



Bergvesenet

Postboks 3021, 7002 Trondheim

Rapportarkivet

Bergvesenet rapport nr BV 1296	Intern Journal nr 199/92	Internt arkiv nr	Rapport lokalisering Trondheim	Gradering Fortrolig
Kommer fra ..arkiv	Ekstern rapport nr	Oversendt fra Erkki Kreivi	Fortrolig pga Muting Prospekteringsfondet	Fortrolig fra dato:

Tittel

Pasvik nikkelbelte, Sør-Varanger, Norge.
Rapport av undersøkelse 1990

Bilag, søknad prospefond - 1992

Forfatter Erkki Kreivi	Dato 21.06 1991	Bedrift Pasvik Malm
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Kommune Sør-Varanger	Fylke Finnmark	Bergdistrikt Troms og Finnmark	1: 50 000 kartblad 23332	1: 250 000 kartblad Kirkenes
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Fagområde Geofysikk Boring Analyser	Dokument type Rapport Prospekteringsfondet	Forekomster Rømlingsås
Råstofftype Malm/metall	Emneord Ni Cu	

Sammendrag

Rapporten er et vedlegg til søknaden om **prospekteringstøtte** for 1992 og omhandler malmletingsarbeider som ble utført i Rømlingsåsen i Syd-Pasvik i 1990.

Det reffereres til undersøkelser og rapporter fra 1986, 1987 (BV 899) og 1989.

Undersøkelsene konsentrerte seg om objektene 3, 4, 5, 7, 11, 12, 13 og 14.

Av disse ble objektene 3, 4 og 5 ble boret med 9 hull på tilsammen 141,15m hvorav 65m var i overdekke noe som ga gj.snitlig overdekke på 7,2m.

Alle objektene ble målt med Mag VLF-R og IP. Røsking/stripping ble foretatt på objekt 3, 4 og 5.

Objekt 3, 4 og 5 ble påsatt 3 hull hver men kun boringen på objekt 3 gav indikasjon på mineralisering med beste analyse på 0,5m med 0,68% Ni og 0,39% Cu.

100 km



PASVIK NIKKELBELTE, Sør-Varanger, Norge

Rapport av undersøkelse 1990

Erkki Kreivi

Arbeidsgruppe:

Erkki Kreivi

geolog, geofysiker

Teuvo Pernu

geofysiker, professorassistent

Eero Heikkinen

geofysiker

Pekka Kääntee

geofysiker-student

Contents

Introduction and conclusion	1
Results	2
Drill-logging	5
Appendix:	
Ni-showings	
Index map	
Diamond-drilling, trenching on the targets 3, 4 and 5.	7 pc
Geophysics on the targets 3,4,5,7,11,12,13 and 14.	46 pc
EDX-analyser results	11 pc
EDX-analyses spectrum	2 pc

Introduction and conclusion

Enclosed is the report of the geological and geophysical prospecting in 1990. The prospected areas are situating in Øvre Pasvik, Sør-Varanger-kommune, Norway, 5 km W of Nyrud.

The work was the continuation of the prospecting in 1986, 1987 and 1989. (See the reports !). The prospected targets are 3,4,5,7,11,12,13 and 14. (See the index map)

The base of the prospecting was the nickel-copper-find in ultramafic blocks in 1977. The best blocks were assayed 4.19 % Ni and 1.84 % Cu. One bedrock source was located by drilling in 1987 in the target 3. The best assays in a drillcore were analyzed 1.55 % Ni and 0.65 % Cu. In 1990 the source was penetrated by three more drillholes. The sulphide-impregnation extends about 50 m in north-south-direction, plunging about 30° westwards in metamorphosed ultramafic body, 2-4 m above its contact with gneiss-granite. The thickness of the mineralization varies irregularly, maximum is 5.5 m.

Drilling and trenching was also done in the targets 4 and 5. The targets 7,11,12,13 and 14 were prospected with geophysics. Almost everyone got interesting anomalies, which should be checked also by drilling and trenching.

In 1990 9 drillholes were drilled, totally 68 m with casing through overburden and 72.7 m in bedrock. 80 hours were used for trenching by excavator. Magnetic, IP- and VLF-R- prospecting were run by co-operating with a staff from the geophysical department in Oulu-university. The staff has got several years experience of the same type of deposits like we have got in Pasvik.

Results

The description of the geology in the area was explained in my report of 1987.

Target 3 (Done: Mag, VLF-R, IP, trenching, drilling)

The target belongs to the rounded mag-anomaly-group, which is running like pearl necklace in north-west-direction from Tangenfjellet at the Russian boarder. All the pearls of this group cause also electromagnetic anomalies. The anomalies could not be picked up by slingram- or VLF-methods, but only by VLF-R and IP. EM-anomalies are usually situating in the NE-end of the mag-anomalies. In this target the mag-anomaly is 80 m x 150 m and EM-anomaly 50 m x 100 m. Found by drilling, the EM-anomaly is caused by Ni-Cu-bearing mineralization. The mineralization was in the foot-side of an ultramafic body, 2-4 m above its contact with gneiss-granite. The mineralization is impregnation-type, irregular, up to 5.5 m thick and 50 m long plate, plunging about 30° SW. The best drill-core-analyse was assayed up to 1.55 % Ni and 0.65 % Cu.

Trenching on the anomalies brought up several Ni-Cu-bearing weathered blocks. The thickness of overburden is 7-10 m .

Target 14 (Done: Mag, VLF-R)

The target is situating 200 m NW of the target 3. The size of the ^{mag/}anomaly is 140 m x 150 m and EM-anomaly 100 m x 170 m. The anomalous area is lying in a swampy valley under a shallow, muddy pond, Keinolampi. The first Ni-Cu-bearing block in the area was found just down-ice of this anomaly, two km NNE of it.

Target 4 (Done: Mag, VLF-R, IP, trenching, drilling)

The target is situating just in up-ice-direction of the best found Ni-Cu-blocks (4.19% Ni, 1.84% Cu), about 300 m SW of them, 500 m SE of the target 3. The size of the mag-anomaly is 60 m x 60 m and EM-anomaly 60 m x 50 m. Comparing to the target 3 the EM-anomaly in this target is same type, but much smaller.

A 65 m long, 10 m wide and 8-9 m deep trench was dug in overburden to the bedrock over the IP-mag-anomalous area. The rock in the bedrock was quite homogeneous, magnetite-rich, barren, metamorphosed peridotite, same type as in the target 3 and in the rich blocks. Some weathered, poor Ni-Cu-bearing blocks were found in the trench. The drilling (3 holes) did not pick up any mineralization. The thickness of overburden is 8 m-10 m.

Target 5 (Done: Mag, VLF-R, trenching, drilling)

The target is situating in up-ice-direction of a Ni-Cu-block, 30 m of it, 500 m SSE of the target 4. The size of the magnetic anomaly is 125 m x 50 m. A weak VLF-R-anomaly overlaps the mag-anomaly. By trenching some brown oxidized, very weathered blocks of ultramafic rock were found near the surface and some black weathered blocks of the same rock type with some malachite were found near the bedrock of ultramafics. By drilling no mineralization was found, only metamorphosed peridotite like in the targets 3 and 4. The thickness of overburden is 3 m - 5 m.

Target 11 (Done: Mag, VLF-R, IP)

The target is situating between Tommabekke and Blankvann, 1600 m E of the target 3. Here the size of the mag-anomaly is 250 m x 300 m and EM-anomaly 50 m x 100 m. The mag-anomaly is as strong as in the target 3, but EM-anomaly weaker.

Target 12 (Done: Mag, IP, VLF-R)

The target is situating 100 m S of the target 11. The size of the mag-anomaly is 100 m x 200 m. No clear EM-anomaly was found.

Target 7 (Done: Mag, IP, VLF-R)

The target is about 400 m SW of the target 12. The size of the mag-anomaly is 80 m x 100 m. EM-anomalies were not found on the mag-anomaly, but only ^{on} W-and E-side of it. An outcrop of ultramafic rock was found on the E-side of the mag-anomaly. 3 Ni-Cu-blocks were also found on the mag-anomaly.

Target 13 (Done: Mag, IP, VLF-R)

The target is 500 m N of the target 7, at Tommabekke. The size of the mag-anomaly is 150 m x 250 m. Also a weak EM-anomaly was found on the mag-anomaly.

Drill-logging1/90 90° 5225W/12030N Target 4

0.00-8.90 Overburden.

8.90-12.50 Metaperidotite

-dark, medium grained, homogeneous, mica-rich

11.75-11.90 -feldspar-rich

12.50-12.85 Gneiss-granite

12.80 End

2/90 90° 5225W/12024N Target 4

0.00-9.80 Overburden

9.80-18.50 Metaperidotite

-like 1/90

15.45-15.75 chlorite-rich

B: 80°

18.50-18.70 Gneiss-granite

18.70 End

3/90 90° 5450W/12266N Target 3

0.00-10.15 Overburden

10.15-18.80 Metaperidotite

-dark, medium grained, homogeneous

10.50-10.65 po+cp-impregnation >1 %

10.95-11.05 - " -

11.40-11.50 - " -

11.75-11.80 chlorite-rich

12.60-13.45 po+cp-impregnation 5 %

17.00-18.40 a little schisted

18.40-18.80 Afb-rich

18.80 End

Assayes:	% Ni	% Cu
10.50-11.00	0.22	0.16
13.00-13.50	0.68	0.39
13.50-14.00	0.11	0.00

4/90 90° 5457W/12302N Target 3

0.00- 6.80 Overburden
 6.80-10.10 Metaperidotite, broken bedrock or blocks } casing
 10.10-16.30 Metaperidotite
 -ore-parts less magnetic, like 3/90
 10.10-12.70 po+cp-impregnation + breccia
 16.30-16.70 Mica-schist
 16.70-17.05 Gneiss-granite
 17.05 End

Assayes:	% Ni	% Cu
8.30-10.00	0.13	0.00
10.00-10.50	0.36	0.38
10.50-11.00	0.38	0.17
11.00-11.50	0.54	0.17
11.50-12.00	0.10	0.00

5/90 90° 5484W/12295N Target 3

0.00- 6.95 Overburden
 6.95-25.00 Metaperidotite
 -like 3/90
 6.75-11.50 mica-chlorite-bearing
 20.20-20.75 po+cp-breccia and impregnation + ilmenite
 25.00 End

Assayes:	% Ni	% Cu
20.00-20.50	0.19	0.17
20.50-21.00	0.00	0.12

6/90 90° 5235W/11998N Target 4

0.00- 8.30 Overburden
 8.30-11.00 Metaperidotite
 -like 3/90
 11.00 End, caving

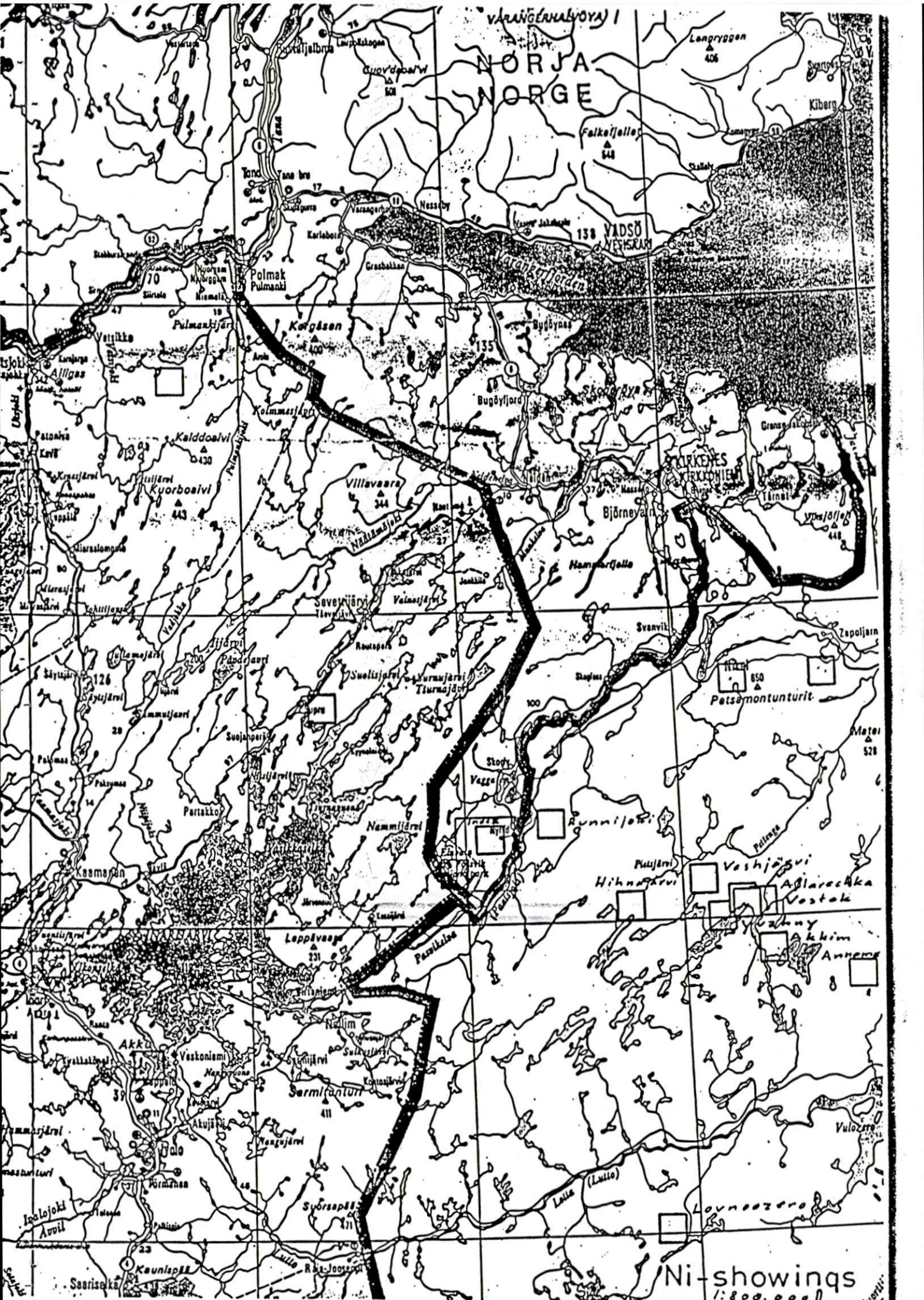
7/90 90° 5040W/11257N Target 5
0.00- 5.10 Overburden
5.10-10.80 Metaperidotite like 3/90
9.20-9.70 Mica-bearing
10.80-11.50 Gneiss-granite
11.50 End

8/90 90° 5090W/11225N Target 5
0.00- 3.35 Overburden
3.35- 8.10 Metaperidotite like 3/90
-a weak foliation 20°, 5.00-5.15 carb-vein
8.10- 9.15 Gneiss-granite
9.15 End

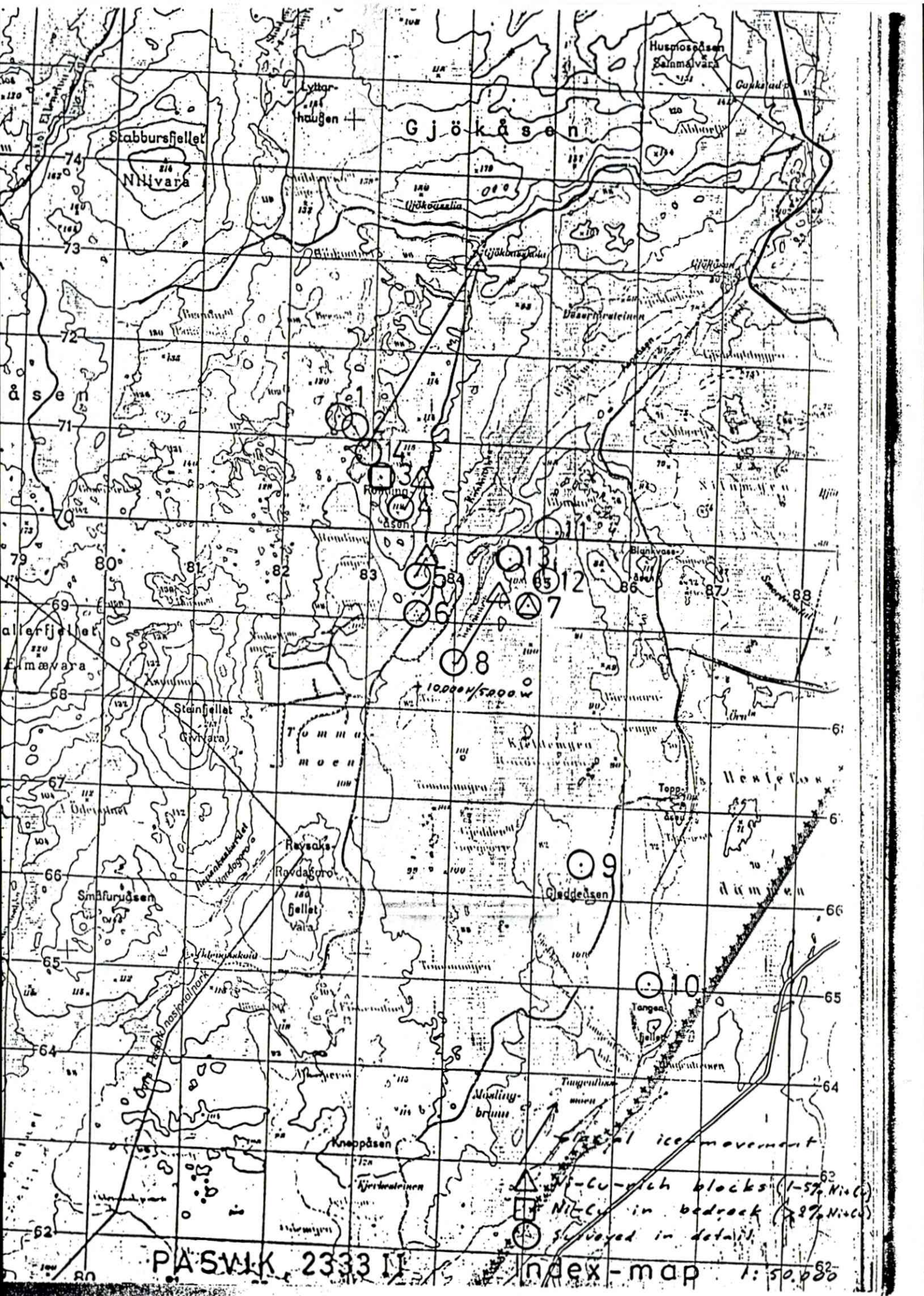
9/90 90° 5028W/11312N Target 5
0.00- 5.35 Overburden
5.35-16.70 Metaperidotite like 3/90
16.60-16.70 **Talc**
16.70 End

Ivalo 21.6.1991


Erkki Kreivi



Ni-showings
1:800,000



PA SVLK 2333 II

Index-map

1:50,000

4/90
90°

Ni	Cu	Depth
0,13		8,30 - 10,00
0,36	0,38	10,00 - 10,50
0,38	0,17	10,50 - 11,00
0,54	0,17	11,00 - 11,50
0,10		11,50 - 12,00

-12300
N

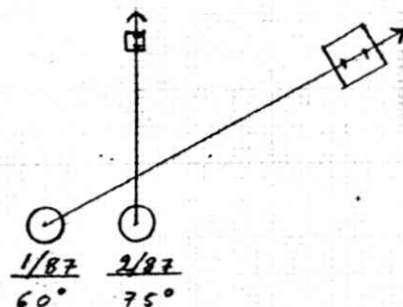
5/90
90°

Ni	Cu	Depth
0,19	0,17	20,00 - 20,50
	0,12	20,50 - 21,00

-12390
N

Ni	Cu	Depth
0,36	0,65	24,00 - 24,50

-12380
N



Ni	Cu	Depth
0,17		18,50 - 19,00
0,17		19,00 - 19,50
0,14		22,00 - 22,50
0,58	0,45	22,50 - 23,00
0,54	0,60	23,00 - 23,50
1,55	0,54	23,50 - 24,00

-12370
N

3/90
90°

Ni	Cu	Depth
0,22	0,16	10,50 - 11,00
0,68	0,39	13,00 - 13,50
0,11		13,50 - 14,00

-12260
N

5500W

5490W

5480W

5470W

5460W

5450W

□ Ni, Cu in drillcore

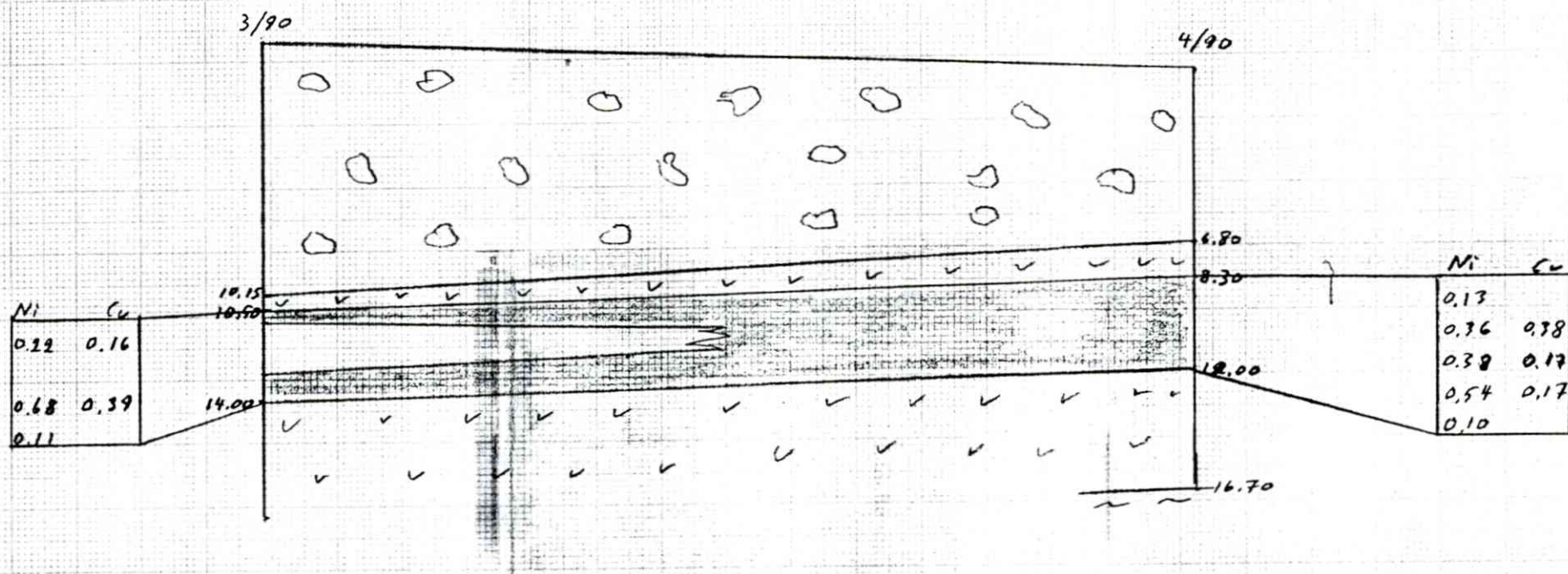
Ramlingsås N

Diamond-drilling

3

1: 250

Target 3

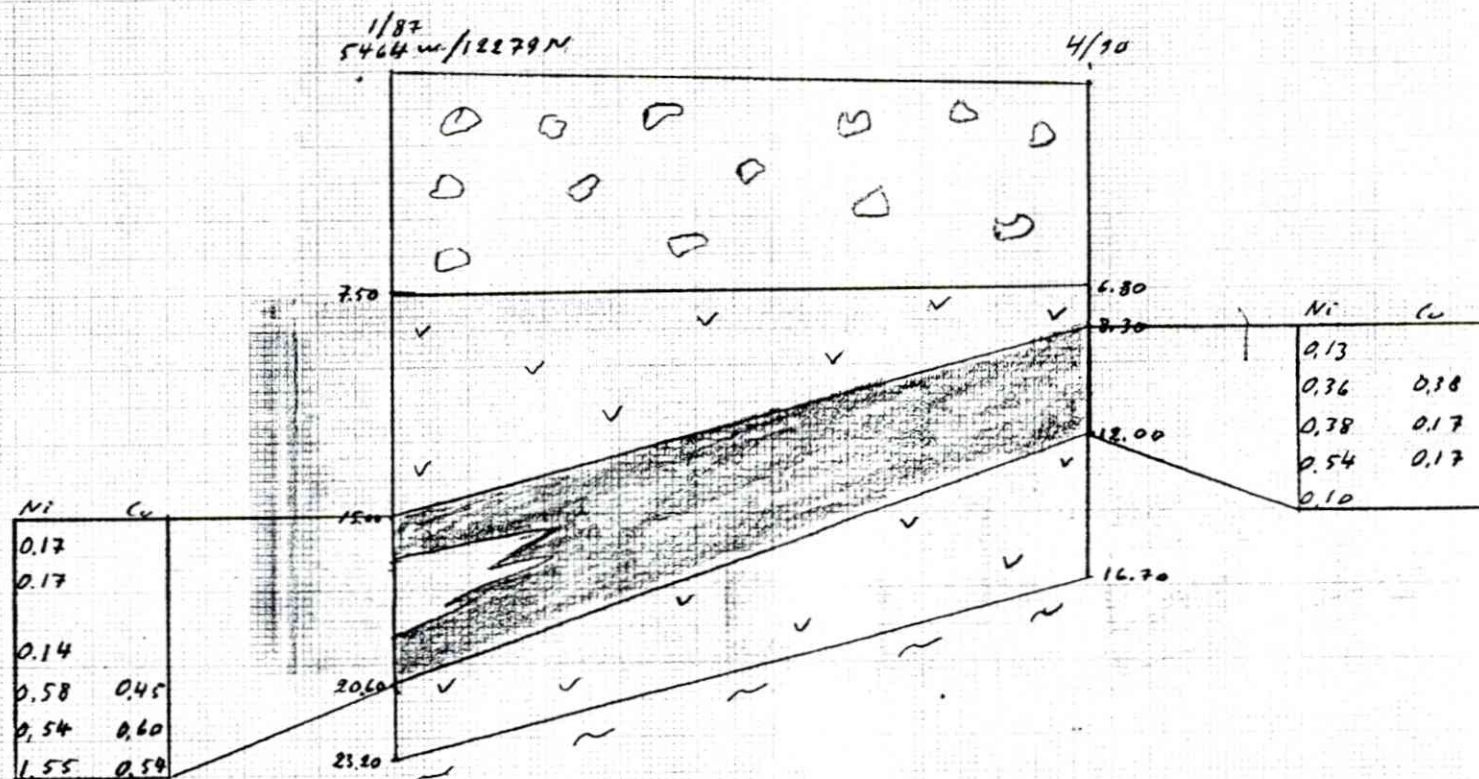


- overburden
- ✓ ultramafic
- Ni-Cu mineralization
- ~ granite-gneiss

1:250

Ramling's N

Cross-section 3/90 - 4/90 3

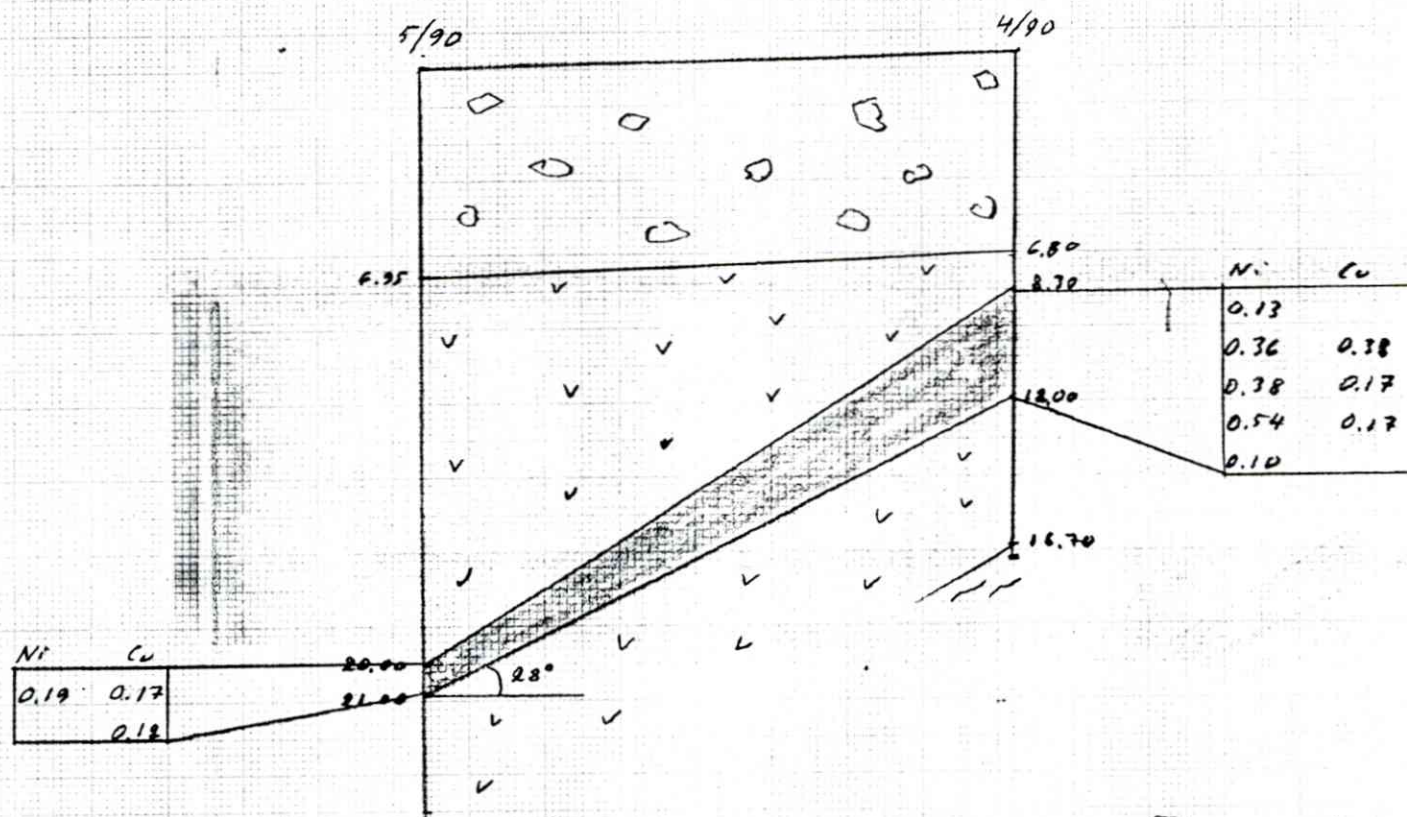


- Overburden
- v ultramafic
- Ni-Cu-mineralization
- ~ granite-gneiss

1:250

Römling 25 M

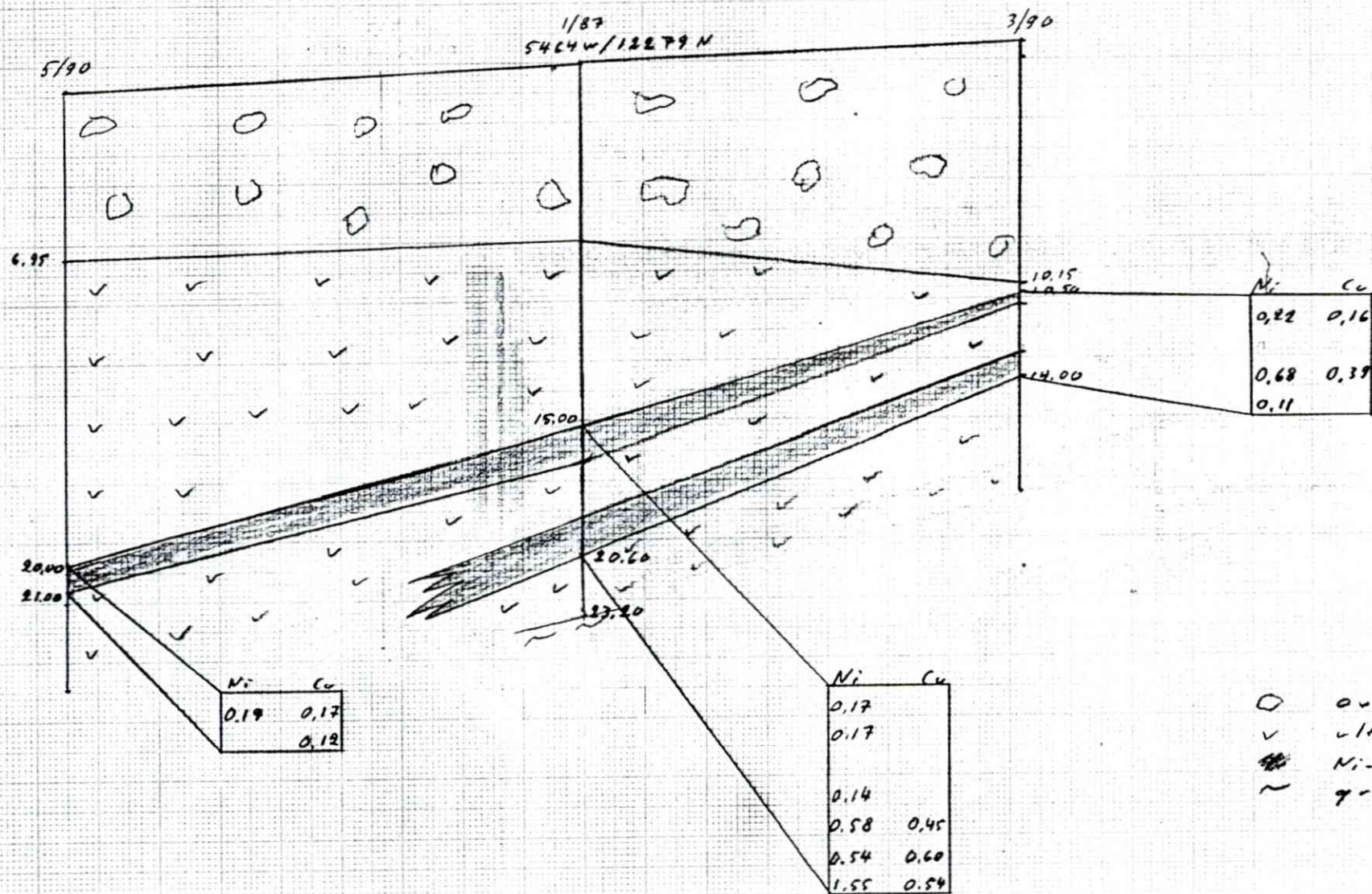
Cross-section 1/87-4/90



○ overburden
 v ultramafic
 ■ Ni-Cu-mineralization

1:250

Rönklings N
 Cross-section 5/90 - 4/90

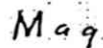
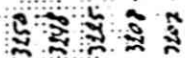


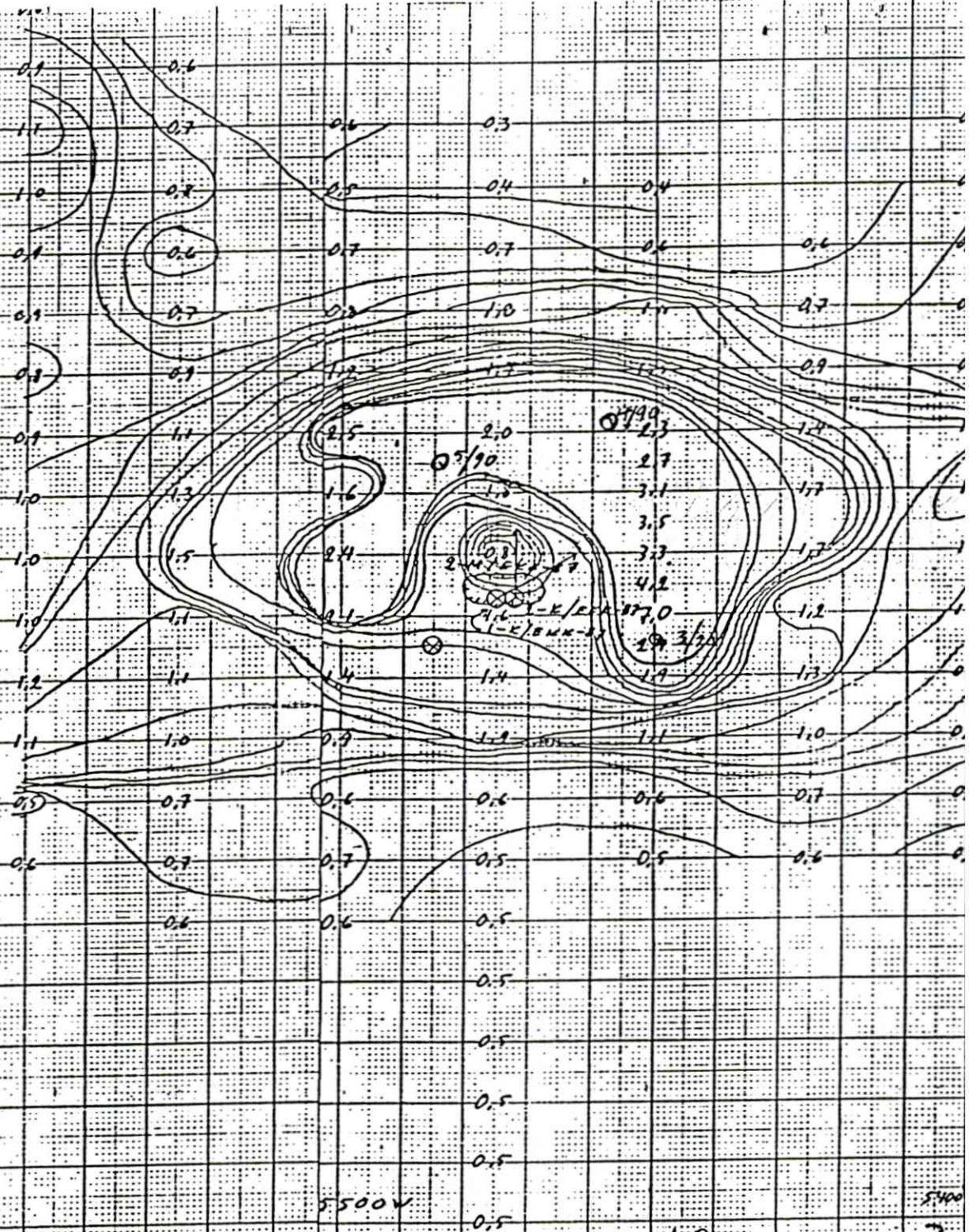
- Overburden
- ✓ ultramafic
- ▨ Ni-Cu-mineralization
- ~ granite-gneiss

1:250

Römlingåsen N

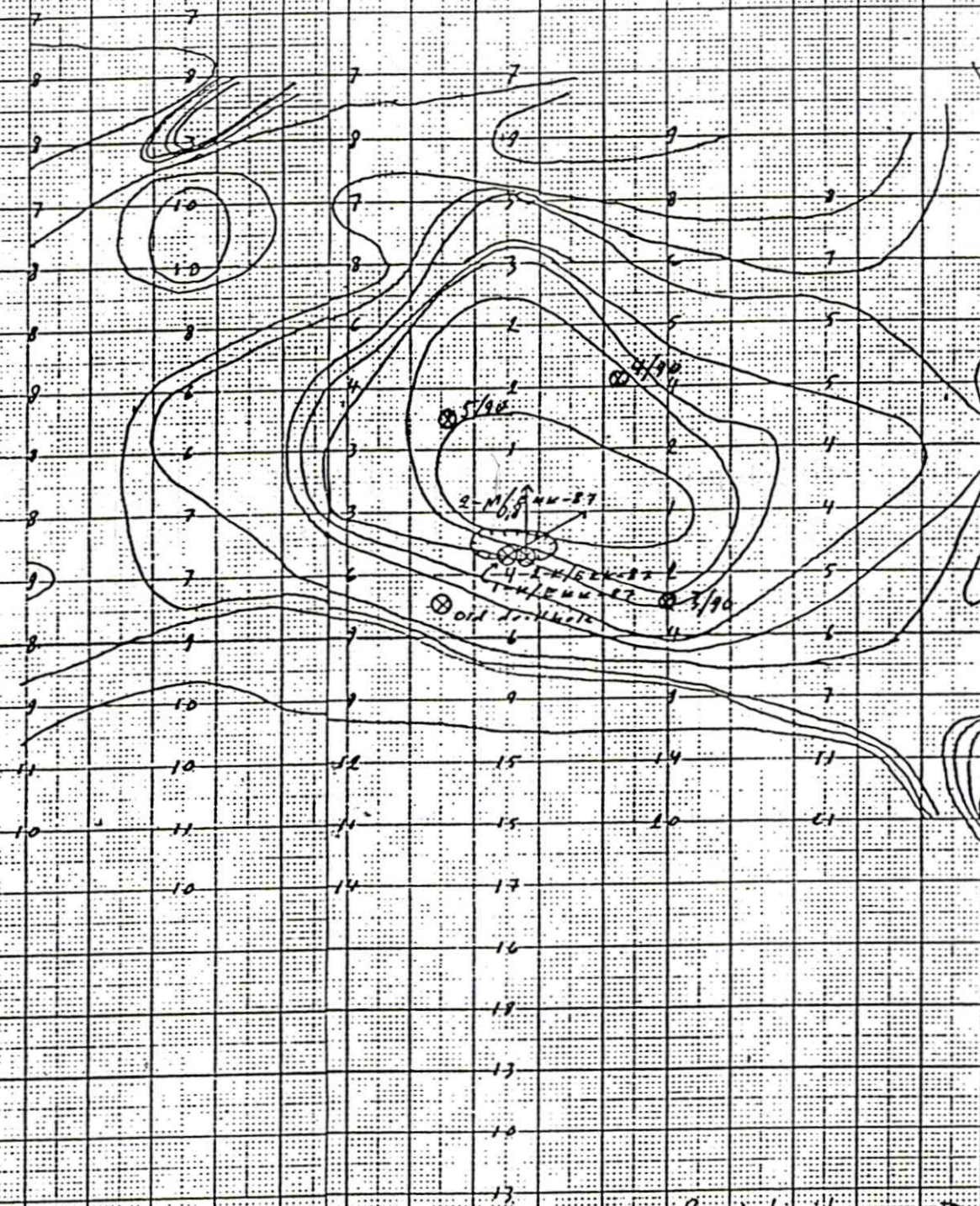
Cross-section 5/90-(2-1)/87-3/90





540

3



Resistivity

2300N

12200N

5500W

5400

VLF-R

3

5700 W

5700 W

5600 W

5500 W

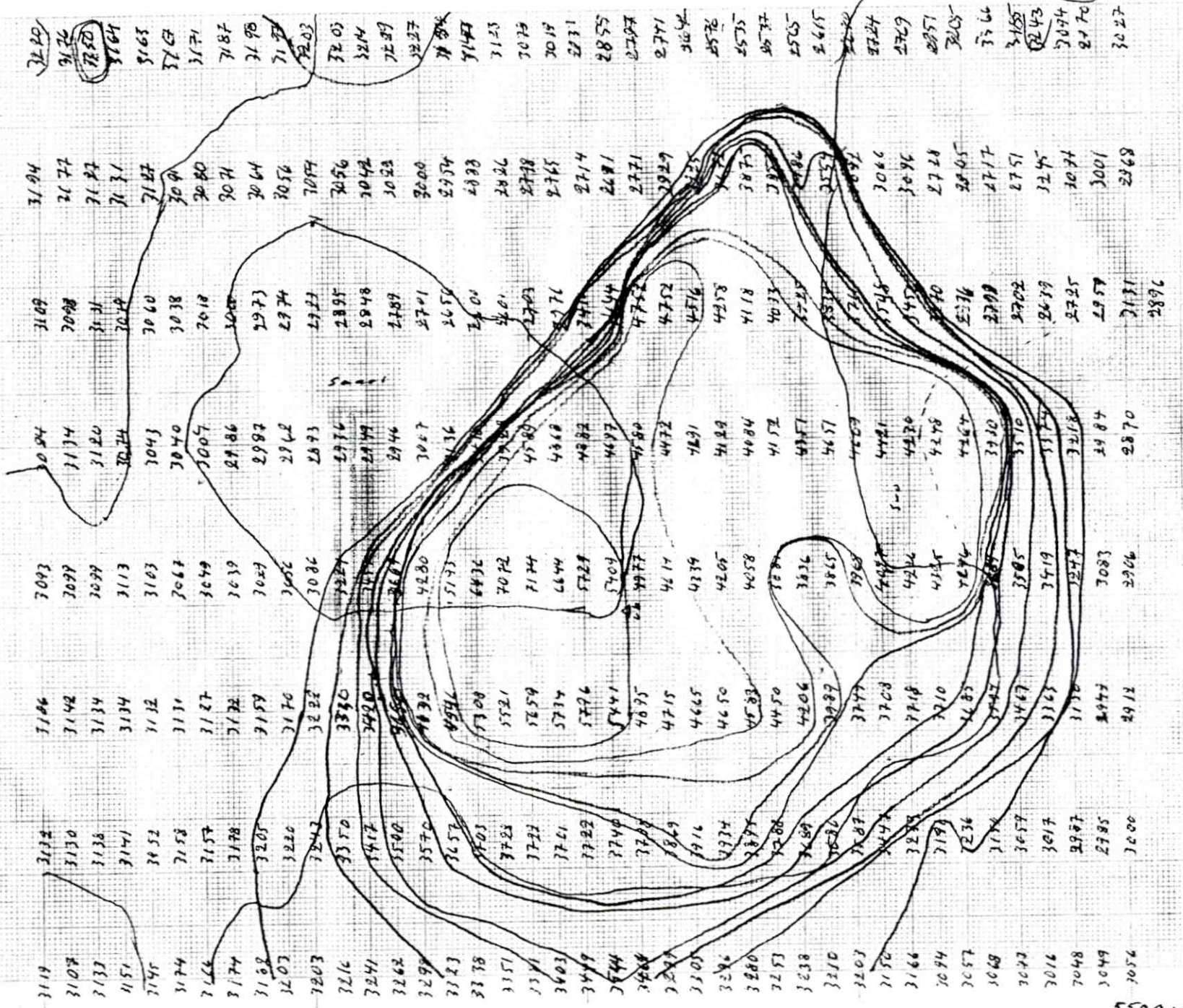
Keinolaampi

Maa

14

1:1000

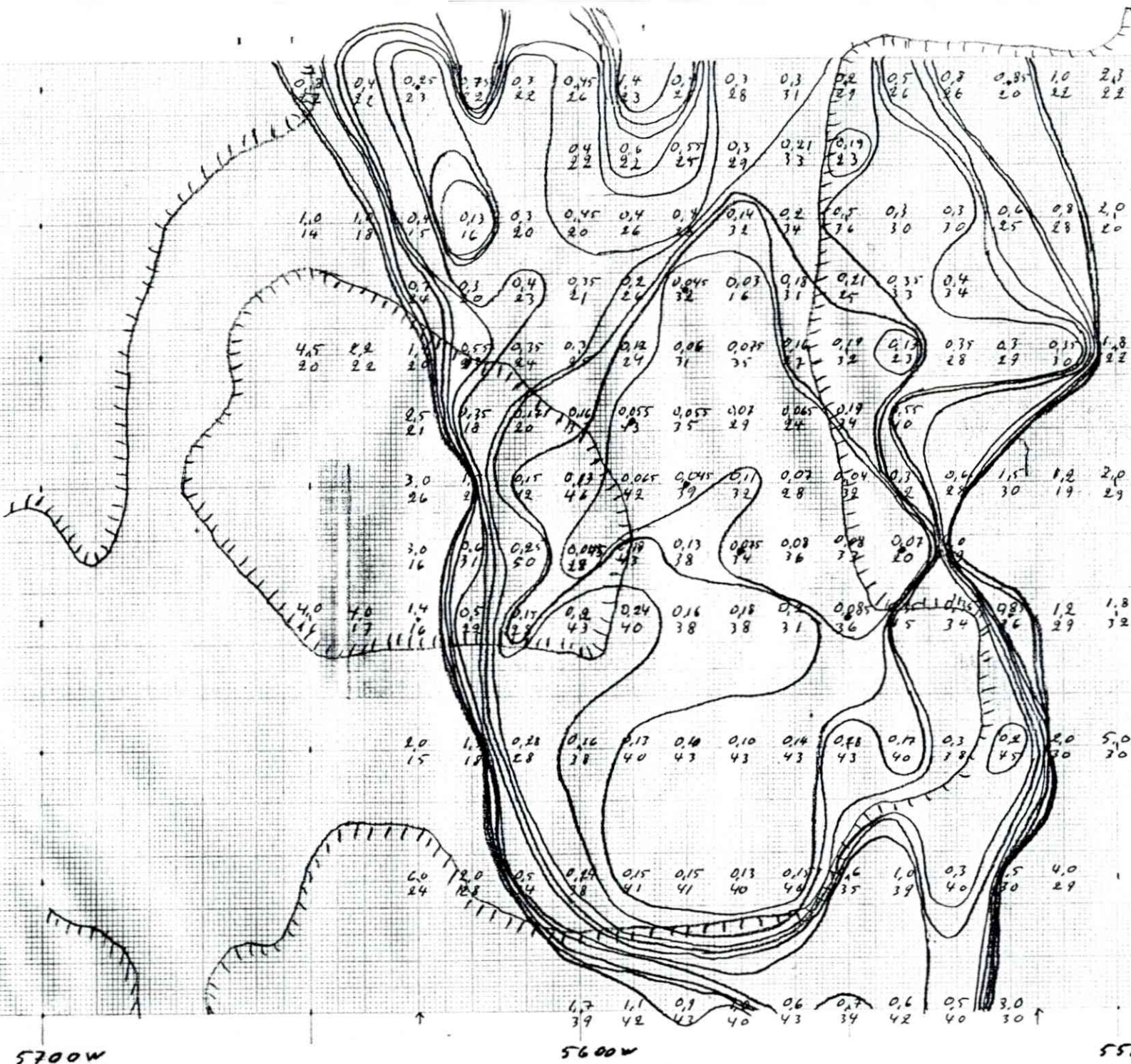
14



17/11 1990
Maa

Keinolaampi

12600



12600
N

←

12500
N

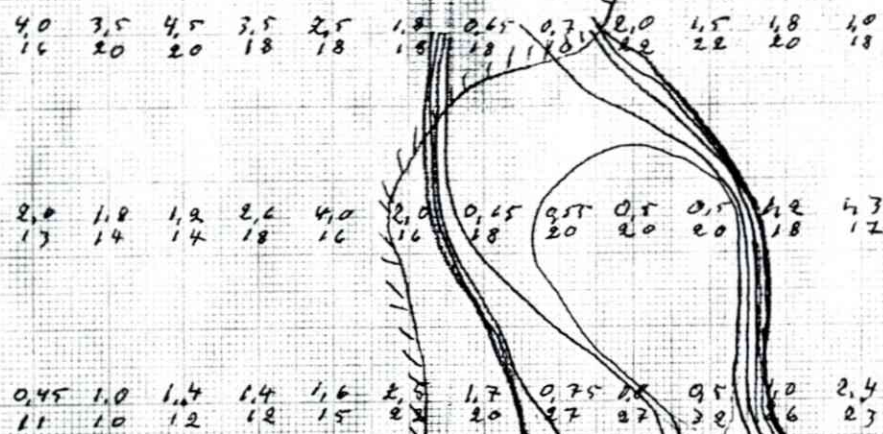
5700W

5600W

5500W

Kainolampi VLF-R

14



5700w

5600 W

5500 w

1:1000

Keinolampi

VLF-R 14

-1230
N

-12700
N

-12800
N



5600w

5500 w

1:1000

Keinolampi Mag

5250W

5240W

5230W

5220W

4

-12060N

-12050N

Trench

Barely m-pd in
bedrock. No Ni-
bearing blocks. -12040N

-3m - 9m

⊗ 1/90

-12030N

⊗ 2/90

-12020N

⊗ 1/78

Trench

-12010N

-8m

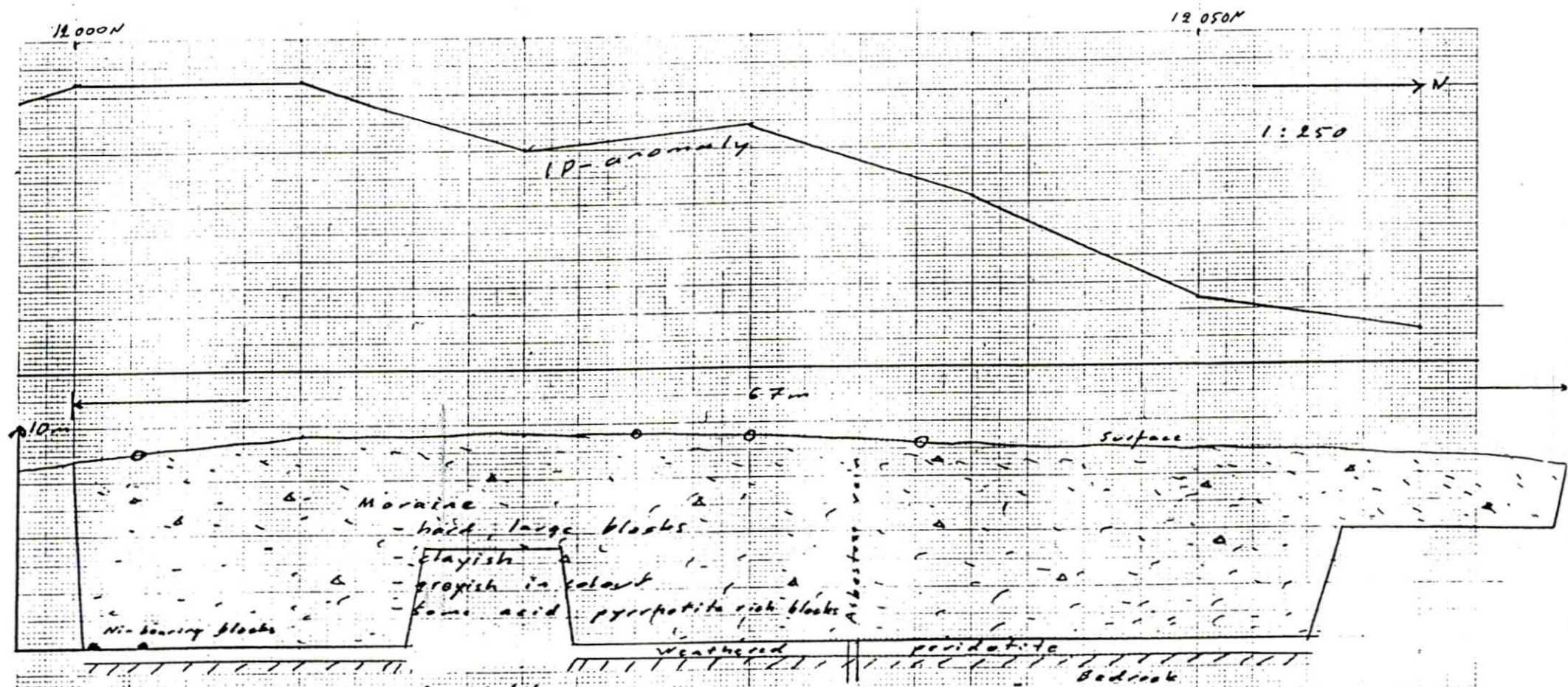
Some Ni-bearing
m-pd - blocks
Barely m-pd in bed-
rock

⊗ 3/87

-12000N

⊗ C/90

Römlingås, trenching, drilling



Peridotite

- black
- homogeneous
- medium grained
- magnetite - impregnation
- main minerals: olivine, monoclinal amphibole, chlorite, opaque
- accessory: talc, calcite, serpentine

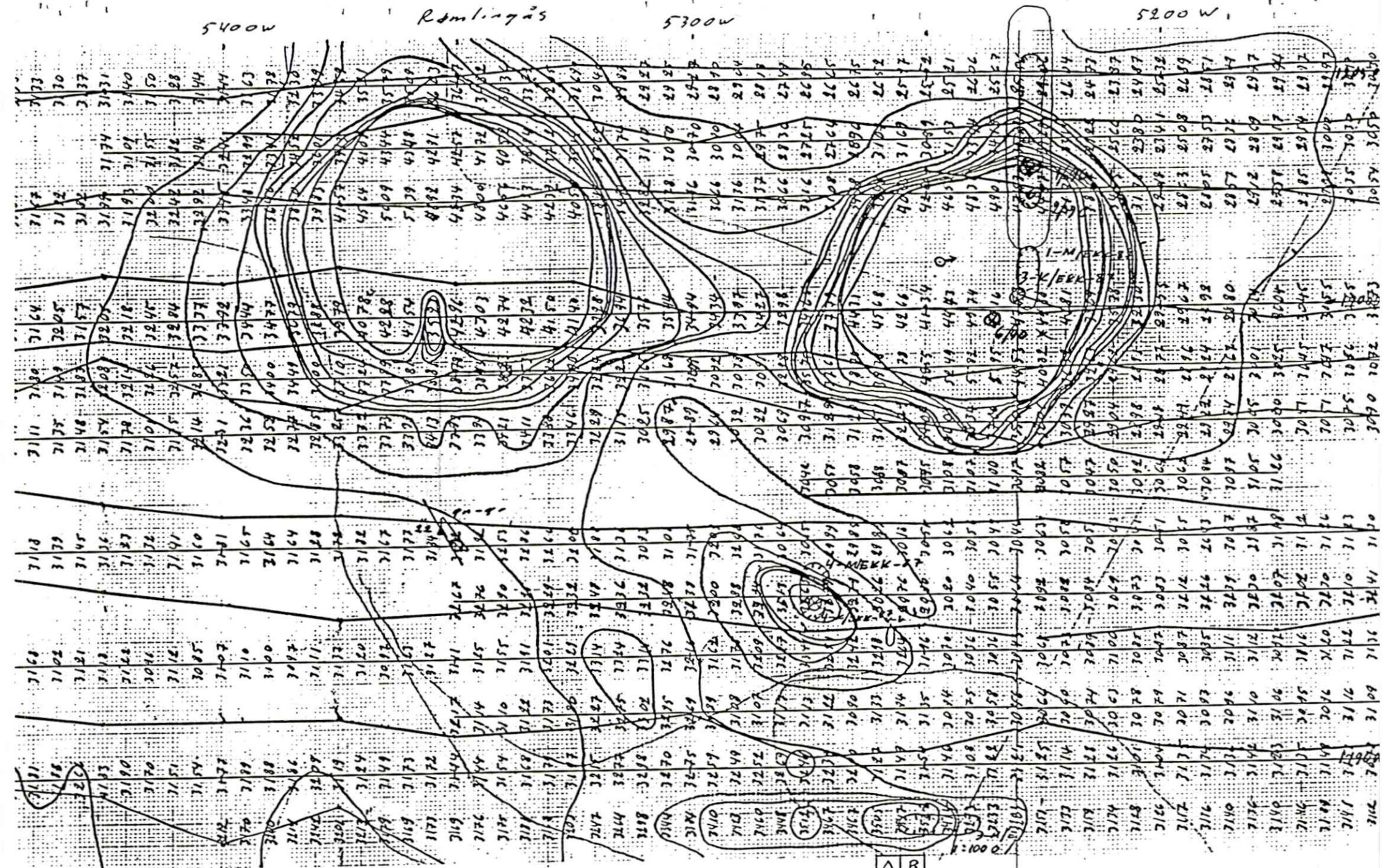
Trenching in 1989

5400w

Ramlingas

5300w

5200w



Mag

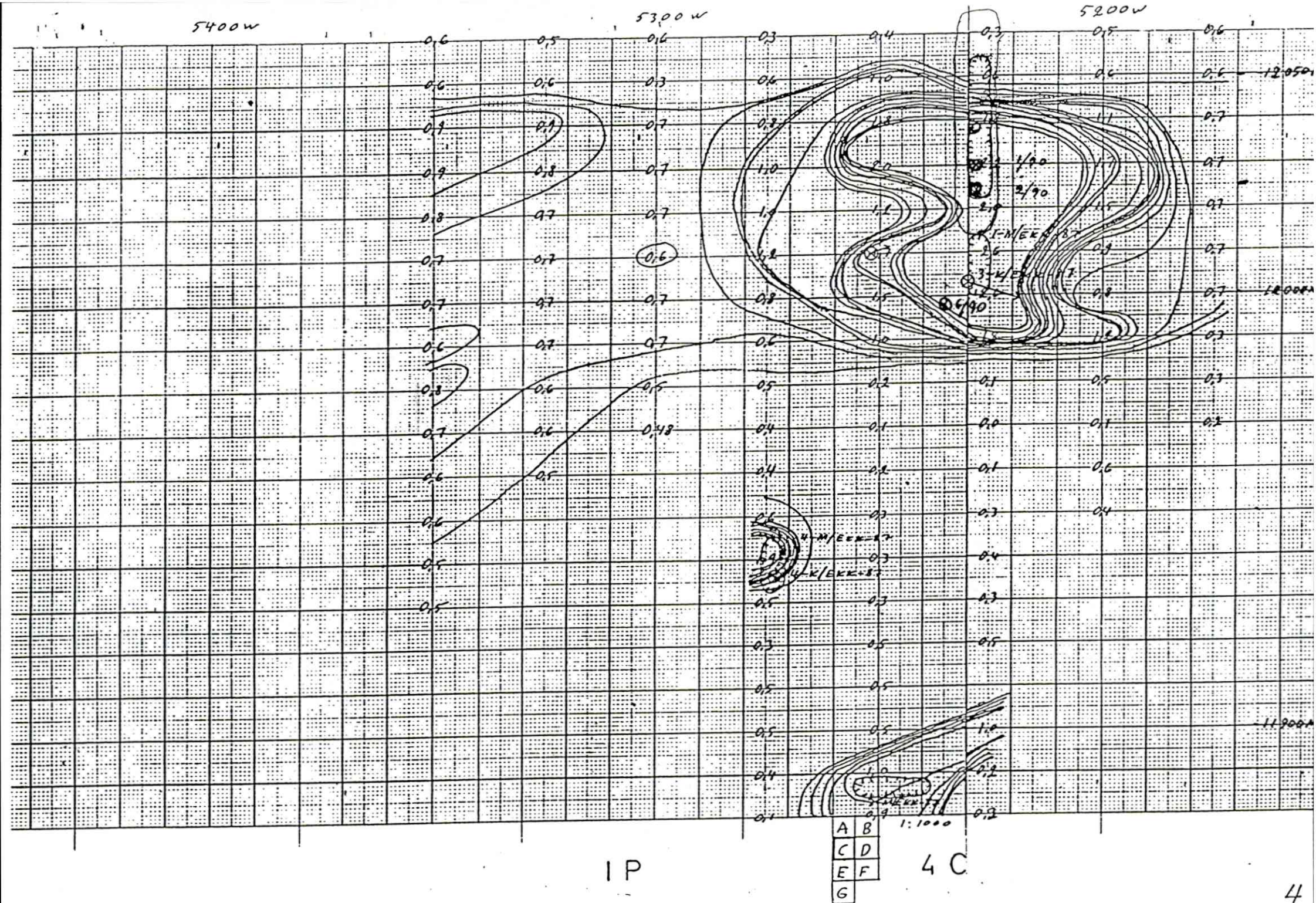
40

A	B
C	D
E	F

5400W

5300W

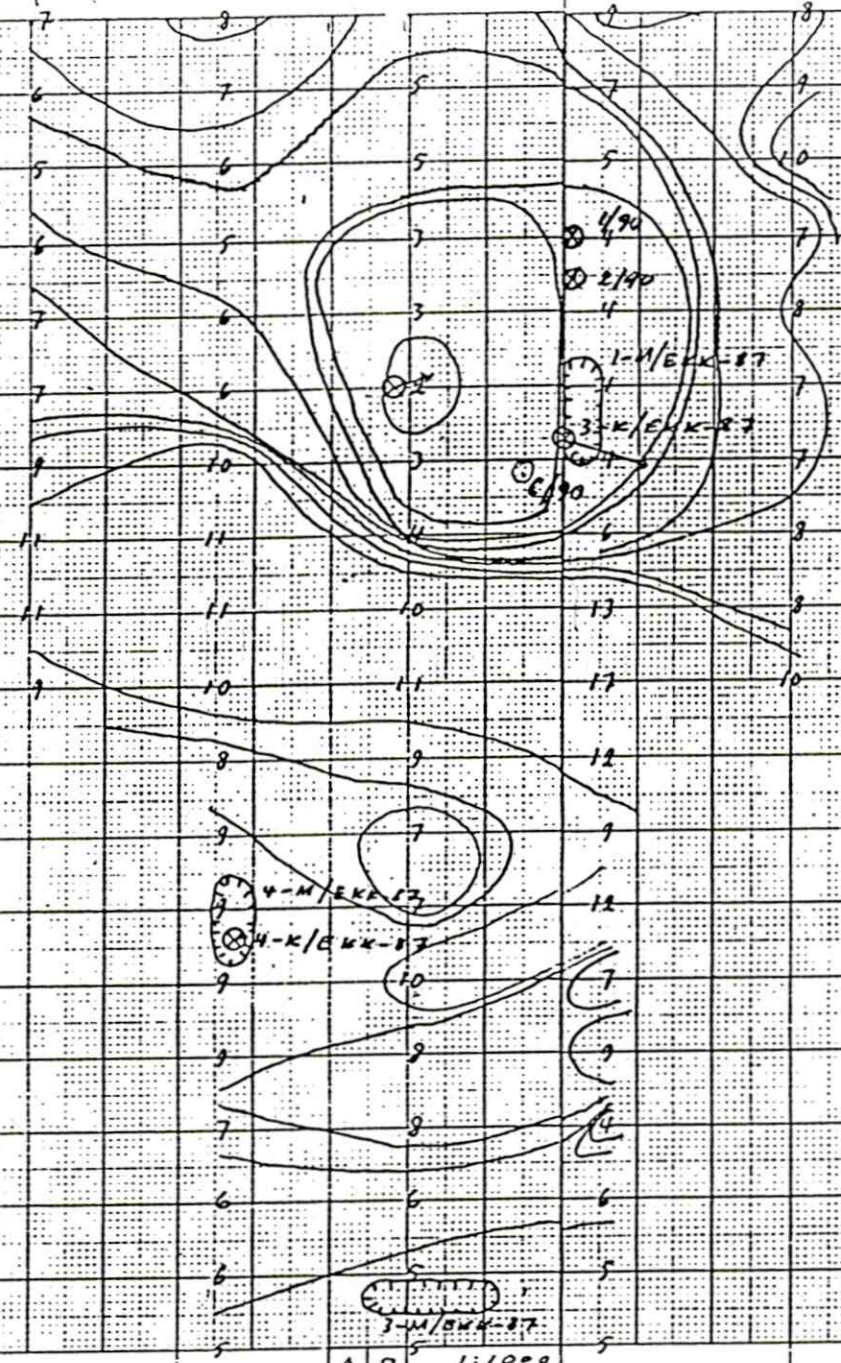
5200W



5400W

5300W

5200W



Resistivity kΩ

A	B
C	D
E	F
G	

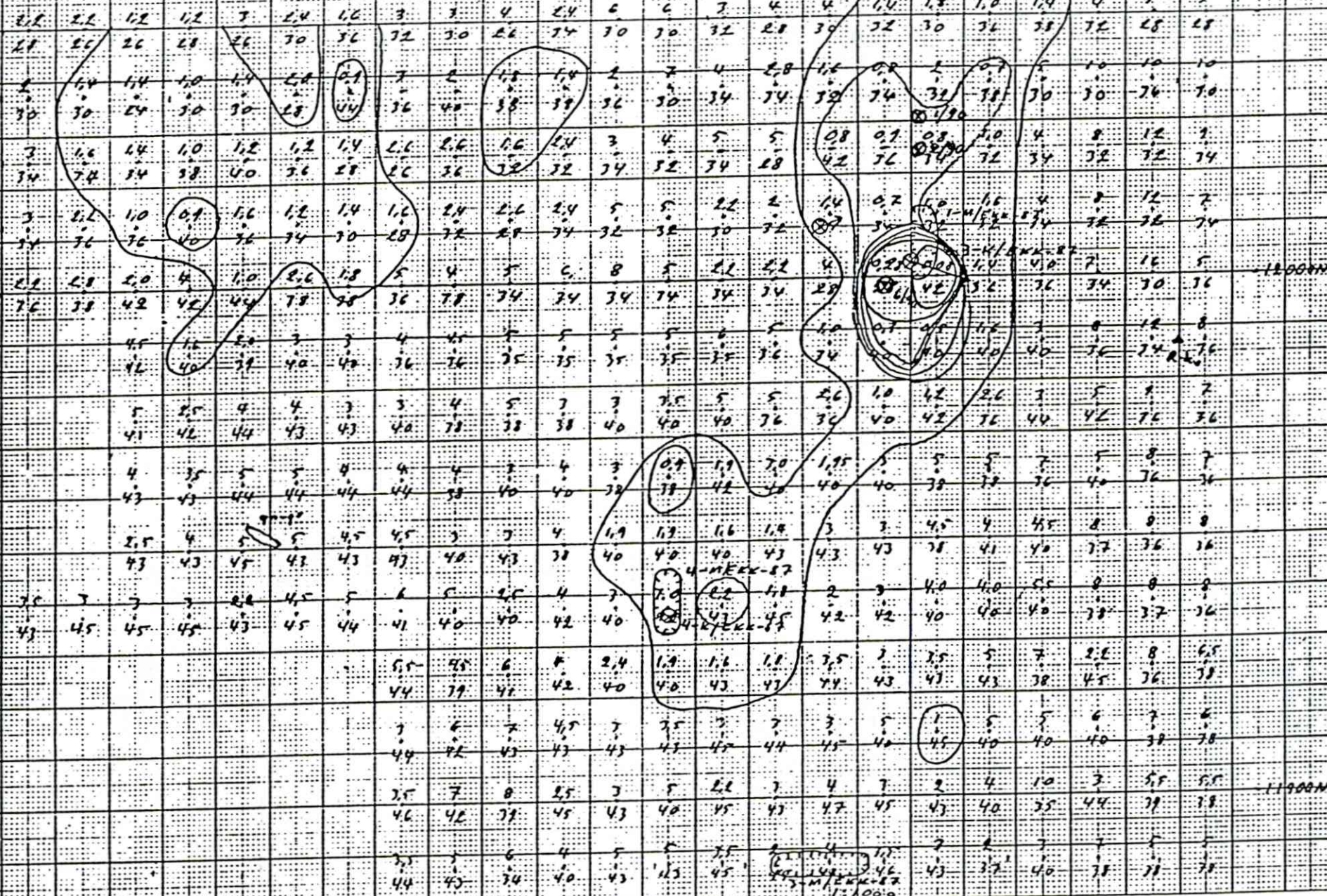
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4 C

5400W

5300V

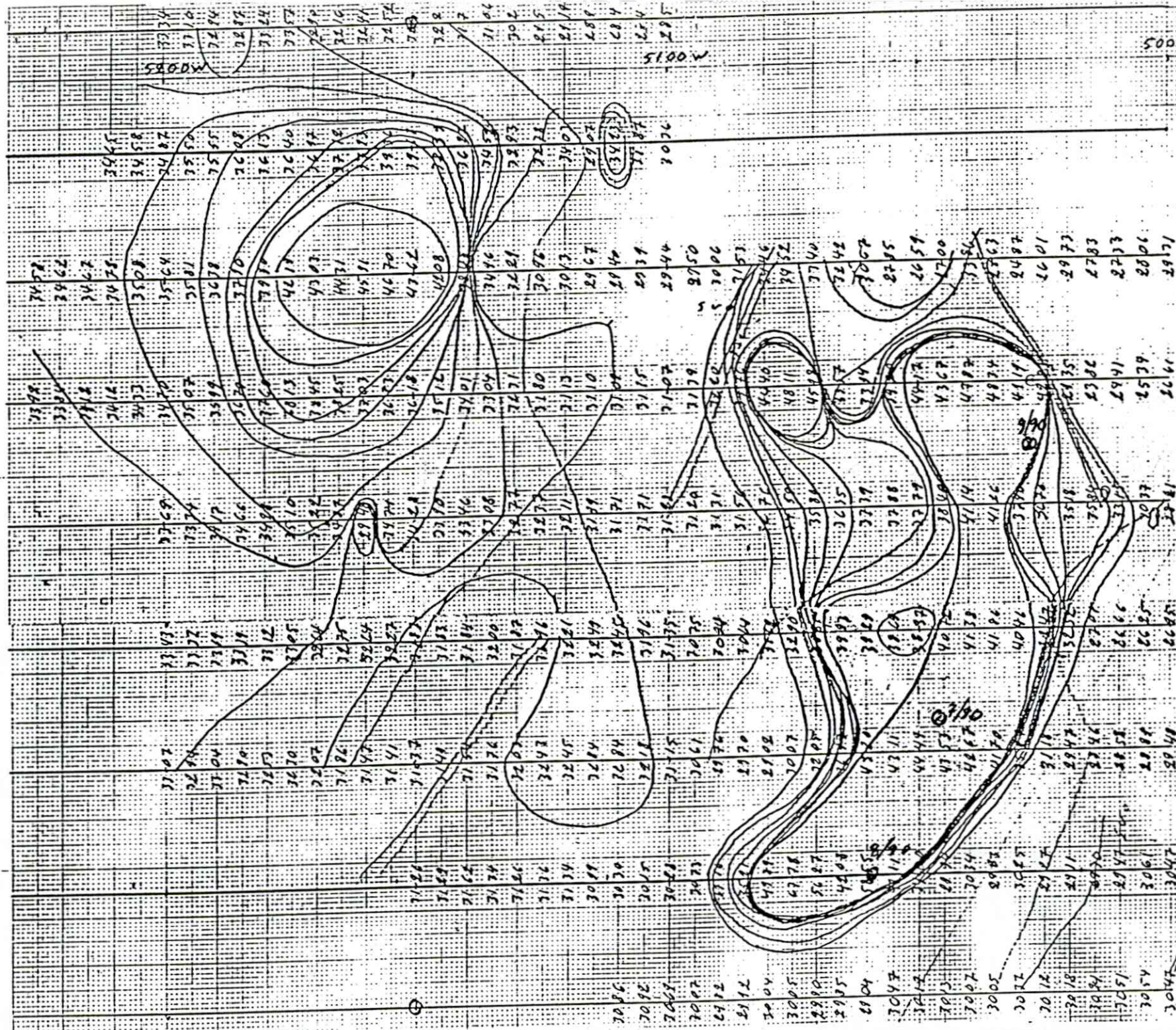
5200W



A	B
C	D
E	F
G	

VLF - R

4 C



Ni, Lu

- 11300V

1:1000

5.

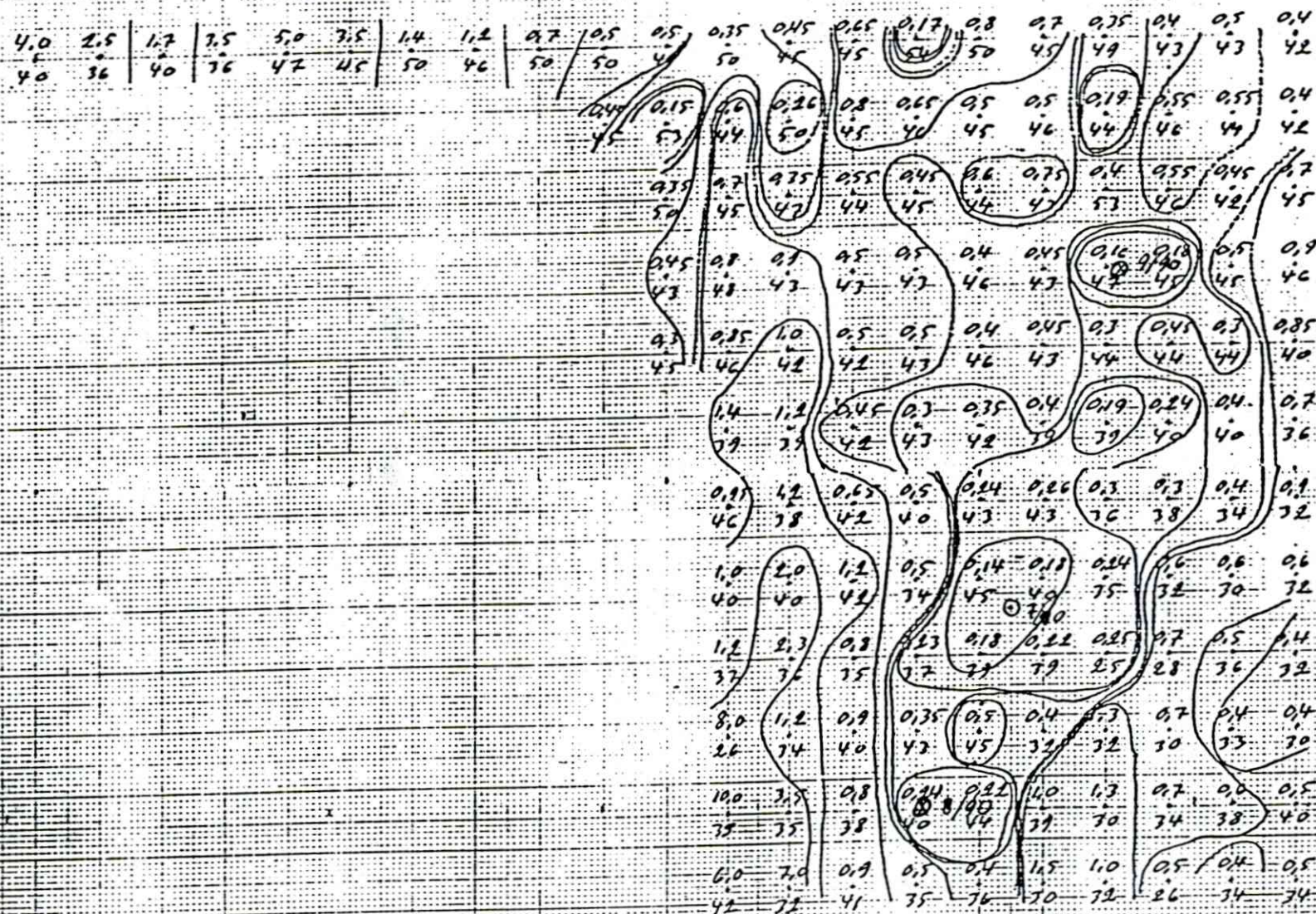
Mag

- 11200V

5100W

5100W

5000W



Δ Ni, Lu

- 11300N

1:1000

VLF-R

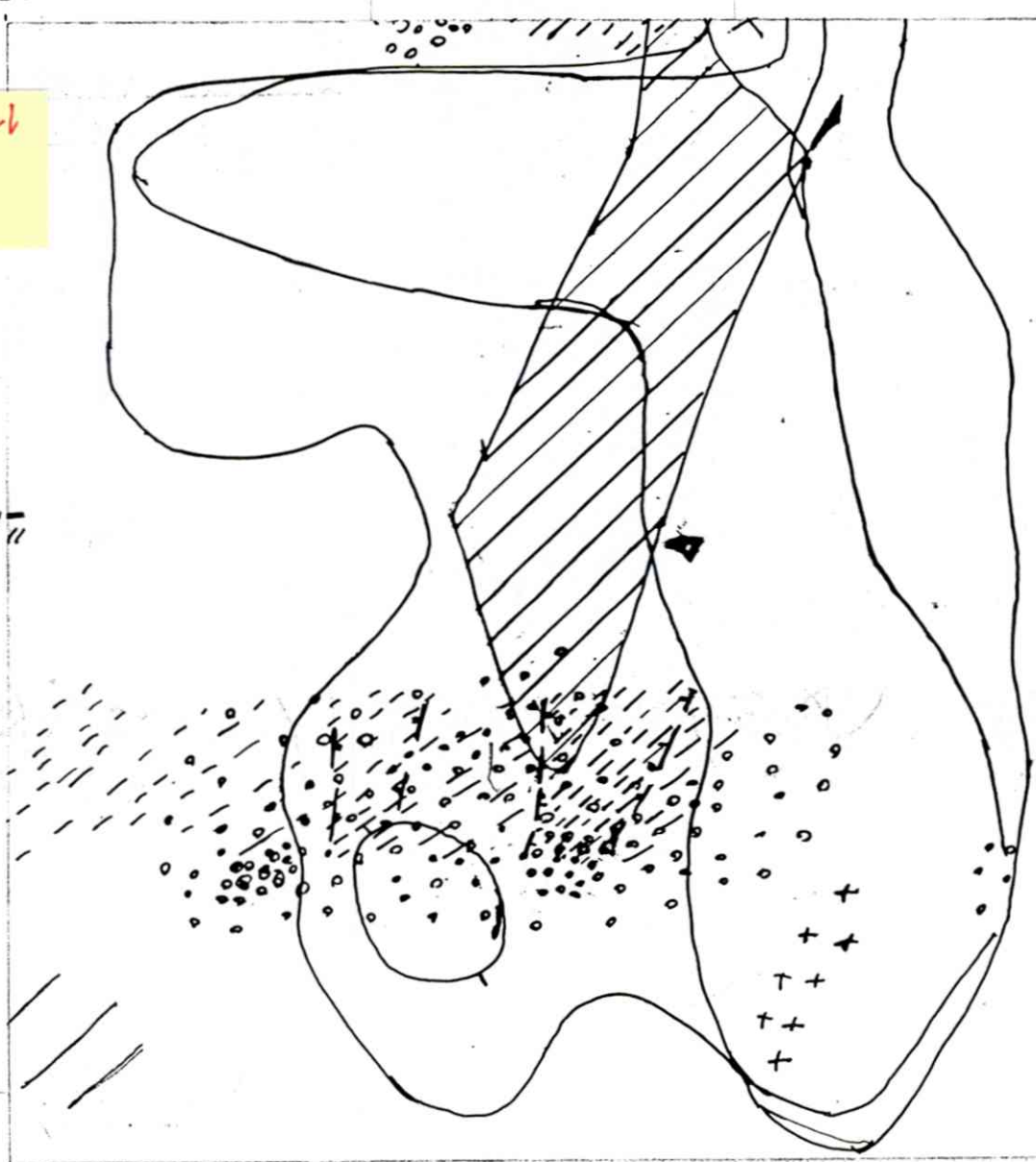
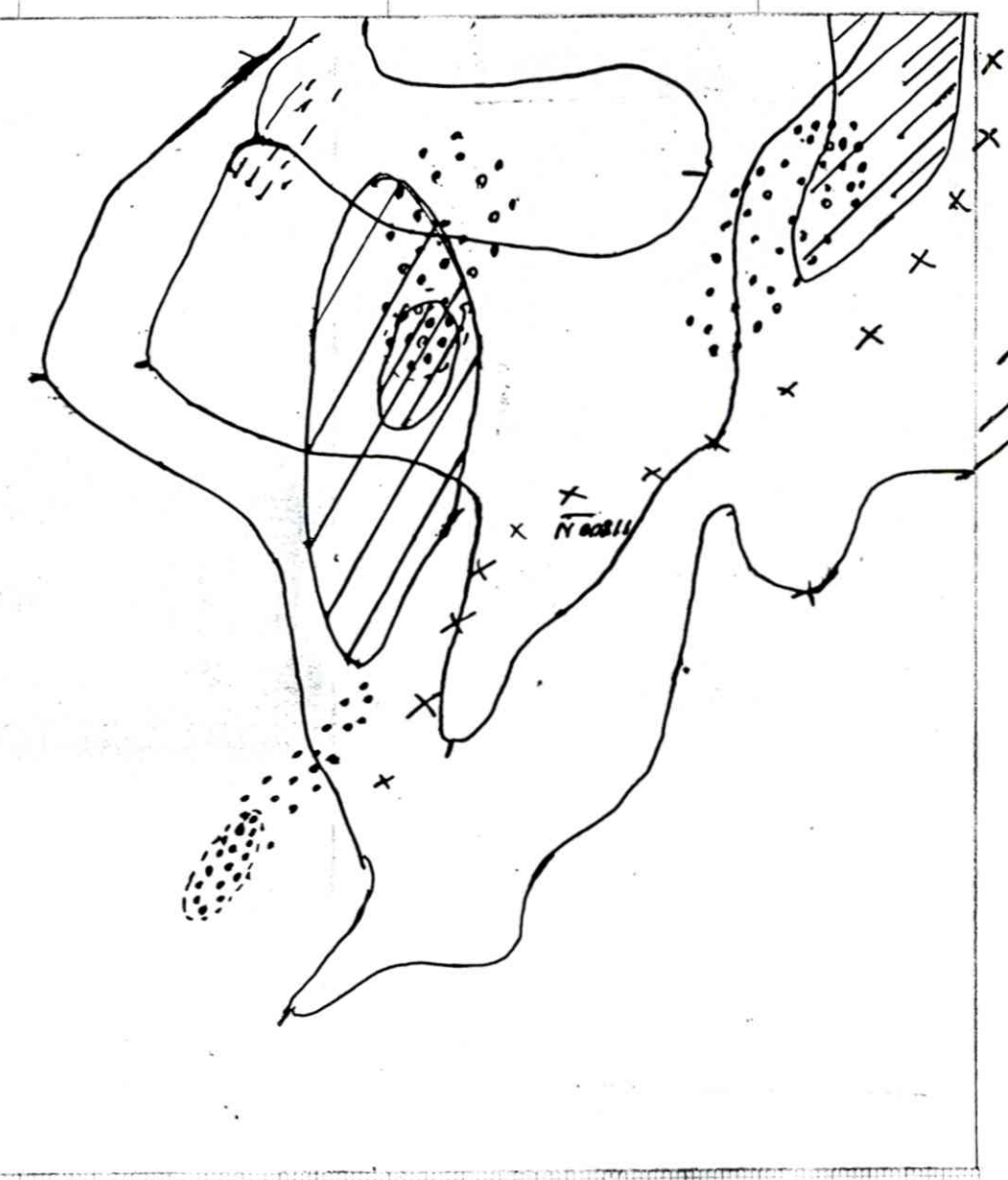
- 11200N

5

map (p)
 charge ability
 8a (OC) (2m)
 111

ft 9a (VLF) conductive zone
 xxx resistivity on

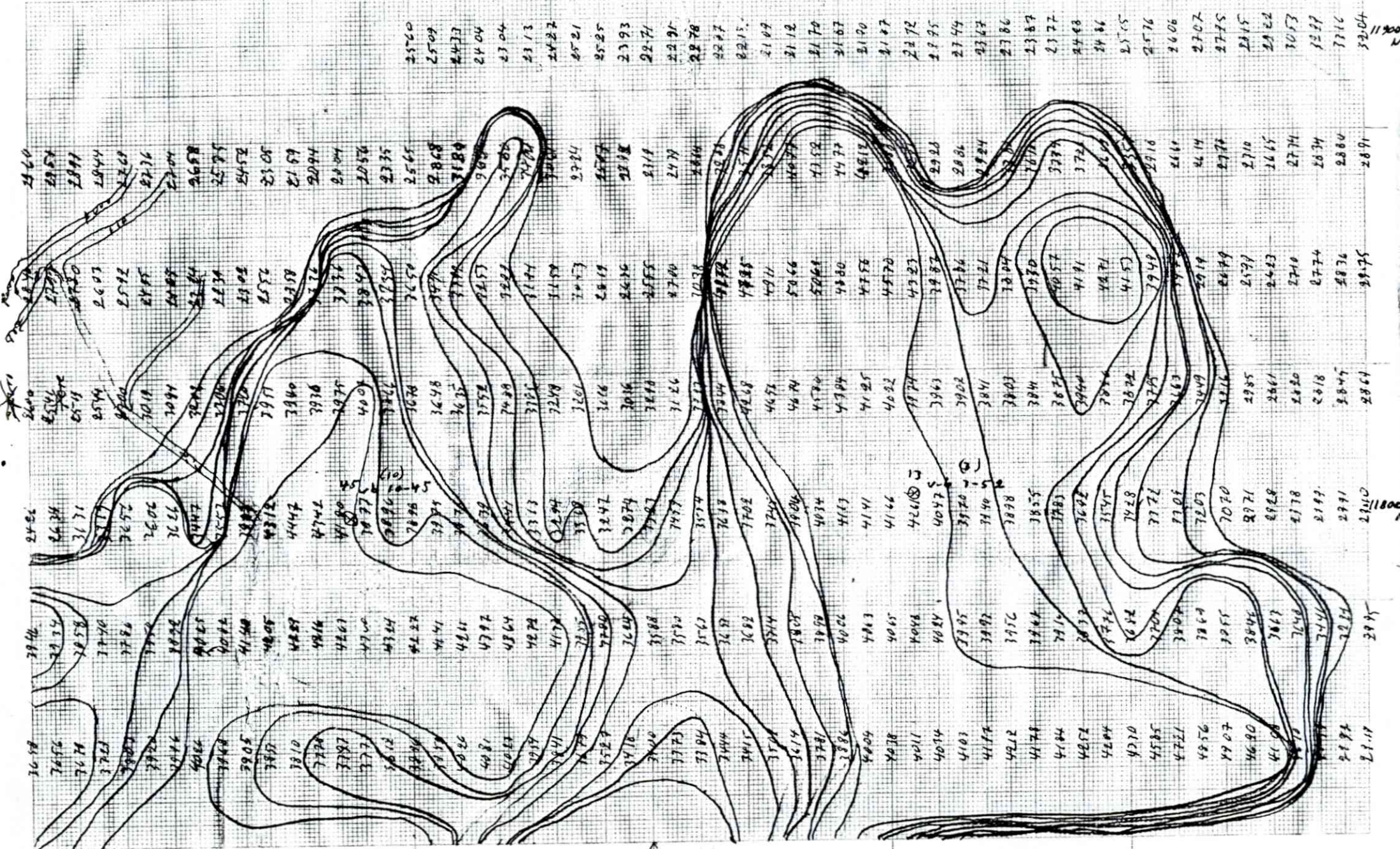
3500w
 111000 11
 N Compilation map
 Bla kranm



11.

111000

111000



3700w

3600w

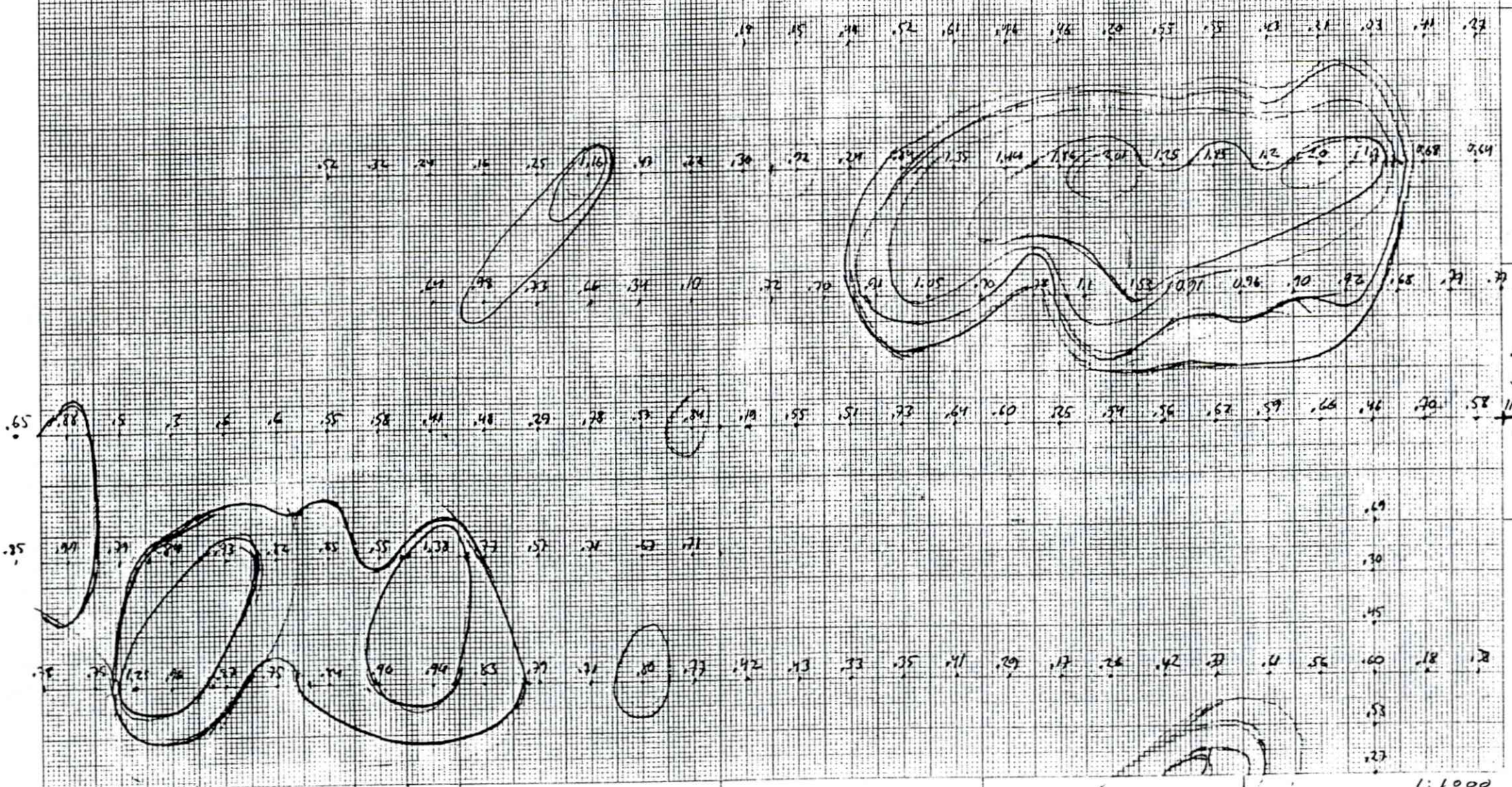
Blankmann N

3800w

Mag 11
1:1000

GJÆDEVANN N 1P

119P
+N



3750

3700W

3600W

Blankvann N

JP 11

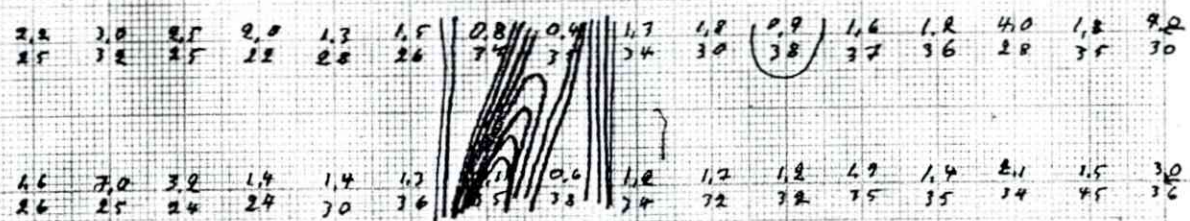
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A350MION350B

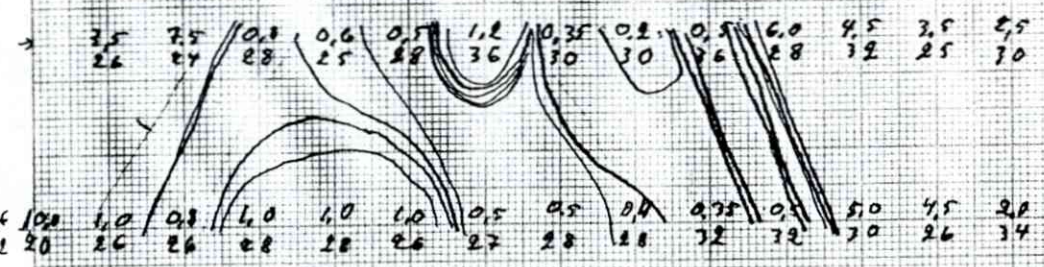


Gjæddevann N 10/10 1990
VLF-R

-11900 N



-11800 N



3700W

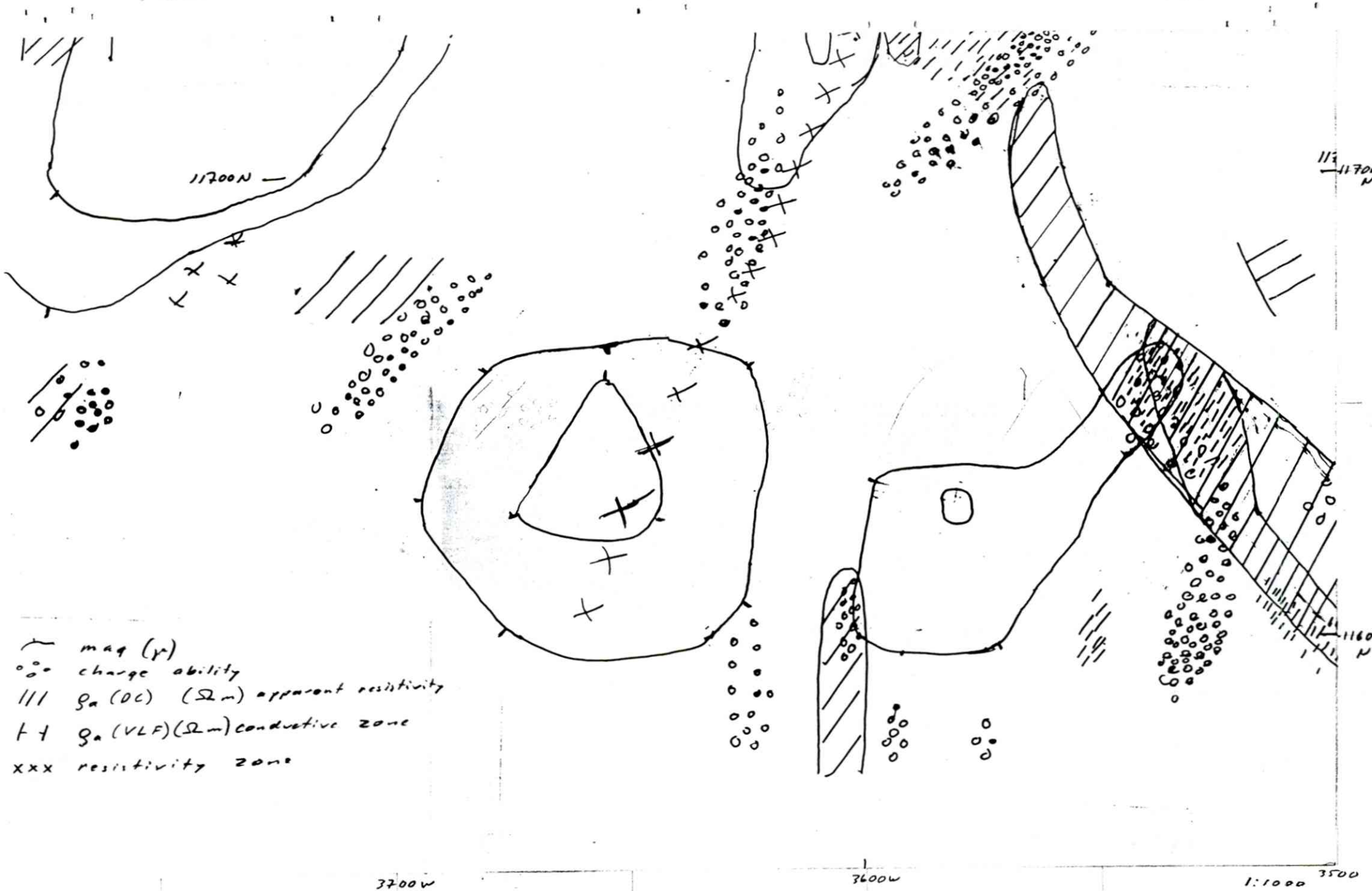
3600W

Blankvann N

1:1000

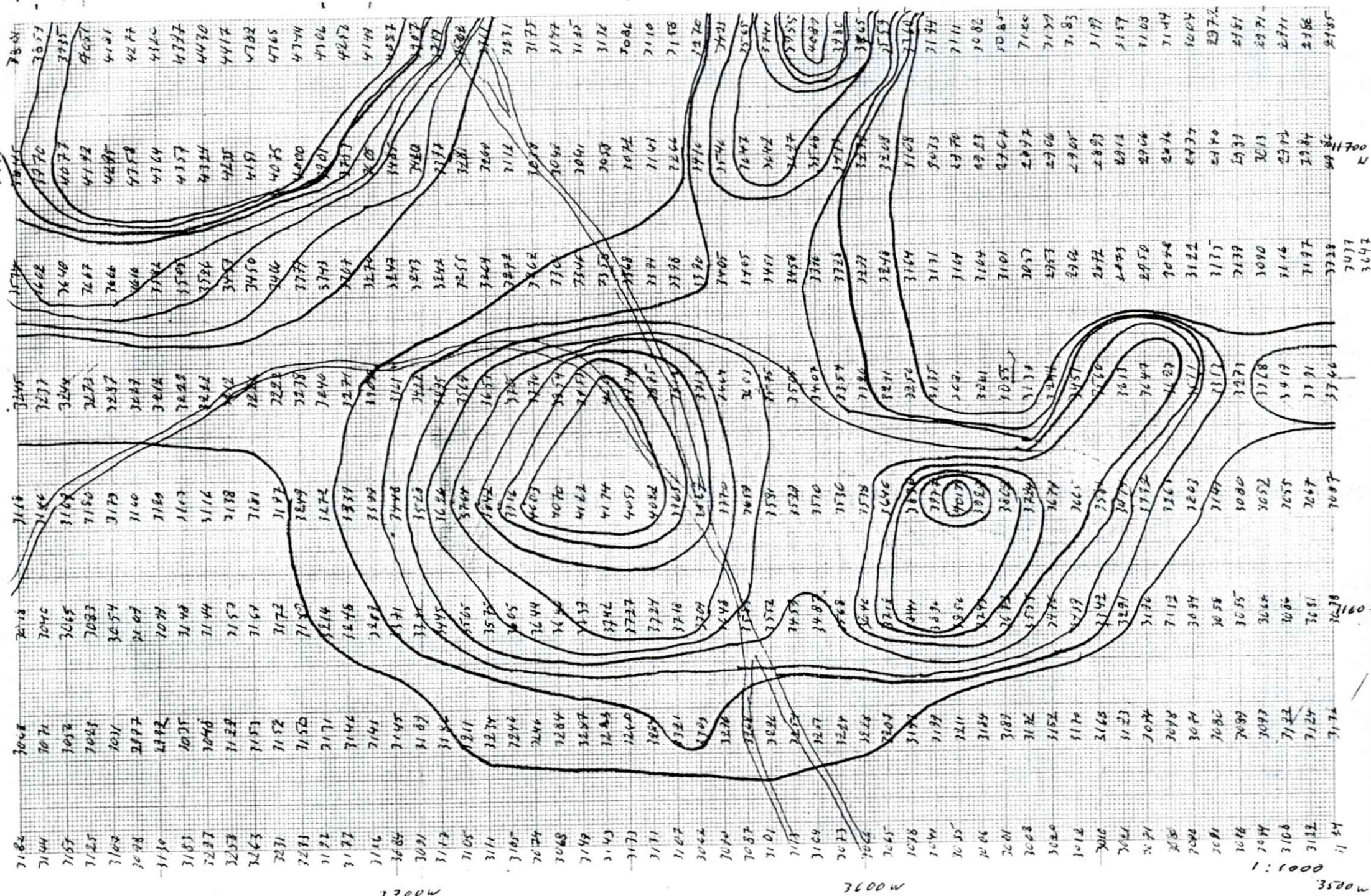
3500W

VLF-R 11



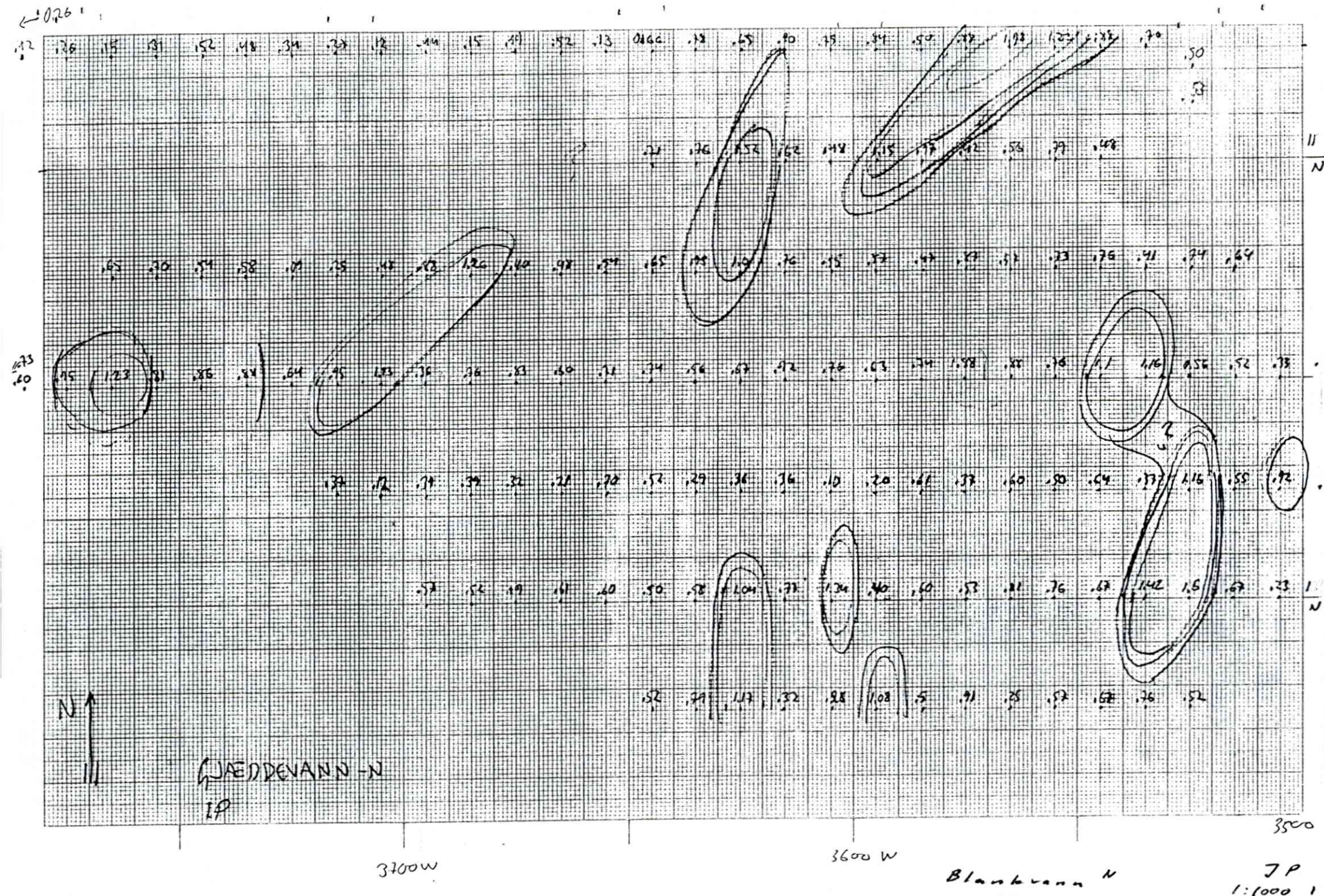
Blankvann N. compilation map 11

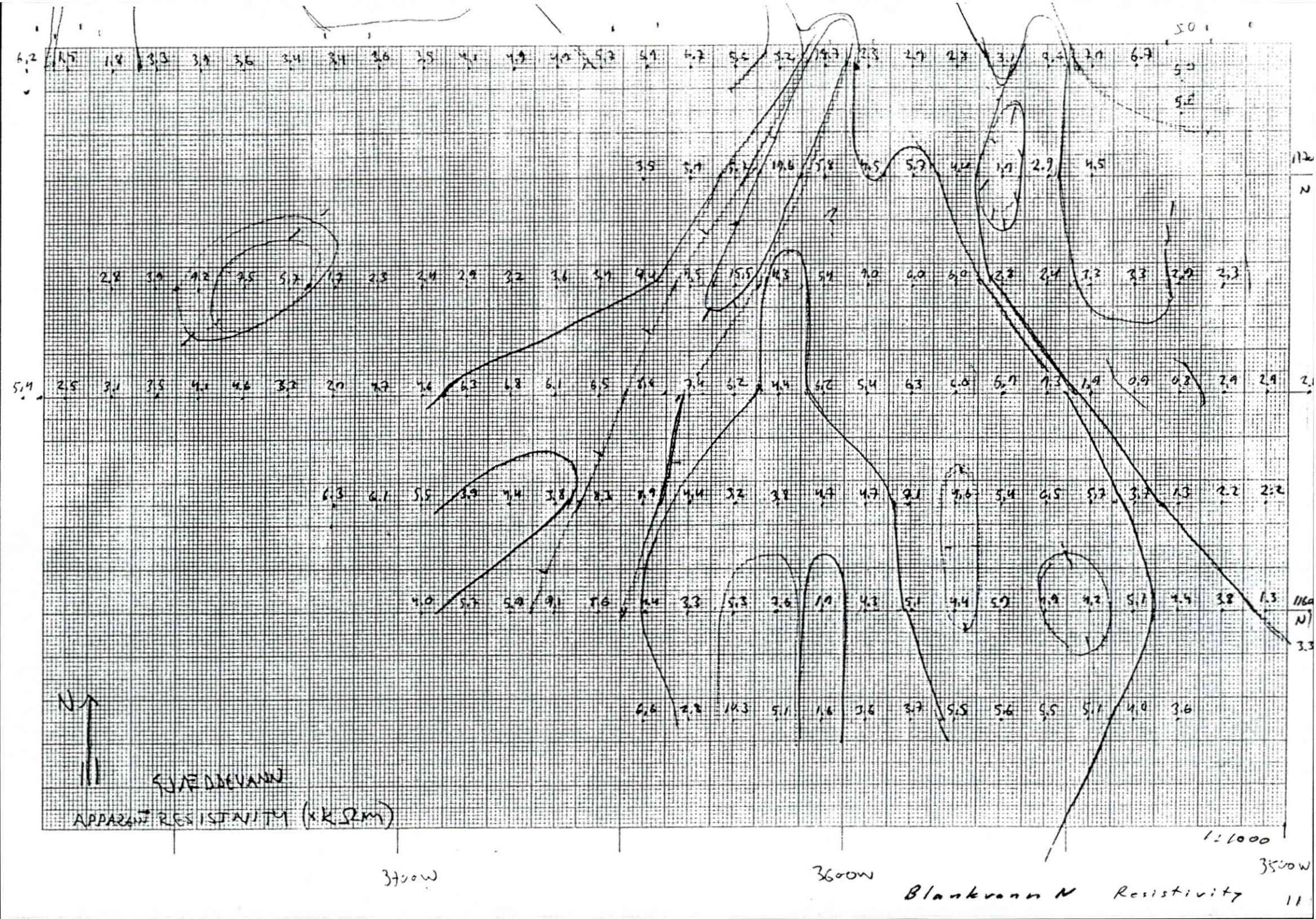
6) ættdættir 20/10 1990



Blackvenn N

May 11





Gjeeddevann N
VLF-R

10/11 1999

1,9	1,8	1,6	1,3	13,0	2,0	0,45	0,55	0,60	0,60	2,2	4,5	5,0
30	36	70	34	26	30	25	77	78	75	41	25	30

11700 N

4,0	5,0	8,5	1,09	0,15	0,24	0,8	1,0	1,8
30	74	30	44	47	40	75	36	75

2,5	3,0	1,8	2,1	2,0	0,7	0,8	1,600
38	40	74	76	36	45	38	28 N

3700W

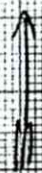
3600W

1:1000

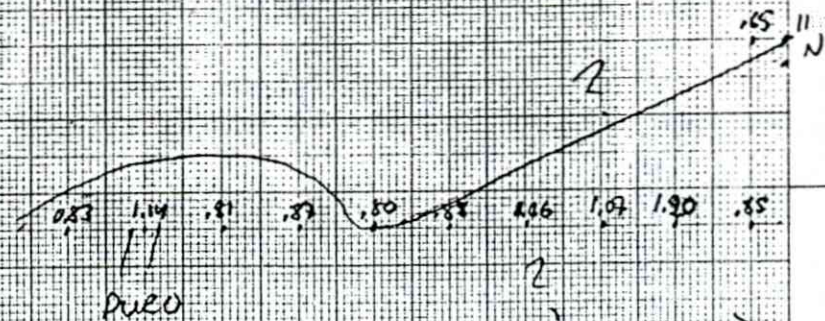
3500W

Blankvann N

VLF-R


 IP Ma
 GLEDDERVANN N
 MIDGRASGENT
 Å 350 MTON 350 B


 A



4000W

3950

3900

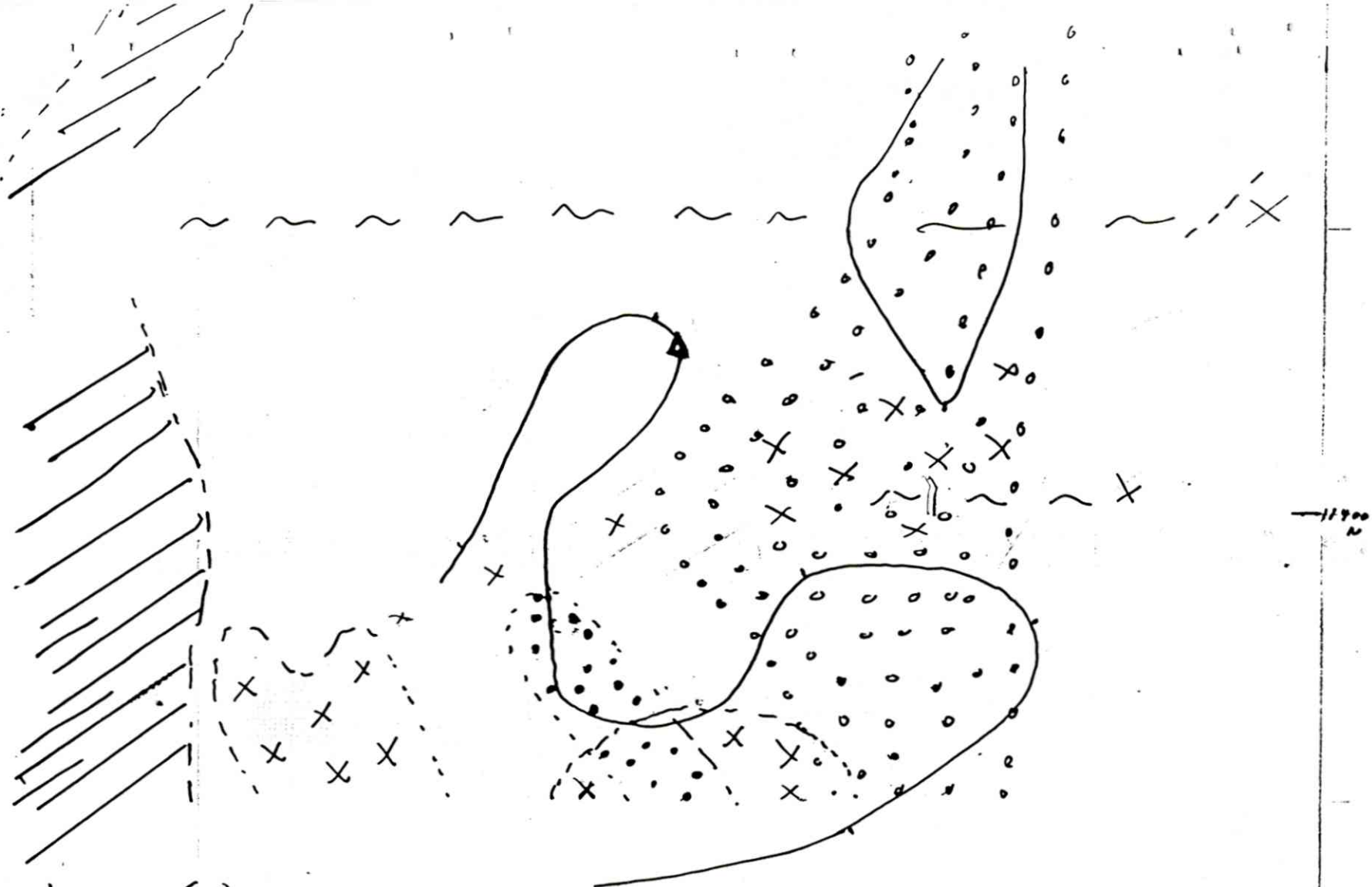
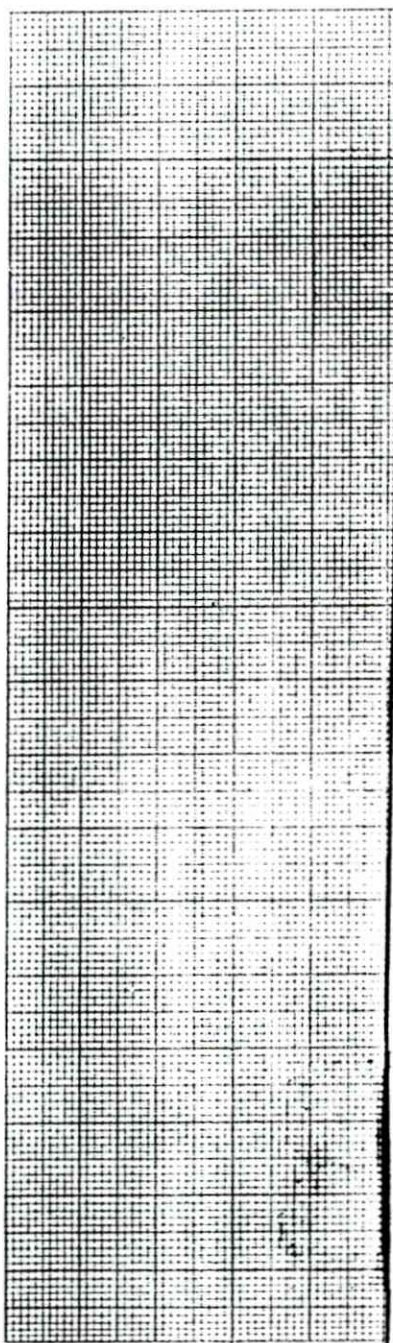
3850

3800

3780

Blanketvann N

JP



mag (y)
 ooo charge ability
 III ρ_a (DC) (Ωm) apparent resistivity
 + ρ_a (VLF) (Ωm) conductive zone
 xxx resistivity zone

3700w

3600w

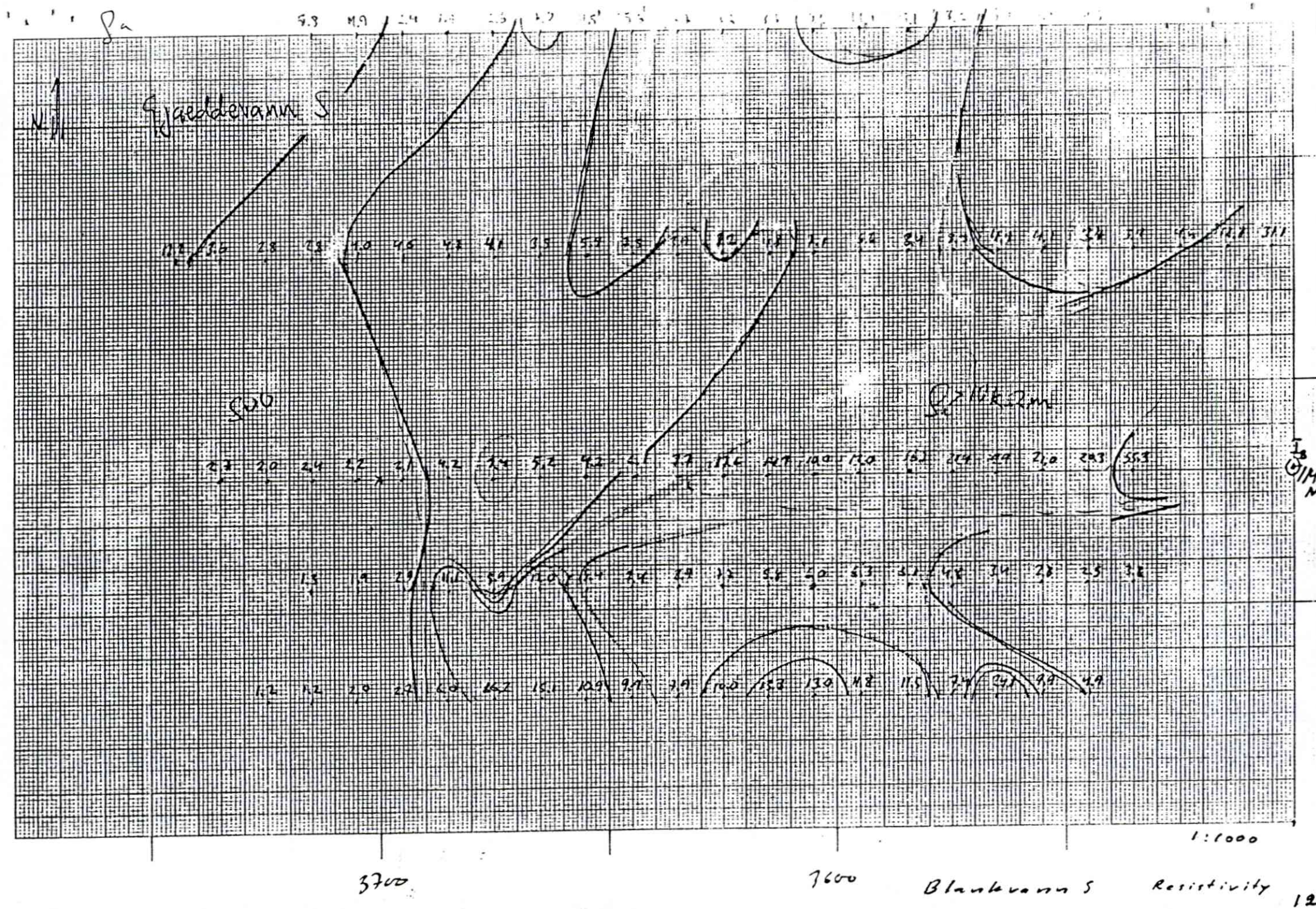
3500w

1:1000

12

Blankenship S, Compilation map

12



Ja GLEDDENUN-N

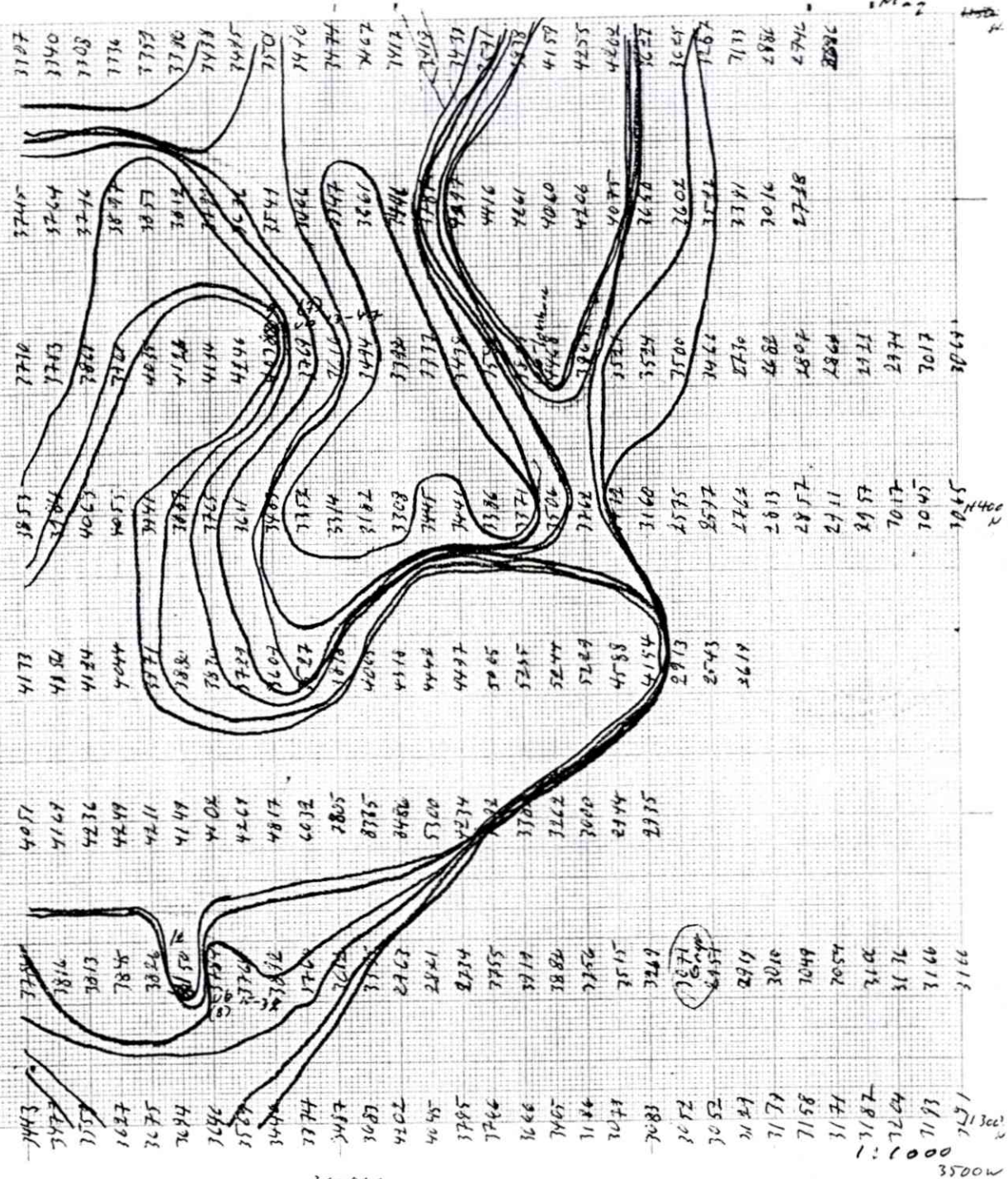
3.0

1.8 1.5 1.2 2.6 3.3 3.0 1.6 1.8 1.6 1.7

1:1000

3500
Blankmann N Resistivity

Gjæddervann S 21/10 1990
M-2

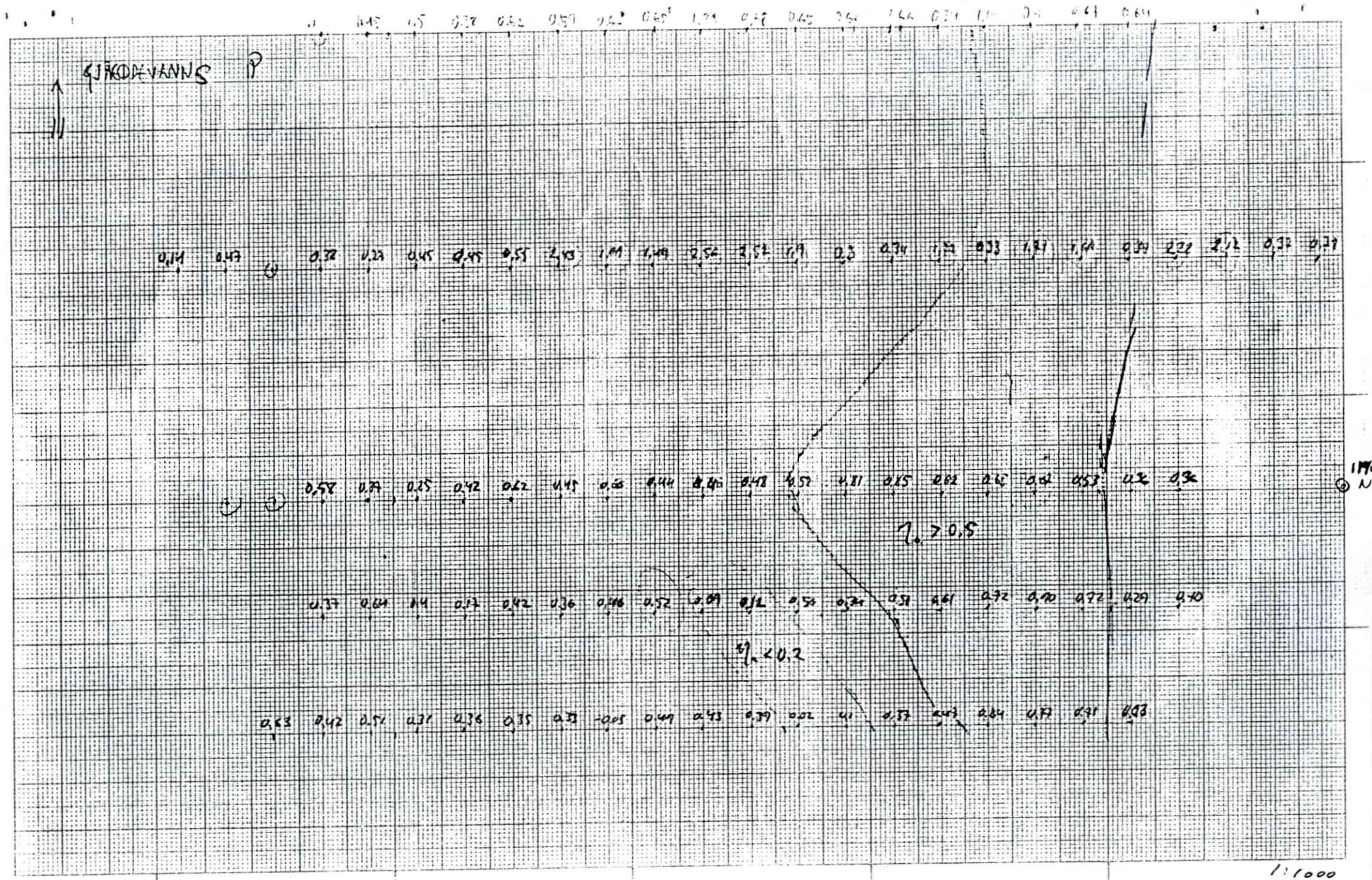


3700W

3600W

Blankvann S

May 12

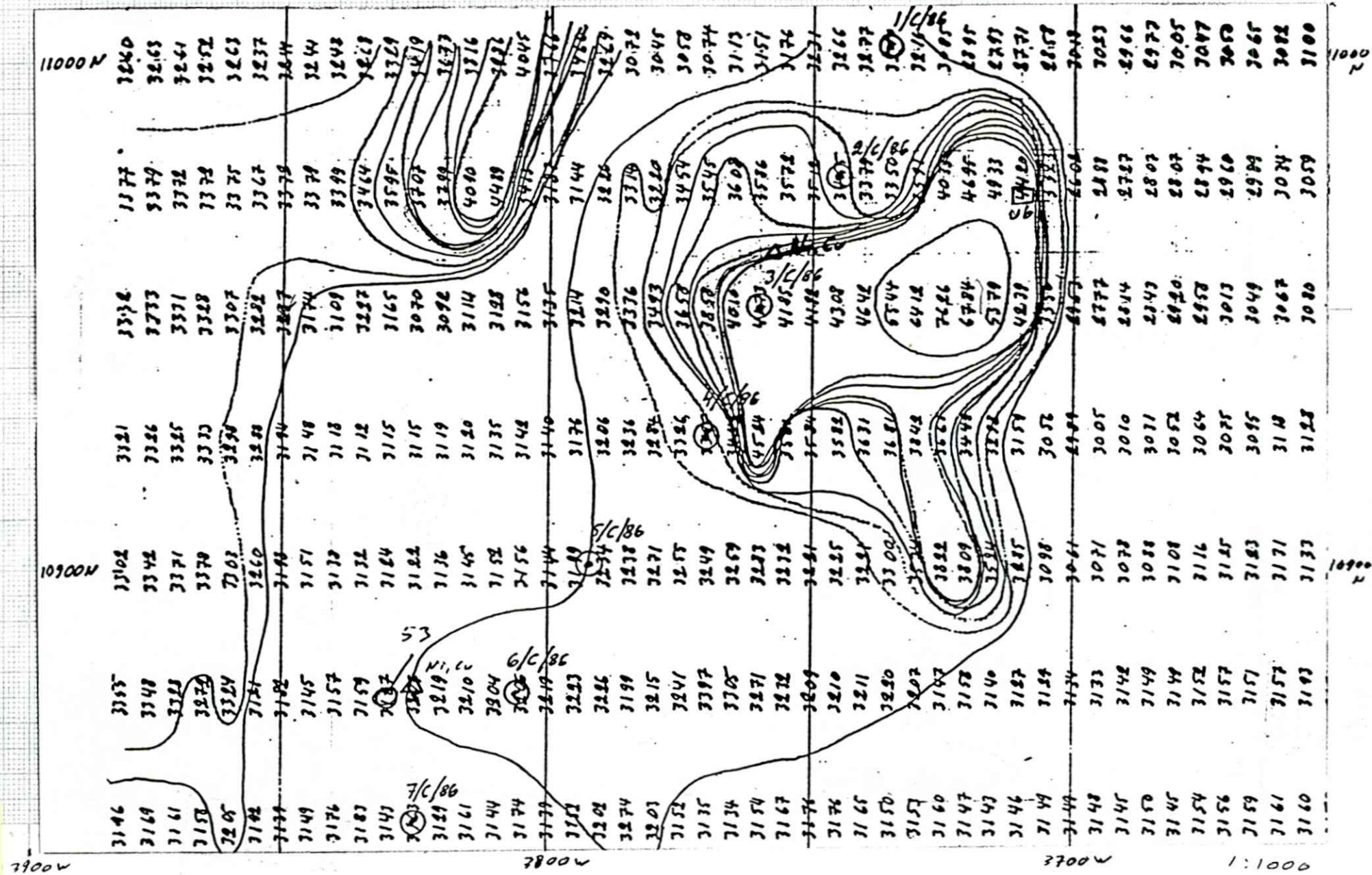


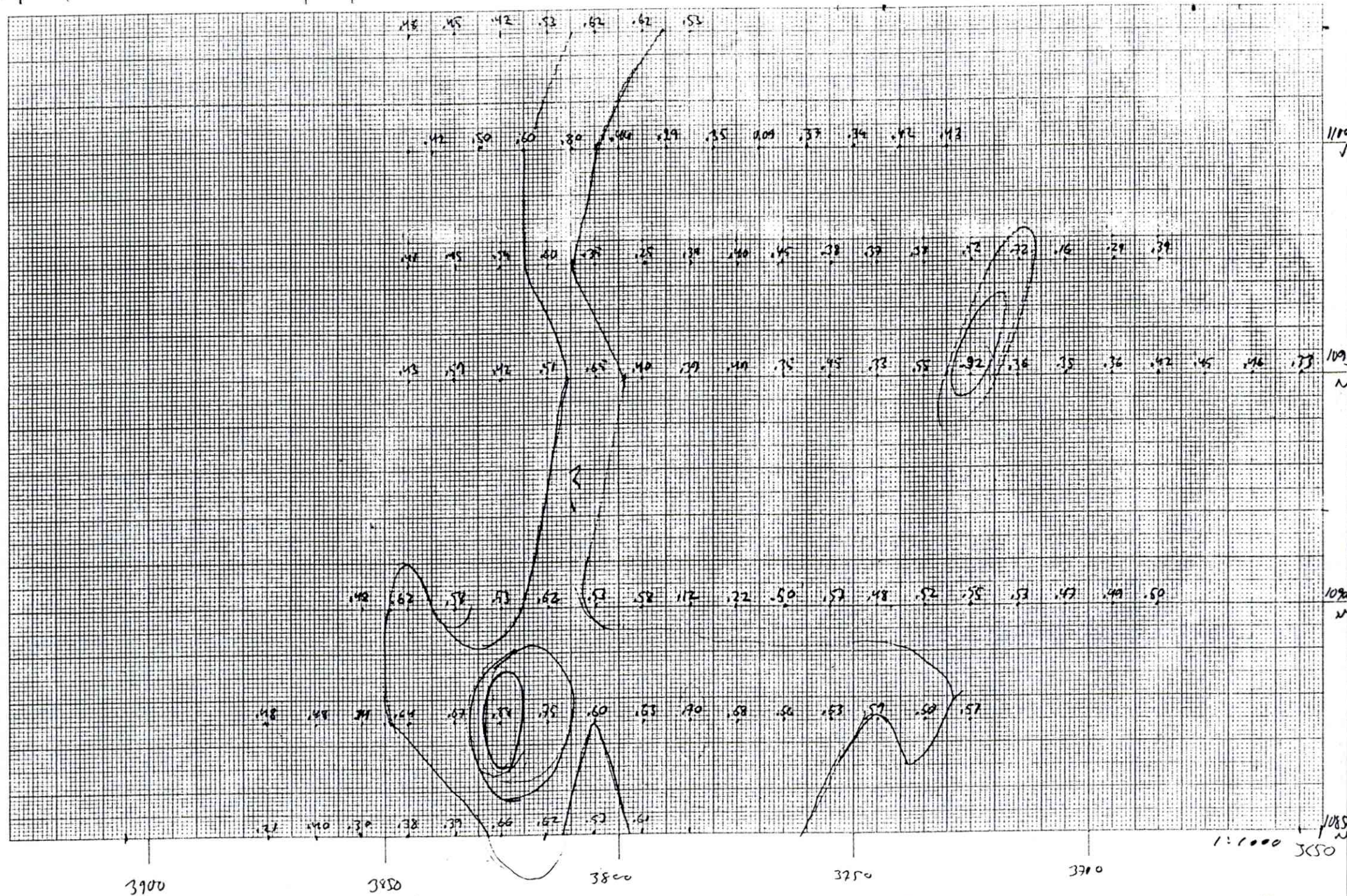
3700

3600

Blankvann 5

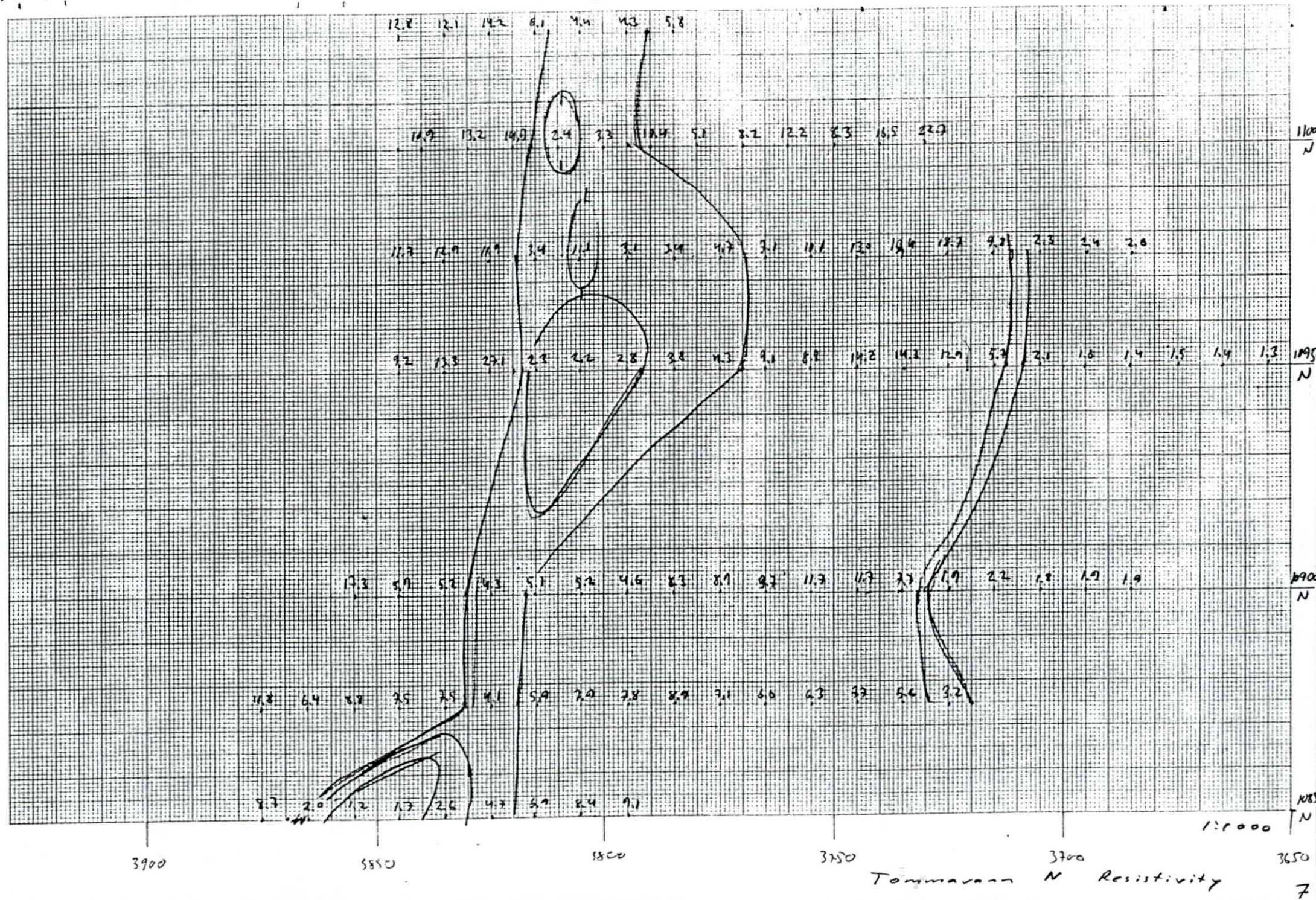
7P 12

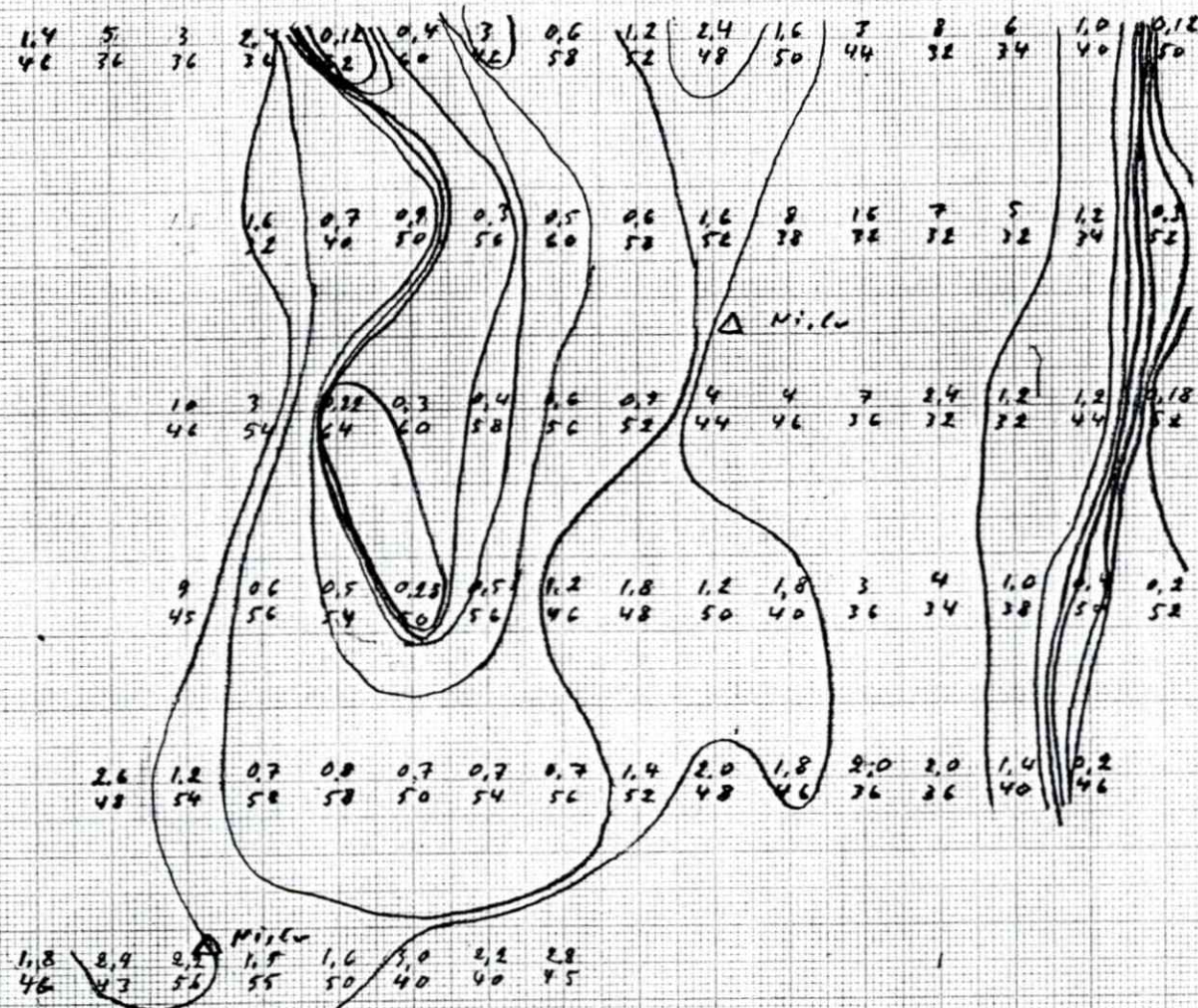




Tommervann N

JP 7





2.6 0.8 0.35 0.6 1.3 2.2 2.8 5.0 4.0
2.8 4.5 5.0 6.7 5.8 5.4 4.5 4.5 4.6
3900W 3800W

3900W

3700W

Tommavann N

1:1000

VLF-R 7

11000 N
3900W

11000 N

10900 N

3900W

3800W

7700W

1:1000

mag (yr)
charge ability

g_a(VLF)(Ωm) conductive zone
resistivity zone

g_a(DC)(Ωm) apparent resistivity

Tommavaan N, Compilation map

3900

48 45 46 45 48 40 46 43 32

7900 W

3200W

7700W

1:1000

Tomriavann N

JP

3900

16.1 15.1 14.5 14 13.5 13 12.5 12 11.5 11

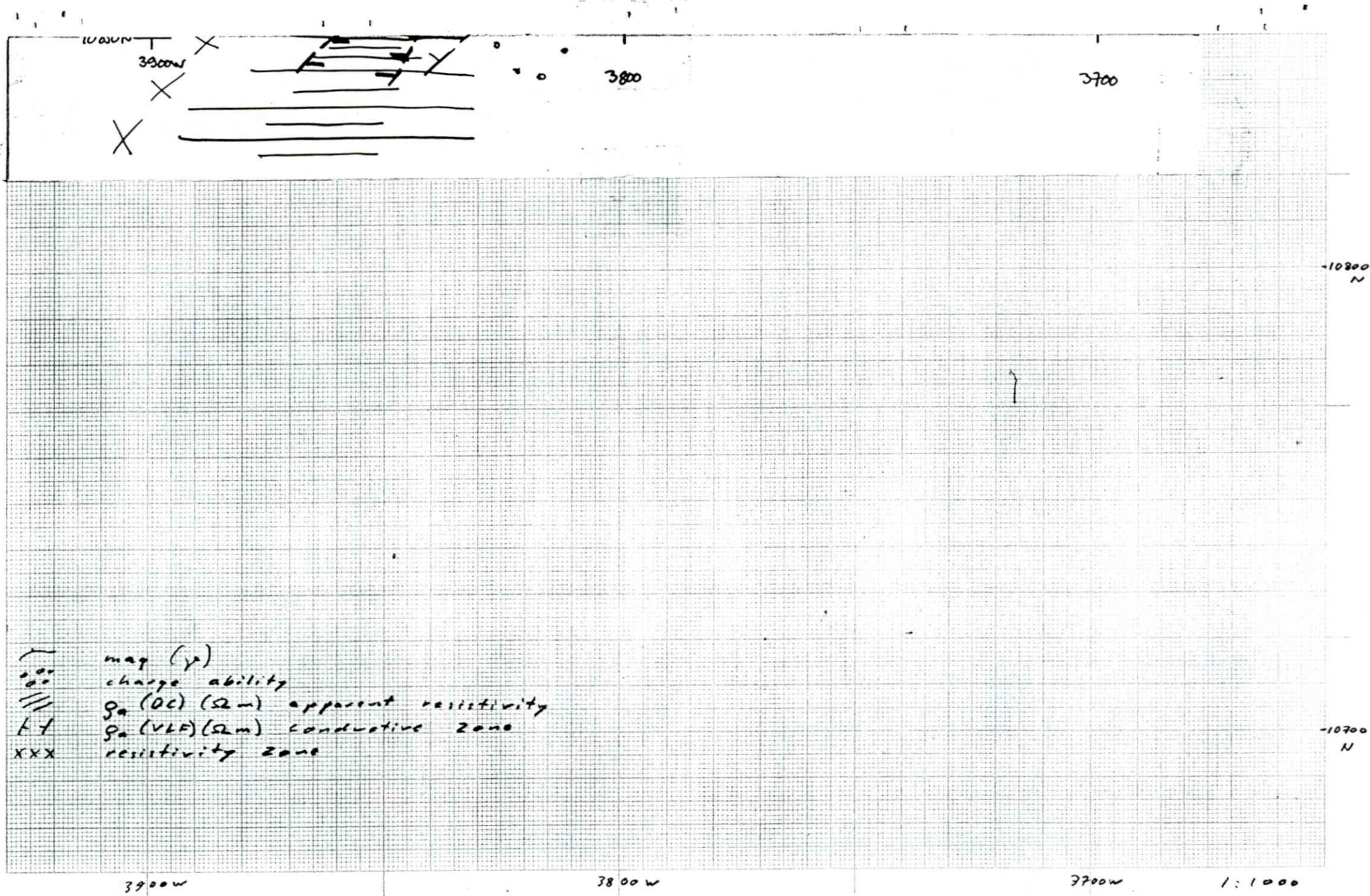
3900w

3800w

3700w

1:1000

Tommavann N Resistivity



3191

3190

3189

3188

3187

3186

3185

3184

3183

3182

3181

3180

3179

3178

3177

3176

3175

3174

3173

3172

3171

3170

3169

3168

3167

3166

3165

3164

3163

3162

3161

3160

3159

3158

3157

3156

3155

3154

3153

3152

3151

3150

3149

3148

3147

3146

3145

3144

3143

3142

3141

3140

3139

3138

3137

3136

3135

3134

3133

3132

3131

3130

3129

3128

3127

13.

4100w

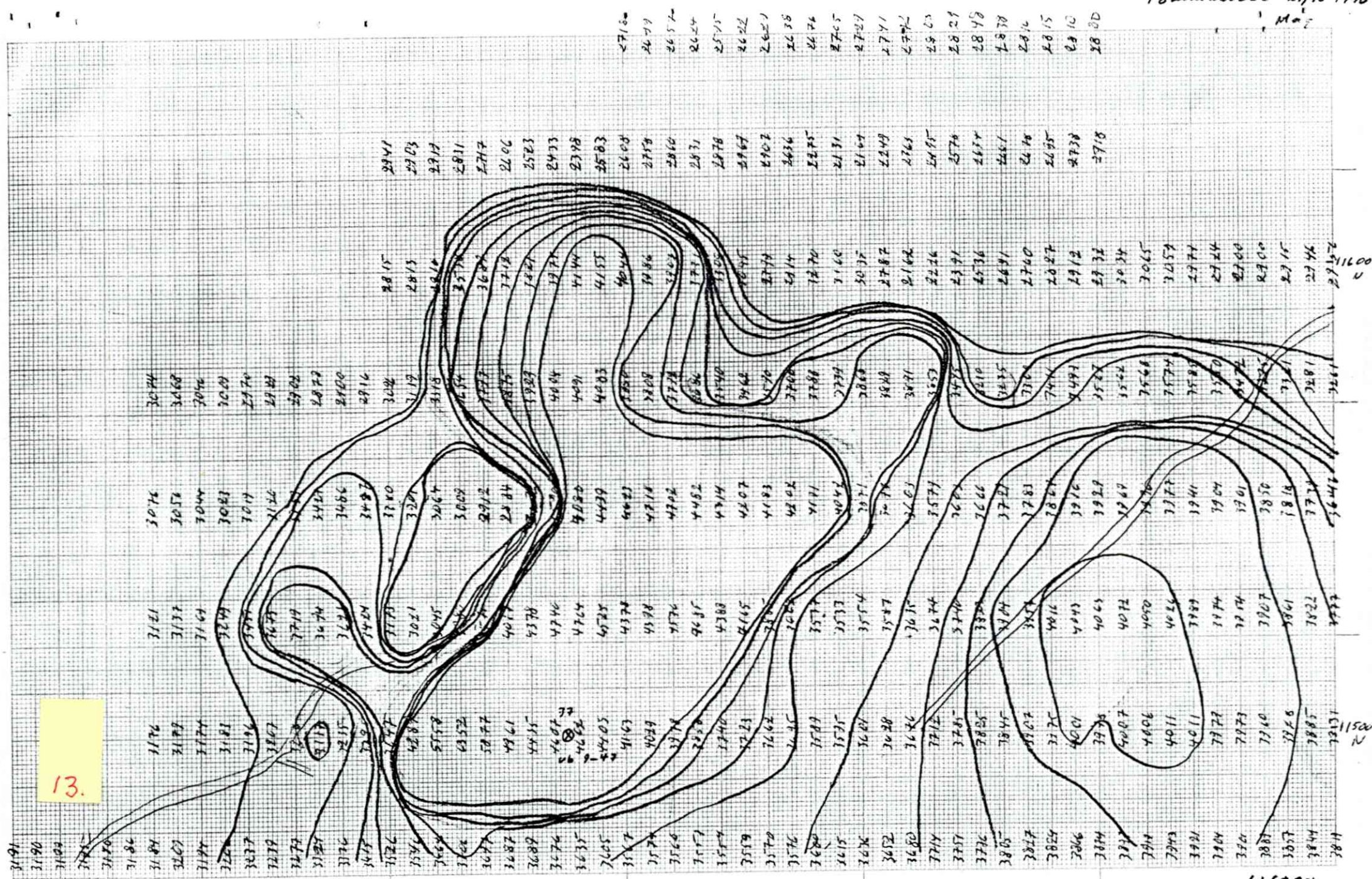
4000w

3700w

Tommiabekke

Mag 13

Tommiabekke 21/10 1970
Mag

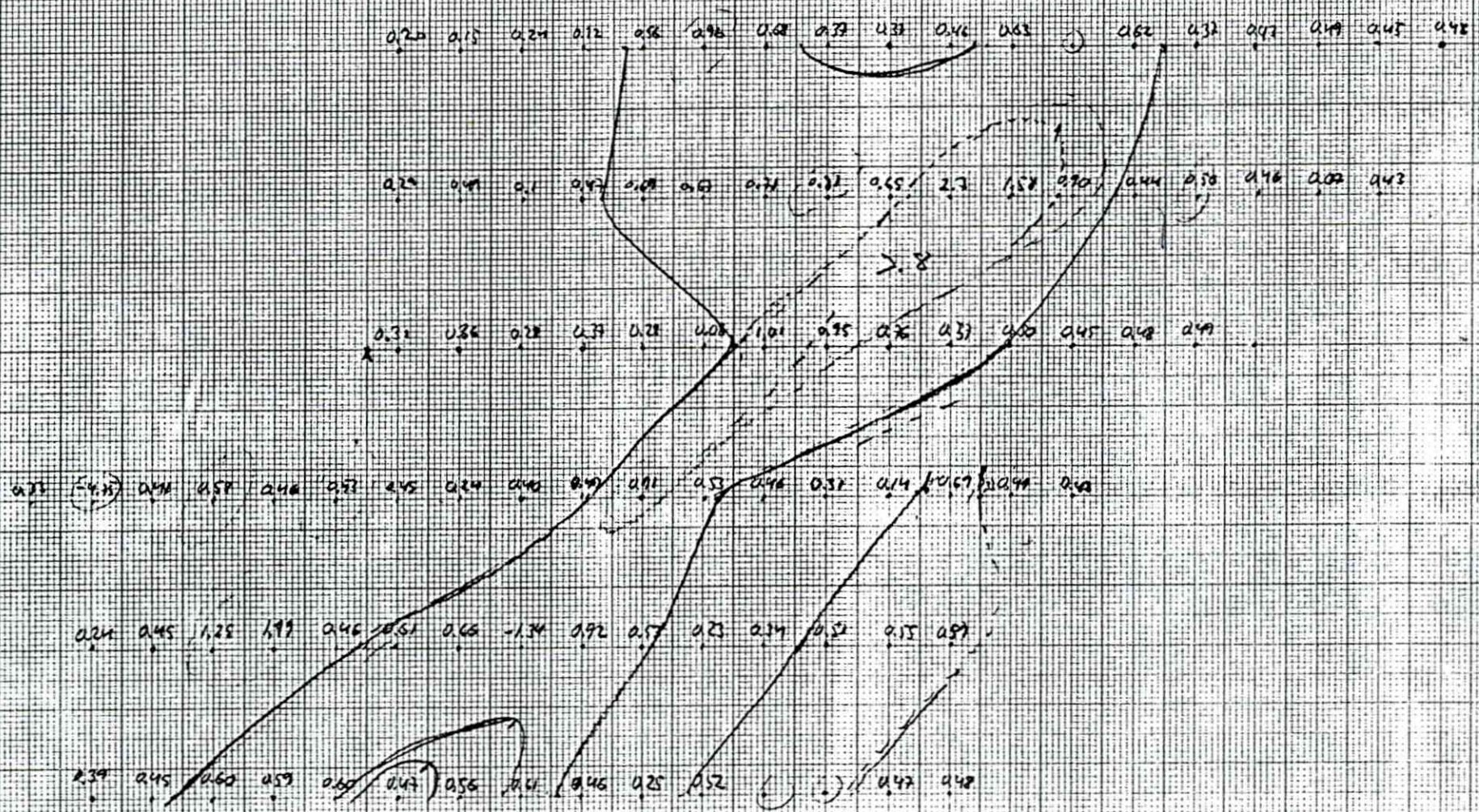




31.10.1990 Tommabekke

1:1000

(%) $\eta_{a/s}$ (näennäinen polaaristuvuus)



1160 N

1155

1150

4100W

4000W

3900W

1:1000

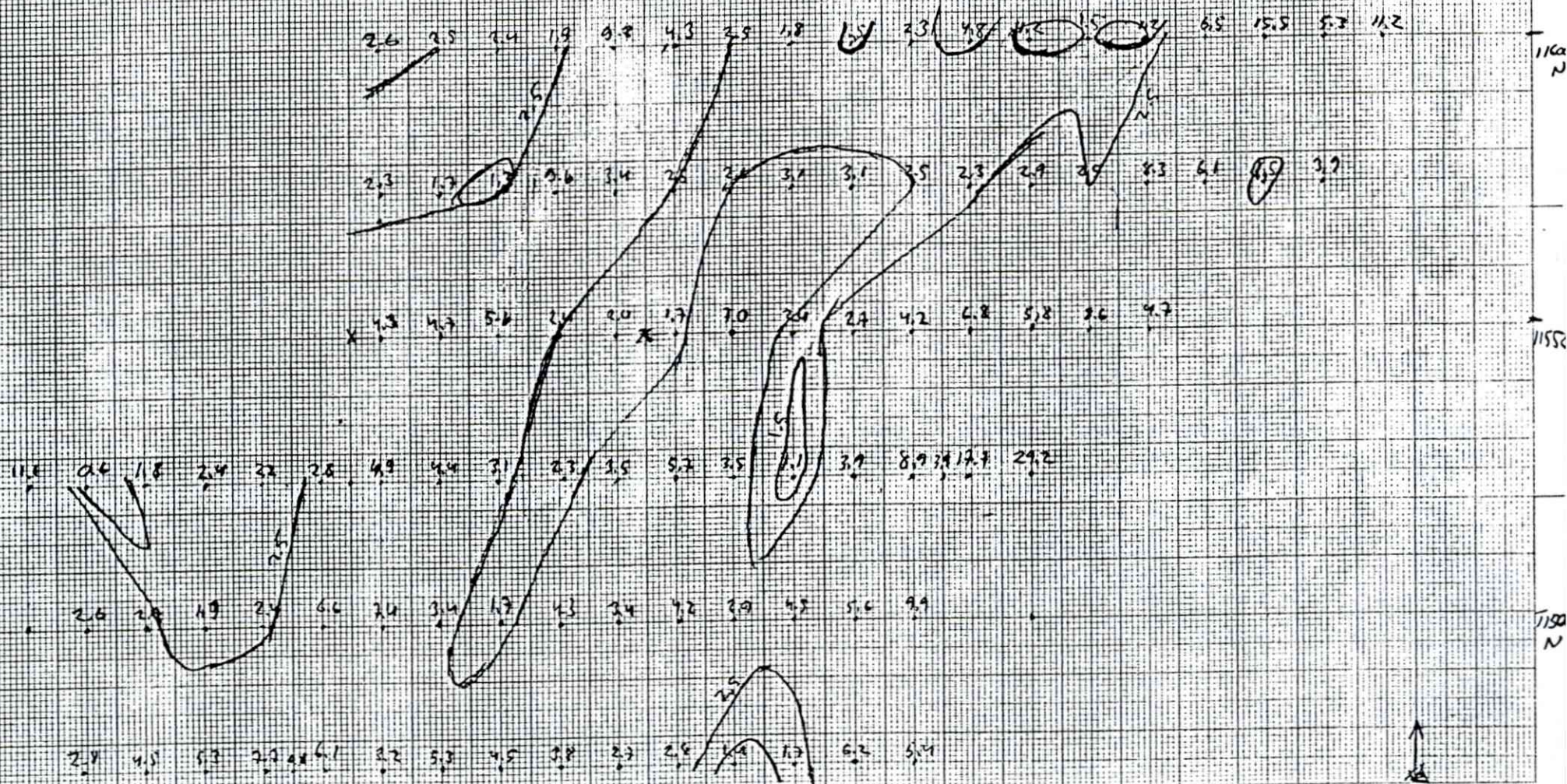
Tommabekke

J P



3110. WMO Tommabeke 1:1000

ρ_a (k Ω m) (näennäsvastus)

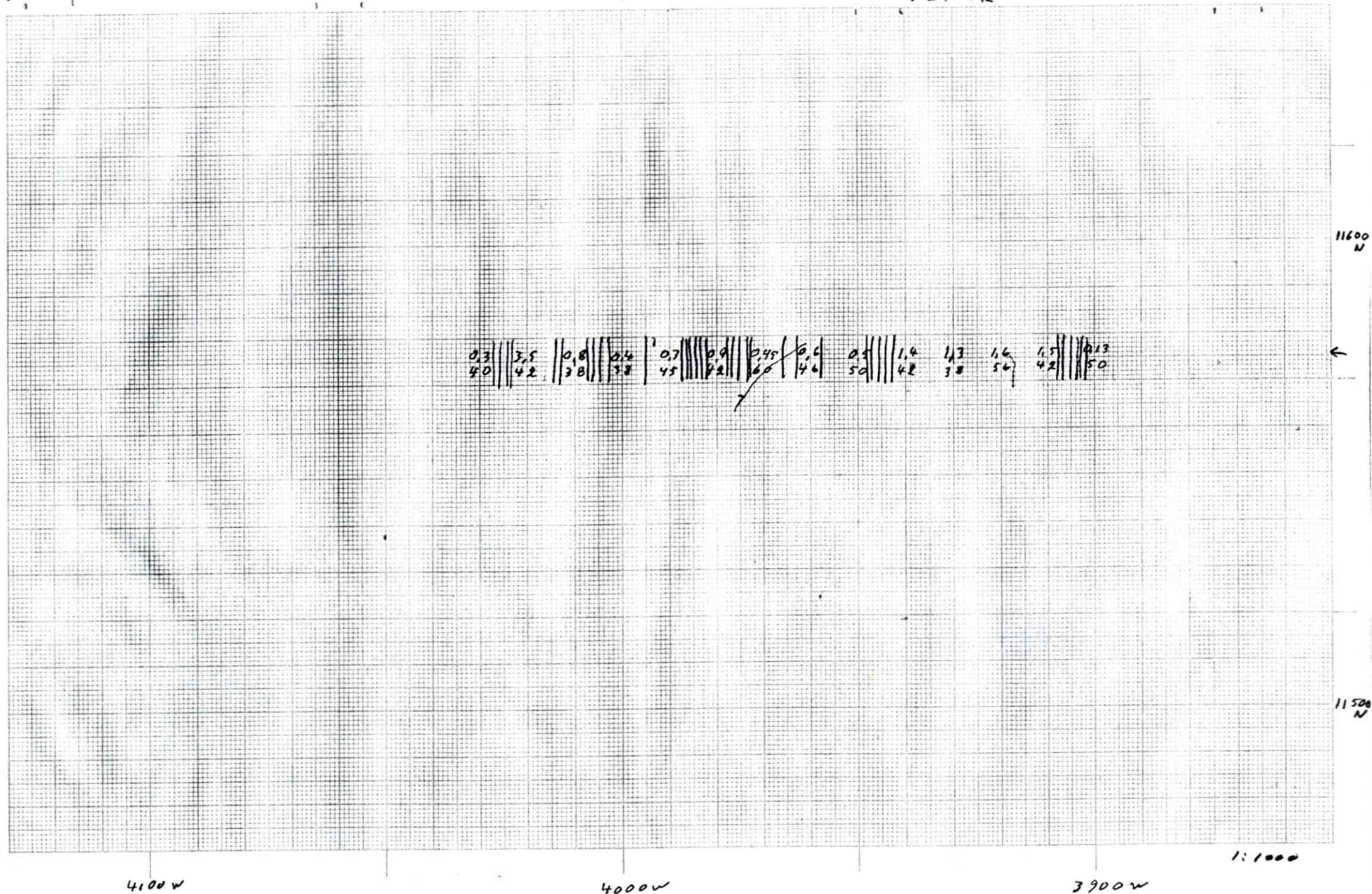


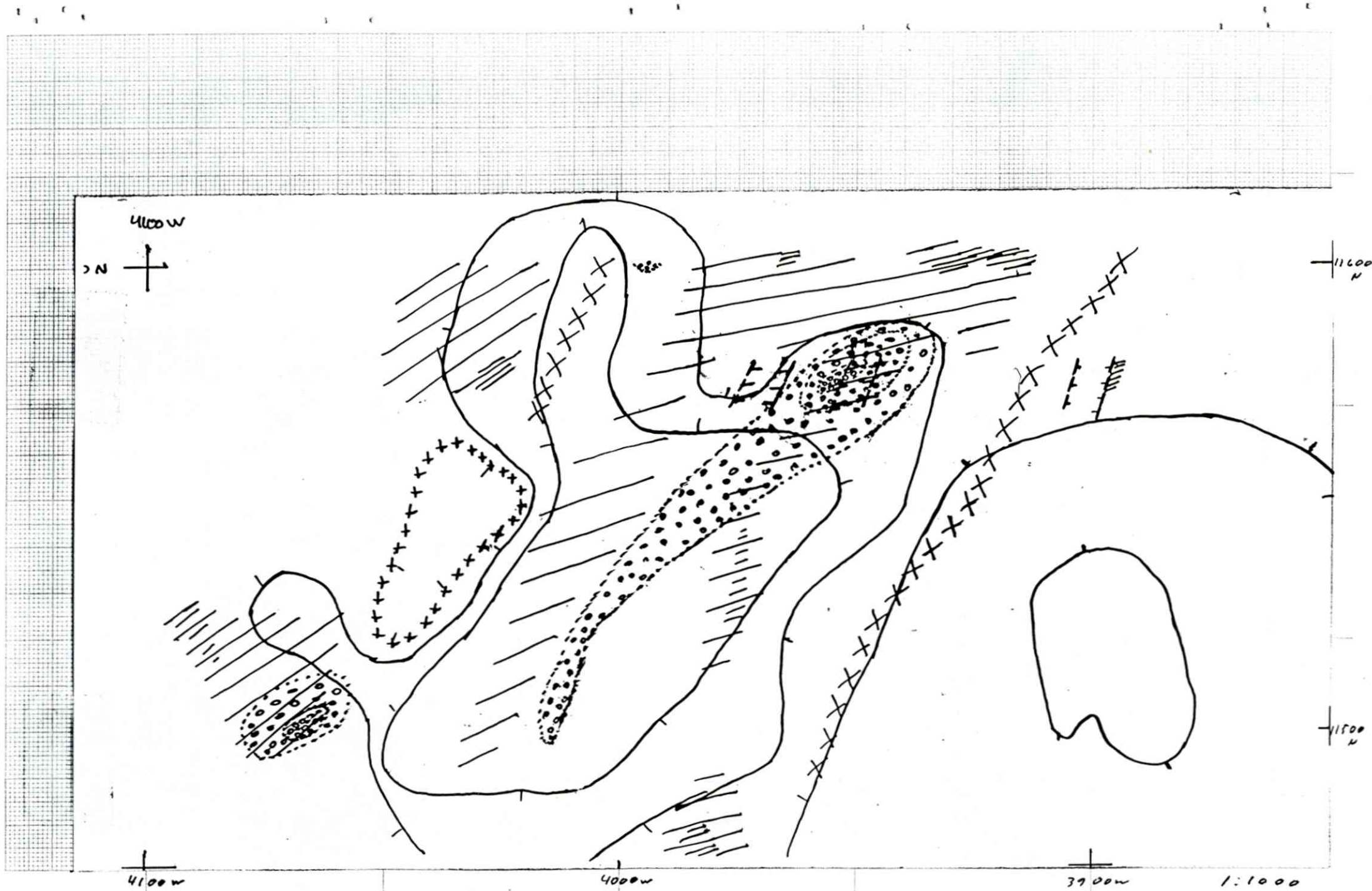
4100W

4000W

3900W

Tommabeke Resistivity 13





γ mag (γ)
 o.o. charge ability
 /// $g_a(DC)(\Omega m)$ apparent resistivity

H $g_a(VLF)(\Omega m)$ conductive zone
 xxx resistivity zone

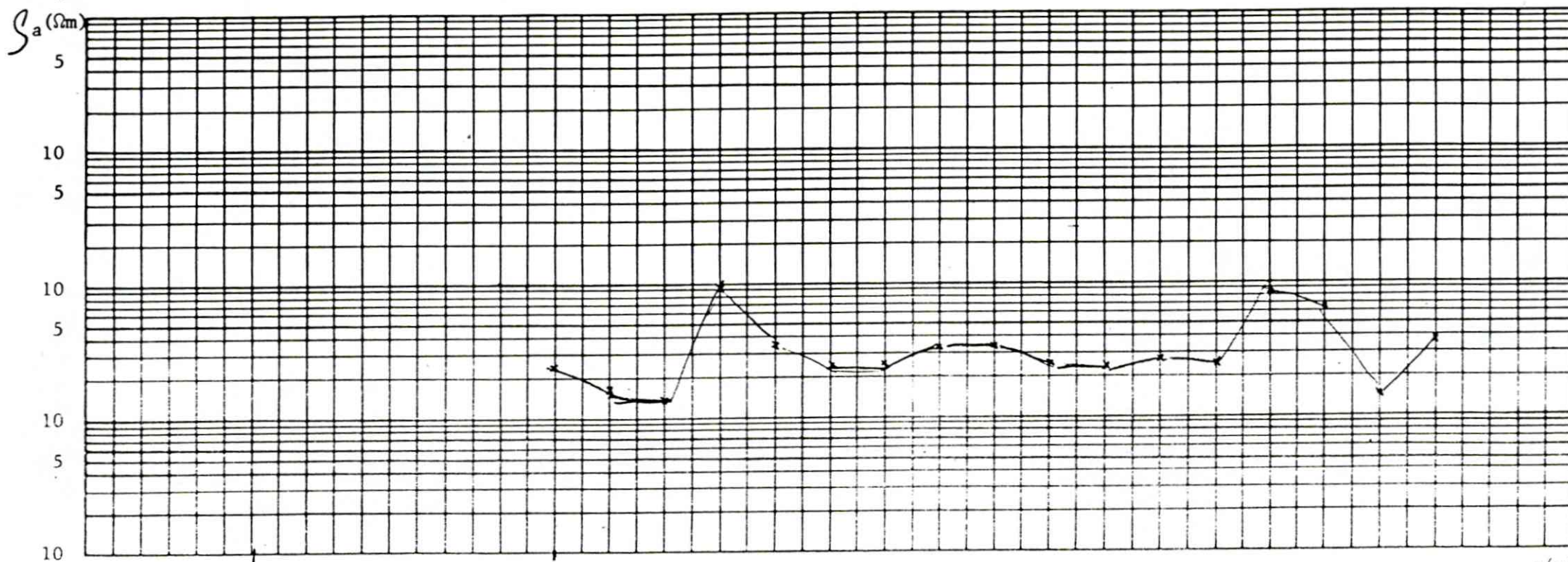
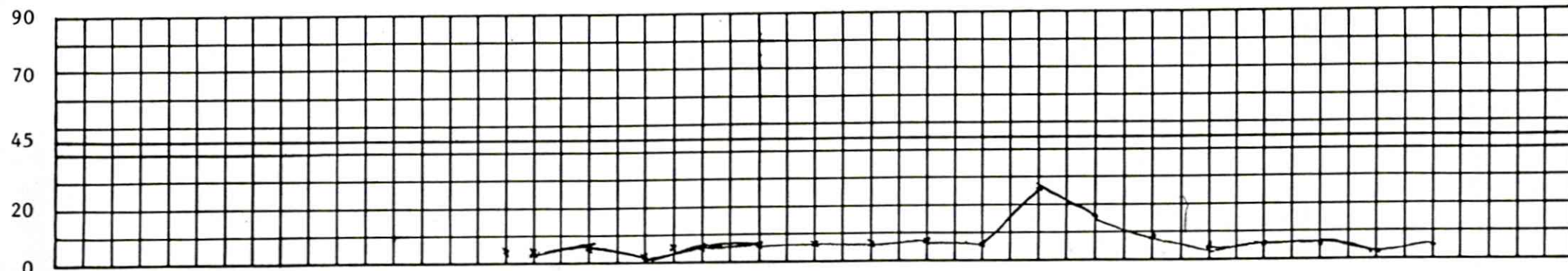
Tommabekke, Compilation map

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DOMAIN *Tammabekke*
PROFILE *11.375*
X X
Y Y

STATION
FREQUENCY
 ρ_1 ☐
 ρ_2 ☐
N
W — E
S

$M_{\text{R}}(\omega)$ VLF - R



W E

$x(m)$

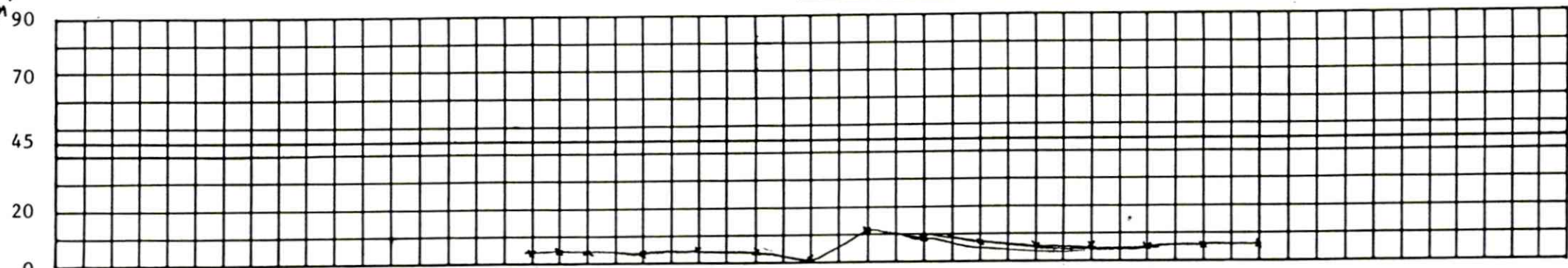
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DEPT. OF GEOPHYSICS

VL - R

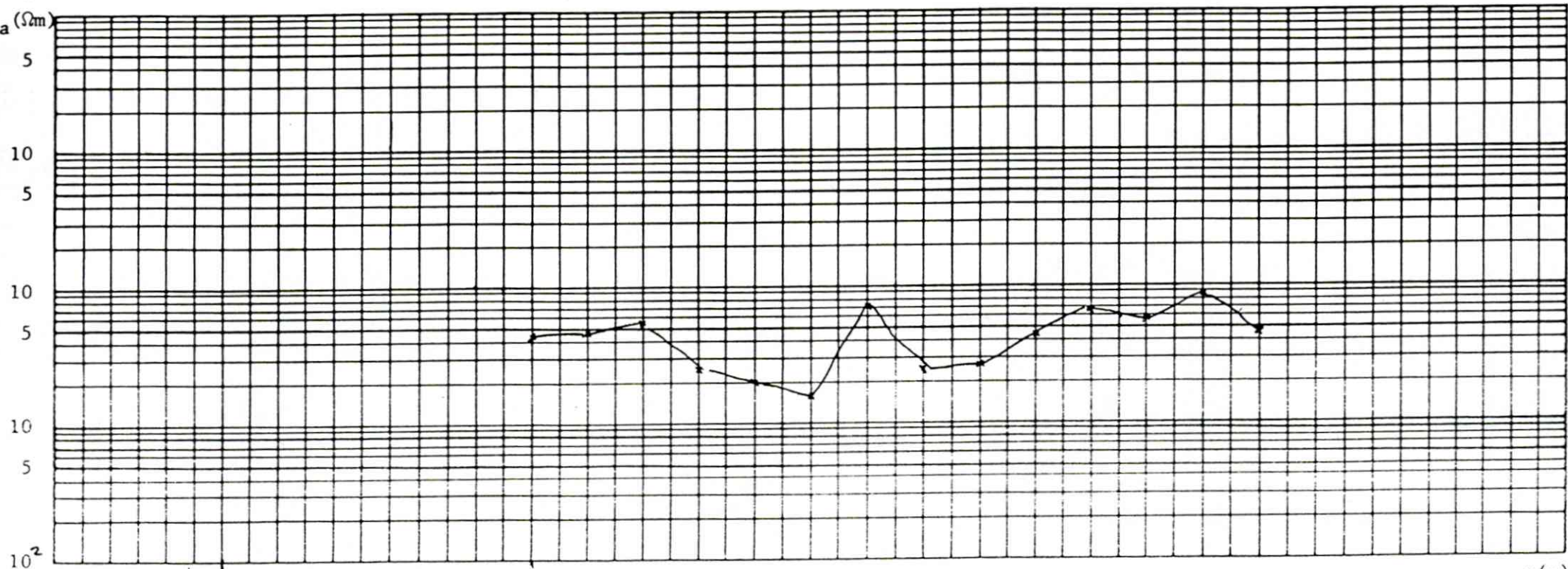
DOMAIN <i>Tammela</i>	
PROFILE <i>11.590</i>	
X	X
Y	Y

STATION	
FREQUENCY	
ρ_1 ☐	N W —+— E S
ρ_2 ☐	

$\eta_{\text{m}}^{(0)}$



S_a (Ωm)



1100 W

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DOMAIN Tommatette	
PROFILE 11.525	
X	X
Y	Y

STATION	
FREQUENCY	
$\rho_{\perp}$ ☐	N W — + — E S
$\rho_{\parallel}$ ☐	

VLf - R

$\mu(0)$

9.0

70

45

20

0

$a(\Omega m)$

5

105

5

10^4

5

10^3

5

10^2

4100

$x(m)$

13

EDX-ANALYYSI

N:O

1

1-K/EKK-87

SAT.LÄHDE CD-109

09.12.87

18,50 - 19,00

Ti	=	0	%
Cr	=	0.35	%
Mn	=	0.4	%
Fe	=	12.62	%
Co	=	0	%
Ni	=	0.17	%
Cu	=	0	%
Zn	=	0.02	%

W	=	0	%
As	=	0	%
Br	=	0	%
Pb	=	0	%
Sr	=	0.008	%
Zr	=	0	%
Nb	=	0	%
Mo	=	0	%

Mittausaika =
 Todellinen aika=

240 s
 255 s

EDX-ANALYYSI

N:O

2

1-K/EKK-87

SAT.LÄHDE CD-109

09.12.87

19,00 - 19,50

Ti	=	0	%
Cr	=	0.39	%
Mn	=	0.41	%
Fe	=	12.7	%
Co	=	0	%
Ni	=	0.17	%
Cu	=	0	%
Zn	=	0.02	%

W	=	0	%
As	=	0	%
Br	=	0	%
Pb	=	0	%
Sr	=	0.012	%
Zr	=	0	%
Nb	=	0	%
Mo	=	0	%

Mittausaika =
 Todellinen aika=

240 s
 256 s

EDX-ANALYYSI

N:O

3

1-K/EKK-87

SAT.LÄHDE CD-109

09.12.87

22,00 - 22,50

Ti	=	0	%
Cr	=	0.22	%
Mn	=	0.22	%
Fe	=	13.25	%
Co	=	0	%
Ni	=	0.14	%
Cu	=	0	%
Zn	=	0.01	%

W	=	0	%
As	=	0	%
Br	=	0	%
Pb	=	0	%
Sr	=	0	%
Zr	=	0	%
Nb	=	0	%
Mo	=	0	%

Mittausaika =
 Todellinen aika=

240 s
 259 s

EDX-ANALYYSI

N:O

4

1-K/EKK-87

SAT.LÄHDE CD-109

09.12.87

22,50 - 23,00

Ti	=	0.61	%
Cr	=	0.51	%
Mn	=	0.3	%
Fe	=	18.16	%
Co	=	0	%
Ni	=	0.58	%
Cu	=	0.45	%
Zn	=	0.04	%

W	=	0	%
As	=	0.005	%
Br	=	0	%
Pb	=	0	%
Sr	=	0.01	%
Zr	=	0.01	%
Nb	=	0	%
Mo	=	0	%

Mittausaika =
 Todellinen aika=

240 s
 253 s

EDX-ANALYYSI

N:O

5

1-K/EKK-87

SAT.LÄHDE CD-109

09.12.87

23,00 - 23,50

Ti	=	0	%
Cr	=	0.37	%
Mn	=	0.24	%
Fe	=	17.68	%
Co	=	0	%
Ni	=	0.54	%
Cu	=	0.6	%
Zn	=	0.03	%

W	=	0	%
As	=	0.005	%
Br	=	0	%
Pb	=	0	%
Sr	=	0.014	%
Zr	=	0.009	%
Nb	=	0	%
Mo	=	0	%

Mittausaika =
 Todellinen aika=

240 s
 254 s

EDX
analyser

EDX-ANALYYSI

N:O

6

1-K/EKK-87

SAT.LAHDE CD-109

09.12.87

23,50 - 24,00

Ti	=	0.48	%
Cr	=	0.7	%
Mn	=	0.28	%
Fe	=	24.46	%
Co	=	0	%
Ni	=	1.55	%
Cu	=	0.54	%
Zn	=	0.04	%

W	=	0	%
As	=	0.009	%
Br	=	0	%
Pb	=	0	%
Sr	=	0.011	%
Zr	=	0.009	%
Nb	=	0	%
Mo	=	0	%

Mittausaika = 240 s
 Todellinen aika= 253 s

EDX-ANALYYSI

N:O

7

2-K/EKK-87

SAT.LAHDE CD-109

09.12.87

24,00 - 24,50

Ti	=	0.78	%
Cr	=	0.34	%
Mn	=	0.2	%
Fe	=	16.41	%
Co	=	0	%
Ni	=	0.36	%
Cu	=	0.65	%
Zn	=	0.03	%

W	=	0	%
As	=	0	%
Br	=	0	%
Pb	=	0	%
Sr	=	0.012	%
Zr	=	0.013	%
Nb	=	0	%
Mo	=	0	%

Mittausaika = 240 s
 Todellinen aika= 253 s

EDX-ANALYYSI

N:O

8

1-M/EKK-87

SAT.LAHDE CD-109

09.12.87

A

Ti	=	1.88	%
Cr	=	0.21	%
Mn	=	0.19	%
Fe	=	15.83	%
Co	=	0	%
Ni	=	0	%
Cu	=	0	%
Zn	=	0.02	%

W	=	0	%
As	=	0.008	%
Br	=	0	%
Pb	=	0	%
Sr	=	0.015	%
Zr	=	0.011	%
Nb	=	0	%
Mo	=	0	%

Mittausaika = 240 s
 Todellinen aika= 254 s

EDX-ANALYYSI

N:O

9

1-M/EKK-87

SAT.LAHDE CD-109

09.12.87

B

Ti	=	1.63	%
Cr	=	0.11	%
Mn	=	0.21	%
Fe	=	17.25	%
Co	=	0	%
Ni	=	0	%
Cu	=	0	%
Zn	=	0.01	%

W	=	0	%
As	=	0	%
Br	=	0	%
Pb	=	0	%
Sr	=	0.015	%
Zr	=	0.012	%
Nb	=	0	%
Mo	=	0	%

Mittausaika = 240 s
 Todellinen aika= 253 s

EDX-ANALYYSI

N:O

10

1-M/EKK-87

SAT.LAHDE CD-109

09.12.87

C

Ti	=	0.63	%
Cr	=	0.37	%
Mn	=	0.26	%
Fe	=	16.15	%
Co	=	0	%
Ni	=	0.26	%
Cu	=	0.09	%
Zn	=	0.01	%

W	=	0	%
As	=	0.006	%
Br	=	0	%
Pb	=	0	%
Sr	=	0.006	%
Zr	=	0.011	%
Nb	=	0	%
Mo	=	0	%

Mittausaika = 240 s
 Todellinen aika= 255 s

EDX-ANALYYSI

N:O

11

2-M/EKK-87

Zn	=	0.01	%	Mo	=	0	%
Mittausaika	=	240	s				
Todellinen aika	=	255	s				

EDX-ANALYYSI	N:O	11
SAT.LÄHDE	CD-109	09.12.87

2-M/EKK-87
A

Ti	=	0.26	%	W	=	0	%
Cr	=	0.57	%	As	=	0	%
Mn	=	0.19	%	Br	=	0	%
Fe	=	19.11	%	Pb	=	0	%
Co	=	0	%	Sr	=	0.009	%
Ni	=	1.74	%	Zr	=	0.011	%
Cu	=	0.19	%	Nb	=	0	%
Zn	=	0.02	%	Mo	=	0	%

Mittausaika	=	240	s
Todellinen aika	=	253	s

EDX-ANALYYSI	N:O	12
SAT.LÄHDE	CD-109	09.12.87

2-M/EKK-87
B

Ti	=	0.41	%	W	=	0	%
Cr	=	0.3	%	As	=	0.008	%
Mn	=	0.18	%	Br	=	0	%
Fe	=	14.48	%	Pb	=	0	%
Co	=	0	%	Sr	=	0.01	%
Ni	=	0.22	%	Zr	=	0	%
Cu	=	0.16	%	Nb	=	0	%
Zn	=	0.01	%	Mo	=	0	%

Mittausaika	=	240	s
Todellinen aika	=	256	s

EDX-ANALYYSI	N:O	13
SAT.LÄHDE	CD-109	09.12.87

2-M/EKK-87
C

Ti	=	0	%	W	=	0	%
Cr	=	0.66	%	As	=	0.006	%
Mn	=	0.37	%	Br	=	0	%
Fe	=	18.56	%	Pb	=	0	%
Co	=	0	%	Sr	=	0.007	%
Ni	=	0.28	%	Zr	=	0	%
Cu	=	0.14	%	Nb	=	0	%
Zn	=	0.01	%	Mo	=	0	%

Mittausaika	=	240	s
Todellinen aika	=	255	s

EDX-ANALYYSI	N:O	14
SAT.LÄHDE	CD-109	09.12.87

3-M/EKK-87

Ti	=	0.95	%	W	=	0	%
Cr	=	0.23	%	As	=	0	%
Mn	=	0.23	%	Br	=	0	%
Fe	=	14.6	%	Pb	=	0	%
Co	=	0	%	Sr	=	0.011	%
Ni	=	0	%	Zr	=	0.013	%
Cu	=	0	%	Nb	=	0	%
Zn	=	0.02	%	Mo	=	0	%

Mittausaika	=	240	s
Todellinen aika	=	254	s

EDX-ANALYYSI

NAYTE N:0

1 - K / EKK -87

SAT.LÄHDE AM-241

11.12.87

1.) 18,50 - 19,60

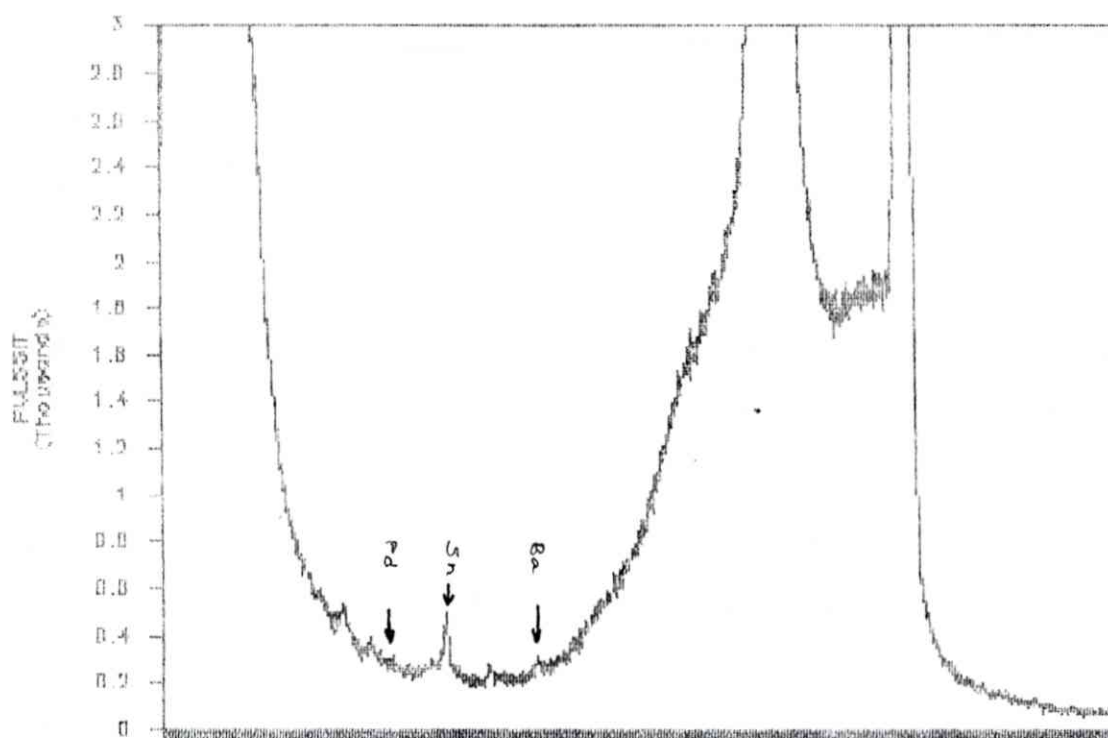
Pd = 0 %
Ag = 0 %
Sn = 0 %
Sb = 0 %

BaO = 0 %
La = 0 %
Ce = 0 %

MITTAUSAIKA = 319 s
TOD.MITTAUSAIKA = 240 s

1.001602 Kalibrointikerroin

SPEKTRI



KAAVAT 100-2000

EDX-ANALYYSI

NAYTE N:0

2 - K / EKK-87

SAT.LAHDE AM-241

11.12.87

Pd = 0 %
Ag = 0 %
Sn = 0 %
Sb = 0 %

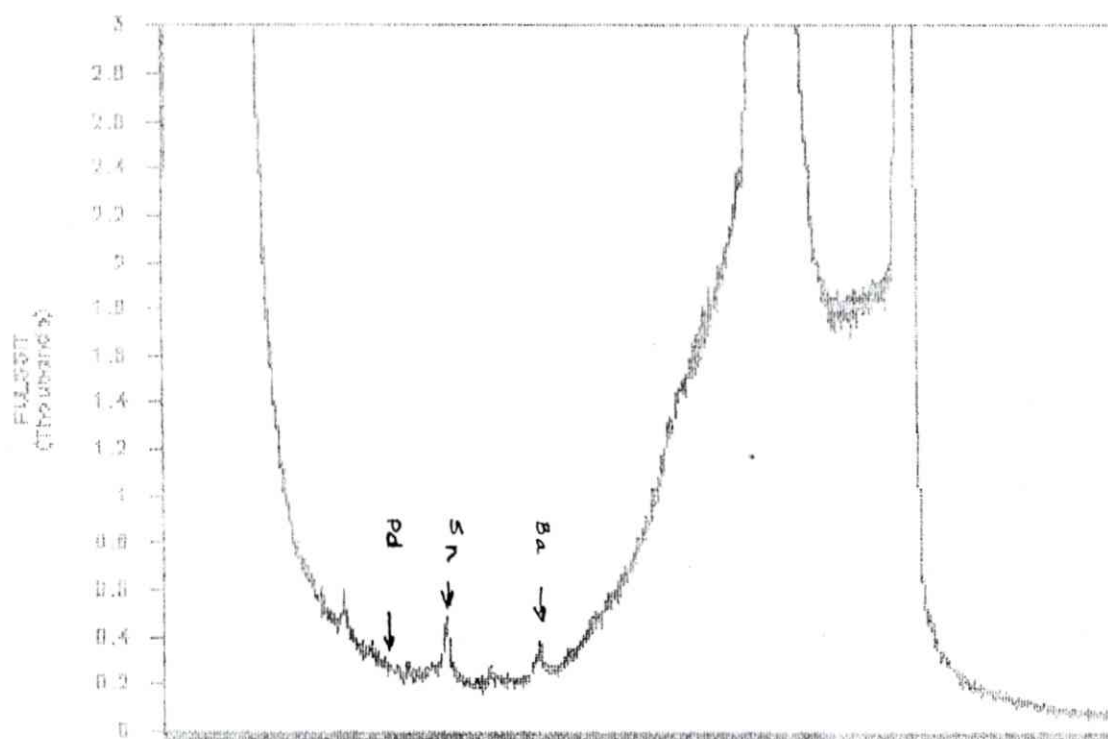
BaO = 0 %
La = 0 %
Ce = 0 %

7/ 24.00 - 24.50

MITTAUSAIKA = 320 s
100.MITTAUSAIKA = 240 s

1.001602 Kalibrointikerroin

SPECTRI



E/keV 100-2000

EDX-ANALYYSI

N:0

1 3 / EKK - 30

SAT.LÄHDE CD-109

10.12.90

10 - 10,5

Ti	=	0	%	W	=	0	%
Cr	=	0	%	As	=	0	%
Mn	=	0.2	%	Br	=	0	%
Fe	=	14.7	%	Pb	=	0	%
Co	=	0	%	Sr	=	0	%
Ni	=	0	%	Zr	=	0	%
Cu	=	0	%	Nb	=	0	%
Zn	=	0	%	Mo	=	0	%

Mittausaika = 240 s
 Todellinen aika = 224 s

EDX-ANALYYSI

N:0

2 3 / EKK - 30

SAT.LÄHDE CD-109

10.12.90

10,5 - 11

Ti	=	0	%	W	=	0	%
Cr	=	0.3	%	As	=	0	%
Mn	=	0.4	%	Br	=	0	%
Fe	=	17.4	%	Pb	=	0	%
Co	=	0	%	Sr	=	0.008	%
Ni	=	0.22	} 0,38 %	Zr	=	0	%
Cu	=	0.16		Nb	=	0	%
Zn	=	0	%	Mo	=	0	%

Mittausaika = 240 s
 Todellinen aika = 220 s

EDX-ANALYYSI

N:0

3 3 / EKK - 90

SAT.LÄHDE CD-109

10.12.90

11 - 11,5

Ti	=	0	%	W	=	0	%
Cr	=	0	%	As	=	0	%
Mn	=	0.2	%	Br	=	0	%
Fe	=	15.5	%	Pb	=	0	%
Co	=	0	%	Sr	=	0.008	%
Ni	=	0	%	Zr	=	0	%
Cu	=	0	%	Nb	=	0	%
Zn	=	0	%	Mo	=	0	%

Mittausaika = 240 s
 Todellinen aika = 220 s

Ni	=	0	%	Zr	=	0	%
Cu	=	0	%	Nb	=	0	%
Zn	=	0	%	Mo	=	0	%

Mittausaika = 240 s
 Todellinen aika= 220 s

EDX-ANALYYSI

N:O

4 3 /EKK-90

SAT.LÄHDE CD-109

10.12.90

11,5 - 12

Ti	=	0	%	W	=	0	%
Cr	=	0.4	%	As	=	0	%
Mn	=	0.3	%	Br	=	0	%
Fe	=	13.3	%	Pb	=	0	%
Co	=	0	%	Sr	=	0.008	%
Ni	=	0	%	Zr	=	0	%
Cu	=	0	%	Nb	=	0	%
Zn	=	0	%	Mo	=	0	%

Mittausaika = 240 s
 Todellinen aika= 220 s

EDX-ANALYYSI

N:O

5 3 /EKK-90

SAT.LÄHDE CD-109

10.12.90

12 - 12,5

Ti	=	0	%	W	=	0	%
Cr	=	0	%	As	=	0	%
Mn	=	0.3	%	Br	=	0	%
Fe	=	15	%	Pb	=	0	%
Co	=	0	%	Sr	=	0.008	%
Ni	=	0	%	Zr	=	0	%
Cu	=	0	%	Nb	=	0	%
Zn	=	0	%	Mo	=	0	%

Mittausaika = 240 s
 Todellinen aika= 219 s

EDX-ANALYYSI

N:O

6 3 /EKK-90

SAT.LÄHDE CD-109

10.12.90

12,5 - 13

Ti	=	0	%	W	=	0	%
Cr	=	0.4	%	As	=	0	%
Mn	=	0.3	%	Br	=	0	%
Fe	=	13.7	%	Pb	=	0	%
Co	=	0	%	Sr	=	0.009	%
Ni	=	0	%	Zr	=	0	%
Cu	=	0	%	Nb	=	0	%
Zn	=	0	%	Mo	=	0	%

Mittausaika = 240 s
 Todellinen aika= 219 s

EDX-ANALYYSI

N:O

7 3 / EKK - 90

SAT.LÄHDE CD-109

10.12.90

13 - 13,5

Ti	=	0	%	W	=	0	%
Cr	=	0.3	%	As	=	0	%
Mn	=	0.4	%	Br	=	0	%
Fe	=	20.5	%	Pb	=	0	%
Co	=	0	%	Sr	=	0.008	%
Ni	=	0.68	%	Zr	=	0	%
Cu	=	0.39	%	Nb	=	0	%
Zn	=	0	%	Mo	=	0	%

Mittausaika = 240 s
 Todellinen aika = 217 s

EDX-ANALYYSI

N:O

8 3 / EKK - 90

SAT.LÄHDE CD-109

10.12.90

13,5 - 14

Ti	=	0	%	W	=	0	%
Cr	=	0.2	%	As	=	0	%
Mn	=	0.3	%	Br	=	0	%
Fe	=	16.1	%	Pb	=	0	%
Co	=	0	%	Sr	=	0.007	%
Ni	=	0.11	%	Zr	=	0	%
Cu	=	0	%	Nb	=	0	%
Zn	=	0	%	Mo	=	0	%

Mittausaika = 240 s
 Todellinen aika = 225 s

EDX-ANALYYSI

N:O

9 3 / EKK - 90

SAT.LÄHDE CD-109

10.12.90

14 - 14,5

Ti	=	0	%	W	=	0	%
Cr	=	0.3	%	As	=	0	%
Mn	=	0.3	%	Br	=	0	%
Fe	=	16	%	Pb	=	0	%
Co	=	0	%	Sr	=	0.008	%
Ni	=	0	%	Zr	=	0	%
Cu	=	0	%	Nb	=	0	%
Zn	=	0	%	Mo	=	0	%

Mittausaika = 240 s
 Todellinen aika = 222 s

EDX-ANALYYSI

N:0

10

4/EKK-90

SAT.LÄHDE CD-109

10.12.90

8,3 - 10

Ti	=	0	%
Cr	=	0.2	%
Mn	=	0.3	%
Fe	=	13.8	%
Co	=	0	%
Ni	=	0.13	%
Cu	=	0	%
Zn	=	0	%

W	=	0	%
As	=	0	%
Br	=	0	%
Pb	=	0	%
Sr	=	0.01	%
Zr	=	0	%
Nb	=	0	%
Mo	=	0	%

Mittausaika = 240 s
 Todellinen aika= 224 s

EDX-ANALYYSI

N:0

11

4/EKK-90

SAT.LÄHDE CD-109

10.12.90

10 - 10.5

Ti	=	0	%
Cr	=	0.3	%
Mn	=	0.3	%
Fe	=	17.6	%
Co	=	0	%
Ni	=	0.36	} 0.74 %
Cu	=	0.38	
Zn	=	0	%

W	=	0	%
As	=	0	%
Br	=	0	%
Pb	=	0	%
Sr	=	0.009	%
Zr	=	0	%
Nb	=	0	%
Mo	=	0	%

Mittausaika = 240 s
 Todellinen aika= 222 s

EDX-ANALYYSI

N:0

12

4/EKK-90

Mittausaika = 240 s
Todellinen aika= 222 s

EDX-ANALYYSI

N:O

12 4/EKK - 30

SÄT.LÄHDE CD-109

10.12.90

10,5 - 11

Ti	=	0	%	W	=	0	%
Cr	=	0	%	As	=	0	%
Mn	=	0.3	%	Br	=	0	%
Fe	=	15.2	%	Pb	=	0	%
Co	=	0	%	Sr	=	0.01	%
Ni	=	0.38	%}	Zr	=	0	%
Cu	=	0.17		Nb	=	0	%
Zn	=	0	%	Mo	=	0	%

Mittausaika = 240 s
Todellinen aika= 225 s

EDX-ANALYYSI

N:O

13 4/EKK - 30

SÄT.LÄHDE CD-109

10.12.90

11 - 11,5

Ti	=	0	%	W	=	0	%
Cr	=	0.3	%	As	=	0	%
Mn	=	0.2	%	Br	=	0	%
Fe	=	18	%	Pb	=	0	%
Co	=	0	%	Sr	=	0.01	%
Ni	=	0.54	%}	Zr	=	0	%
Cu	=	0.17		Nb	=	0	%
Zn	=	0	%	Mo	=	0	%

Mittausaika = 240 s
Todellinen aika= 217 s

EDX-ANALYYSI

N:O

14 4/EKK - 30

SÄT.LÄHDE CD-109

10.12.90

11,5 - 12

Ti	=	0	%	W	=	0	%
Cr	=	0.3	%	As	=	0	%
Mn	=	0.3	%	Br	=	0	%
Fe	=	15.1	%	Pb	=	0	%
Co	=	0	%	Sr	=	0.009	%
Ni	=	0.1	%	Zr	=	0	%
Cu	=	0	%	Nb	=	0	%
Zn	=	0	%	Mo	=	0	%

Mittausaika = 240 s
Todellinen aika= 222 s

EDX-ANALYYSI

N:O

15 4/EKK - 30

12 - 13,5

EDX-ANALYYSI

N:O

15 4/EKK-90

SÄT.LÄHDE CD-109

10.12.90

12 - 12,5

Ti = 0 %
 Cr = 0.3 %
 Mn = 0.3 %
 Fe = 16 %
 Co = 0 %
 Ni = 0 %
 Cu = 0 %
 Zn = 0 %

W = 0 %
 As = 0 %
 Br = 0 %
 Pb = 0 %
 Sr = 0.009 %
 Zr = 0 %
 Nb = 0 %
 Mo = 0 %

Mittausaika = 240 s
 Todellinen aika= 220 s

EDX-ANALYYSI

N:O

16 4/EKK-90

SÄT.LÄHDE CD-109

10.12.90

12,5 - 13

Ti = 0 %
 Cr = 0.3 %
 Mn = 0.2 %
 Fe = 13.5 %
 Co = 0 %
 Ni = 0 %
 Cu = 0 %
 Zn = 0 %

W = 0 %
 As = 0 %
 Br = 0 %
 Pb = 0 %
 Sr = 0.009 %
 Zr = 0 %
 Nb = 0 %
 Mo = 0 %

Mittausaika = 240 s
 Todellinen aika= 221 s

EDX-ANALYYSI

N:O

17 4/EKK-90

SÄT.LÄHDE CD-109

10.12.90

13 - 13,5

Ti = 0 %
 Cr = 0.3 %
 Mn = 0.3 %
 Fe = 15.3 %
 Co = 0 %
 Ni = 0 %
 Cu = 0 %
 Zn = 0 %

W = 0 %
 As = 0 %
 Br = 0 %
 Pb = 0 %
 Sr = 0.009 %
 Zr = 0 %
 Nb = 0 %
 Mo = 0 %

Mittausaika = 240 s
 Todellinen aika= 216 s

EDX-ANALYYSI

N:O

18 5/EKK-90

SÄT.LÄHDE CD-109

10.12.90

20 - 20,5

Ti = 0 %
 Cr = 0.3 %
 Mn = 0.3 %
 Fe = 17 %
 Co = 0 %

W = 0 %
 As = 0 %
 Br = 0 %
 Pb = 0 %
 Sr = 0.01 %

Co	=	0	%
Ni	=	0.19	%
Cu	=	0.17	%
Zn	=	0	%

Sr	=	0.01	%
Zr	=	0	%
Nb	=	0	%
Mo	=	0	%

Mittausaika = 240 s
 Todellinen aika = 224 s

EDX-ANALYYSI

N:O

19 5 / EKK - 90

SÄT.LÄHDE CD-109

10.12.90 20,5 - 21

Ti	=	0	%
Cr	=	0.2	%
Mn	=	0.2	%
Fe	=	13.9	%
Co	=	0	%
Ni	=	0	%
Cu	=	0.12	%
Zn	=	0	%

W	=	0	%
As	=	0	%
Br	=	0	%
Pb	=	0	%
Sr	=	0.009	%
Zr	=	0	%
Nb	=	0	%
Mo	=	0	%

Mittausaika = 240 s
 Todellinen aika = 218 s

EDX-ANALYYSI

N:O

20 5 / EKK - 90

SÄT.LÄHDE CD-109

10.12.90 21 - 21,5

Ti	=	0	%
Cr	=	0.2	%
Mn	=	0.3	%
Fe	=	15.4	%
Co	=	0	%
Ni	=	0	%
Cu	=	0	%
Zn	=	0	%

W	=	0	%
As	=	0	%
Br	=	0	%
Pb	=	0	%
Sr	=	0.007	%
Zr	=	0	%
Nb	=	0	%
Mo	=	0	%

Mittausaika = 240 s
 Todellinen aika = 220 s

EDX-ANALYYSI

N:O

21 8 / EKK - 90

SÄT.LÄHDE CD-109

10.12.90 kohkare

Ti	=	0	%
Cr	=	0.3	%
Mn	=	0.3	%
Fe	=	17.6	%
Co	=	0	%
Ni	=	0	%
Cu	=	0	%
Zn	=	0	%

W	=	0	%
As	=	0	%
Br	=	0	%
Pb	=	0	%
Sr	=	0.008	%
Zr	=	0	%
Nb	=	0	%
Mo	=	0	%

Mittausaika = 240 s
 Todellinen aika = 223 s