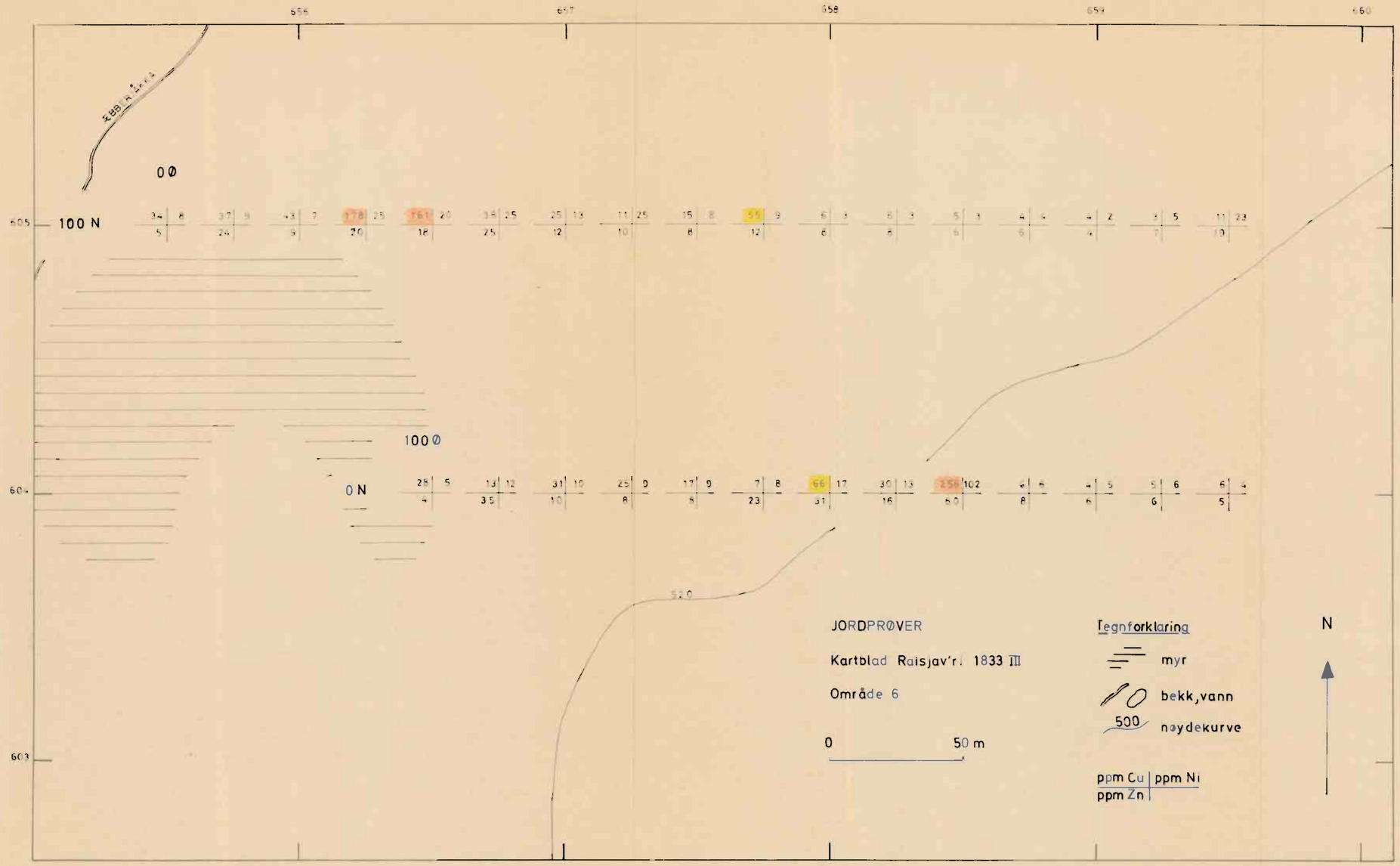
500 Elevation contour

ppm Cu | ppm Ni
ppm Zn |

0 50m

N

Soil samples Area number 4,5. Dæl'ljadas	Scale 1:1250
	Obs
	Draw. K.B. 11/83
	Trac H.B. 11 /83
PROSPEKTERING A/S	Fig. 5



LEGEND

Bog

Stream, lake

500 Elevation contour

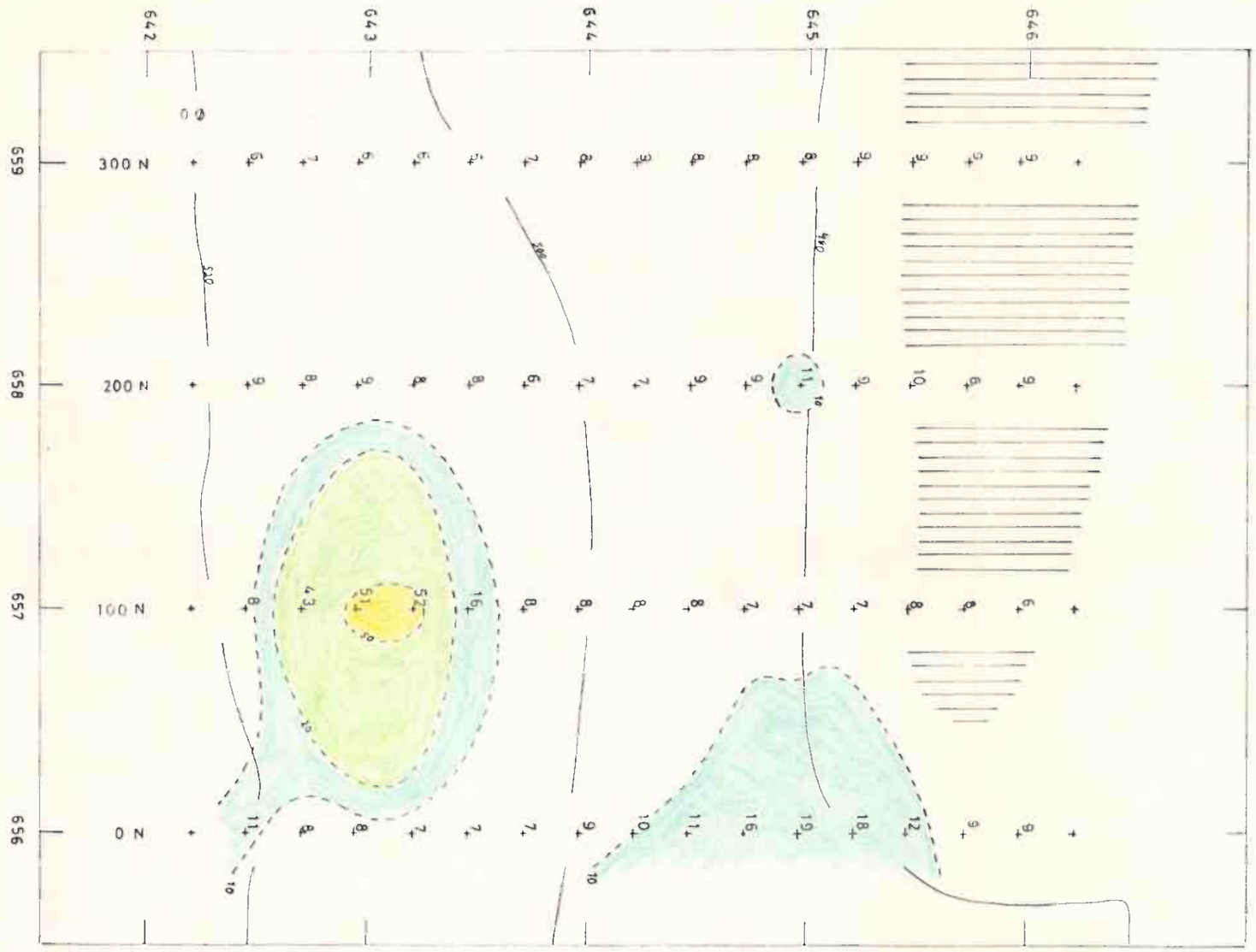
ppm Cu | ppm Ni
ppm Zn

0 50m

N

Soil samples Area number 6 Dæl'ljadas	Scale 1:1250
	Obs
	Draw. K.B. 11/83
	Trac H.B. 11/83
PROSPEKTERING A/S	Fig. 6.

AREA 1.

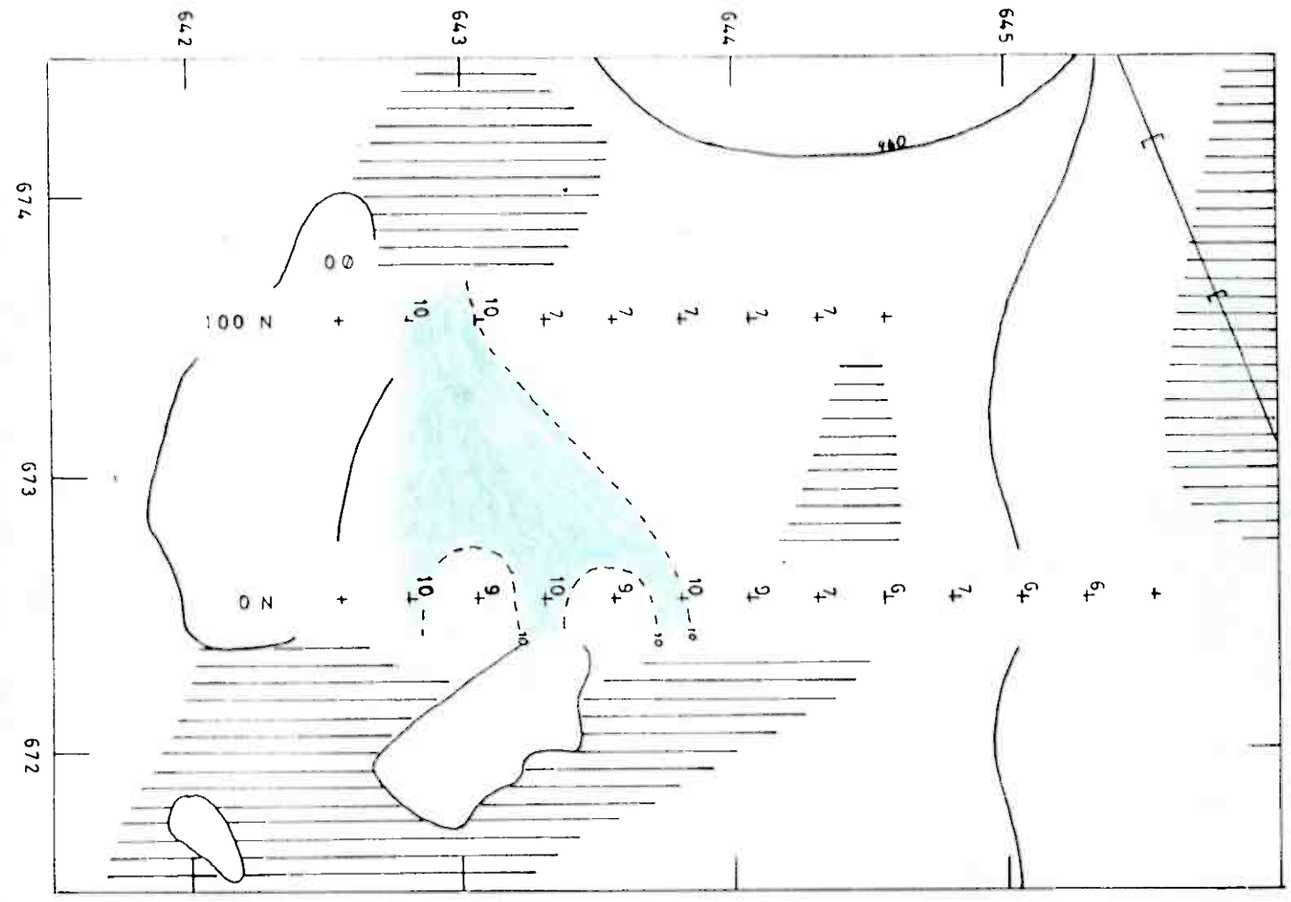


LEGEND

- bog
- stream lake
- elevation contour
- + sample point
- contoured Cu moving average ppm
- < 10 ppm
- 10 - 20 ppm
- 20 - 50 ppm
- 50 - 100 ppm
- 100 - 500 ppm
- 500 - 1000 ppm
- > 1000 ppm

SOIL SAMPLES Area number 1 Dætljadas Contoured moving average Cu, ppm	Scale 1:2500
	Obs
	Draw K.B. 11/83
	Trac H.B. 11/83
PROSPEKTERING A/S	Fig -7

AREA 2.



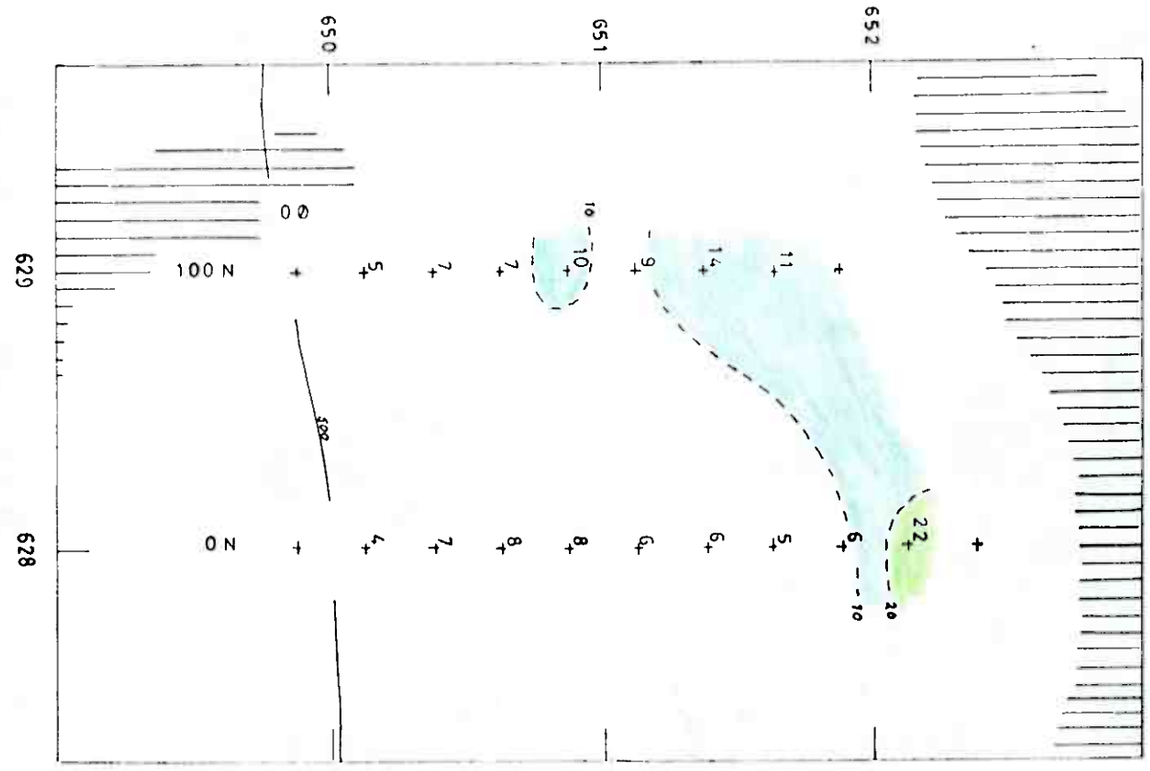
LEGEND

- bog
- stream, lake
- elevation contour
- sample point
- contoured Cu moving average, ppm

	< 10 ppm
	10 - 20 ppm
	20 - 50 ppm
	50 - 100 ppm
	100 - 500 ppm
	500 - 1000 ppm
	> 1000 ppm

SOIL SAMPLES Area number 2 Dælljadas Contoured moving average Cu ppm	Scale 1:2500
	Obs
	Draw K.B. 11/83
	Trac K.B. 11/83
PROSPEKTERING A/S	Fig - 8

AREA 3.



SOIL SAMPLES Area number 3 Dælljadas Contoured moving average Cu. ppm	Scale 1:2500
	Obs
	Draw K.B. 11/83
	Trac K.B. 11/83
PROSPEKTERING A/S	Fig - 9

AREA 4, 5

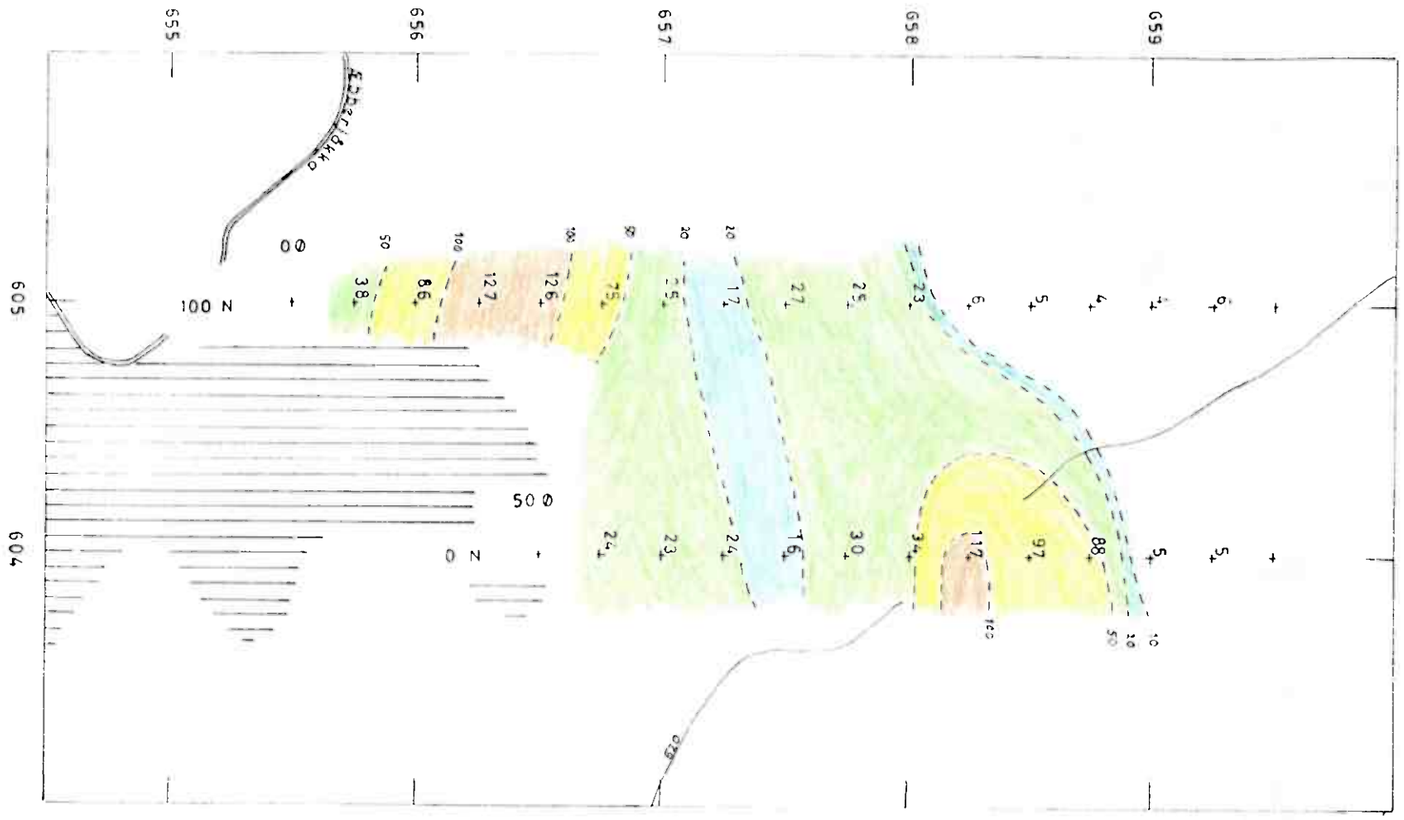
LEGEND

- bog
- stream, lake
- elevation contour
- sample point
- contoured Cu moving average, ppm

	< 10 ppm
	10 - 20 ppm
	20 - 50 ppm
	50 - 100 ppm
	100 - 500 ppm
	500 - 1000 ppm
	> 1000 ppm

SOIL SAMPLES Area number 4,5 Dælijadas Contoured moving average Cu. ppm	Scale 1:2500
	Obs
	Draw K.B. 11/83
	Trac H.B. 11/83
PROSPEKTERING A/S	Fig - 10

AREA 6.



LEGEND

- bog
- stream, lake
- elevation contour
- sample point
- contoured Cu moving average, ppm

	< 10 ppm
	10 - 20 ppm
	20 - 50 ppm
	50 - 100 ppm
	100 - 500 ppm
	500 - 1000 ppm
	> 1000 ppm

SOIL SAMPLES Area number 6 Dælljadas Contoured moving average Cu ppm	Scale 1:2500
	Obs
	Draw K.B 11/83
	Trac K.B 11/83
PROSPEKTERING A/S	Fig - 11