Bergvesenet

Postboks 3021, 7002 Trondheim

Rapportarkivet

Bergvesenet rapport nr	Intern Journal nr	Internt arkiv nr	Rapport lokalisering	Gradering
BV 1147			Trondheim	**Åpen**
Kommer fra ..arkiv	Ekstern rapport nr	Oversendt fra	Fortrolig pga	Fortrolig fra dato:
USB	Syd 846			

Tittel

Kvæfjord Kopperforekomster, Berg gruveområde, Hinnøy

Forfatter	Dato	Bedrift
Johs. Færden	18.11 1975	Sydvaranger A/S

Kommune	Fylke	Bergdistrikt	1: 50 000 kartblad	1: 250 000 kartblad
Kvæfjord	Troms	Finnmark	12321	Svolvær Narvik

Fagområde	Dokument type	Forekomster
Geologi Geofysikk		Berg grube
Råstofftype	**Emneord**	
Malm/metall	Cu	

Sammendrag

I rapport av 1973-12-18, Kvæfjord Kobberforekomster, Hinnøya, Troms, er konklusjonen at videre arbeide bør konsentreres om, Berg grubeområde. Videre at det bør foretas geologisk kartlegning, enklere geofysiske målinger, geokjemi og prøvetagning.

Av dette er nu geologisk kartlegging og geokjemi utført. Efter et negativt resultat av disse to disipliner, finner vi ikke grunnlag for å foreta geofysiske målinger og har heller ingen objekter å prøveta.

A/S Sydvaranger.
Prospekteringsavdeling.
Nordraaks vei 2. 1324 Lysaker, Norge.
Tlf: 538976 - 120518

1147

INTERN RAPPORT.

DATO: 1975-11-18	RAPPORT NR: 846	KARTBLAD	Antall sider —"— bilag

Industridepartementet - Bergvesenet
Undersøkelse av Statens Bergrettigheter
Postboks 3006, 7001 Trondheim

SAKSBEARBEIDER Johs. Færden

RAPPORT VEDRØRENDE:

KVÆFJORD KOBBERFOREKOMSTER
Berg Grube-område,
Hinnøy, Troms.

RESYMÉ:

Det ble foretatt orienterende undersøkelser av Kvæfjord Kobberforekomster i 1973 og geologisk kartlegning og geokjemisk prøvetagning i 1974.

Den tidligere kjente malmmengde er liten, og mulighetene for funn av ny malm av økonomisk interesse er svært små.

Vi er kjent med at Industridepartementet vil foreta VLF-målinger over Berg grube. Vi avventer disse resultatene før vi tar endelig stilling til vårt leieforhold med Staten.

FORDELING

OSLO:

- ☐ Hovedkontoret
- ☐ Prospekteringsavd.
- ☐ Prof. Bugge
- ☐
- ☐
- ☐
- ☐
- ☐
- ☐

KIRKENES:

- ☐
- ☐
- ☐
- ☐
- ☐
- ☐
- ☐

ANDRE:

- ☐ Kommüneingeniør
- ☐
- ☐
- ☐
- ☐
- ☐
- ☐

KOMMENTAR:

Industridepartementet - Bergvesenet
Undersøkelse av Statens Bergrettigheter
Postboks 3006, 7001 Trondheim

Ide Bergmans

Bergsgrufvan.

Sedd 1:800

Skala 1:800

Erik G. Svanberg

1903

KVÆFJORD KOBBERFOREKOMSTER, BERG GRUBEOMRÅDE, HINNØY, TROMS.

Innledning.

I rapport av 1973-12-18, Kvæfjord Kobberforekomster, Hinnøya, Troms, er konklusjonen at videre arbeide bør konsentreres om, Berg grubeområde. Videre at det bør foretas geologisk kartlegning, enklere geofysiske målinger, geokjemi og prøvetagning.

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Beliggenhet.

Selve Berg grube ligger 800 m i luftlinje rett nord for Borkenes i Kvæfjord, ca. 100 m.o.h.

Tidligere arbeider.

Undersøkelsesarbeider, stolldrift og synker er utført av:
C. Anker, ca. 1895
Bache-Wiig, 1899-1900
Konsul Persson, 1902-1903
Norsk-Svensk selskap, 1916-1917.

Resultatet av undersøkelsesarbeidene ble et malmareal på 50 m lengde x gjennomsnitt max. 2 m mektighet = max. 100 m^2 med 1,5-2% Cu. Motstående skisse er av E.G. Svanberg 1903.

Det er flere skjerp - korte stoller i strøkretningen.

Nupneset
Bremnes
Olsboen
Bremnes-
högda
Haugtangen
Kasfjorden
Nupmyra
Nupen
Snerneset
Skoglund
Sildolje
Skjerstad
Flesungan
Aspenes
Myra
Böneset
Bremneso
Myrvik
Kasfjord
Jessevollen
Reinspælen
Meraftesfj
Finnmyra
Grasmyra
Storehornet
Holmen
Bukta
Bedehus
Nantind
Skjerstad-
dalen
Laagfj
Högfj
Raumoldheia
Utstrand
Skjerstaddalso
Daleskallen
Torkhaugen
Storlitind
Surenaasen
Dale
Borkenesaasen
Svartaasen
Trastad
Leaasen
Blomsaas-
myra
Stormyra
Berg
Meieri
Borkenes
Sildolje
Kvæfjord
Toppen
Blomlia
Strand
Lundebogen
Skallen
Gaura
Vikelandselva
Bedehus
Hokland
Hamn
Vikeland
Vikelandsfjell
Vebbestad
Hundstad
Hundstadneset
Molneset
Öysundet
JORDEN
Vikvaagen
Vebbestad Sr
Straumen
Kleiva
Rydningen
Rosaasen
Hundstad Sr
1:50000

Egne arbeider.

Swainbank, Stenmark og Nordrum besøkte Kvæfjord noen dager i 1973. Resultatet av dette foreligger i nevnte rapport av 1973-12-18.

I 1974 ble området Berg - Raumoldheia geologisk kartlagt i M 1:10000av McPherson og Stenmark.

Samtidig ble dreneringsområdet fra Raumoldheia mot syd og vest geokjemisk prøvetatt (bekkesedimenter). Noen få prøver ble også tatt nord for Raumoldheia, se motstående kart. Prøvetagningen ble foretatt av Stenmark og Pantdalsli.

Ertsmineraler.

Ifølge Nordrum er ertsmineralene ved Berg grube kobberkis og magnetkis med mindre mengder svovelkis, magnetitt og molybdenglans.

Resultatet av undersøkelsene.

McPhersons rapport følger vedlagt, bilag 1.

Av rapporten fremgår at hva man har av interessant mineralisering finnes i amfibolitt og fortrinnsvis ved kontakt mot kvarts-feltspatbergarter. Det ble ikke funnet mineralisering utover det tidligere kjente.

Han anbefaler mer detaljert kartlegging av amfibolittdraget og grubeområdet, røsking og prøvetagning av mineralisert amfibolitt og jordprøvetagning. Ham mener også at et slikt program bare kan gis lav prioritet.

Resultatet av den geokjemiske prøvetagningen er behandlet av N.B. Hollander, bilag 2. Han finner det lite sannsynlig at det finnes interessante mineraliseringer i dreneringsområdet.

Konklusjon.

Efter de foreliggende undersøkelser er det lite sannsynlig at vi vil kunne finne malm av betydning ved fortsatte undersøkelser.

Kvæfjord kommune planlegger et boligfelt ved Berg grube. Av den grunn vil Industridepartementet la foreta VLF-målinger over grubeområdet.

Vi avventer resultatet av disse målingene før vi tar stilling til vårt leieforhold med Staten, gjeldende 67 anvisninger i Kvæfjord.

Nr. 5. 5000. 5-74.

Bilag 1

Summary of Examination - Immediate Report

From: R. I. Mcpherson, Bidjovagge

To: J. Færden, Oslo

Date: 29. July 1974

Subject: Berg Mine and Rødmålheia prospects, Kvæfjord.

Conclusions

No encouraging signs of base metal mineralisation have been located beyond the general area of the Berg Mine.

1. Berg Mine and Area.

All copper mineralisation of any interest, mine workings and prospects pits are located in amphibolitic rocks and in rocks of probable pyroclastic origin within a belt generally striking east/west. Economic mineralisation appears patchy and restricted to within amphibolites directly in contact with felsic intrusives.

Contact metasomatic introduction of silica and possibly of sulphur concurrent with intrusion of granodiorite, felsic pegmatite and quartz, appears to have generated these local skarns of pyrrhotite and chalcopyrite. The source of some of the copper may be restricted to and syngenetic within certain beds of amphibolitised tuffs. Ore shoots may therefore be stratabound within amphibolites, localised against intrusive rocks and steeply plunging along the contact of amphibolite beds with intiusive. However, it apears unlikely that the tonnage of any new discovered patch of similar contact mineralisation will exceed $\sim$ 500 - 1000 T perhaps grading 2 - 3 vol % copper sulphides.

Chalcopyrite and malachite in fractured and dioritised (?) granite in very poorly exposed in thick scrub about 400 m NE of K 12 Berg Mine and indicates that interesting copper mineralisation probably extends beyond the immediate area of the mine.

2. Rødmålsheia and Area.

Felesic gneisses are complexly intruded by granite. Pyrrhotite (magnetite) are developed in the hornfelsic and silicified aureole. Only traces of copper are present, probably in the order of 0,01 to 0,1 %.

Recommendations.

1. That Rødmålheia is of no further interest and that no further work be undertaken beyond the belt of amphibolite containing the Berg Mine and several other scattered occurrences of copper mineralisation.

2. That any further work might include:

a) More detailed mapping of the amphibolites and mine area at 1:5.000 scale, including extending reconnaissance further to the east.

b) Concurrent trenching and chip sampling of one or two mineralised locations, perhaps including some representative chip sampling over amphibolites to determine total copper.

c) Scout soil sampling grid.

3. That in terms of the total exploration programme such work be given low priority.

Time Distribution.

Dates 2 - 21 July inclusive were spent in the Kvæfjord area:

8 days: fieldwork

2 days: accomodation search; acquiring base maps and air photos; servicing vehicle.

1 day: lost to rain

4 days: Purchase of equipment for Finnmarksvidda; fitting brake circuit to caravan and obtaining parts.

3 days: Map and rough draught of report.

Data.

Provided by the kommuneingeniøren office: Topographic (økonomisk) sheets 1:10.000 scale. Air photo flight paths J, K, L and M.
Map sheets at 1:5.000 scale are also available.

Geology.

Five lithological units are defined, commencing stratigraphically with possibly the oldest:

Unit 1: Felsic gneiss assemblage.

Assemblage in which mafic gneiss is subordinate to felsic. Mineralogy is essentially quartzofeldspathic with subordinate mafic minerals, biotite in excess of amphibole. The unit contains massive gneiss dominantly granoblastic in texture, and banded gneiss containing schistose - structured

mica - rich layers.
Some of the strongly lineate, even sub-foliate, rocks blotched with mafic, glomeroporphyroblasts and mapped as "granodiorite" alternatively may be orthogneissic components of this unit.
Felsic lithologies also include a leucocratic variety locally moderately rich in sub-to anhedral magnetite, and a small amount of breccia possibly tectonic in origin. Collectively the assemblage is considered paragneissic.

Unit 2: Mafic gneiss assemblage.
Hornblende ($\pm$ biotite) - plagioclase gneiss - commomly finely foliate; subordinate felsic gneiss or amphibolite. This unit is poorly defined, solely by a gross mafic colour index generally lower than in the amphibolite assemblage.

Unit 3: Amphibolite ("greenstone") assemblage.
Contains meta - lithologies probably representative of a mafic volcanic pile: Fine grain igneous textured amphibolite (meta - basalt?), schistose or rather granular amphibolite (meta - basaltic tuff?), occasionally thinly banded with highly siliceous layers (thin cherts?), one or possibly two beds of breccia. Breccia fragments are mostly felsic and finely granoblastic, and are contained within a submicroscopic mafic groundmass. Fragments are extremely angular and vary in size from 1 mm to$\sim$ 3 - 4 cms, and are non-sorted (pyroclast of brecciated chert or sandwacke in volcanic mud matrix?).
Igneous - textured hornblende - plagioclase rocks seen at several localities and in float may represent meta-diabase and diorite.
Preceding units are intruded by the following plutonic/hypabyssal assemblages

Unit 4: Granodiorite assemblage, and

Unit 5: Granite assemblage.

In the granodiorite assemblage the rocks mostly contain quartz, plagioclase and mafic minerals ranging 15 to 40 - 45 vol %.
Megascopically these rocks appear pseudo - coarse textured as they mostly contain patches or "clots" of mafics.
Structurally they range from very weakly lineate with igneous or relic igneous textures to, in a few localities, more strongly foliate orthogneissic rocks of possibly older origin. Mesoscopically most granodiorite contains rather platy glomeroporphyroblasts of biotite and hornblende, distributed lineate through a finely granoblastic quartzofeldspathic groundmass. Compositional extremes possibly include diorite or monzodiorite, and certainly hornblende granite (potassic feldspar and hornblende).

Fine to medium grain biotite or hornblende granite, aplite, barren K-spar pegmatite and vein quartz are included in the granite assemblage. Igneous textures and structures are most common. A lineation is particulary evident in fine grain granite at all angles to regional foliation and is probably of intrusive origin.

Regional Structure.

At least some of the lineear structures inferred from air photographs are faults. The area mapped is divided north from south by the east - west erosional depression Dalelva - Surenassmyra - Vikelandselva/Kroketåa (see 1:50.000 Harstad). The distribution of lithologies and the drainage morphology suggests that this depression is excavated along the trace of a south (?) dipping thrust fault.
To the north the trace of at least several linear E - W structures, and recognition on Rødmålheia of mylonite cropping out on one of these, suggest thrust faulting from north to south. The regional attitude of foliation within the gneisses is not well defined but these generally dip north.
To the south gneisses mostly dip south at 40 - 60 degrees. Linear structures in this area trend NE and again the distribution of lithologies, and the trace of several of these structions suggest some earlier thrusting from SE to NW; however this is largely conjectural.

Age Relationships.

It is inferred that the felsic gneiss assemblage largely underlies but probably interdigitates the mafic gneiss assemblage. Both appear to be overlain by the greenstone amphibolite assemblage.
All of the foregoing assemblages are cut by granodiorite and obscured but 600 m ENE of Berg Mine granodiorite hosts many xenoliths of mafic gneiss.
A general impression is that, close to unfaulted contacts within mafic gneiss or amphibolite, the colour index within the instructive increases to as high as 40 - 50 vol % suggesting some partial assimilation.
Granite and aplite at Rødmålheia and on Surenåsen contain swarms of xenoliths, both as splinters and as partly absorbed patches, and some "migmatite" vein injection by granite into the biotite - quartz - plagioclase gneissic assemblages is evident. In the area of the Berg Mine actual contacts between granodiorite (contaminated granite?) and the amphibolite assemblage are sometimes pervasive and "soaked" in appearance. But pegmatites, both sill and dikeform are generally uncontaminated and exhibit sharp planar contacts with their hosts.

The relation of granodiorite, largely metamorphosed, to the granite assemblage, largely weakly to non-metamorphosed, is problemmatic, but the lack of metamorphism suggest the granite assemblage to be younger. The writer favours multiphase rather than totally separate phases of injection, with granite, aplite, felsic pegmatite and vein quartz injected late in the regional metamorphic cycle and with subjacent hornfelsing especially evident in host rocks of similar composition.

Mineralisation.

1. Rødmålsheia Prospect.

Much limonite - stained soil and some scree is widely exposed on the south flank of this hill. Reconnaissance mapping indicates a zone 50 to 100 m x 2 km of weak pyrrhotite skarn mineralisation in hornfelsic gneiss, with possibly local sulphide concentration to 30 vol % in hornfels. Only two or three small patches of these strongly mineralised goethite - stained rocks crop - out; generally the exposure is poor.

Clearly the zone is considerably injected by granite with subjacent felsic gneisses generally hornfelsed and locally strongly silicified. Biotite has been replaced by pyrrhotite, possibly after pyrite, with Fe in excess of S present as magnetite.

At a locality about 400 m SE of the summit of Rødmålsheia a patch (5 x 2,5 m) of pyrrhotite hornfels is exposed in the bank of a steep gully, and carries a trace ($< 0{,}5$ vol %) of chalcopyrite and/or iridecent pyrrhotite.

By analogy, in the Kaikoura Ranges in New Zealand large pyrite "gossans" are exposed in the deeply dissected contact zone of multiphase mafic and fels intrusives - the largest in steep bluffs 300 m high x 2 - 3 kms length. These carry 100 to 1000 ppm Cu. The writer anticipates that Rødmålsheia is a similar situation.

Small exposures of similary mineralised hornfelsic rocks crop out on the Borkenes - Surenåsen track. In a roadside pit at Gammeltorvhågen acid leaching has reduced much of the near - surface rock to a porous aggregate of granular quartz, sericite - muscovite and films of gypsum rosettes.

2. Berg Mine area and the Amphibolite belt.

Copper sulphide mineralisation is inferred to be mostly restricted to the belt of amphibolite rocks. Furthermore it is restricted to wall rocks in contact with both granodiorite and pematite, and is only very sparse within or absent from the intrusives in contact.

Rather sparse traces of copper mineralisation were located on reconnassance, usually narrowly restricted to amphibolite rocks in contact with pegmatite, sheets of vein quartz or granite, or to a sparse scatter of grains or small pods ($\sim$ 1 - 2 cm) within the margins of these. Several shallow prospect pits, one south of Surenåsen and another 700 m NW of the Berg Mine, at Trastadåsen, testify both to the smallness of these occurrences and to the intensity of prospecting. About 400 m NE of the K 12 adit at Berg Mine a few rocks very poorly exposed in rather dense secondgrowth bush consist of fractured dioritised (?) granite containing pods of finely granular chalcopyrite and strong films of malachite on the fractures. This area could be of interest and a possible extension of the Berg mineralisation - see map: red circle midway between Trollvasshågen and K 12.

The Berg Mine area was examined and localities K 8, 9, 10 and 12 relocated and plotted - see map. A number of points emerge which have a bearing on the nature and genes of the mineralisation:-

Locality Notes.

K 10. Amphibolite intensely brecciated and riddled by aplite. Fragments altered to green aggregates of epidote - chlorite. Intense silicification of wall rock; bunches, one of 20 cm width of massive sulphide: cpy-pyr-mt. In best mineralisation, ratio Cu:Fe = 3:1.

Structuring - fracturing: S 80 D 60 N.
Intense silicification in outcrop 10 m south of K 10, where fracturing and general linearity : S 80 D 50 N.

K 9. Portal of adit: Strike about 10° W of N. Shear- structured hornblende granite/granodiorite strikes 80° and dips steeply west in the footwall east of the portal. Hanging wall is in amphibolites

K 8 Prospect pit.

Dikeform coarse granodiorite in footwall to south, becoming finely aplitic near contact. S 78 D 70 N. Several scales of stained granodiorite embedded beyond in hanging wall to north. Amphibolites in HW dip 76° N and are compressed against the intrusive into a tight antiform on which classic axial plane facturing strikes 62°. The fold plunges 44°SW and the core carries jarosite bloom and is mineralised. Silicification is intense and extends across the HW beyond the fold crumpled beds, through finely layered amphibolite into coarser amphibolite finely impregnated with disseminated chalcopyrite. Four samples were collected from the HW:

a) from on footwall: scale of coarse granodiorite mineralised with chalcopyrite.

b) from close to footwall: intensely silicified hornfelsic rock.

c) from outer limb of fold: finely layered amphibolite.

d) from beyond intensaly silicified contact zone: amphibolite impregnated with chalcopyrite.

K 12 area. Adits at K 12, prospect pits above K 12, mullock dumps, lowermost adit some distance below K 12 and closest to the fjord.

At K 8 and K 9 granodiorite is footwall to mineralised amphibolites, but in the area of K 12 is in the hanging wall above mineralisation. K 12 itself is of particular interest. Trenching leads into adits on three levels and clearly exposes a strong hanging wall on the west, of hornblende granite/granodiorite, which dips 48° W and strikes,variably, about north - northeast. Contact with the footwall is shear-brecciated. The higest adit is only about 5 m deep. At the middle level, actually marked as K 12, the HW consists of coarse non - foliate granodiorite and dips 36° W. The footwall on the east contains silicified amphibolites and quartzose rock, both containing cpy, pyr and a trace of bornite, and dips ~ 60°W.

Students at the Hagebruksskole report K 12 to penetrate ~ 100 m, then to extend sharp left for ~ 100 m, possibly connecting by raises to K 9, but this is only speculation. The lowermost adit stops at a depth of 20 m. The contact is stoped - through between the middle and lower levels, and a reverse sloping winze extends a short dep below the lowest adit.
Both the access trench and adits at K 12 expose silicified and mineralised amphibolites in the footwall on the east. Structuring indicates that this strike 80°, dip 54° N, so that the workings cross-cut the foliation (bedding?)

A general impression is that amphibolite is interbedded with felsic layers possibly rich in primary quartz, and that secondary silicification has selectively more intensely permeated, both on the scale of bedding and of individual laminae, the more felsic layers concomitant with the overprint of a little brecciation.

Clearly amphibolites carry most chalcopyrite, patchily ~3 - 5 %, with only a slight impregnation of felsic intrusives. At the entrance to the uppermost adit, impressive bleeding of malachite and azurite has masked amphibolite impregnated with 2 - 3 % cpy, probably over a width of 6 m.

In addition to the lithologies described, the dumps also carry:
pyr and cpy - impregnated siliceous material containing aggregates of biotite - epidote - chlorite, probably replacing fragments of amphibolite; quartz - biotite - magnetite hornfels; mafic granodiorite contaminated with clasts of biotite amphibolite; amphibolite, possibly basaltic and impregnated with biotite and 2 - 3 % cpy.

Genetic Affinity of Mineralisation in Berg Mine area.

Ores are finely granular typical of metamorphic terrain. The mineralisation is predominantly within amphibolite or schistose amphibolite which is intensely silicified and in contact with intrusives. Possibly the mineralisation appears strongest where intrusives are HW or else where the host is crumpled into an adjacent structural trap.
Existing adits are little more than stopes and most certainly crosscut the mineralised amphibolites, probably terminating in dead rock. Collectively the quantity of ore beaten - out probably amounts to around 1000 T, but judging from the higest grade material on the dumps the grade may locally have gone as high as 5 - 6 % Cu, but probably averaged 2 - 3 % Cu (~6 - 9 vol % sulphide).

Breccia beds thought to be of pyroclastic origin crop out north and south of the mineralised amphibolites and are either stratigaphically separate or denote the limbs of an isoclinal fold. No mineralisation was seen in these pyroclasts. Some magnetite and possibly chert occur in amphibolites, but no manganese was seen, although this should be checked.

The problem centers on a source for both sulphur and copper. Although silicification and the proximity to intrusion suggest a source concomitant with intrusion, no where do pegmatite, vein quartz or granite (etc) carry more than trace quantities of chalcopyrite and this usually on contact with or close to outcrops of amphibolite.

The setting suggest contact-metasomatism, with silica and sulphur introduced by intrusion, and a source for at least some of the copper in either of schistose or finely amphibolitic rocks, possibly of tuffaceous basaltic/andesitic origin, or in basaltic amphibolite. But in attemting to define a strata - bound source for copper it should be pointed out that evidently little or no effort was made to mine away from the contact mineralisation, which suggests that amphibolites beyond are only very weakly or non-mineralised.

The problem may be clarified by chip sampling across the belt of amphibolites and assaying for total ($Cu \pm Zn$) to determine whether in fact beds richer in copper do exist. No zinc mineralisation is apparent in these deposits.

Bilag 2

GEOKEMISK MALMLETNING I KVÆFJORD-OMRÅDET, NORD=LAND, 1974.

1. INLEDNING

Vid sälskapets malmletning i området användes också en geokemisk prospekteringsmetod, nämligen insamling av bäcksediment. Under fältsäsongen inhämtades 205 st prover, som våtsiktades till minus 80 mesh.på provtagningsplatsen. Proverna insamlades på var 250.e meter. Alla fältdata noterades på speciella EDB-kort, vilka sändes till dataavdelningen i Kirkenes. Proverna sändes till selskapets laboratorium på samma plats för analys på koppar, järn och mangan.

2. RESULTAT

Resultaten av de kemiska analyserna sändes till dataavdelningen(med kopia till Lysaker), som så sammanställde alla data i en speciell øversikt, bilaga 1,Dessutom plottades alla provnummer och element, figurerna 1-4. (På grund av bl.a. omroganisation i data-avdelningen blev datakørningarna ej klara førrän i maj.)

Frekvensfördelningen (tabell)1)och figur 5) visar att närmare 93% av alla prover har < 40 ppm Cu. Detta kan betraktas som en generell "bakgrundsnivå" i området. (Bergartsobservationer har ej gjorts på provtagningsplatserna. Den geologiska kartan täcker endast en del av området. Undertecknad har därför ej varit i stånd att undersøka frekvensfördelningarna i de olika bergarterna. Jag tror dock ej att en sådan undersøkning skulle förändrat resultatet nämnvärt i detta område. Man skulle fått fram en något høgre kopparhalt i amfibolbergarterna än i gnejserna, men det hade sannolikt varit allt.

Fördelningen av koppar är ej klart anomaløs. Det finnes isolerade høga värden (> 4o ppm)., men ingen fördelning från låga till gradvis upp mot høga halter. De flesta "anomalierna" førekommer i sanka områden och har høga järn-och/eller manganhalter, varfør det finnes stora møjligheter før medfällning av koppar på hydroxider eller organiskt material. I sødra delen av området finnes ett par høga värden (50 och 53 ppm)., men dessa ligger endast några hundra meter från ett skärp med något kopparkis.

S

Sannolikheten før att det skall finnas några mineraliseringar av intresse i de ävbäckarna dränerade områdena må anses som mycket liten, varfør fortsatta geokemiska undersøkningar ej kan rekommenderas.

Oslo den 7.6 1975

Nils B. Hollander

(Nils B. Hollander)

Øversikt øver figurer och tabeller.

X Oppbevares på prospekteringskontoret og er ikke tatt med i denne rapporten.

Bilaga 2. Frekvenstabell før Cu i samtliga prov.

Intervall (ppm)	Antal	Kumulativ %.	Kumulativ %
0	00	0	0
1-5	3	1,46	1,46
6-10	30	14,63	16,09
11-15	34	16,59	32,68
16-20	42	20,49	53,17
21-25	30	14,63	67,80
26-30	27	13,67	80,97
31-35	12	5,85	86,82
36-40	12	5,85	92,67
41-45	1	0,49	93,16
46-50	5	2,44	95,60
51-55	5	2,44	98,04
86-90	1	0,49	98,53
116-120	1	0,49	99,02
121-124	1	0,49	99,51
141-145	1	0,49	100,00

Antal prover:205 st.

Aritmetiskt medelvärde: 23 ppm.

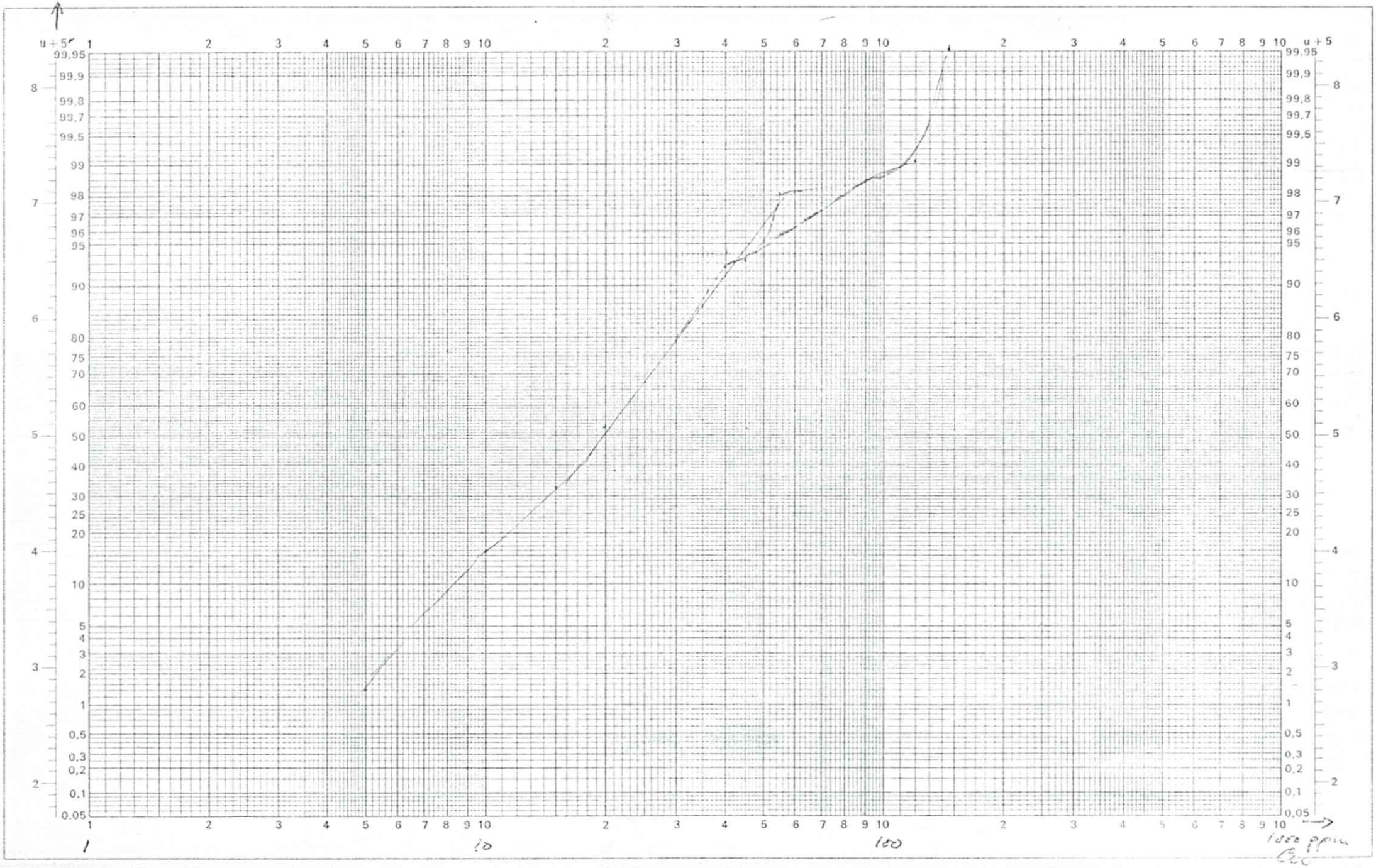
Log × Gauss Modul 2333

Nr. 2109

AGP

Fig. 5. Cu i bäcksediment från Kutsfjord, Nordland.

Σ %



Kart

KEY

youngest

Inferred stratigraphic sequense

oldest

- Biotite granite; aplite; quartz - K spar pegmatite; barren vein quartz.
- Granodiorite minor monzo - diorite or diorite, and hornblende granite.
- Amphibolite; minor hornblende - plagioclase and felsic gneiss. Pyroclast?
- Hornblende - plagioclace gneiss; minor amphibolite and felsic gneiss.
- Biotite quartzo - feldspathic gneiss, including minor magnetite - bearing gneiss, possibly conglomerate Mafic gneiss. More foliate - lineate varieties mapped as granodiorite May represent orthogneissic comonenents of this unit.

Projected northern limit of zone extensively injected with granite, dioritised granite, aplite, barren K spar pegmatite and vein quartz.

Inferred northern edge of mafic paragneissic lithologies: amphibolite, basaltic (?) amphibolite, banded schistose amphibolite, silicious (chert?) bands, framental (pyroclastic?) beds. with crenulation

56 Foliatin

Shatter, crush, shear

Lineation in granodiorite mesoscopically defined by mafic glomeroporphyroblasts, or by biotite in granite.

Linear structures inferred from air photographs; some, at least, faults.

Portal / azimuth prospect adits.

Prospect pits.

Features on Intrusive Contacts

	Intrusive	Host	Hornfels	Hornfelsic	Secondary Silicification	Magnetite	Pyrrhotite skarns	Cpy (bornite) - Pyrrhotite	Secondary copper minerals	Host
Swarms of xenoliths especially within granite contacts										
Occasionally more acidic leucocatic	Granites slightly more mafic	Mafics may increase to 40 vol %								
Gneiss frequently "injected" and contacts irregular		Granite, granodiorite, and K pegmatites complexly intruded, both sheet - form and stockwork								
Extensive against granite	Not observed		Very local							Amphibolite - pyroclast unit
Widespread	Not observed		Widespread							
Extensive in granite injected gneiss	Not observed		Local and very intense							Intermediat gneiss unit (Ho - Plag)
										Felsic gneiss unit

Tr = trace copper (cpy)
S = secondary (malachite)
Qz = quartz
mt = magnetite
pyr. = pyrrhotite
cpy = chalcopyrite

ØKONOMISK KARTVERK

A/S Sydvaranger	Målt	M	
	Tegn	1:10 000	
	Trace H.J.		Nov. 1975
Kvæfjord Berg Mine and Rödmålheia Prospects			

1430/1