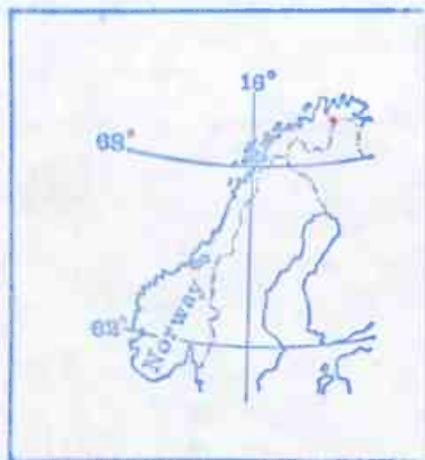


FOR FALCONBRIDGE NIKKELVERK A/S  
A/S SULFIDMALM

Ingajokka, Masi: Ground geophysics  
and diamond drilling, 1975

By  
E. Kreivi

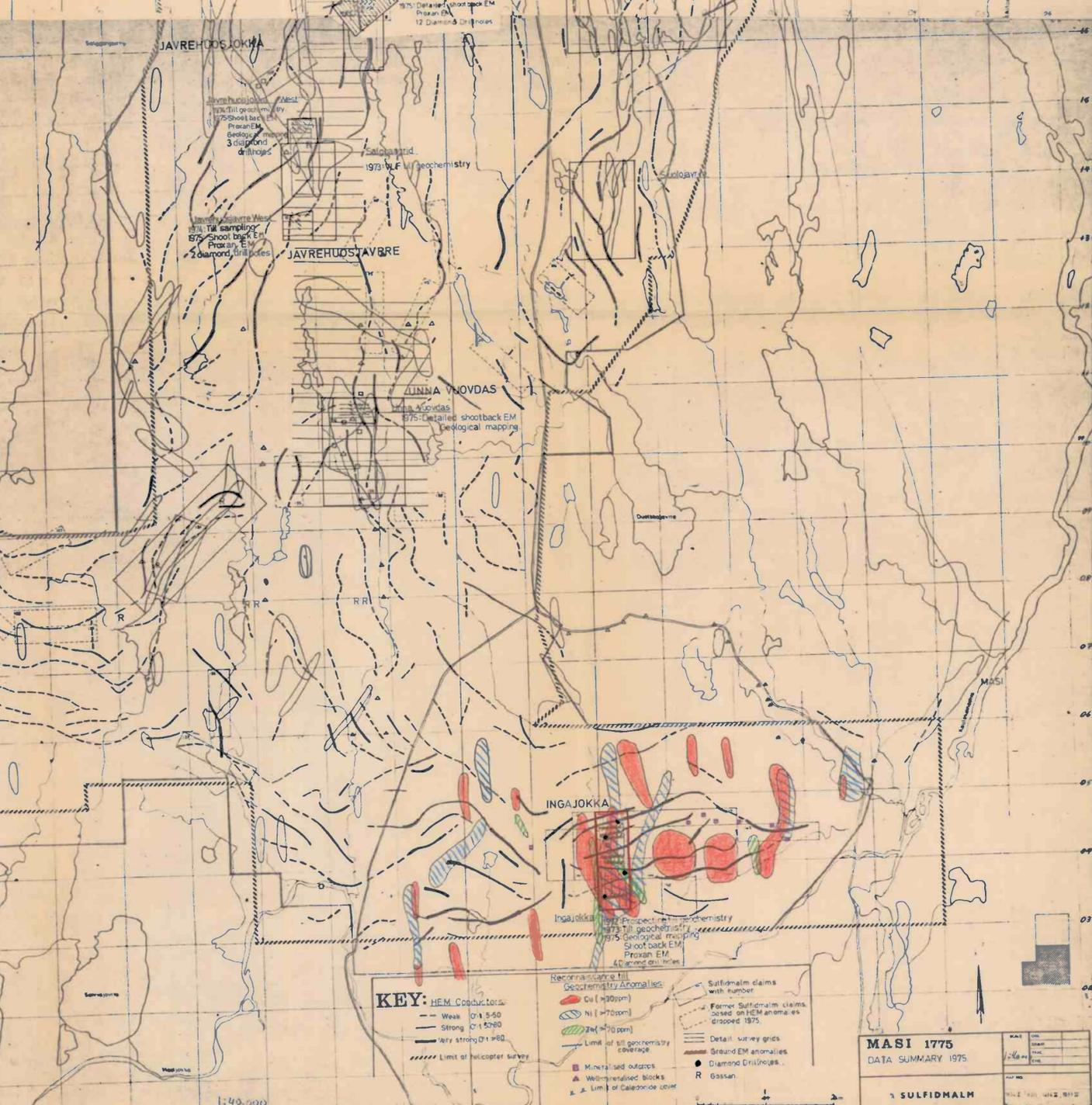
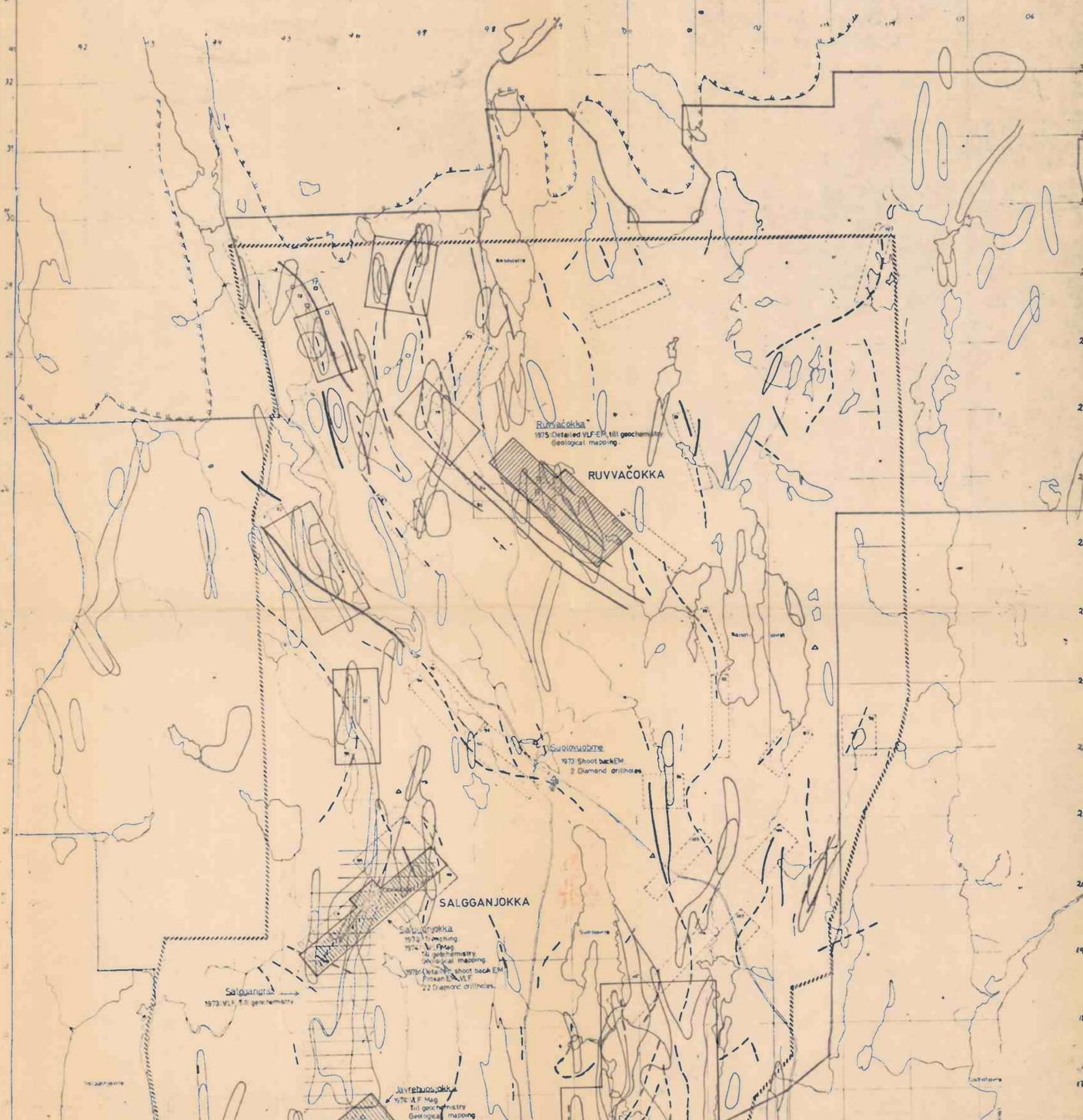
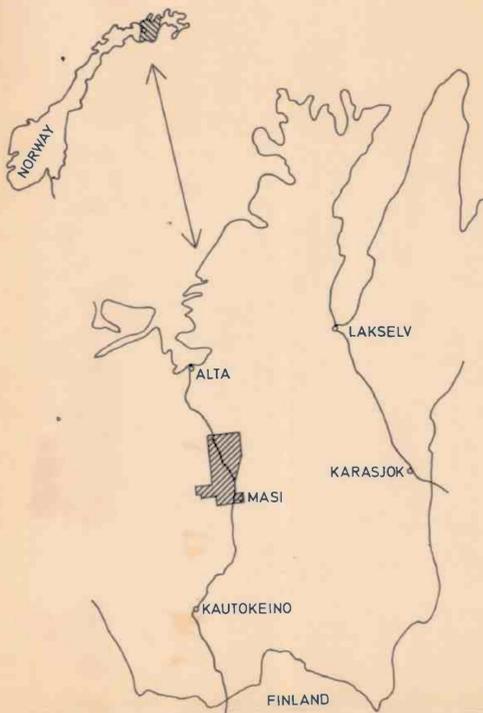


SUMMARY  
AND CONCLUSIONS

## 1. SUMMARY AND CONCLUSIONS

Massive pyrrhotite outcrops were found in the bed of the Njakkalavzzejokka River ( a tributary of the Ingajokka River) in 1972. The mineralized zone was traced by gossan patches and isolated outcrops for a strike length of ca. 5 km (Rpt. 217/17/72). Detailed mapping showed that there were at least five distinct sulphide horizons in the flat-lying Njakkalavzzejokka succession (Rpt. 280/17/73). Careful examination showed minor concentrations of chalcopyrite in small scale folds within the massive sulphide horizons. Reconnaissance till sampling carried out in 1972 and 1974 pointed to the westernmost portion of the zone as being the most promising with strong Cu, Ni and Zn till anomalies (Rpt. 217/17/73, 341/17/74). Fig. 1 shows the location of Ingajokka in relation to other targets in the Masi area.

In 1975 the westernmost portion of the Ingajokka zone was covered with a detailed Shootback EM survey, detecting at least 13 individual conductors within a broad conductive zone more than 800 m wide. Four diamond drill holes, totalling 198 m were put down to test these conductors. Fig. 2 summarizes the geophysical, geochemical and diamond drilling results. Each of the drill holes intersected zones of massive, but barren pyrrhotite/pyrite varying in width from 3.00 to 17.60 m. Very little chalcopyrite was present in the mineralization intersected, the best assay being 0.48% Cu, 0.15% Ni over 1.50 m in DDH 4-N. The widest mineralized intersection of 17.60 m, in DDH 1-N, gave an average assay of only 0.07% Cu and 0.20% Ni. No further work is planned at the Ingajokka locality.



UNDERSØKT 1975  
 PLANLAGT UNDERSØKT 1976

**KEY:**

- Weak ( $\sigma < 5 \cdot 10^{-4}$ )
- - - Strong ( $\sigma > 1 \cdot 10^{-3}$ )
- Very strong ( $\sigma > 10^{-2}$ )
- Limit of helicopter survey
- Reconnaissance till Geochemistry Anomalies
- Cu ( $> 30 \text{ ppm}$ )
- Ni ( $> 70 \text{ ppm}$ )
- Zn ( $> 70 \text{ ppm}$ )
- Limit of till geochemistry coverage
- Mineralised outcrop
- ▲ Well-sorted blocks
- △ Limit of Calcic zone cover
- Sulfidmalm claims with number
- Former Sulfidmalm claims based on EM anomalies dropped 1975
- Detail survey grids
- Ground EM anomalies
- Diamond Drillholes
- R Gassan

**MASI 1775**  
 DATA SUMMARY 1975  
 1 SULFIDMALM

1:40,000

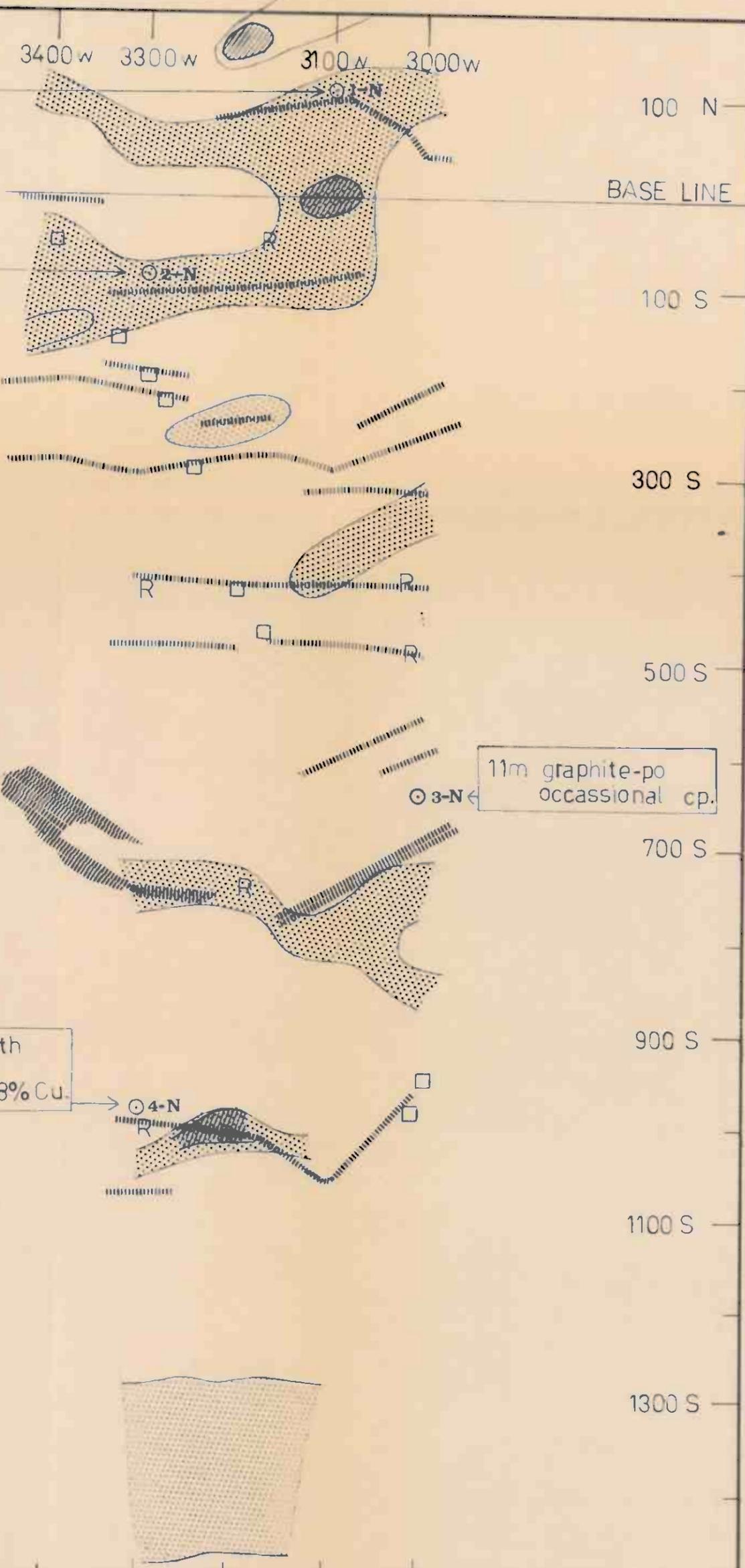
A.S. Terrapin, 1000 A.J. E 9 St. 10-71, Senstun Trykker.

15m graphite po  
occl. cp  
(2 horizons)

11<sup>25</sup>m graphite-po,  
with occasional cp  
(2 horizons)

11m graphite-po  
occasional cp.

3<sup>50</sup>m graphite-po with  
minor cp.  
Best assay 0.48% Cu.



**KEY:**

- ⊙ 2-N Drill hole
- Cu-anomaly >100ppm
- " " >300 " "
- Shoot-back-EM-anomaly
- Mineralized showing
- R Rusty area

**Masi 1775**  
**INGAJOKKA Data summary 1976.**

SCALE	OBS. EK	1975
1: 5,000	DRAW. EK	1976
	TRAC. BB	— " —
	CHK.	— " —

MAP NO.	
MAP SHEET	

1/5 **SULFIDMALM**

GEOPHYSICAL  
RESULTS

## 2. GEOPHYSICAL RESULTS

### a) Shootback Survey

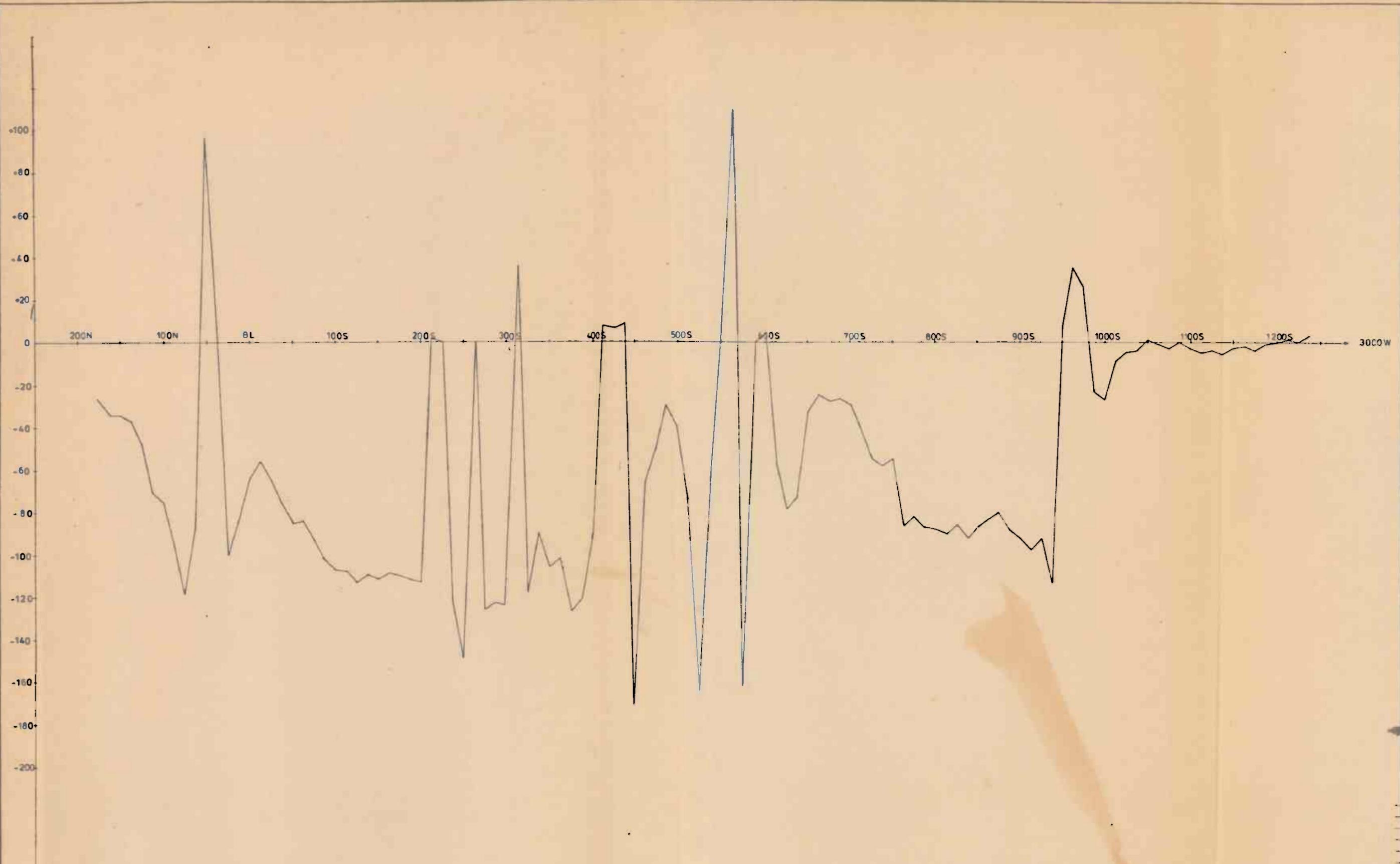
A total of 6.0 line km of Shootback EM was run over the westernmost portion of the Ingajokka grid in 1975. The survey was run using a 50 m coil separation, with a 25 m reading interval along lines 50 m apart. Individual Shootback profiles are presented in figs. 3-7, and conductor traces are shown on fig. 2. The survey detected a total of 13 individual conductors within a broad conductive zone more than 800 m wide. This very broad conductive zone reflects the flat-lying nature of the Ingajokka massive sulphide zones, which dip north-wards at ca.  $20^{\circ}$ .

### b) Proxan Survey

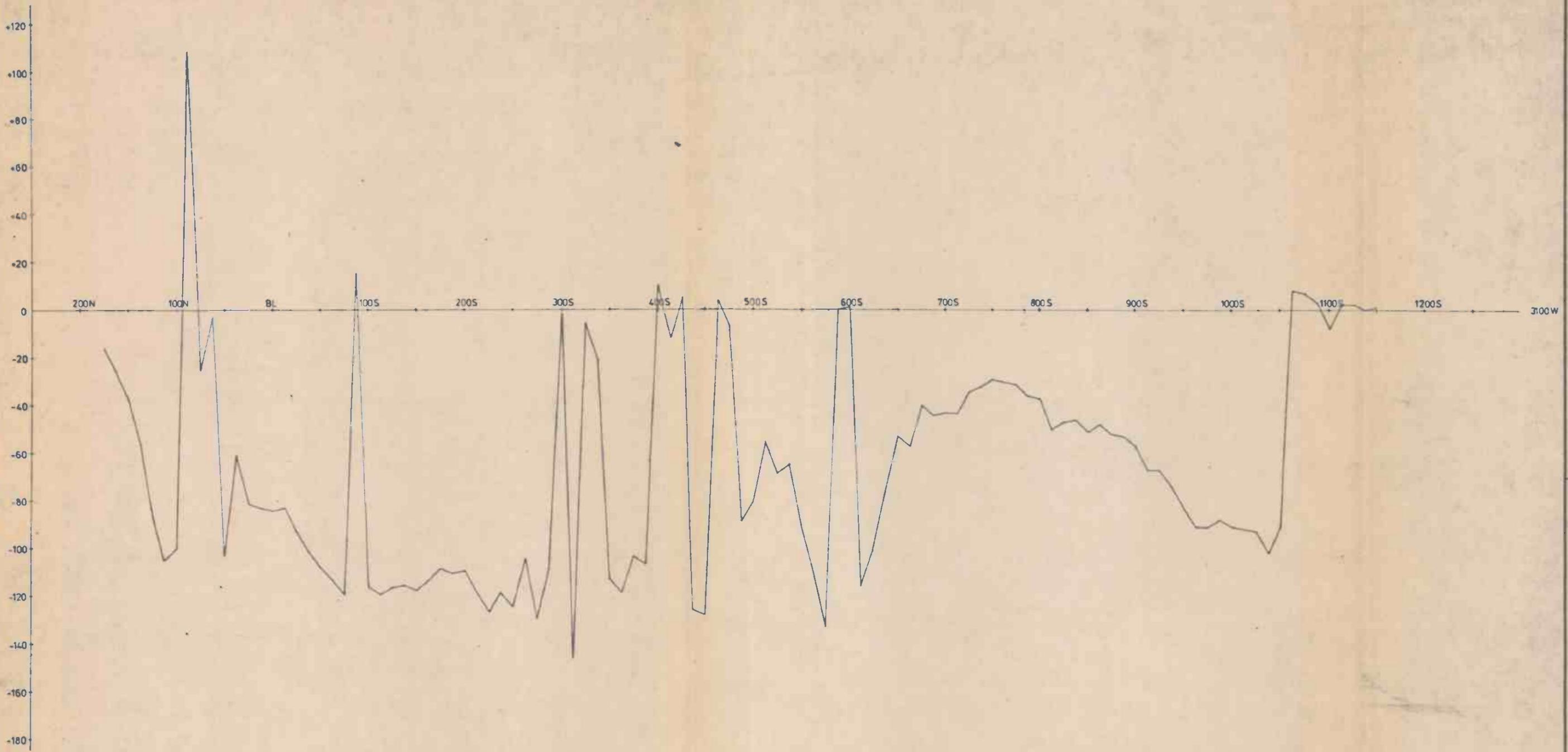
The Proxan is a one-man, shallow penetration EM unit, made by Outokumpu's instrument division. It was loaned to Sulfidmalm for trials in Masi during the summer of 1975. The unit consists essentially of a rigid bar, ca. 1 m long, with sender and receiver coils mounted at opposite ends. The operating frequency is 50Hz. To carry out a survey the operator moves along the profile, with the Proxan horizontal. A loud buzz indicates when the unit is passing over a conductor, and the operator then locates the conductor exactly using a field strength meter. Having located the conductor it is then possible to determine the depth of burial by taking field strength readings at three different heights (30 cms, 60 cms, 90 cms above ground level). Depth of burial is obtained by plotting these values on a special graph, and then matching against standard curves.

Due to the short coil separation the Proxan has a very limited depth penetration, and is primarily meant as an aid in the boulder-prospecting. The very short coil spacing also produces some differences from the Shootback EM conductor distribution. The Proxan will pick up very narrow conductors, which may be missed by the Shootback system, and it will also of course pick up mineralized blocks. Due to the very short coil separation the Proxan will also not register wide conductors, but will show narrow anomalies along the edges of such conductors. In shallow overburden areas it can be used to locate bedrock conductors, in which case the depth of burial data can be useful. At Salganjokka for example (Rpt. 362/17/75) the depth of overburden estimates obtained from the Proxan survey agreed very well with actual overburden depths encountered in the diamond drilling programme.

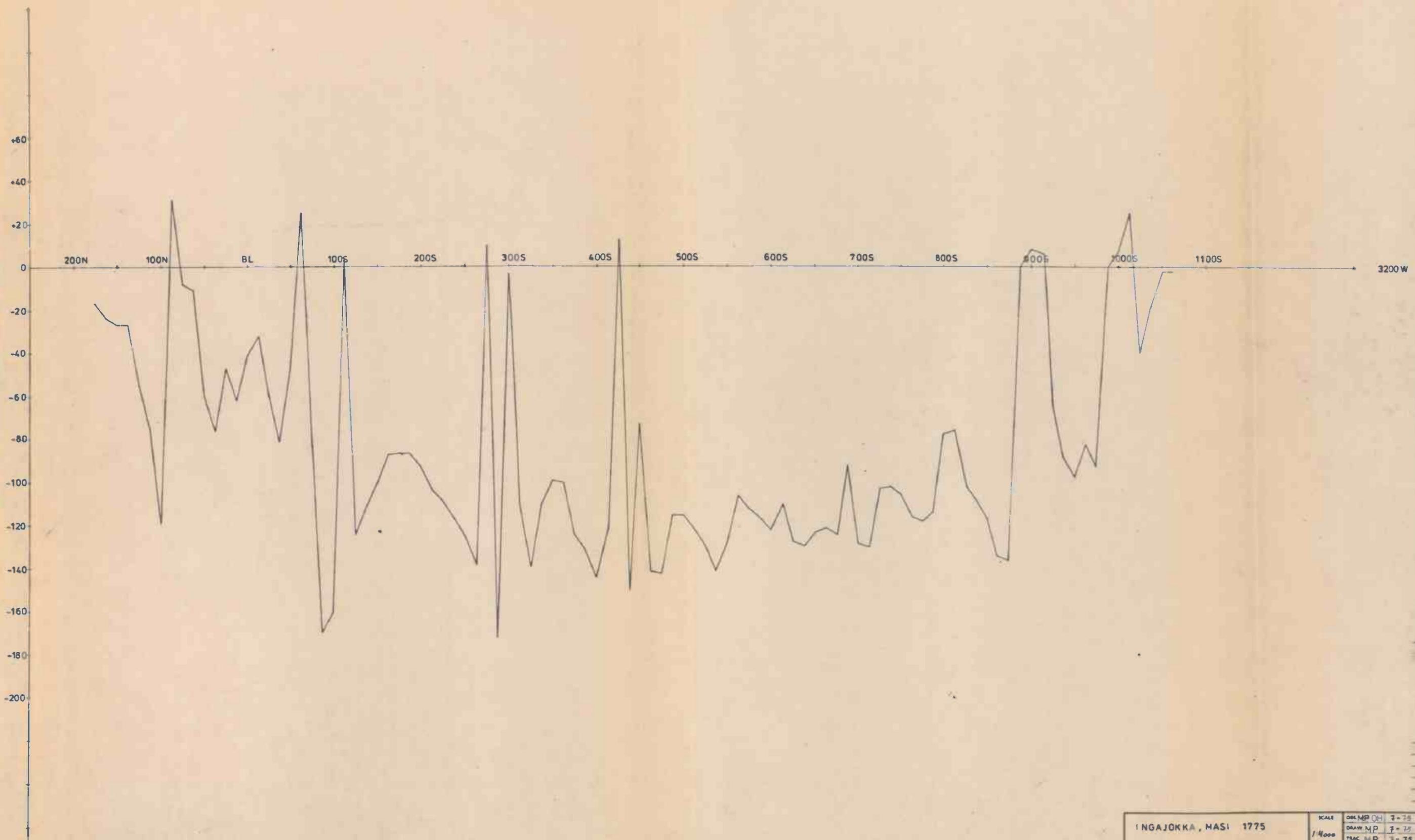
Proxan survey results are presented in fig.8. Conductor locations are in good agreement with those interpreted from the Shootback survey.



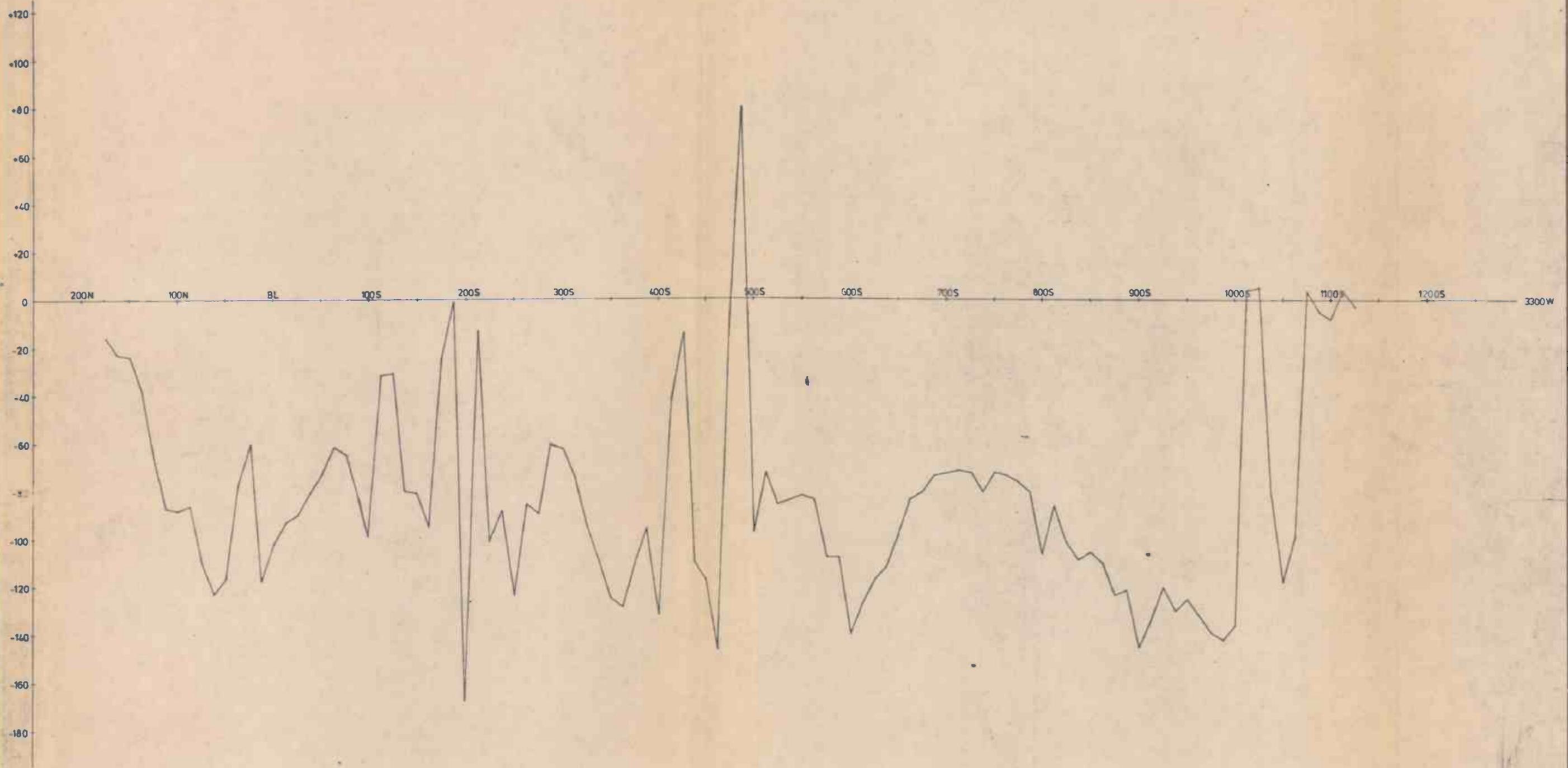
INGAJOKKA, MASJ 1775		DATE	08 MAR 75
SHOOT-BACK PROFILE 3000W		DRAN MP	1-25
(50M)		TRAC MP	1-14
		HE. 2"	1-16
<b>S SULFIDMALM</b>		MAP NO.	364-75-17



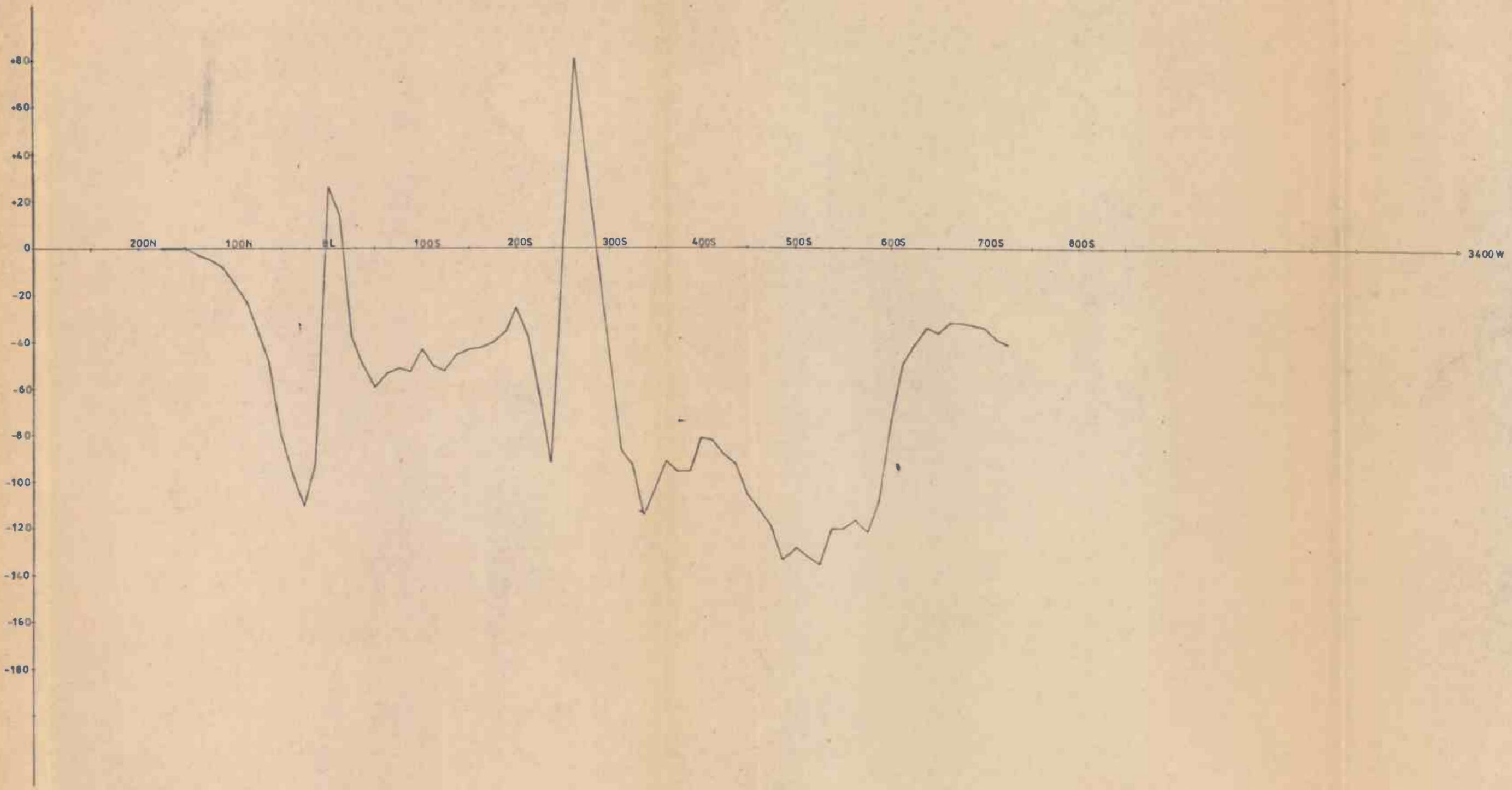
INGAJOKKA, MASI 1775 SHOOT-BACK 50m PROFILE 3100W	SCALE	OBS 1204 7-75 DRAW OH 7-75 TRAC OH 7-75 CHK EK 1-75
	MAP NO.	364-75-17
S SULFIDMALM		MAP SHEET



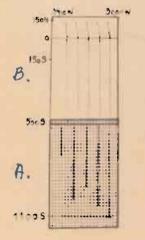
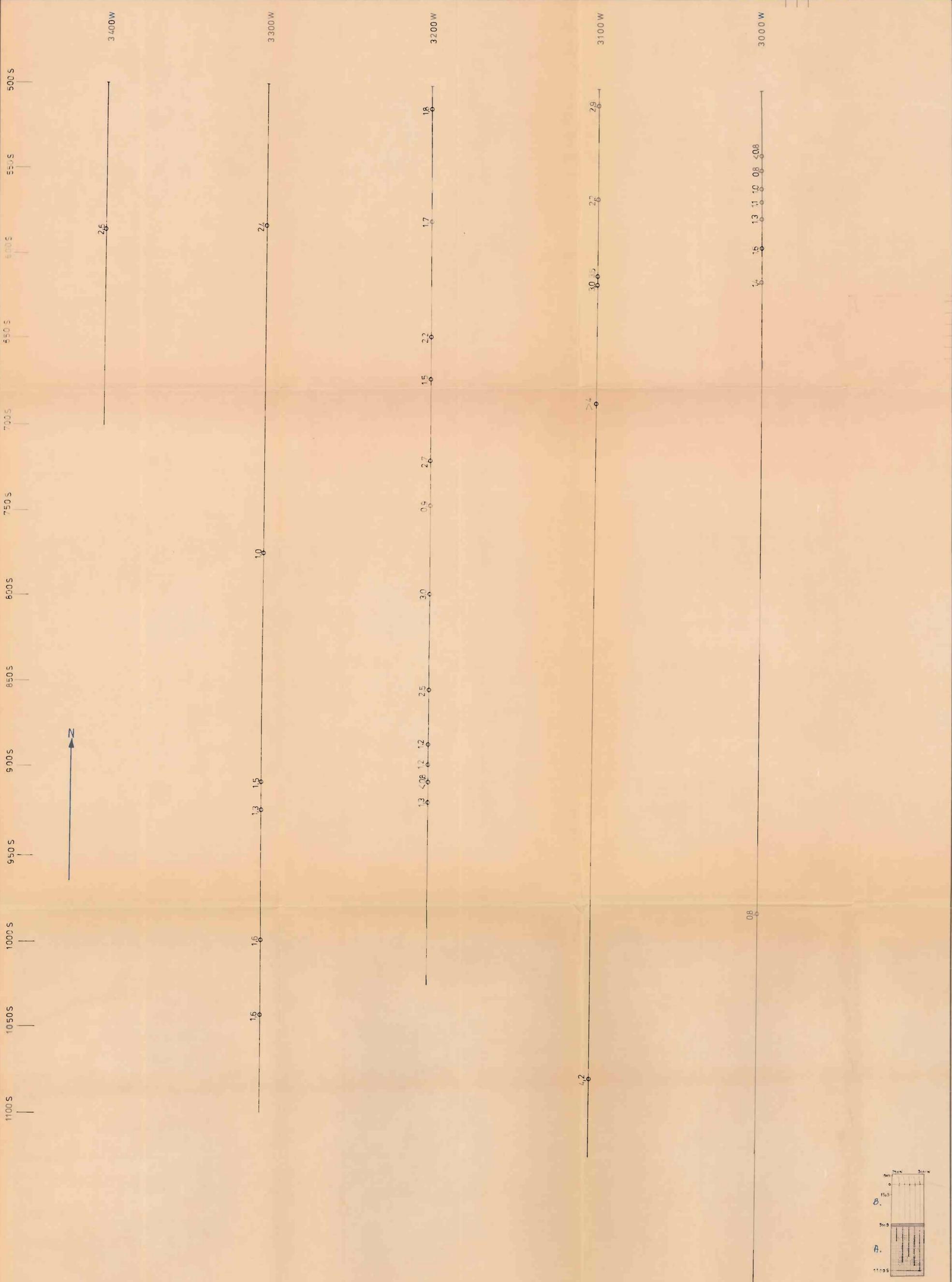
INGAJOKKA, MASI 1775	SCALE	1/4000	DATE	7-75
	DRAWN	M.P.	DATE	7-75
SHOOT-BACK PROFILE 3200W	TRACED	M.P.	DATE	7-75
	CHEK	E.N.	DATE	7-76
MAP NO.		364-75-17		
MAP SHEET				



INGAJOKIKA, MASI 1775		SCALE	OH	MP	7-75
SHOOT-BACK 50m		1:4000	OH	OH	7-75
PROFILE 3300W			TRAC	OH	7-75
			CHK	E.M.	1-76
SULFIDMALM		MAP NO.			
		364-75-17			
		MAP SHEET			



INGAJOKKA MASI 1975 SHOOT-BACK 50 m PROFILE : 3400W	SCALE	OBS MP	7-75
	1:4000	DRAW MP	7-75
		TRAC MP	7-75
		CHE EW	7-76
MAP NO.		364-75-17	
MAP SHEET			



1.4  
 ○ Top of the conductor with the thickness of overburden.

INGAJOKKA, MASI 1775		SCALE	OBS. OH JA	7-75
PROXAN		1:1000	DRAW. JA	7-75
1/2 SULFIDMALM		MAP NO.		364-75-17
		MAP SHEET		



DRILLING PROCEDURES  
AND RESULTS

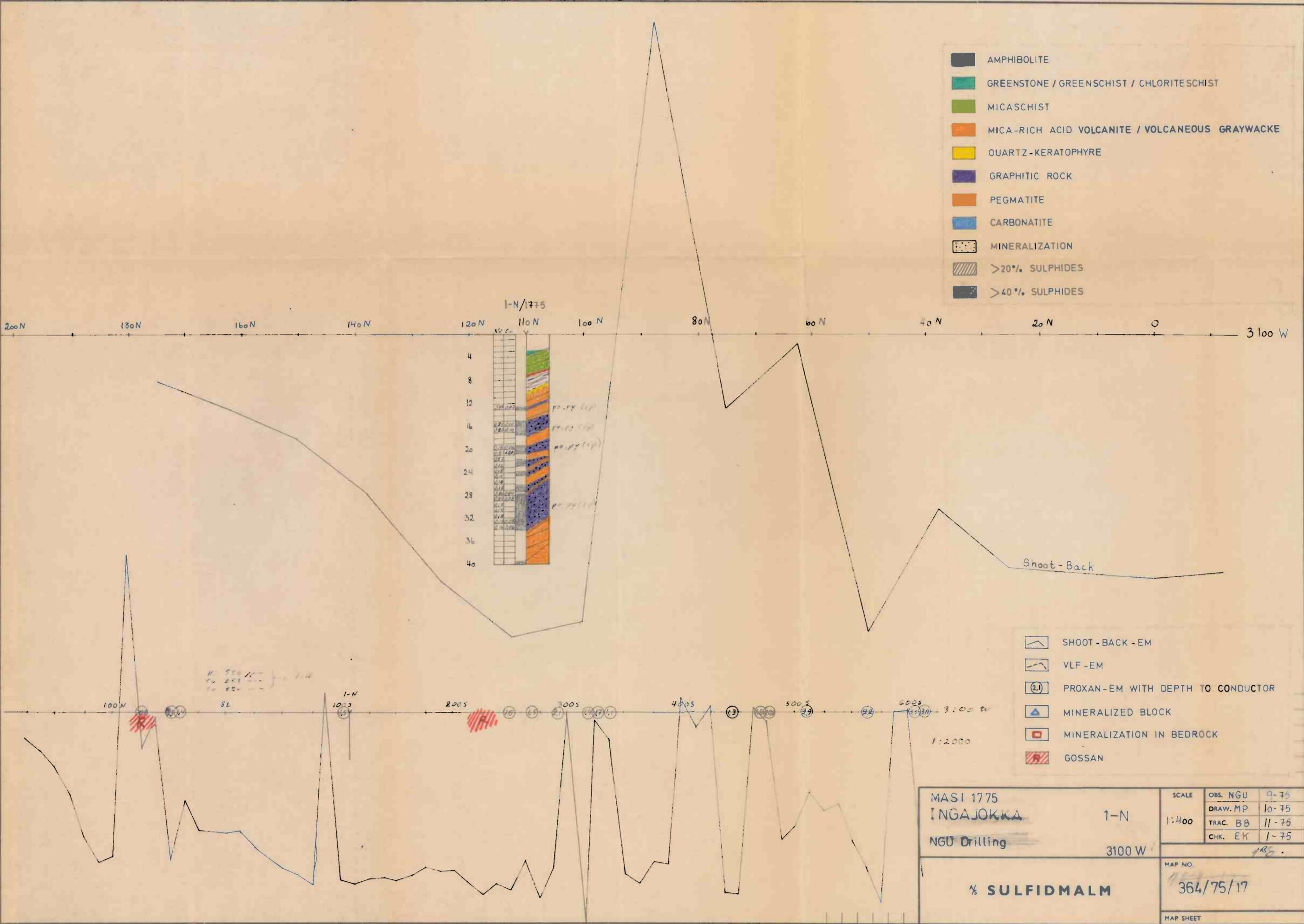
### 3. DRILLING PROCEDURES AND RESULTS

The Ingajokka drill programme was carried out by NGU in the period 26/9 - 9/10/75. A total of 199 m was drilled in 4 drill holes. The drill programme was supervised by E. Kreivi. Core samples were assayed by Falconbridge, Kristiansand. Drilling results are summarized on Fig. 2. Detailed drill sections are given in figs. 9 - 12 and drill logs and assay results are presented as Appendix I.

Each of the drill holes intersected from one to three horizons of almost massive sulphide associated with graphitic acid tuffs. Individual sulphide horizons vary from 3.00 to 15.00 m, and occur in a rapidly alternating sequence of acid and basic volcanics. The widest sulphide intersection DDH 1-N showed three separate sulphide horizons, with a total combined thickness of 17.60 m. Sulphide minerals are pyrrhotite and pyrite in varying proportions with only occasional chalcopyrite present. There is a tendency for the proportion of pyrite to increase in the lower sulphide horizons. The average assay for the combined sulphide intersection in DDH 1-N (17.60 m) is only 0.07% Cu and 0.20% Ni. The best assay in the Ingajokka drilling was 0.48% Cu, 0.15% Ni over 1.50 m in DDH 4-N.

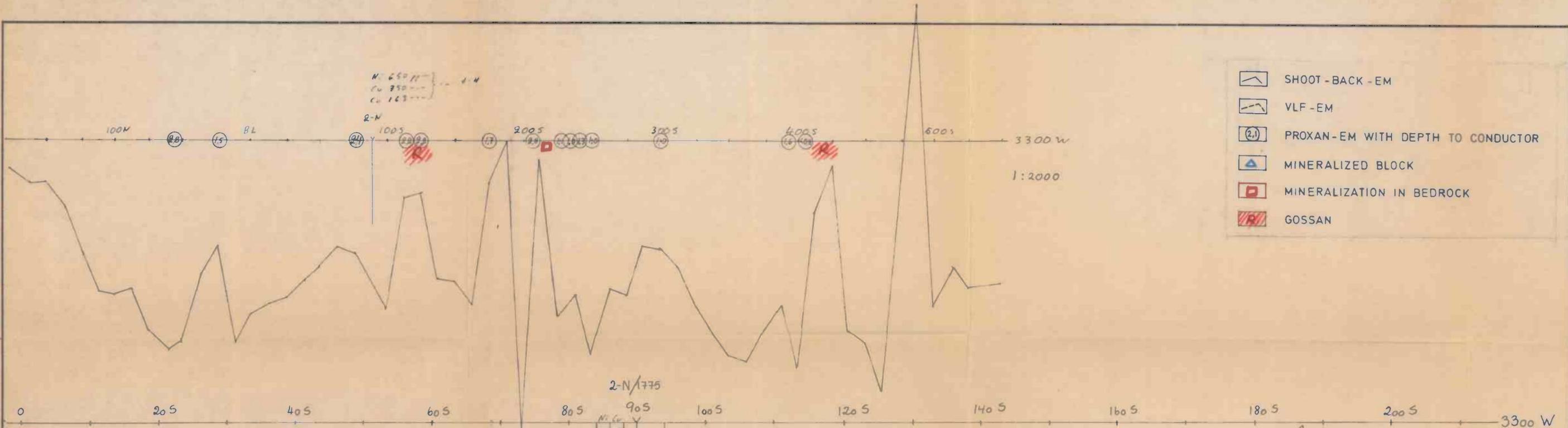
No further work is planned on the Ingajokka locality.

- AMPHIBOLITE
- GREENSTONE / GREENSCHIST / CHLORITESCHIST
- MICASCHIST
- MICA-RICH ACID VOLCANITE / VOLCANEOUS GRAYWACKE
- QUARTZ-KERATOPHYRE
- GRAPHITIC ROCK
- PEGMATITE
- CARBONATITE
- MINERALIZATION
- >20% SULPHIDES
- >40% SULPHIDES

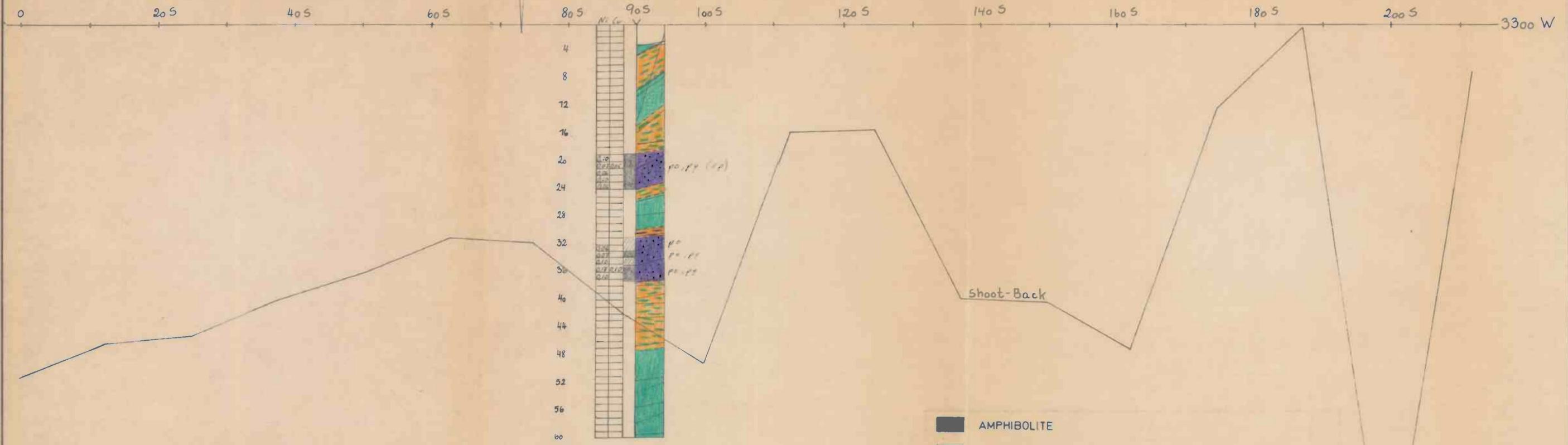


- SHOOT-BACK-EM
- VLF-EM
- PROXAN-EM WITH DEPTH TO CONDUCTOR
- MINERALIZED BLOCK
- MINERALIZATION IN BEDROCK
- GOSSAN

MASI 1775 INGAJOKKA NGU Drilling	1-N	SCALE	OBS. NGU 9-75
		1:400	DRAW. MP 10-75
3100 W	MAP NO	TRAC. BB 11-75	
		CHK. EK 1-75	
<b>% SULFIDMALM</b>		364/75/17	
		MAP SHEET	

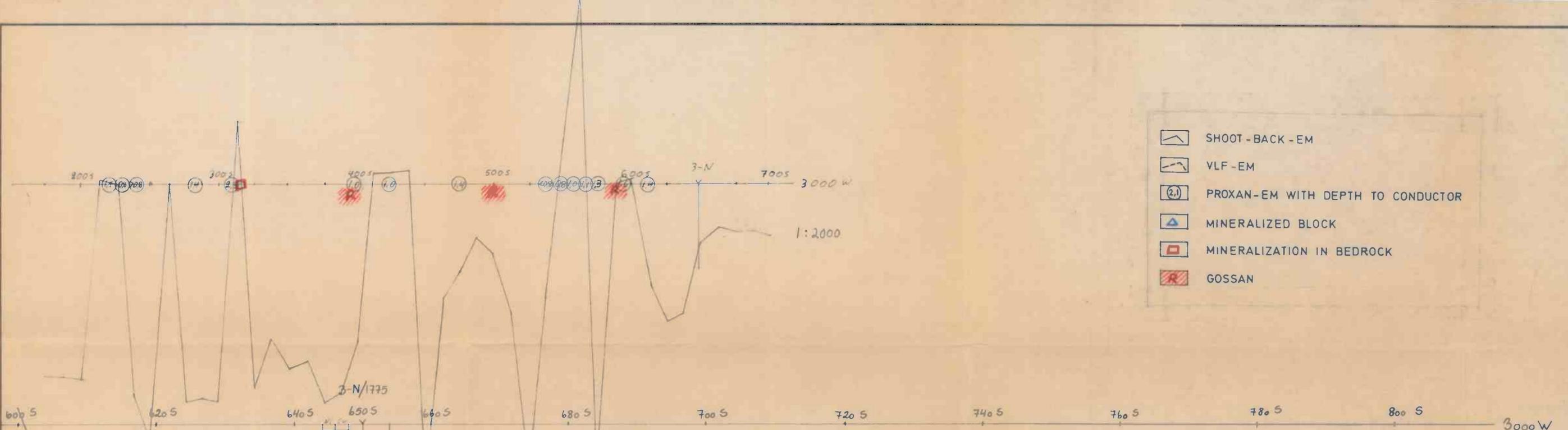


- SHOOT-BACK-EM
- VLF-EM
- PROXAN-EM WITH DEPTH TO CONDUCTOR
- MINERALIZED BLOCK
- MINERALIZATION IN BEDROCK
- GOSSAN

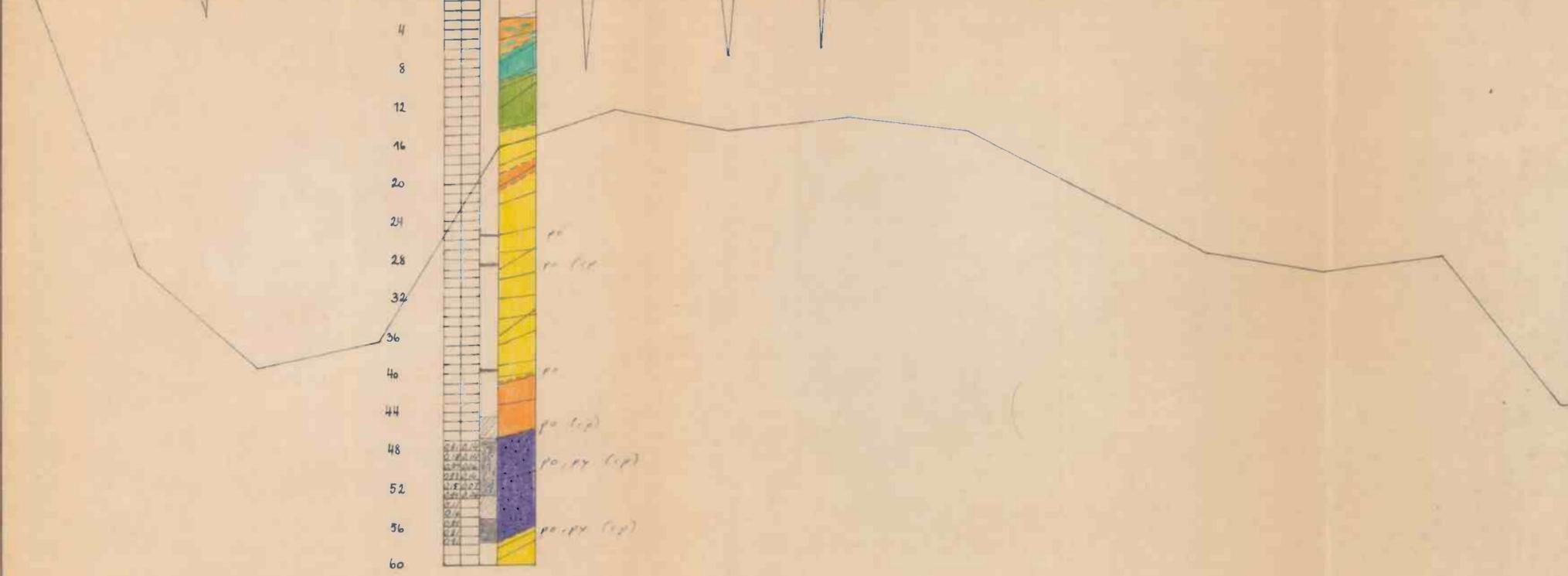


- AMPHIBOLITE
- GREENSTONE / GREENSCHIST / CHLORITESCHIST
- MICASCHIST
- MICA-RICH ACID VOLCANITE / VOLCANEOUS GRAYWACKE
- QUARTZ-KERATOPHYRE
- GRAPHITIC ROCK
- PEGMATITE
- CARBONATITE
- MINERALIZATION
- >20% SULPHIDES
- >40% SULPHIDES

MASI 1775 INGAJOKKA 2-N NGU-drilling	3300 W	SCALE	OBS. NGU	9-75
		1:400	DRAW. MP	10-75
1/2 SULFIDMALM		MAP NO.		
		364/75/17		
		MAP SHEET		

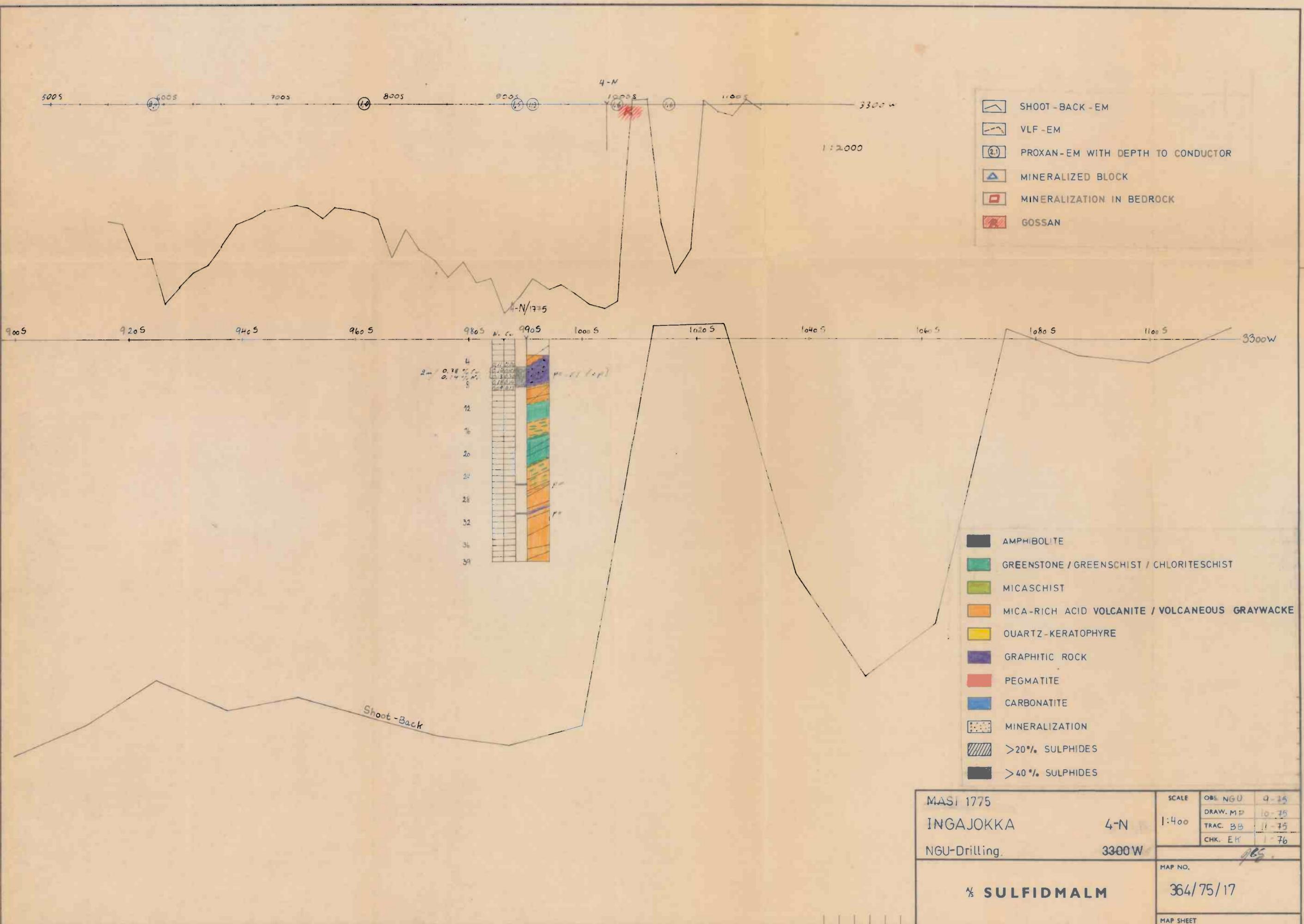


- SHOOT-BACK-EM
- VLF-EM
- PROXAN-EM WITH DEPTH TO CONDUCTOR
- MINERALIZED BLOCK
- MINERALIZATION IN BEDROCK
- GOSSAN



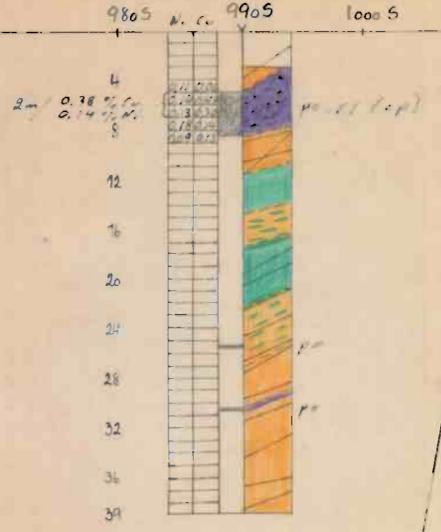
- AMPHIBOLITE
  - GREENSTONE / GREENSCHIST / CHLORITESCHIST
  - MICASCHIST
  - MICA-RICH ACID VOLCANITE / VOLCANEOUS GRAYWACKE
  - QUARTZ-KERATOPHYRE
  - GRAPHITIC ROCK
  - PEGMATITE
  - CARBONATITE
  - MINERALIZATION
  - >20% SULPHIDES
  - >40% SULPHIDES
- Shoot-Back*

MASI 1775 INGAJOKKA NGU drilling	3-N 3000W	SCALE	OBS. NGU	9-75
		1:400	DRAW. MP	10-75
1/2 SULFIDMALM			TRAC. BB	11-75
			CHK. EK	1-76
MAP NO.		364/75/17		
MAP SHEET				



- SHOOT-BACK-EM
- VLF-EM
- PROXAN-EM WITH DEPTH TO CONDUCTOR
- MINERALIZED BLOCK
- MINERALIZATION IN BEDROCK
- GOSSAN

- AMPHIBOLITE
- GREENSTONE / GREENSCHIST / CHLORITESCHIST
- MICASCHIST
- MICA-RICH ACID VOLCANITE / VOLCANEOUS GRAYWACKE
- QUARTZ-KERATOPHYRE
- GRAPHITIC ROCK
- PEGMATITE
- CARBONATITE
- MINERALIZATION
- >20% Sulphides symbol"/> >20% SULPHIDES
- >40% Sulphides symbol"/> >40% SULPHIDES



MASI 1775	SCALE	OBS. NGU	9-75
INGAJOKKA	1:400	DRAW. MP	10-75
NGU-Drilling.		TRAC. BB	11-75
		CHK. EK	1-76
<b>½ SULFIDMALM</b>		MAP NO.	364/75/17
		MAP SHEET	

APPENDIX I - DRILL  
LOGS AND ASSAY RESULTS  
GEOL. MAP.

# SULFIDMALM

## DIAMOND DRILL RECORD

LOCATION: 3100 W/110N      BEARING: .....      DIP: 90°      HOLE NO: N/1775      SHEET NO: 10  
 LOGGED BY: E. Kreivi      STARTED: 6/10-75      PROPERTY: Ingajokka  
 CASING: 2.80m      FINISHED: 7/10-75  
 CORE SIZE: I AX 35mm      TESTS (CORRECTED): .....

From	To	Description
0	2.80	Overburden
2.80	2.95	Greenschist
2.95	3.60	Mica-schist
3.60	3.80	Greenschist
3.80	7.00	Mica-schist
7.00	7.35	Qtz-vein
7.35	10.00	Phyllite
10.00	10.40	Qtz-keratophyre, 10% po-breccia
10.40	12.35	Carbonate-rich, mica-bearing feldspathic rock
12.35	13.00	Graphitic rock
13.00	15.05	-60-70% po-, 10% py-breccia, occasionally cp. Carbonate-rich mica-schist
15.05	17.35	13.00-13.60 graphite-bearing Graphitic rock
17.35	19.35	-70% po-, 10% py-breccia some cp. Carbonate - rich greywacke
19.35	34.00	-some graphitic beds brecciated by po Graphitic rock
		-70% po-, 5% py-breccia, occasionally cp
		20.80 - 21.30
		22.80 - 23.80
		24.50 - 26.00 } acid mica-bearing tuffite, 10% po
		27.20 - 27.50 }
34.00	40.00	Carbonate-rich-chlorite-bearing rock (greywacke?), 5% po
		39.50 - 40.00 30% po-, 5% py-breccia with graphite
		31.50 - 39.60 60% po-, 10% py
	40.00	End of hole

This hole had about 17.60 m of mineralized graphitic beds  
 (12.35-13.00, 15.05-17.35, 19.35-34.00). Might be a  
 good reason for the Shootback anomalies.

## A/s SULFIDMALM

## DIAMOND DRILL RECORD

LOCATION: 3100W/110N BEARING: ..... DIP: 90° HOLE NO: 1-N/1775 SHEET NO: 1  
 LOGGED BY: E. Kreivi STARTED: 6/10-75 PROPERTY: Ingajokka  
 CASING: 2.80m FINISHED: 7/10-75  
 CORE SIZE: IAX 35mm TESTS (CORRECTED): .....

From	To	Description
0	2.80	Overburden
2.80	2.95	Greenschist
2.95	3.60	Mica-schist
3.60	3.80	Greenschist
3.80	7.00	Mica-schist - very homogenous
7.00	7.35	Qtz-vein
7.35	10.00	Phyllite
10.00	10.40	Qtz-keratophyre - po - (py-) breccia, 10% po
10.40	12.35	Carbonate-rich, mica-bearing, feldspathic rock (greenwacke?)
12.35	13.00	Graphitic rock - brecciated by po and py, occasionally cp. 60-70% po, 10% py
13.00	15.05	Carbonate-rich mica-schist 13.00-13.60 graphite-bearing
15.05	17.35	Graphitic rock, brecciated by po and py - 70% po, 10% py some cp
17.35	19.35	Carbonate-rich greywacke - some graphitic beds, which are brecciated by pyrrhotite
19.35	34.00	Graphitic rock -70% po-, 5% py-breccia, occasionally cp 20.80 - 21.30 acid tuffite, 10% po 22.80 - 23.80 acid carbonate- and mica-bearing tuffite 5% po 24.00 - 24.50 graphite, very soft and broken 24.50 - 26.00 acid tuffite, 10% po, mica-bearing 27.20 - 27.50 " " "

# 7s SULFIDMALM

## DIAMOND DRILL RECORD

LOCATION: 3100W/110N BEARING: \_\_\_\_\_ DIP: 90° HOLE NO: I-N/1775 SHEET NO: 2  
 LOGGED BY: E. Kreivi STARTED: 6/10-75 PROPERTY: Ingajokka  
 CASING: 2.80 m FINISHED: 7/10-75  
 CORE SIZE: IAX 35mm TESTS (CORRECTED): \_\_\_\_\_

From	To	Description
34.00	40.00	Carbonate-rich, mica-chlorite-bearing rock (greywacke?), 5% po
		39.50 - 40.00 Graphite-bearing, 30% po-, 5% py-breccia
		39.50 - 39.60 60% po, 10% py
	40.00	End of hole
		Core-angles
		B: 15° 3.80 19° 14.60 34° 34.80
		18 5.60 23 17.70 24 35.70
		15 7.90 10 20.80 20 37.40
		33 9.30 27 23.80 35 39.80
		23 11.50 34 29.80
		S: 41 14.00 ← 29 30.80
		crossing bedding

# SULFIDMALM

## DIAMOND DRILL RECORD

LOCATION: 3300W/90S      BEARING:      DIP: 90°      HOLE NO: 2-N/1775      SHEET NO: 1a  
 LOGGED BY: E. Kneivi      STARTED: 26/9-75      PROPERTY: Ingajokka  
 CASING: 2.90m      FINISHED: 6/10-75  
 CORE SIZE: IAX 35 mm      TESTS (CORRECTED):

From	To	Description
0	2.90	Overburden
2.90	3.30	Mica-schist
3.30	4.10	Chlorite-schist
4.10	9.15	Chlorite-biotite-schist, carbonate-bearing
9.15	14.80	Greenschist
4.80	18.90	Carbonate-rich, mica- and chlorite-bearing feldspathic rock
18.90	24.00	Graphitic rock - 70% po-, 5% py-breccia, occasionally cp
24.00	25.30	Mica-chlorite-schist, carbonate-rich
25.30	29.70	Greenschist
29.70	30.95	Mica-chlorite-schist, carbonate-rich
30.95	33.00	Graphitic schist with thin po-beds, 10-20% po
33.00	34.00	Graphitic rock - 80% po-, 5% py-breccia
34.00	35.10	Graphitic schist with thin po-beds - 30% po
35.10	37.10	Graphitic rock - 90% po-, 5% py-breccia
37.10	47.20	Chlorite-biotite-schist, carbonate-rich
7.20	60.00	Greenschist
	60.00	End of hole
		Two different graphitic beds with iron sulphide-mineralization were penetrated. The first one was 5.10 ms thick (18.90-24.00) and the second one 6.15 ms thick (30.95-37.10).

# 7's SULFIDMALM

## DIAMOND DRILL RECORD

LOCATION: 3300W/90S      BEARING: .....      DIP: 90°      HOLE NO: 2-N/1775 SHEET NO: 1  
 LOGGED BY: E. Kreivi      STARTED: 26/9-75      PROPERTY: Ingajokka  
 CASING: 2.90m      FINISHED: 6/10-75  
 CORE SIZE: IAX 35 mm      TESTS (CORRECTED): .....

From	To	Description
0	2.90	Overburden
2.90	3.30	Mica-schist
3.30	4.10	Chlorite-schist
4.10	9.15	Chlorite-biotite-schist - carbonate-breccia
9.15	14.80	Greenschist - carbonate-bands
		10.00-11.00 Carbonate-rich
14.80	18.90	Carbonate-rich, mica-and chlorite-bearing, feldspathic rock - banded
18.90	24.00	Graphitic rock -brecciated by 70% po, 5% py, occasionally cp - sometimes graphitic pebbles are filled by po
24.00	25.30	Mica-chlorite-schist, carbonate-rich
25.30	29.70	Greenschist - no clear contact
29.70	30.95	Mica-chlorite-schist, carbonate-rich
30.95	33.00	Graphitic schist with thin po-beds 10-20% po 30.95 - 31.00 po-py-breccia
33.00	34.00	Po-breccia with some py, 80% po, 5% py - some graphite
34.00	35.10	Graphitic-schist with thin po-beds - 30% po
35.10	37.10	Po-breccia with some py, 90% po, 5% py - graphitic pebbles are filled by po
37.10	47.20	Chlorite-biotite-schist, carbonate-rich 37.10 - 38.10 garnet-bearing 38.10 - 38.90 some graphite and some po and some garnets

# 7s SOLFIDMALM

## DIAMOND DRILL RECORD

LOCATION: 3300W/90S      BEARING:      DIP: 90°      HOLE NO: 2-N/1775 SHEET NO: 2  
 LOGGED BY: E. Kneivi      STARTED: 26/9-75      PROPERTY: Ingajokka  
 CASING: 2.90m      FINISHED: 6/10-75  
 CORE SIZE: IAX 35 mm      TESTS (CORRECTED):

From	To	Description
7.20	60.00	Greenschist
		- no clear contact
	60.00	End of hole
		Core-angles
		B: 9° 3.40 27° 21.00
		26 4.60 14 25.60 2° 37.80 6° 51.50
		35 9.70 5 27.70 8 39.70 20 53.30
		34 10.50 4 29.80 2 40.50 12 55.50
		72 13.30 4 30.60 3 42.50 22 57.90
		30 15.50 24 32.90 4 44.50 5 59.50
		7 17.30 14 34.80 6 46.50

# 7s SULFIDMALM

## DIAMOND DRILL RECORD

LOCATION: 3000W/650S BEARING: ..... DIP: 90° HOLE NO: 3-N/1775 SHEET NO: 1a  
 LOGGED BY: E. Kreivi STARTED: 7/10-75 PROPERTY: Ingajokka  
 CASING: 2.80m FINISHED: 8/10-75  
 CORE SIZE: IAX 35 mm TESTS (CORRECTED): .....

From	To	Description
0	2.80	Overburden
2.80	6.80	Chlorite-mica-schist
6.80	9.40	Greenschist
9.40	14.50	Mica-schist
14.50	18.90	Qtz-keratophyre, scattered py-grains, magnetite impregnation (16.00 - 17.00)
18.90	20.70	Mica-schist
20.70	41.00	Qtz-keratophyre scattered po-grains
	25.70 - 25.75	100% po-breccia
	28.40 - 28.60	80% " with graphite, oc, cp
	39.70 - 39.80	60% " "
41.00	46.80	Greywacke
	44.60 - 46.80	po-breccia, 20% po, occasionally cp
46.80	52.80	Graphitic rock, 70% po-, 10% py-breccia, occasionally cp
52.80	55.10	Graphitic rock, 10-20% po in thin beds
55.10	57.80	Graphitic rock, 80% po-, 5% py-breccia, occasionally cp
57.80	60.00	Qtz-keratophyre
	60.00	End of hole
		The hole hit 11ms thick (46.80 - 57.80) graphitic bed with mainly iron sulphides

## 7s SULFIDALM

## DIAMOND DRILL RECORD

LOCATION: 3000W/650S BEARING: \_\_\_\_\_ DIP: 90° HOLE NO. 3-N/1775 SHEET NO. 1  
 LOGGED BY: E. Kreivi STARTED: 7/10-75 PROPERTY: Ingajokka  
 CASING: 2.80 m FINISHED: 8/10-75  
 CORE SIZE: IAX 35 mm TESTS (CORRECTED): \_\_\_\_\_

From	To	Description
0	2.80	Overburden
2.80	6.80	Chlorite-mica-schist, -feldspar-rich, carbonate-bearing 2.80 - 3.35 Chlorite -porphyroblasts 5.60 - 6.80 Chlorite-rich
6.80	9.40	Greenschist - carbonate-rich (-breccia), some mica
9.40	14.50	Mica-schist 10.40 - 11.55 Chlorite-rich 11.35 - 11.55 Sheared zone
14.50	18.90	Quartz-keratophyre with some mica-rich beds, scattered py-grains 16.00 - 17.00 some magnetite impregnation
18.90	20.70	Mica-schist with carbonate-bands and breccia
20.70	41.00	Quartz-keratophyre - some scattered po-grains - some mica-rich beds 25.70 - 25.75 po-breccia 28.40 - 28.60 graphitic bed, brecciated by po. 80% po, occasionally cp 39.35 - 39.80 Sheared zone, some po-breccia 39.70 - 39.80 60% po with graphite
41.00	46.80	Greywacke - carbonate-bearing, mica-rich, some chlorite and talc 44.60 - 46.80 po-breccia, 20% po, occasionally cp
46.80	52.80	Graphitic rock, brecciated by po and py, occasionally cp, 70% po, 10% py - graphitic pebbles are often filled by po 52.50 - 52.80 Sheared zone

# 's SULFIDALIV.

## DIAMOND DRILL RECORD

LOCATION: 3000W/650S      BEARING: .....      DIP: 90°      HOLE NO: 3-N/1775      SHEET NO: 2  
 LOGGED BY: E. Kreivi      STARTED: 7/10-75      PROPERTY: Ingajokka  
 CASING: 2.80m      FINISHED: 8/10-75  
 CORE SIZE: IAX 35 mm      TESTS (CORRECTED): .....

From	To	Description
52.80	55.10	Graphitic rock with thin po-rich beds with some py, 10 - 20% po
55.10	57.80	Graphitic rock with po-py-breccia, occasionally cp, 80% po, 5% py - quartz-pebbles
57.80	60.00	Qtz-keratophyre - some thin chlorite-talc-beds, and carbonate-breccia 59.10 - 59.30 carbonate-po-breccia 59.25 - 59.30 po-band 59.45 - 59.50 "
	60.00	End of hole
		Core-angles
		B: 14°      3.20      24°      37.10
		13      5.20      10      39.20
		28      7.60      4      40.50
		17      9.50      15      41.30
		21      10.40      7      43.30
		35      12.30      14      51.10
		12      14.40      18      53.40
		10      16.20      26      58.40
		22      18.30      30      59.80
		30      20.50
		18      22.30
		11      25.30
		3      27.30
		30      29.20
		11      30.20
		6      32.30
		5      34.30
		36      36.20

# A/s SULFIDMALM

## DIAMOND DRILL RECORD

LOCATION: 3300W/99oS BEARING: \_\_\_\_\_ DIP: 90° HOLE NO: 4-N/1775 SHEET NO: 1a  
 LOGGED BY: E. Kreivi STARTED: 8/10-75 PROPERTY: Ingajokka  
 CASING: 3.00m FINISHED: 9/10-75  
 CORE SIZE: IAX 35 mm TESTS (CORRECTED): \_\_\_\_\_

From	To	Description
0	3.00	Overburden
3.00	5.00	Acid tuffite
		3.50 - 5.00 10% po-, 5% py-breccia
5.00	8.50	Graphitic rock
		- 80% po-, 5% py- and 1% cp-breccia
8.50	11.60	Mica-schist (greywacke)
11.60	14.60	Greenstone
14.60	17.40	Mica-rich chlorite- and carbonate-bearing
		not bedded or schisted rock
17.40	22.30	Greenschist
22.30	27.10	Chlorite-mica-schist
		25.40 - 25.50 50% po-breccia
27.10	39.00	Carbonate-mica-bearing, albite-rich acid tuffite
		29.60 2cm po-breccia
		30.40 - 30.60 Graphitic bed with 70% po-breccia
	39.00	End of hole
		Core-angles
		B: 34° 3.70 25° 20.40 22° 31.50
		13 8.90 24 22.40 27 34.50
		14 10.50 25 24.50 11 36.50
		41 11.50 25 26.60 20 38.50
		15 17.60 29 27.40
		28 19.60 20 29.60
		Shoot-Back-anomaly seems to be caused by the 3.50ms
		thick (5.00 - 8.50) graphitic rock, which is
		brecciated by about 85% sulphides. (p.s. py.)

## A/s SULFIDMALM

## DIAMOND DRILL RECORD

LOCATION: 3300W/99oS BEARING: \_\_\_\_\_ DIP: 90° HOLE NO: 4-N/1775 SHEET NO: 1  
 LOGGED BY: E. Kreivi STARTED: 8/10-75 PROPERTY: Ingajokka  
 CASING: 3.00m FINISHED: 9/10-75  
 CORE SIZE: IAX 35mm TESTS (CORRECTED): \_\_\_\_\_

From	To	Description
0	3.00	Overburden
3.00	5.00	Acid tuffite? - some mica-bearing beds 3.50 - 5.00 po-py-breccia, 10% po, 5% py
5.00	8.50	Graphitic rock -brecciated by 80% po, 5% py, 1% cp
8.50	11.60	Mica-schist (greywacke) - carbonate - rich
11.60	14.60	Greenstone - a little of carbonate - quite homogenous
14.60	17.40	Mica-rich, chlorite-and carbonate-bearing not bedded or schisted rock 16.70 - 16.95 Fel-carb-vein 17.00 - 17.40 Chlorite-rich
17.40	22.30	Greenschist 18.50 - 18.80 Mica-bearing
22.30	27.10	Chlorite-mica-schist 25.40 - 25.50 50% po-breccia
27.10	39.00	Carbonate-mica-bearing acid tuffite, albite rich 29.60 2 cm po-breccia 30.00 - 30.50 Broken 30.40 - 30.60 Graphitic bed with 70% po-breccia 34.00 - 39.00 Very broken
	39.00	End of hole

Prosjekt nr. Masl 1775

Date 10/10 1975

Innsendt av: E. Kvivik

Prøve- nr.	Prove- nr.	Lokalitet	Provetype	Beskr.	Ni	Cu						Bemerk:
2262	3-N/08-10	Javvehus- jøkka	Drill core		0.34	0.48						
2263	1-N/12-13	Ingejokka	"		0.29	0.07						
2264	1-N/15-16	"	"		0.25	0.10						
2265	1-N/16-17	"	"		0.20	0.14						
2266	1-N/19-20	"	"		0.18	0.06						
2267	1-N/20-21	"	"		0.21	<0.05						
2268	1-N/21-22	"	"		0.23	<0.05						
2269	1-N/22-23	"	"		0.16	<0.05						
2270	1-N/23-24	"	"		0.18	<0.05						
2271	1-N/24-25	"	"		0.15	<0.05						
2272	1-N/25-26	"	"		0.16	<0.05						
2273	1-N/26-27	"	"		0.18	<0.05						
2274	1-N/27-28	"	"		0.26	0.24						
2275	1-N/28-29	"	"		0.24	0.08						
2276	1-N/29-30	"	"		0.17	<0.05						

ANMERKNINGER TIL LAB.:

7.A

Dette skjema skal sendes i egen  
 lutt sammen med prøvene til  
 Kristiansandkontoret, ved motveien  
 lage kopier til Oslokontoret og  
 Prøvene fra forskjellige prosjekt, som  
 eget skjema.

Prosjekt nr. Masi 1775

Dato 10/10 1975

Innsendt av: E. Røed

Prøve- nr.	Localitet	Prøvetype	Beskr.	N <sub>2</sub>	Lu					Bemerk:
2277	1-N/30-31	Jugajarka	Dwill core	0.15	<0.05					
2278	1-N/31-32	"	"	0.18	<0.05					
2279	1-N/32-33	"	"	0.17	0.08					
2280	1-N/33-34	"	"	0.16	0.06					
2287	1-N/19-20	Z 42-N 19-20	"	0.10	<0.05					
2281	2-N/20-21	"	"	0.07	0.05					
2282	1-N/21-22	"	"	0.06	<0.05					
2283	2-N/22-23	"	"	0.10	<0.05					
2284	2-N/23-24	"	"	0.06	<0.05					
2285	2-N/32-33	"	"	0.06	<0.05					
2286	2-N/33-34	"	"	0.07	<0.05					
2287	2-N/34-35	"	"	0.10	<0.05					
2288	2-N/35-36	"	"	0.17	0.10					
2289	2-N/36-37	"	"	0.10	<0.05					
2290	3-N/47-48	"	"	0.21	0.14					

ANMERKNINGER TIL LAB.:

7. A

Detta skjema skal sendes i egen  
lett sammen med prøvene til  
Kristiansandkontoret, ved mottakelse  
lage kopier til Oslokontoret og til  
Prøvene fra forskjellige prosjekt, send  
 eget skjema.

Prosjekt nr. Mas: 1775

Dato 10/10 1975

Innsendt av: E. Kveivi

Prøve- nr.	Lokalitet	Prøvetype	Beskr.	Ni		Cu		Bemerk:
				Ni	Cu	Ni	Cu	
2291	3-N/48-49	Inngjørelse	Drill core	0.18	0.14			
2292	3-N/49-50	"	"	0.24	0.06			
2293	3-N/50-51	"	"	0.23	0.14			
2294	3-N/51-52	"	"	0.15	0.07			
2295	3-N/52-53	"	"	0.24	0.06			
2296	3-N/53-54	"	"	0.11	<0.05			
2297	3-N/54-55	"	"	0.16	<0.05			
2298	3-N/55-56	"	"	0.25	<0.05			
2299	3-N/56-57	"	"	0.21	0.06			
2300	3-N/57-58	"	"	0.20	<0.05			
2301	4-N/4-5	"	"	0.11	0.06			
2302	4-N/5-6	"	"	0.14	0.47			
2303	4-N/6-6.5	"	"	0.16	0.48			
2304	4-N/6.5-7	"	"	0.10	0.22			
2305	4-N/7-8	"	"	0.18	0.14			
2306	4-N/8-9	"	"	0.09	0.13			

ANMERKNINGER TIL LAB.:

7. A

Dette skjema skal sendes i egen  
lutt sammen med prøvene til  
Kristiansundkontoret, ved mottagelse  
lage kopier til Oslokontoret og  
Prøvene fra forskjellige prosjekt, se  
egne skjema.

#### 4. GEOLOGICAL MAPPING

The Ingajokka grid was mapped geologically by P. Ericsson, at a scale of 1:1000 (figs. 13I and 13II). He found the major part of the grid to be underlain by a flat-lying graphite schist unit, brecciated in part and including quartzite horizons in the southern outcrops. The graphite schists are cut by minor gabbro intrusions, in part altered to amphibolite.

The north of the grid is underlain by mica schists. Drill hole data indicate that these overly the graphite schists, and that the whole succession dips northwards at a flat angle. DDH 1-N '75 shows a gradational contact between the two units marked by a zone of alternating mica and graphite schist bands.

A number of sulphide-bearing locations were discovered during the course of the mapping. Of these five were in the graphite schist unit (including the original Ingajokka showing), four in gabbro or amphibolite and two in mica schists outcrops. Pyrite was the dominant sulphide mineral, but pyrrhotite and minor chalcopyrite were also found in the mineralized graphite schist (locality 25/PE). In addition Ericsson mapped extensive gossans overlying graphite schist areas.

Structural observations show shallow dips of 10-20° with widely varying dip-directions. The inter-effect of topography and a flat-lying succession has produced a complicated exposure pattern, but the overall structure is of an east-west strike with a gentle northerly dip.



### KEY:

- GRANITIC ROCK
- QUARTZITE, CHERT
- QUARTZ, KERATOPHYRE
- CONGLOMERATE
- MICA SCHIST, GREYWACKE
- ALBITE CARBONATE ROCK
- GRAPHITIC SCHIST
- AMPHIBOLITE
- GREENSTONE SCHIST
- GABBROIC ROCK
- ULTRABASIC ROCK
- SULFIDES IN BEDROCK
- SULFIDES IN ROCK
- RUSTY AREA, GOSSAN
- CONTACT BETWEEN ROCK-TYPES
- GRANODIORITE



INGAJOKKA  
MASI 1775  
LITHOLOGICAL MAP

1/2 SULFIDMALM

SCALE	OBS. PE	7-75
	DRAW. PE	7-75
	TRAC. PE	7-75
	CHK. EK	7-75

MAP NO.	364-75-17
MAP SHEET	

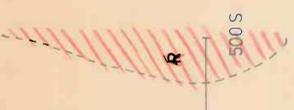
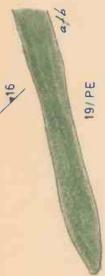
3400 W

3300 W

3200 W

3100 W

3000 W

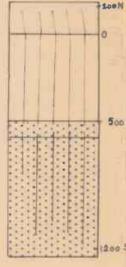
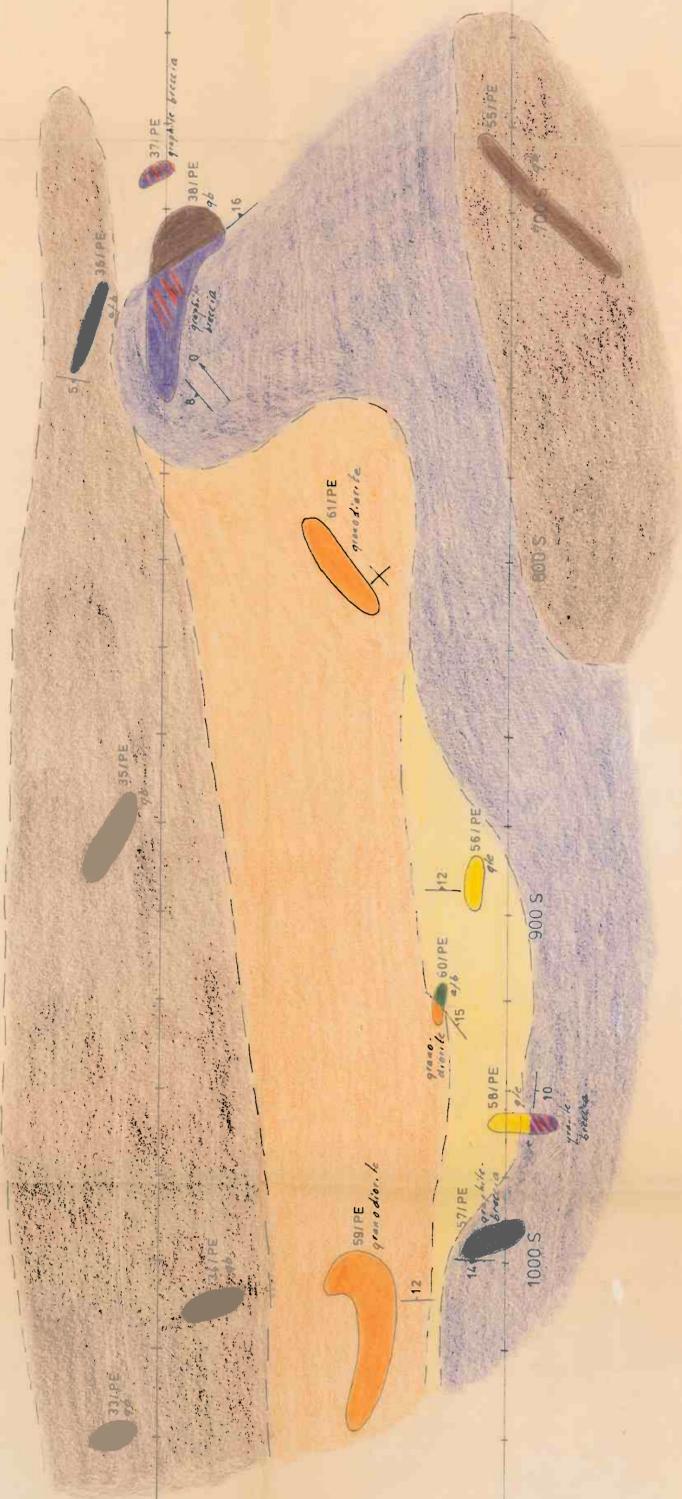
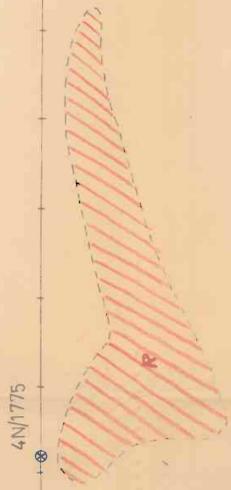


4N/1775

3-N/1775

**KEY:**

- GRANITIC ROCK
- QUARTZITE, CHERT  
QUARTZ KERATOPHYRE  
CONGLOMERATE
- MICA SCHIST, GREYWACKE
- ALBITE CARBONATE ROCK
- GRAPHITIC SCHIST
- AMPHIBOLITE
- GREENSTONE SCHIST
- GABBROIC ROCK
- ULTRABASIC ROCK
- SULFIDES IN BEDROCK
- SULPHIDES IN ROCK
- RUSTY AREA, GOSSAN
- CONTACT BETWEEN ROCK-TYPES
- GRANDDIORITE



INGAJOKKA  
MASI 1775  
LITHOLOGICAL MAP

1/3 SULFIDMALM

SCALE 1:1000	OBS. PE	7-75
	DRAW. PE	7-75
	TRAC. PE	7-75
	CHK. EK	7-75

MAP NO.	364-75-17
MAP SHEET	

Inqajokka / per Ericsson / 1775

1 Quartz/mica-schist. ~1% py. <sup>F</sup> 130/30N; <sup>B</sup> 208/28W

2 same as 1, slightly more sheared. Some py,  
<sup>B</sup> 41/30NW

a ③ Graphite-schist, slight tendency to lineation along the strike, <sup>B</sup> 52/29N; <sup>F</sup> 150/18N. Contact to the south to a severely sheared gabbro, ~2% py, <sup>S</sup> 90/8W (distinct); <sup>S</sup> 83/82S. The gabbro is not folded. Contact: 83/38N.

a ④ Fine grained amphibolite/diortite-schist. ~5% py, <sup>S</sup> 31/24W; <sup>S</sup> 2/13W. Remnants of sheared gabbro, ~3% py, tr. of cp

⑤ Graphite-schist, 10% py in s-planes. Contacts to the north to a quartz/mica schist.  
<sup>B</sup> 84/31N; <sup>S</sup> 60/10S (also contact)

6 same quartz/mica schist as 5, <sup>S</sup> 140/18S

7 \_\_\_\_\_ " \_\_\_\_\_ , <sup>S</sup> 50/20N

8 \_\_\_\_\_ " \_\_\_\_\_ , <sup>S</sup> X. horizontal

9 \_\_\_\_\_ " \_\_\_\_\_ , <sup>S</sup> 60/16NW

10 \_\_\_\_\_ " \_\_\_\_\_ , <sup>S</sup> 180/10W, to the south contact to a gabbro, rusty.

- 11 gabbro
- (12) slightly sheared gabbro, <sup>S</sup> 170/17N, rusty, 2% py
- 13 graphite-schist, very rusty
- 14 same quartz/mica-schist as 5, <sup>S</sup> 170/20E
- 15 gabbro, partly albite/carbonate altered, 0.5% py, <sup>S</sup> 140/40 SV
- 16 graphite-schist, very rusty, sub-outcrop
- 17 same as 15
- 18 — " —
- 19 amphibolite, finegrained, <sup>S</sup> 44/16N
- 20
- 21 graphite-schist, <sup>T<sub>1</sub></sup> 60/10NW, very rusty
- 22 gabbro, fresh, <sup>S</sup> ~ x horizontal
- 23 — " — , <sup>S</sup> 46/18W
- 24 — " — , partly very rusty, <sup>S</sup> 12/12W
- (25) fresh gabbro, upon a graphite-breccia forming a dome-structure, <sup>F</sup> 123/5SE. The breccia is ~5 m thick, 10% py, tr. of cp. On the top the breccia is more schist-like.

a (26) Continuation of same graphite-schist horizon as 25. Here ~12 m thick

27 Gabbro, slightly albite/carbonate-altered, § 179/23W

28 Very rusty graphite-schist

29 Quartz/mica-schist, § 165/5W

30 ——— " ——— , § 100/18N, ~170/14

31 Very rusty graphite-breccia

32 Quartz-keratophyre, sub-outcrop

33 Gabbro, slightly albite/carbonate-altered

34 ————— " —————

35 ————— " —————

36 Fine grained amphibolite or biotite-schist, § 100/5S

<sup>3</sup>  
37 Graphite-breccia, very rusty

38 Gabbro, slightly sheared, § 50/16N. Below a very rusty graphite-breccia. Contact along schistosity.

39 Graphite-schist, rusty. <sup>B</sup> § 120/28SW

40 Rusty graphite-breccia

- 41 Rusty graphite-schist, <sup>B</sup> 142/30 NE
- 42 Chlorite-schist, 80/25 N
- 43 same as 33
- 44 ——— " ———
- 45 Very rusty keralofyr
- 46 Graphite-schist, <sup>B</sup> 190/12 E
- 47 gabbro, fresh
- ⊙ (48) Graphite-schist (?), 1 topy in s-planes,  
102/14 N
- 49 Quartz/mica-schist, <sup>S</sup> 96/22 S
- 50 Same as 33, <sup>S</sup> 72 horizontal
- 51 Very rusty graphite-breccia
- 52 ——— " ———, <sup>S</sup> 72 horizontal  
+ (?)
- 53 ——— " ———, sub-outcrop
- 54 ——— " ———, <sup>S</sup> 72 horizontal
- 55 Same as 33
- ⊙ (56) ~~Graphite-schist~~, <sup>B</sup> 92/12 N Quartz-keralofyric
- 57 Very rusty graphite-breccia, <sup>S</sup> 92/12 N

- 58 Very rusty graphite-breccia overlying a  
Quartz-keratophyre as 56<sup>S</sup>  
~~gabro as 53~~, + 5/10W
- 59 Coarse granodioritic schist, 85/12N +<sup>S</sup>
- 60 Fine grained amphibolite / biotite-schist,  
+40/15N overlying a schist of 59. Contact  
along schistosity.
- 61 same as 59, + ~ X <sup>S</sup> hornstone.