



Bergvesenet

Postboks 3021, N-7441 Trondheim

Rapportarkivet

Bergvesenet rapport nr 7195	Intern Journal nr	Internt arkiv nr	Rapport lokalisering	Gradering
Kommer fra ..arkiv Ni & Ol A/S	Ekstern rapport nr	Oversendt fra Ni & Ol A/S	Fortrolig pga	Fortrolig fra dato:

Tittel

Geophysical Surveys at Nikkel og Olivin Mine in Ballangen, NORWAY

Forfatter

Laurila, Tero

Dato År

05.01 1996

Bedrift (Oppdragsgiver og/eller oppdragstaker)

Soumen Malmi OY

Kommune

Ballangen

Fylke

Nordland

Bergdistrikt

1: 50 000 kartblad

1331 1

1: 250 000 kartblad

Narvik

Fagområde

Geofysikk

Dokument type

Forekomster (forekomst, gruvefelt, undersøkelsesfelt)

Bruvannsfeltet
Råna

Råstoffgruppe

Malm/metall

Råstofftype

Cu, Ni

Sammendrag, innholdsfortegnelse eller innholdsbeskrivelse

Rapporten beskriver magnetiske-, slingram Max-Min, borhullslogging av motstand og ledningsevne, samt magnetisme og susceptibilitet. Til slutt misse-a -la-masse.

Måleresultatene er overlevert som kart uten kommentar. For tolkning, se BV-rapp 7196

Det er vedlagt diskett med måleresultater

NIKKEL OG OLIVIN AS

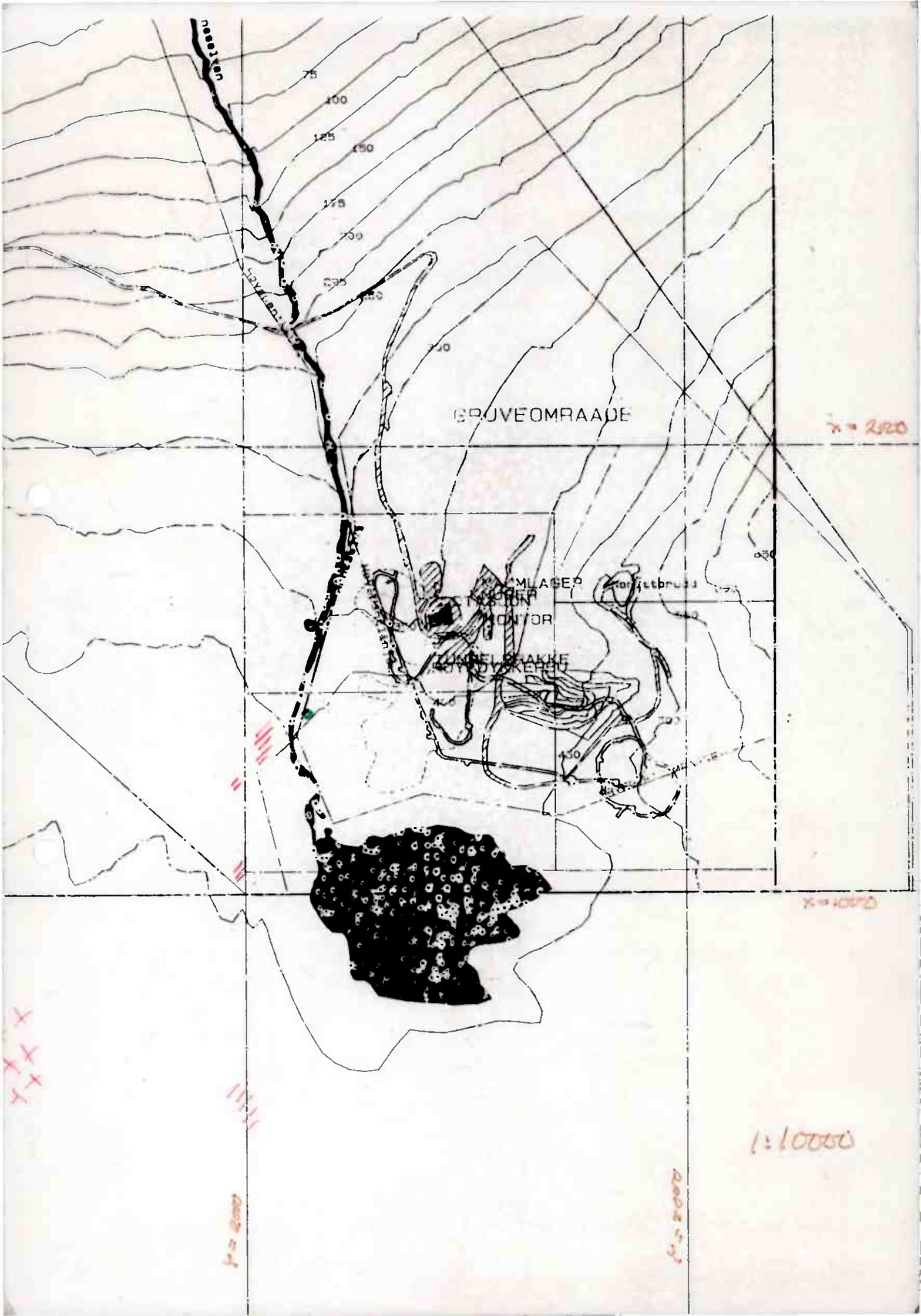
GEOPHYSICAL SURVEYS AT NIKKEL OG OLIVIN MINE IN BALLANGEN, NORWAY

Espoo, 5 January, 1996



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NIKKEL OG OLIVIN AS

**GEOPHYSICAL SURVEYS AT NIKKEL OG
OLIVIN MINE IN BALLANGEN, NORWAY**



GEOPHYSICAL SURVEYS AT NIKKEL OG OLIVIN MINE IN BALLANGEN, NORWAY

I N D E X

1. GENERAL
2. SURVEY AREA
3. STAKING
4. MAGNETIC SURVEY
5. SLINGRAM SURVEY
6. BOREHOLE LOGGINGS
7. MISE-À-LA-MASSE SURVEY
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1. GENERAL

This report describes geophysical surveys at Nikkel og Olivin Mine in Ballangen, Norway. The surveys were carried out on behalf of Nikkel og Olivin AS (the Corporation) by Suomen Malmi Oy (the Contractor) during the period 13.11-18.12.1995.

The aim of the survey was to delineate geological structures.

The work consisted of geophysical surveys according to the invitation of tender dated on 23rd October 1995 (OMR) and order dated on 1st November 1995 (Nikkel og Olivin AS). The survey plan was made by the Corporation. The field crew consisted of one foreman and two observers. The duration of the field work was 29 days.

2. SURVEY AREA

The survey area is located at Nikkel og Olivin Mine in Ballangen about 35 km west of the city of Narvik in northern Norway. The size of the area where slingram and magnetic surveys were carried out is about 1.7 km x 1 km. The borehole loggings and the mise-à-la-masse survey were made at the mine site.

3. STAKING

The lining was made by using a Sokkisha theodolite and a measuring tape. The survey lines were orientated by using compass. Totally 1000 m of E-W base line and 3600 m of N-S rapid base line were staked.

4. MAGNETIC SURVEY

An automatically reading Scintrex Envi-Mag proton magnetometer was used in the survey. As a base station a Scintrex MP-2 magnetometer equipped with a KTP data logger was used.

A standard procedure for magnetic total field survey was applied. The station interval was 10 m and the line spacing was 50 m. Totally 3,475 points were measured.

The results are presented as total field magnetic profile maps and as color maps in appendices 2, 3, 13 and 14. Digital field data on a data diskette in Geosoft format is enclosed to this report.

5. SLINGRAM SURVEY

An APEX Max Min I HLEM system was used in the survey. Measuring frequencies were 220 Hz, 1,760 Hz and 7,040 Hz and the coil separation was 100 meters.

The station interval was 20 m and the line spacing was 50 m. Totally 1,723 points were measured.

The results are presented as profile maps and color maps in appendices 4 - 12 and 5 - 23. Digital field data on a data diskette in Geosoft format is enclosed to this report.

6. BOREHOLE LOGGINGS

In the borehole survey, an OMS-logg borehole logging system consisting of a hand-held computer and a drill hole interface was used. The measured parameters were galvanic resistivity (wenner array), conductivity, susceptibility and 3-components of the magnetic field.

The survey interval for the 3-component magnetic survey was 5 m, for the other components the survey interval was 0,1 m. The loggings were made in two holes. Totally 2,793 m were logged.

The results are presented in appendices 24 - 31. Digital field data on a data diskette is enclosed to this report.

7. MISE-À-LA-MASSE SURVEY

In mise-à-la-masse (MAM) measurements, a Gefinex 100 system made by Outokumpu Oy was used.

The field work was done according to the client's instructions. The amount of the work was 208 man hours.

The results were delivered as data sheets to the client on the field.

Espoo, 5th January, 1996



Tero Laurila, Eng.
Suomen Malmi Oy

8. APPENDICES

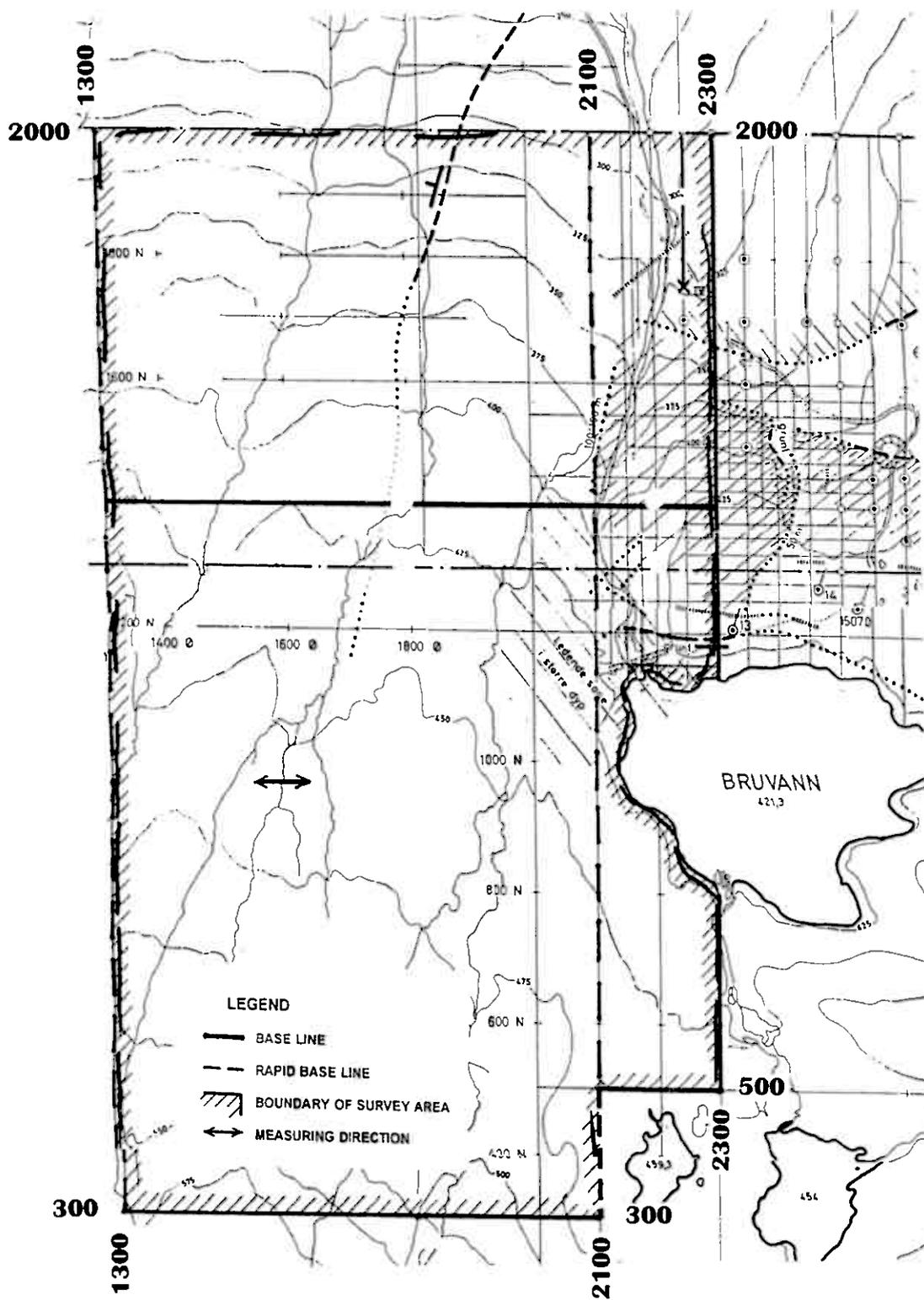
1. Location map of the survey area ~ 1:10 000

GROUND SURVEYS

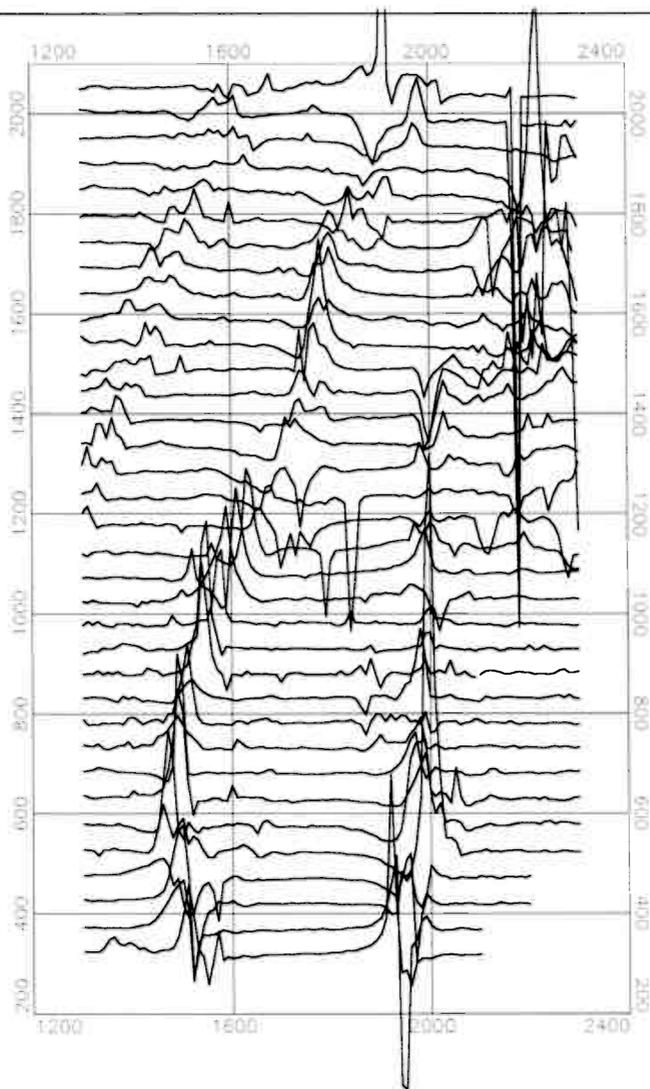
- | | | | | |
|-----|----------------------|-------------|------------------------|----------|
| 2. | Magnetic profile map | | | 1:5 000 |
| 3. | Magnetic color map | | | 1:5 000 |
| 4. | Slingram profile map | f = 220 Hz | Re- and Im- component | 1:5 000 |
| 5. | Slingram color map | f = 220 Hz | Re- component | 1:5 000 |
| 6. | Slingram color map | f = 220 Hz | Im- component | 1:5 000 |
| 7. | Slingram profile map | f = 1760 Hz | Re- and Im- components | 1:5 000 |
| 8. | Slingram color map | f = 1760 Hz | Re- component | 1:5 000 |
| 9. | Slingram color map | f = 1760 Hz | Im- component | 1:5 000 |
| 10. | Slingram profile map | f = 7040 Hz | Re- and Im- components | 1:5 000 |
| 11. | Slingram color map | f = 7040 Hz | Re- component | 1:5 000 |
| 12. | Slingram color map | f = 7040 Hz | Im- component | 1:5 000 |
| 13. | Magnetic profile map | | | 1:10 000 |
| 14. | Magnetic color map | | | 1:10 000 |
| 15. | Slingram profile map | f = 220 Hz | Re- and Im- components | 1:10 000 |
| 16. | Slingram color map | f = 220 Hz | Re- component | 1:10 000 |
| 17. | Slingram color map | f = 220 Hz | Im- component | 1:10 000 |
| 18. | Slingram profile map | f = 1760 Hz | Re- and Im- components | 1:10 000 |
| 19. | Slingram color map | f = 1760 Hz | Re- component | 1:10 000 |
| 20. | Slingram color map | f = 1760 Hz | Im- component | 1:10 000 |
| 21. | Slingram profile map | f = 7040 Hz | Re- and Im- components | 1:10 000 |
| 22. | Slingram color map | f = 7040 Hz | Re- component | 1:10 000 |
| 23. | Slingram color map | f = 7040 Hz | Im- component | 1:10 000 |

BOREHOLE LOGGINGS

- | | | | |
|-------|----------------------|--------------|---------|
| 24. | Susceptibility | hole 235-120 | 1:2 000 |
| 25. | Conductivity | hole 235-120 | 1:2 000 |
| 26. | Resistivity | hole 235-120 | 1:2 000 |
| 27. | 3-component magnetic | hole 235-120 | 1:2 000 |
| 28 a. | Susceptibility | hole 245-125 | 1:2 000 |
| 28 b. | Susceptibility | hole 245-125 | 1:2 000 |
| 29 a. | Conductivity | hole 245-125 | 1:2 000 |
| 29 b. | Conductivity | hole 245-125 | 1:2 000 |
| 30. | Resistivity | hole 245-125 | 1:2 000 |
| 31. | 3-component magnetic | hole 245-125 | 1:2 000 |

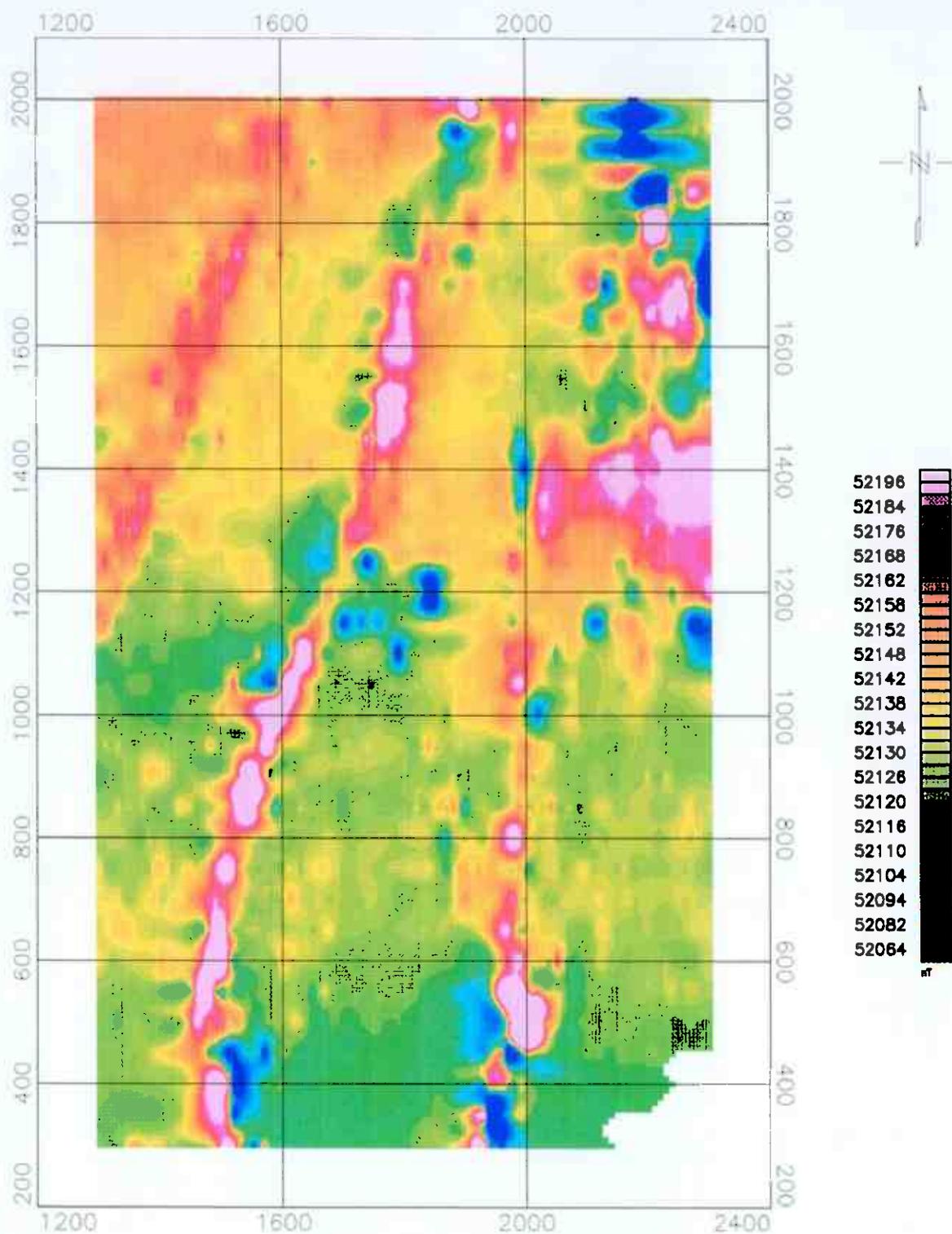


BALLANGEN, NORWAY
 Nikkel og Olivin AS
 Location map of the
 surveyd area ~ 1:10 000
 1.96 SMOY/aml



MAGNETIC SURVEY
BALLANGEN NORWAY
Nikkel og Olivin AS
52100 \pm 100 nT/cm
December 1995 SMOY
1: 10000

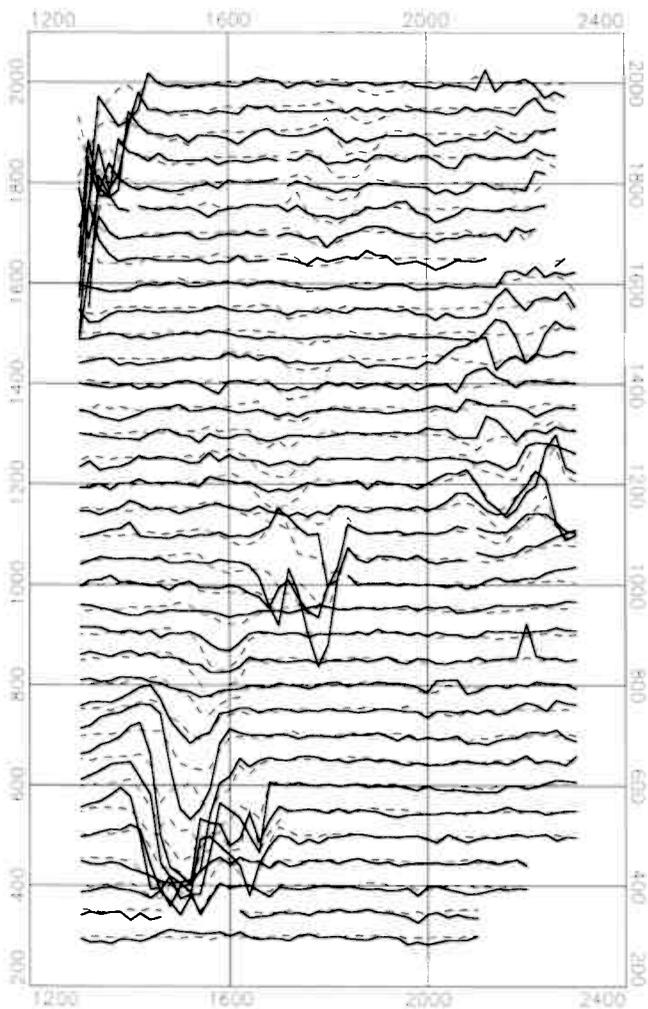




MAGNETIC SURVEY
BALLANGEN NORWAY
Nikkel og Olivin AS

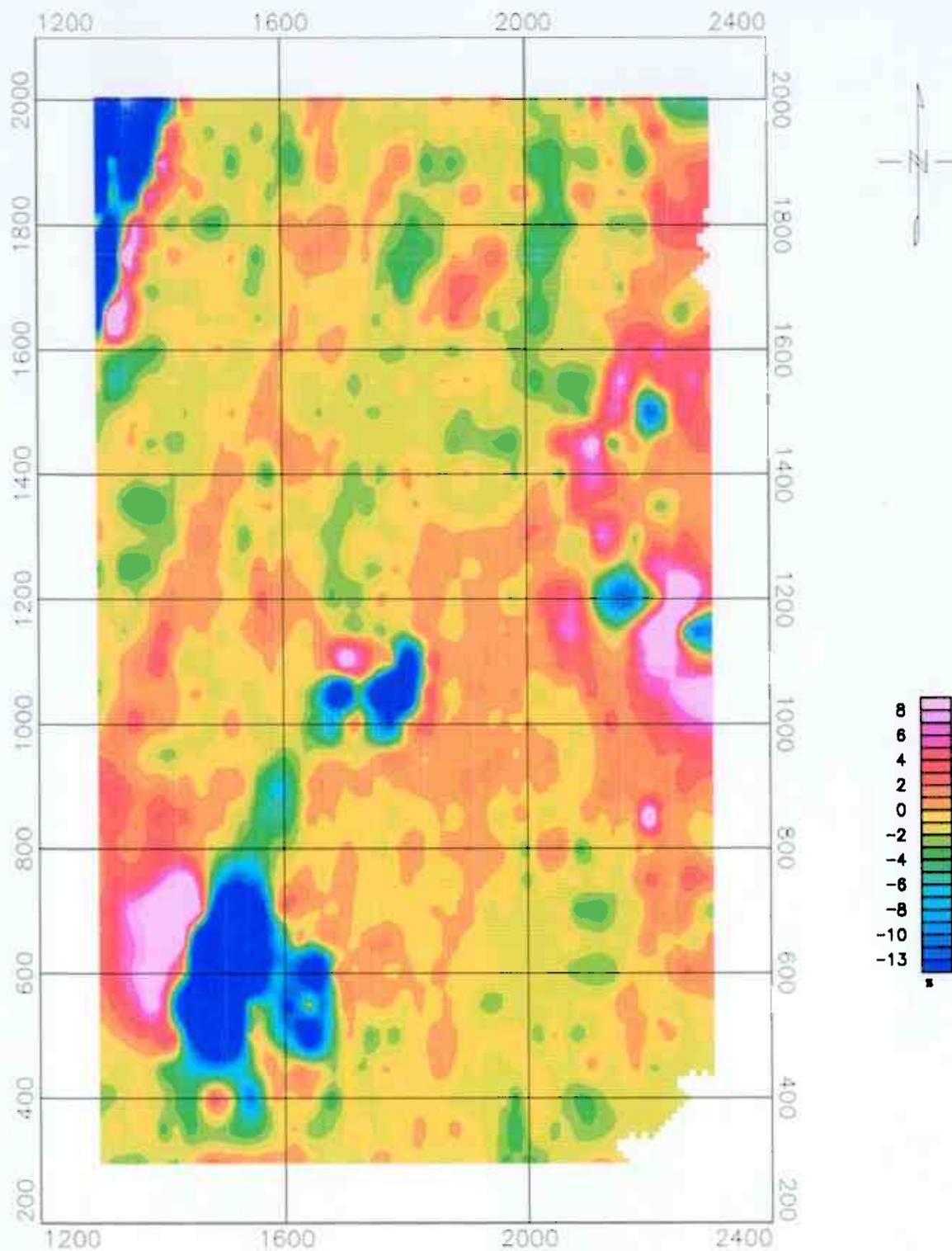
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250 0 250
(metres)



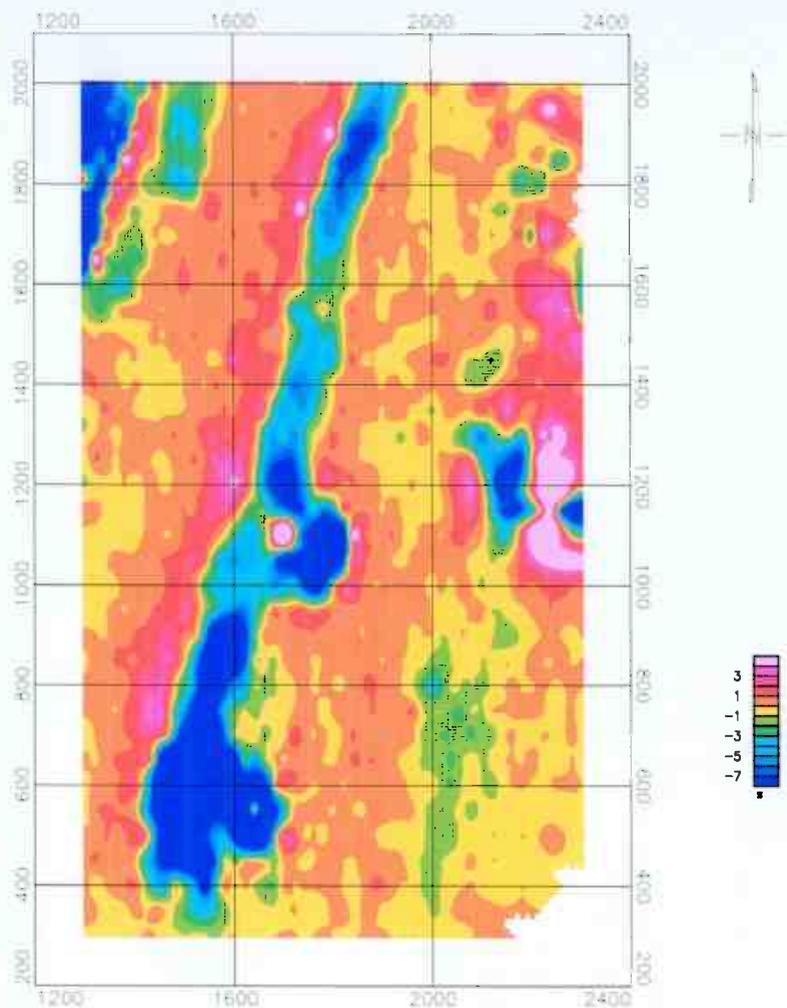
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 BALLANGEN NORWAY
 Nikkel og Olivin AS
 220 Hz, 0 - 20 %/cm, Re solid
 December 1995 SMOY
 1: 10000





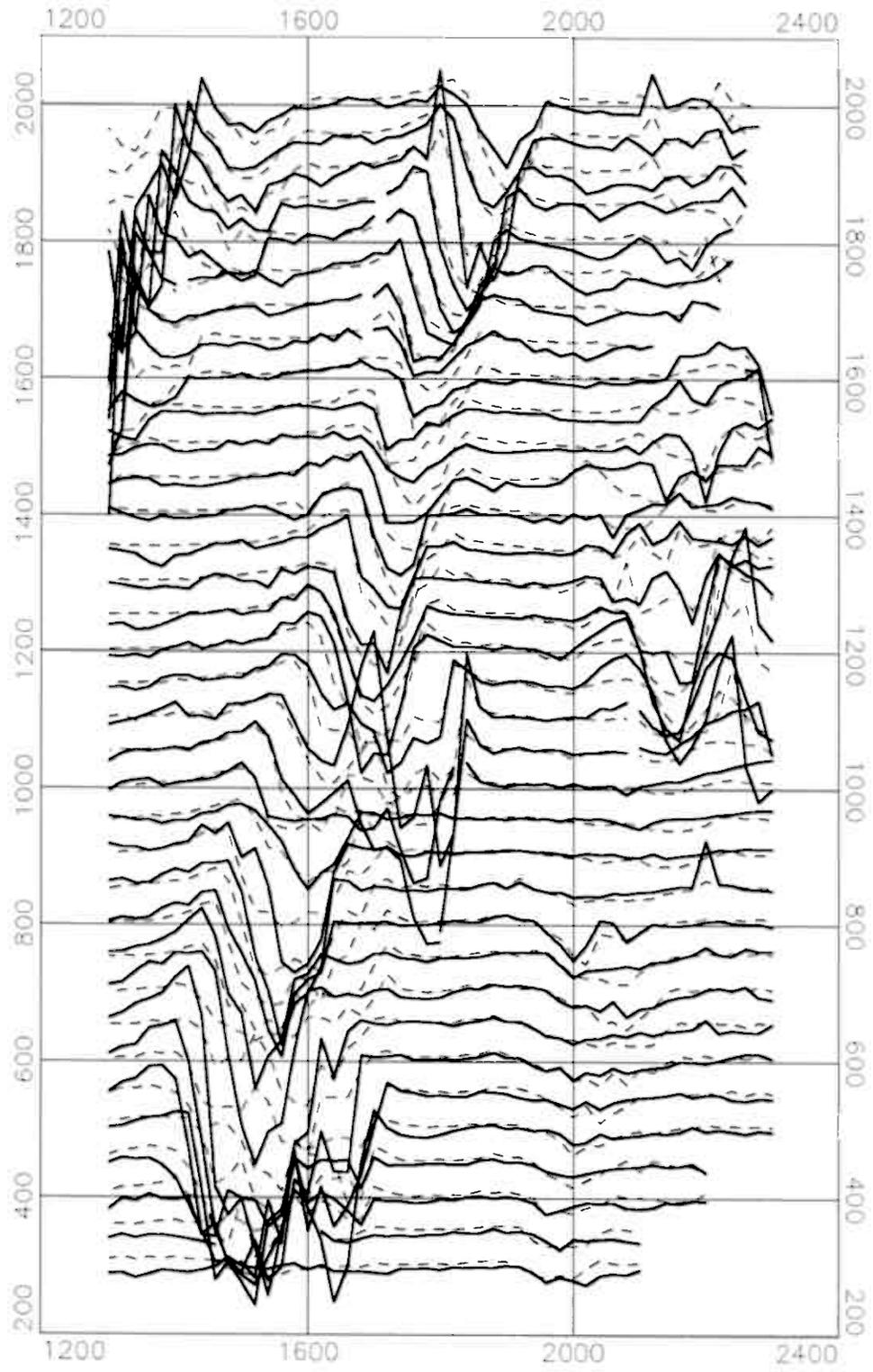
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Nikkel og Olivin AS
Re: 220 Hz
December 1995 SMOY
1: 10000

250 0 250
(metres)



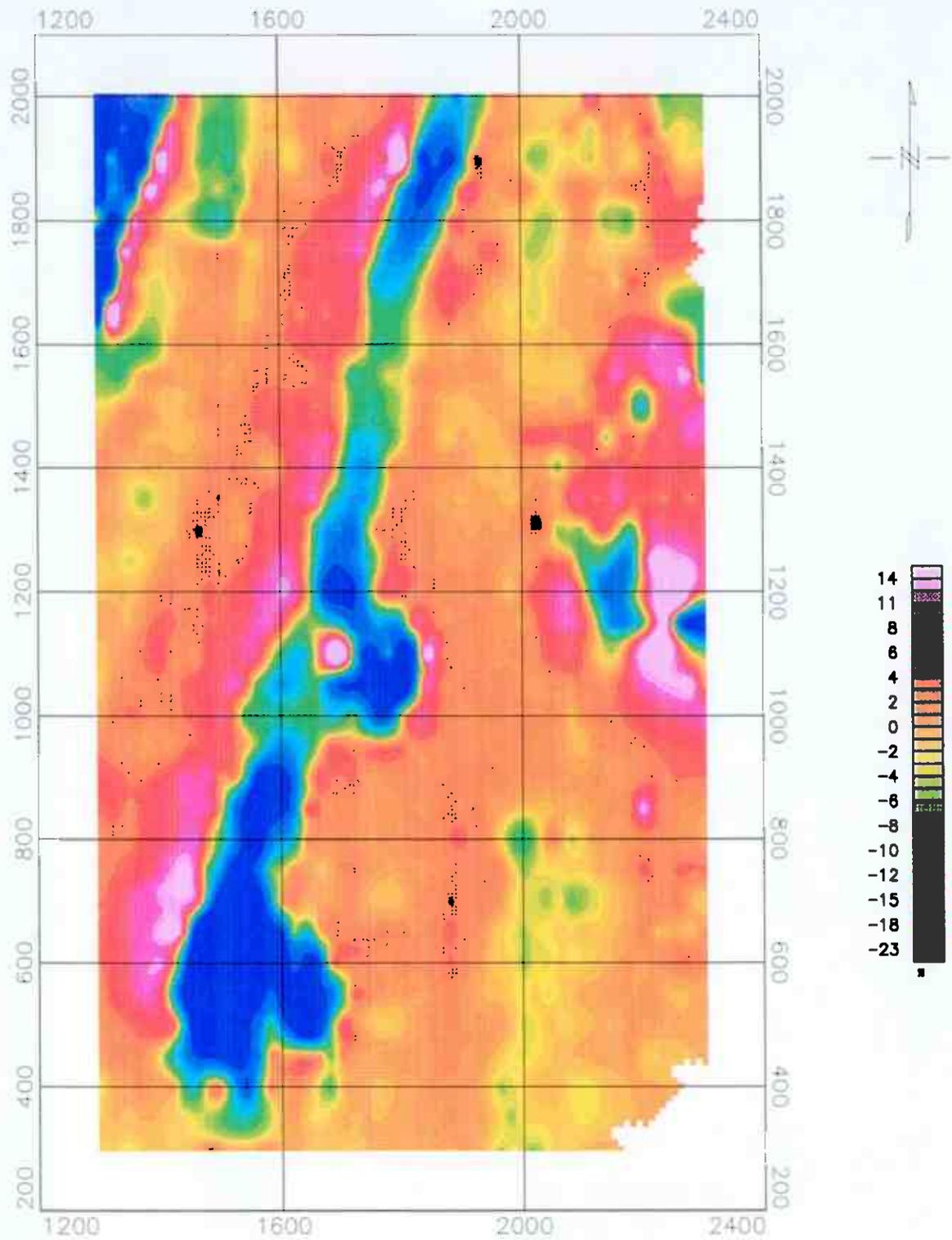
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 Nikkel og Olivin AS
 Im 220 Hz
 December 1995 SMOY
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250 0 250
 (metres)



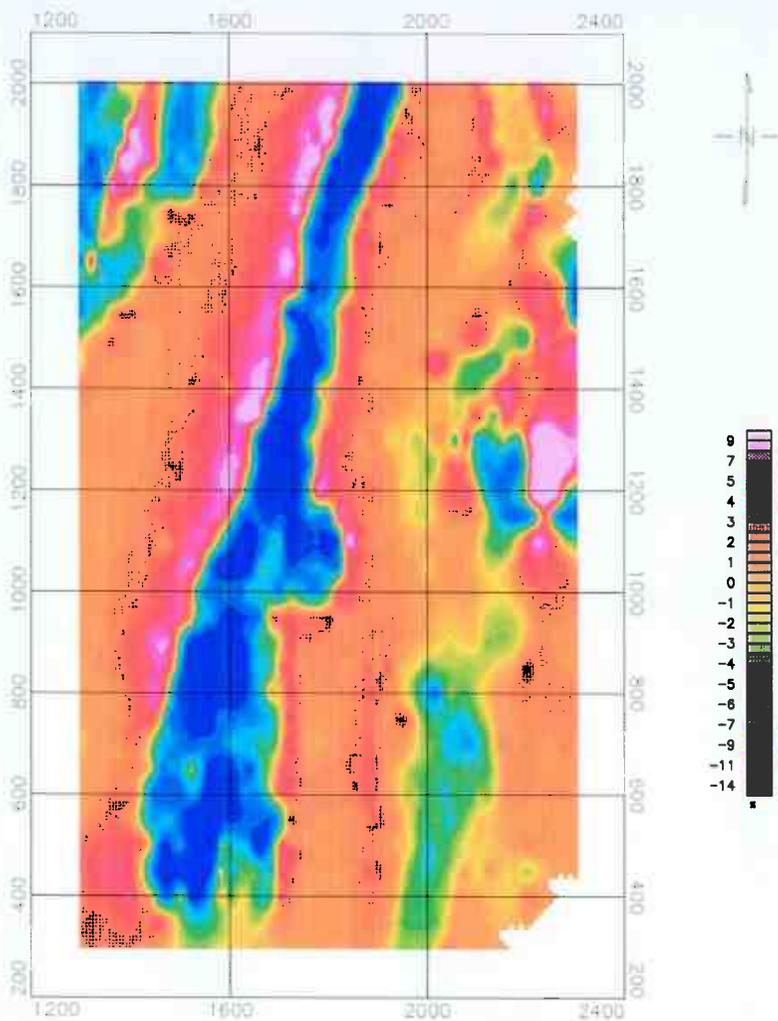
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BALLANGEN NORWAY
Nikkel og Olivin AS
1760 Hz, 0 - 20 %/cm, Re solid
December 1995 SMOY
1: 10000





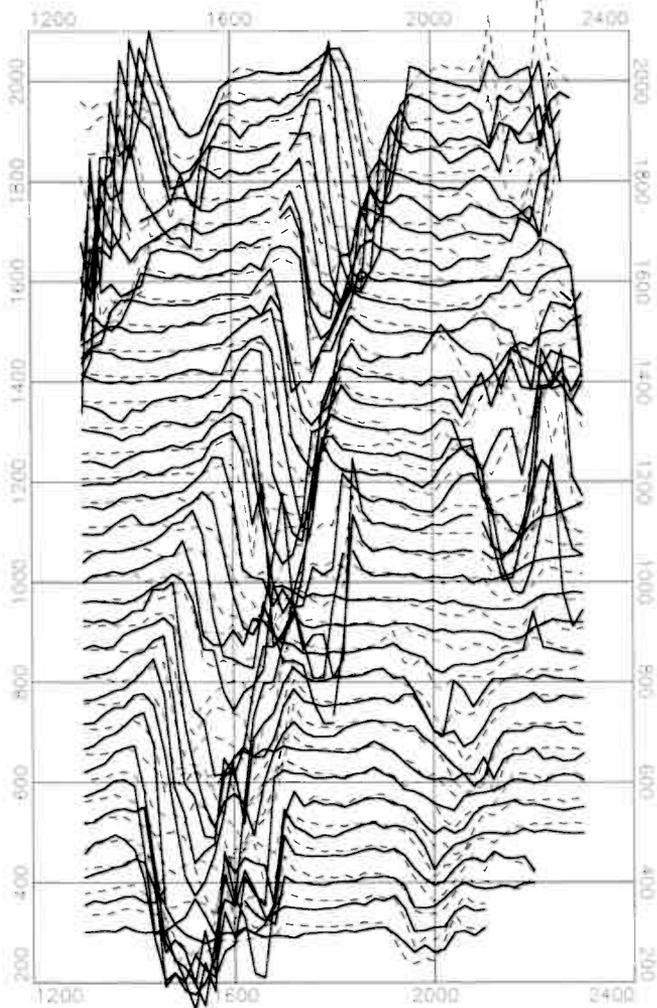
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 Nikkel og Olivin AS
 Re 1760 Hz
 December 1995 SMOY
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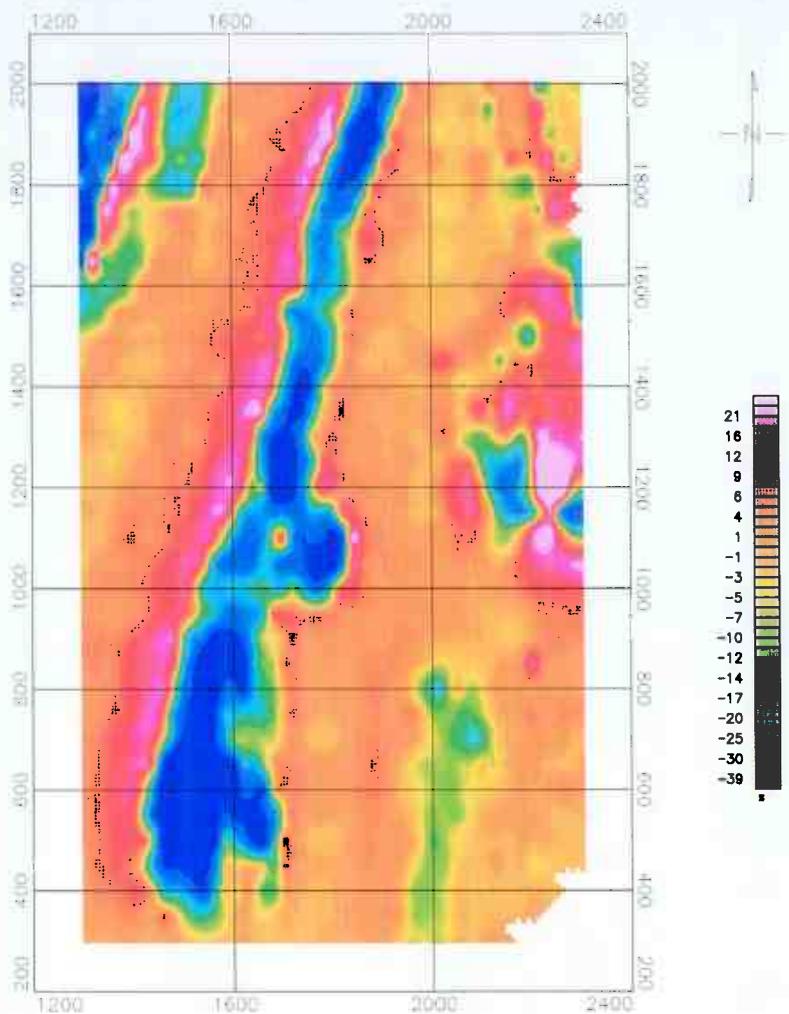
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 Nikkel og Olivin AS
 Im 1760 Hz
 December 1995 SMOY
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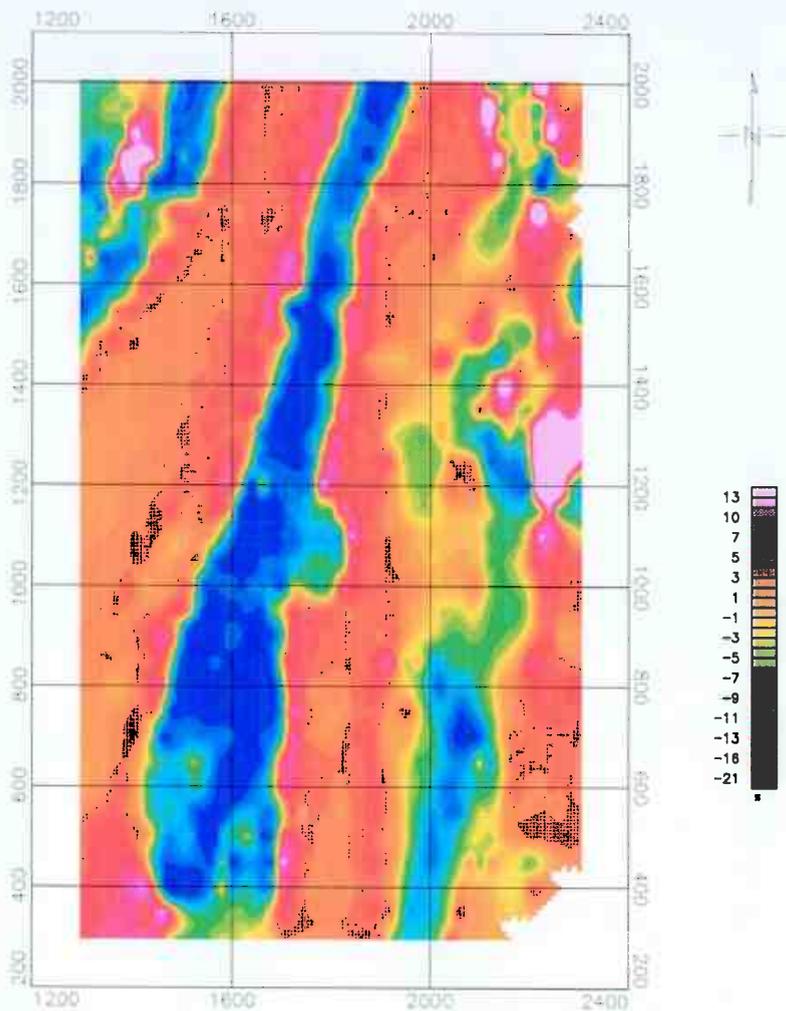
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BALLANGEN NORWAY
Nikkel og Glivin AS
7040 Hz, 0 - 20 %/cm, Re solid
December 1995 SMOY
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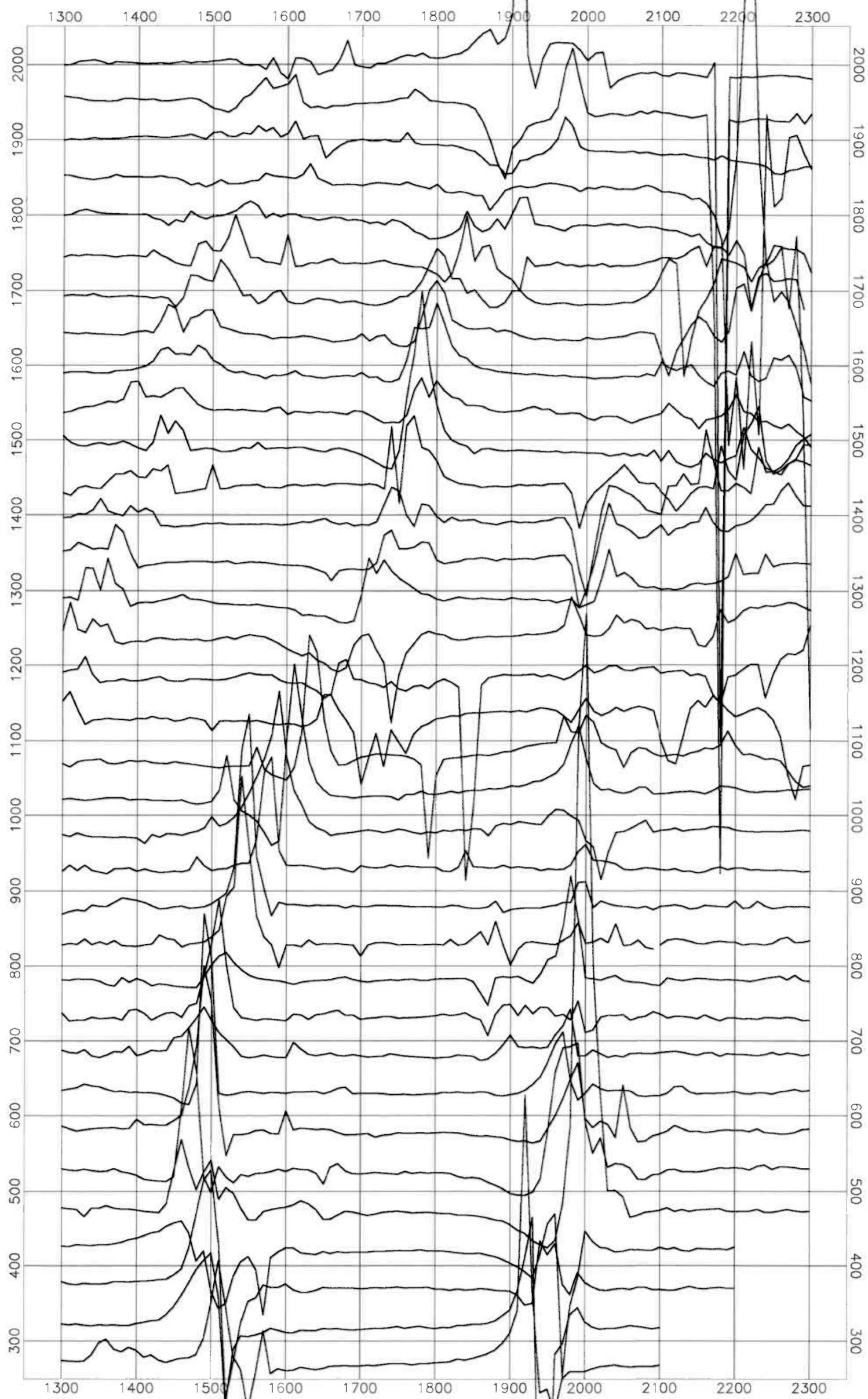
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 Nikkel og Olivin AS
 Re 7040 Hz
 December 1995 SMOY
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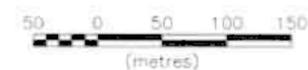
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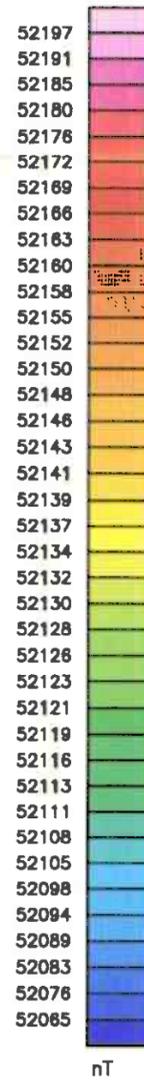
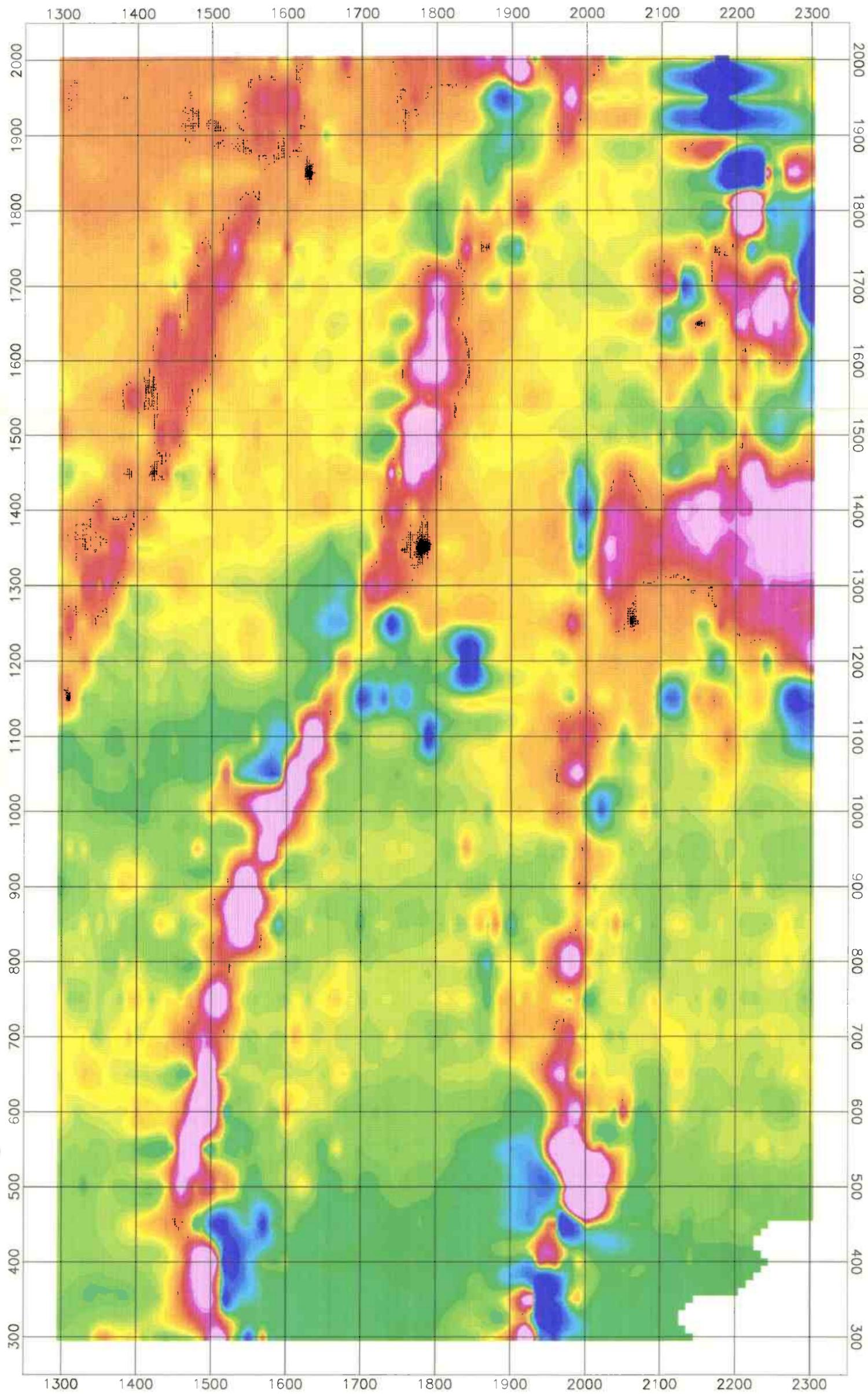




APPENDIX 13

MAGNETIC SURVEY
BALLANGEN NORWAY
Nikkel og Olivin AS
52150 \pm 50 nT/cm
December 1995 SMOY
1: 5000

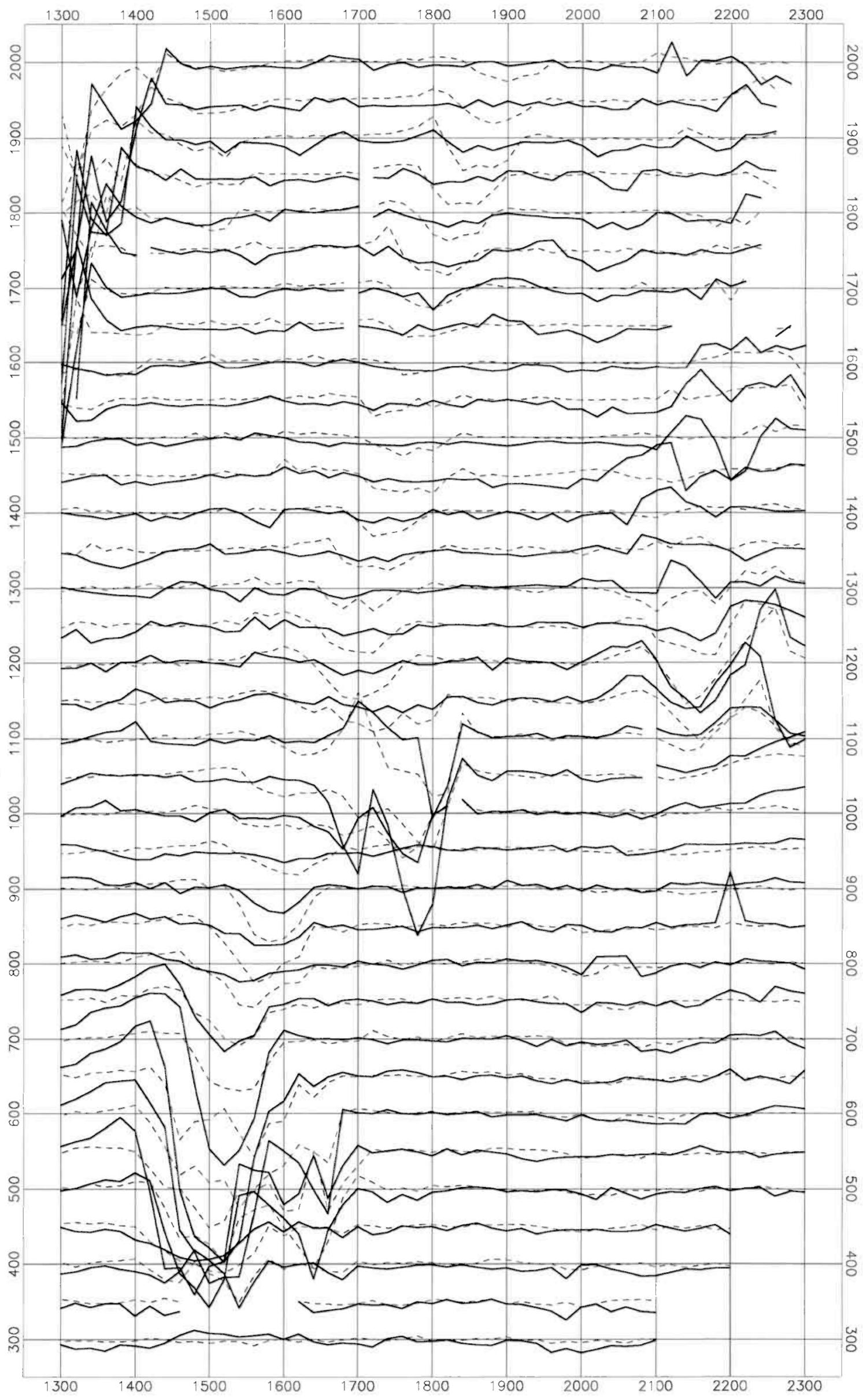




MAGNETIC SURVEY
 BALLANGEN NORWAY
 Nikkel og Olivin AS

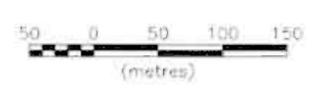
December 1995 SMOY
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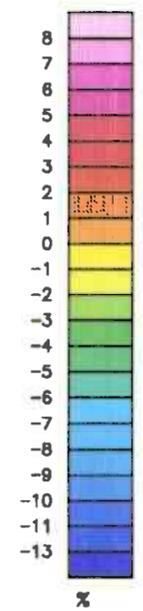
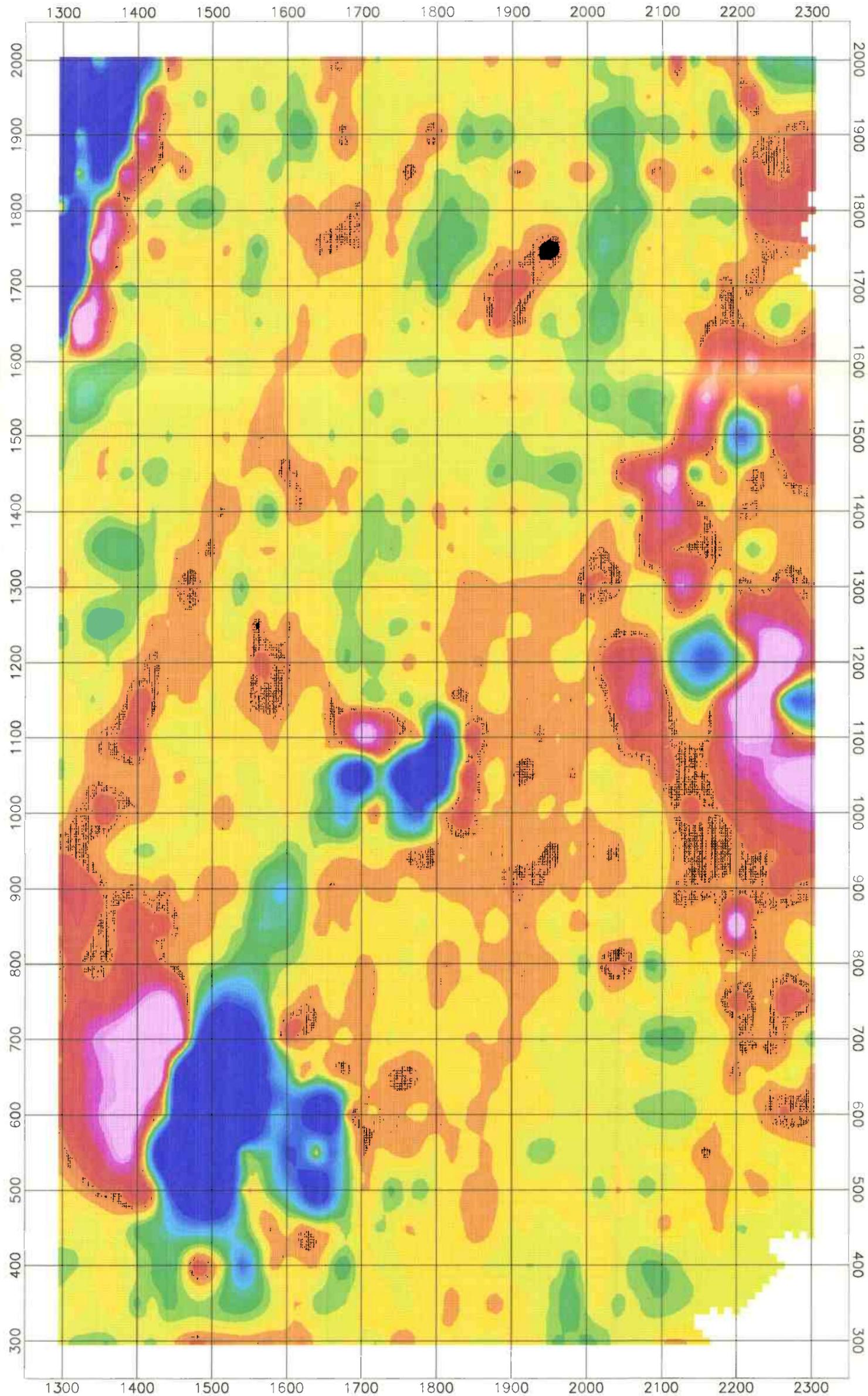




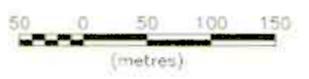
APPENDIX 15

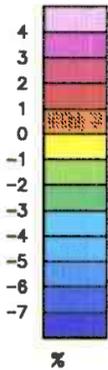
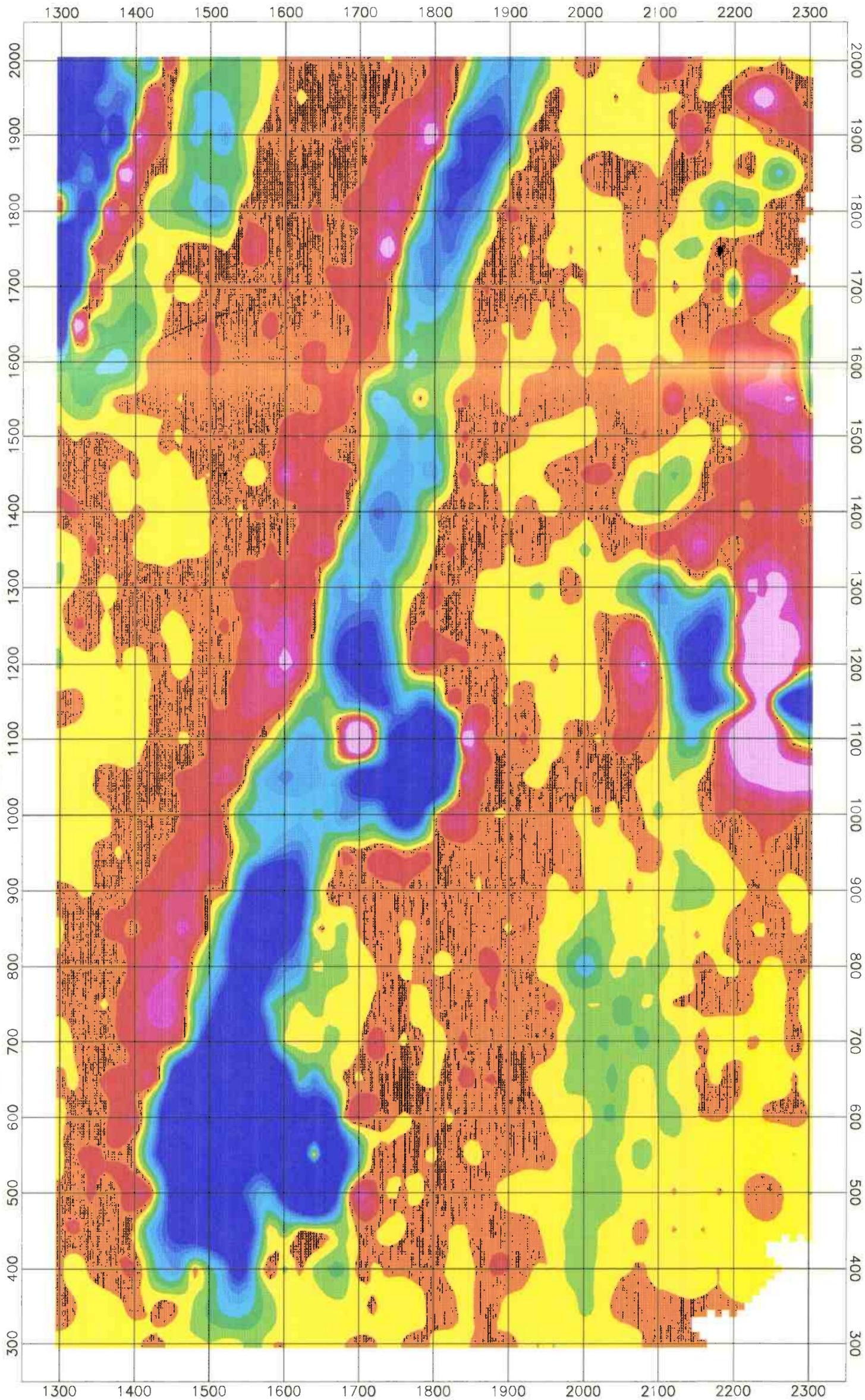
ELECTROMAGNETIC SURVEY
 BALLANGEN NORWAY
 Nikkel og Olivin AS
 220 Hz, 0 +/- 10 %/cm
 Real solid
 December 1995 SMOY
 1: 5000



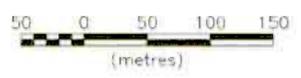


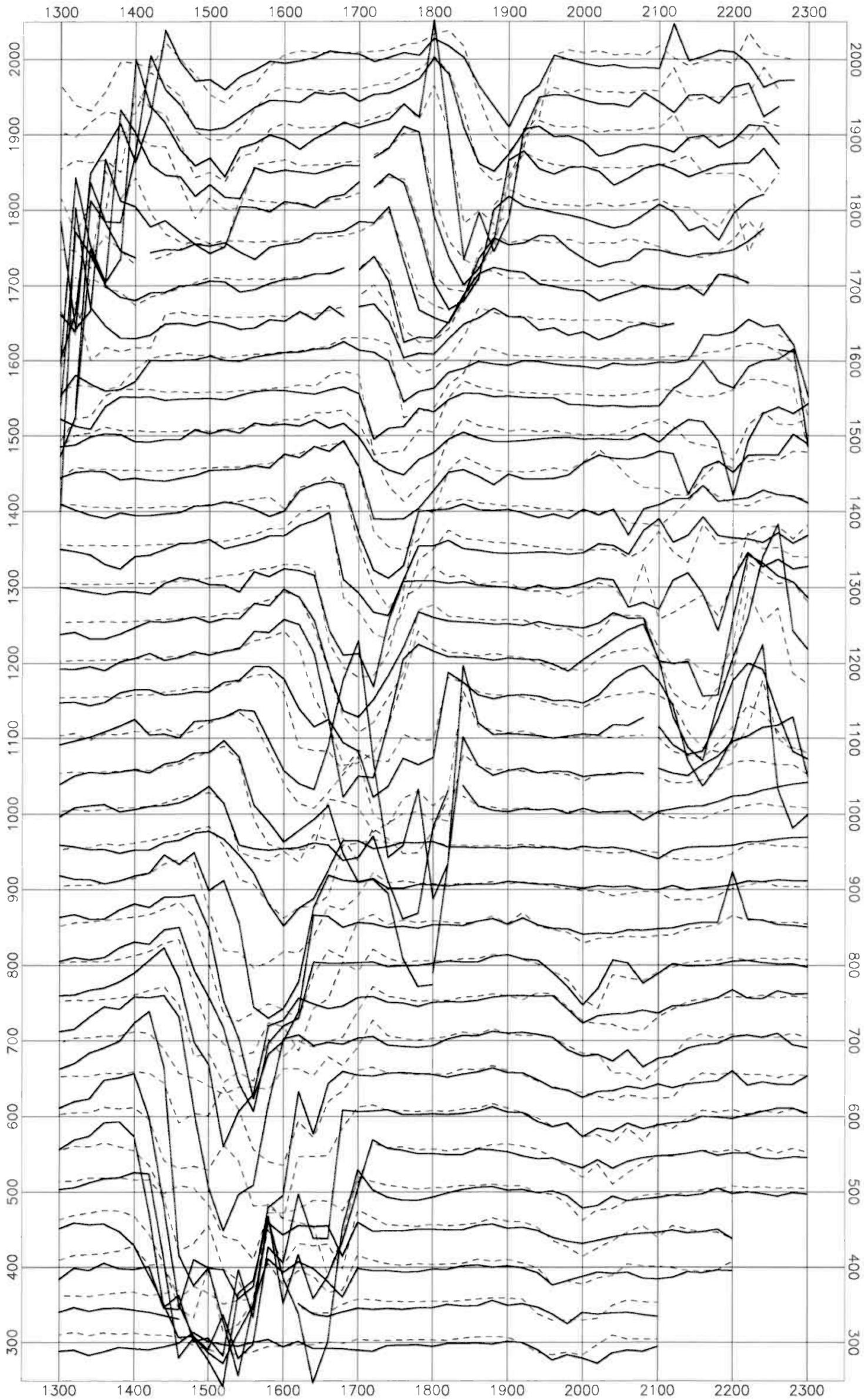
ELECTROMAGNETIC SURVEY
BALLANGEN NORWAY
Nikkel og Olivin AS
Re 220 Hz
December 1995. SMOY
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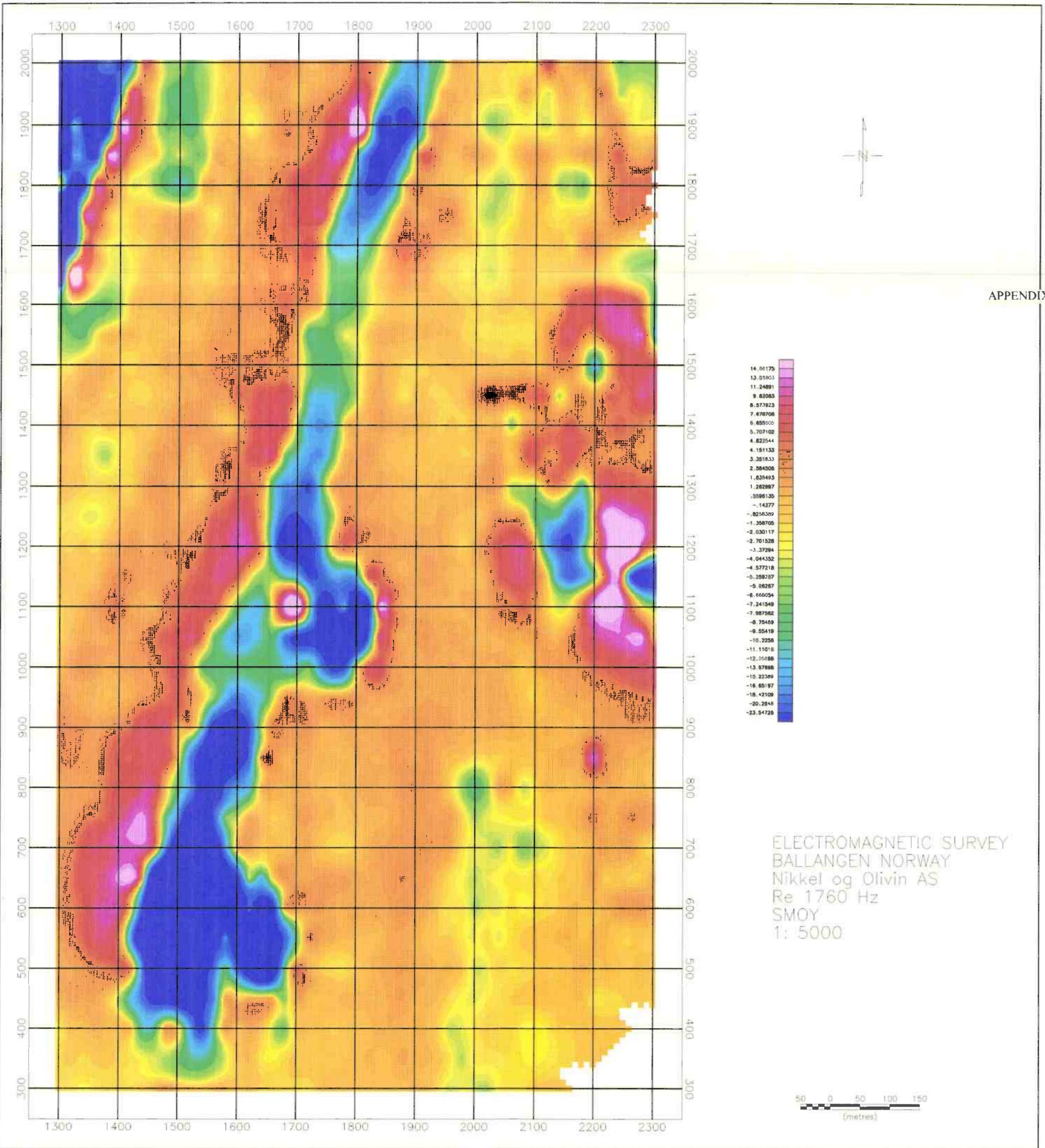
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Nikkel og Olivin AS
Im 220 Hz
December 1995 SMOY
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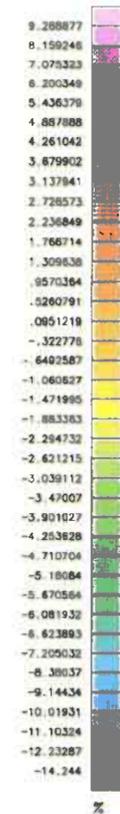
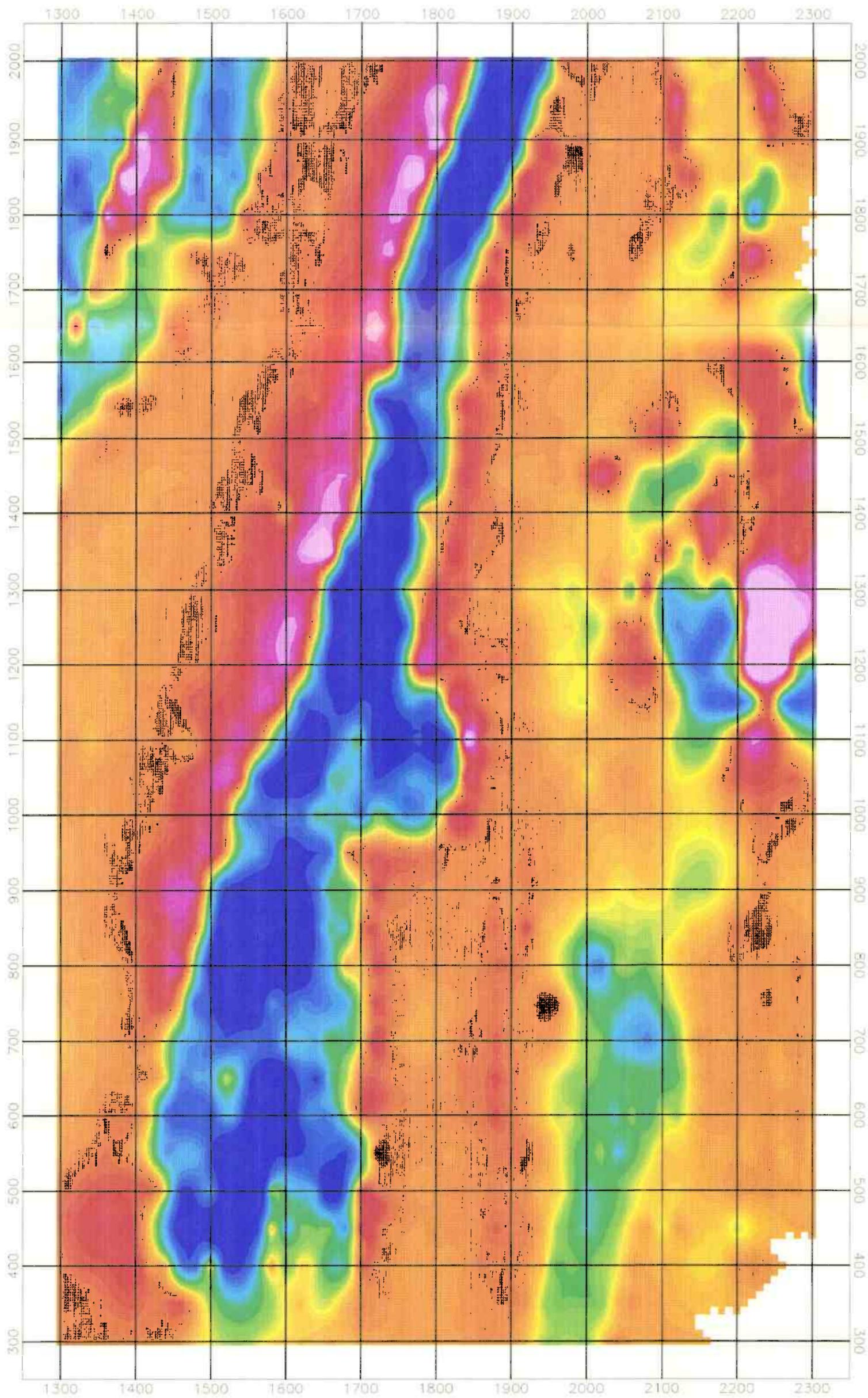


ELECTROMAGNETIC SURVEY
BALLANGEN NORWAY
Nikkel og Olivin AS
1760 Hz, 0 +/- 10 %/cm
Real solid
December 1995 SMOY
1: 5000



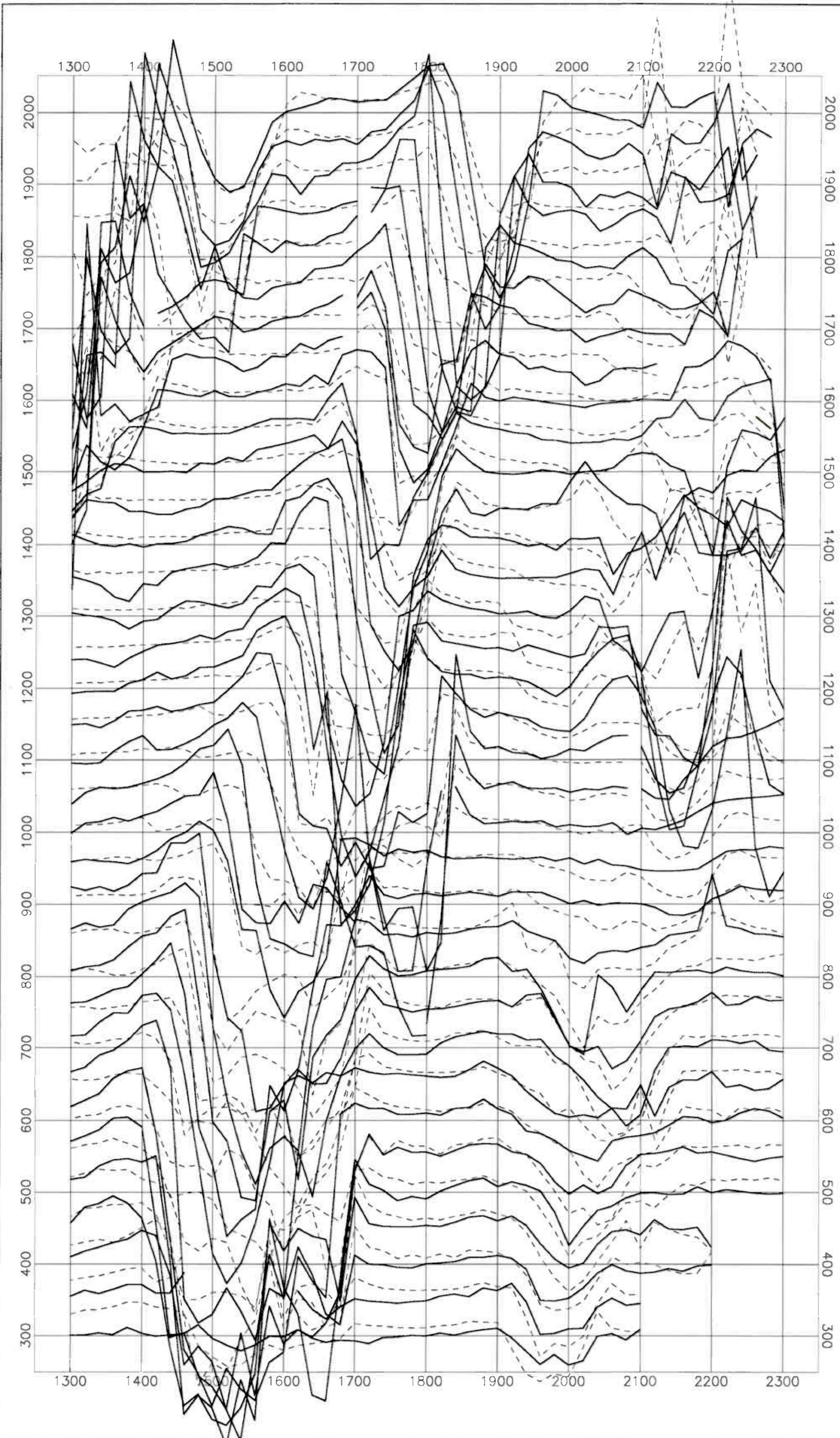


ELECTROMAGNETIC SURVEY
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 Nikkel og Olivin AS
 Re 1760 Hz
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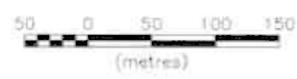


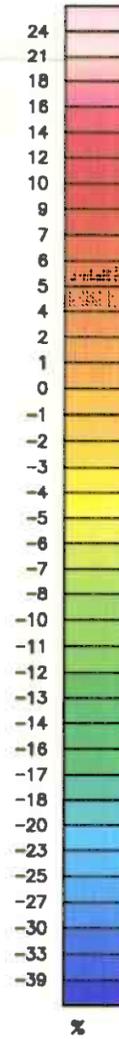
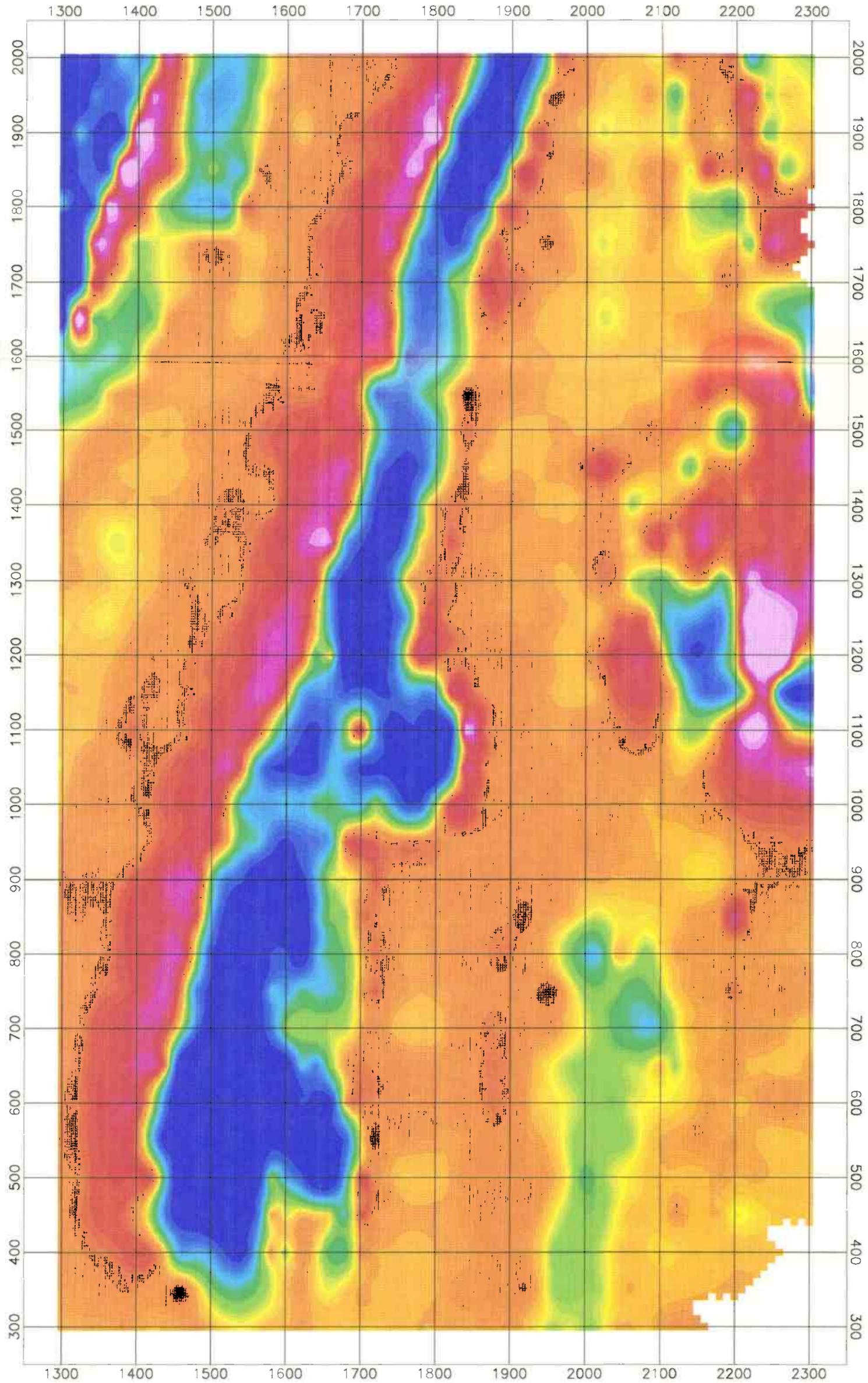
ELECTROMAGNETIC SURVEY
 BALLANGEN NORWAY
 Nikkel og Olivin AS
 Im 1760 Hz
 SMOY
 1: 5000



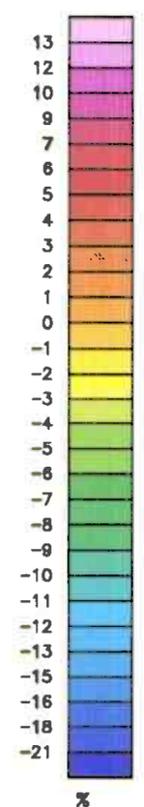
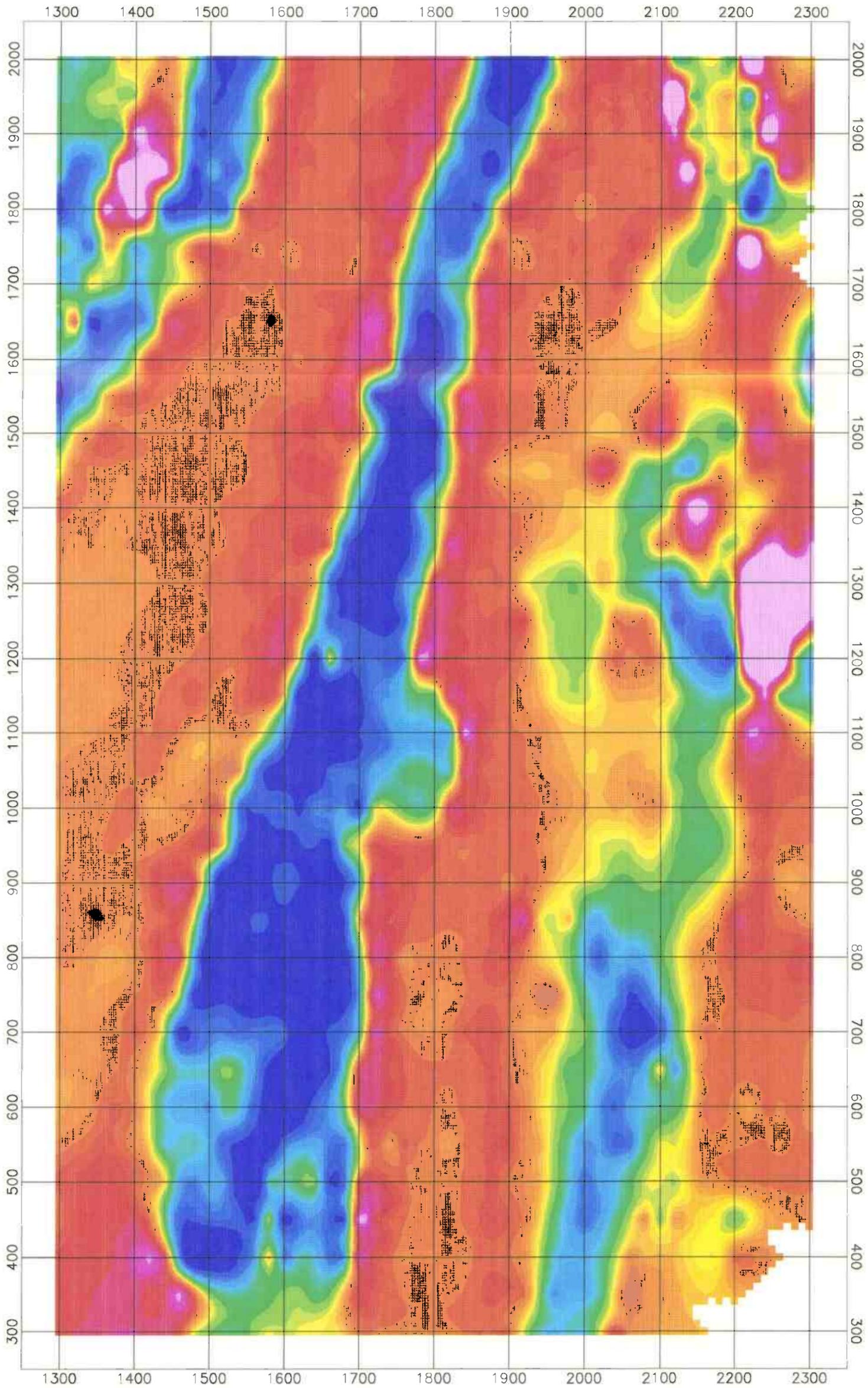


ELECTROMAGNETIC SURVEY
BALLANGEN NORWAY
Nikkel og Olivin AS
7040 Hz, 0 +/- 10 %/cm
Real solid
December 1995 SMOY
1: 5000



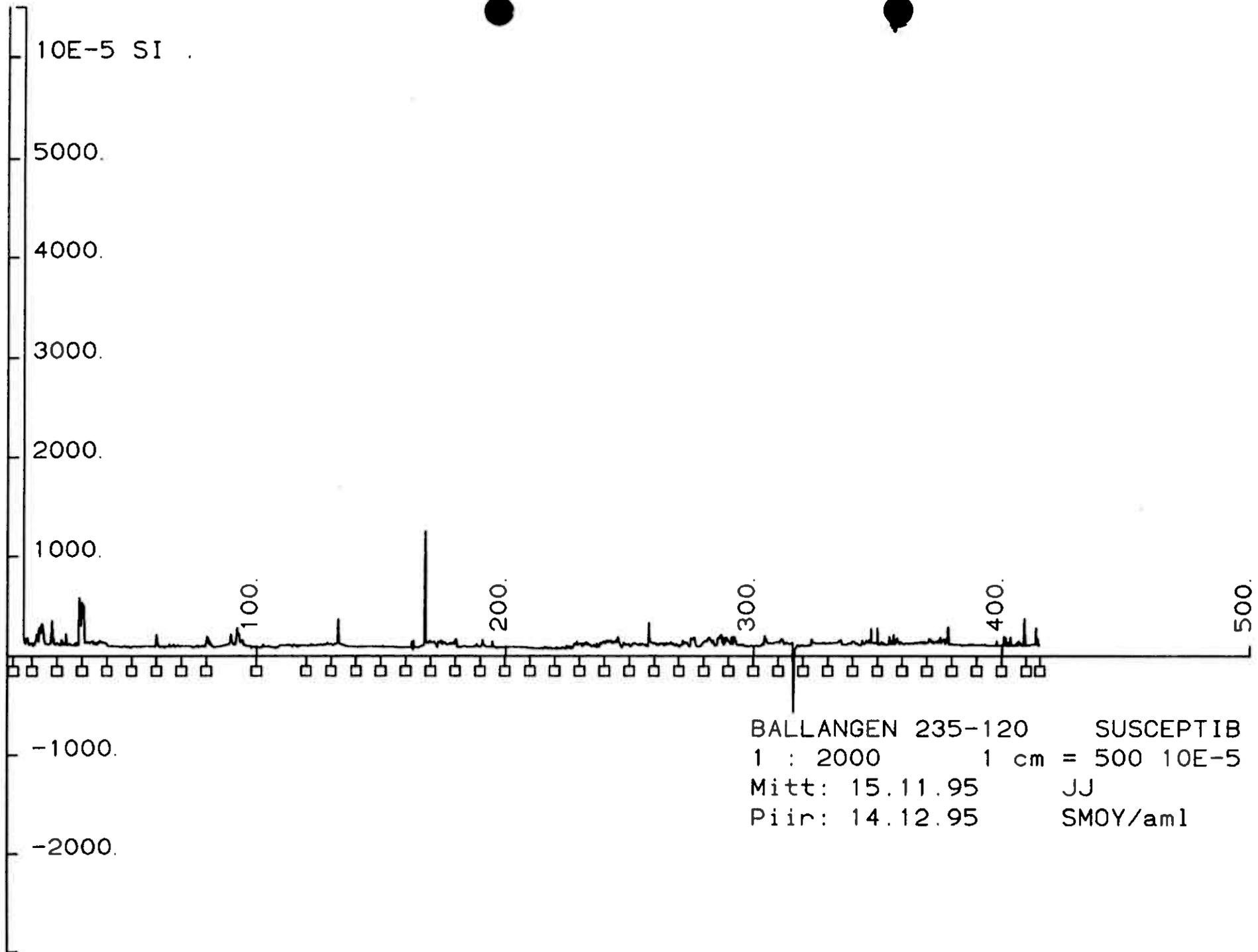


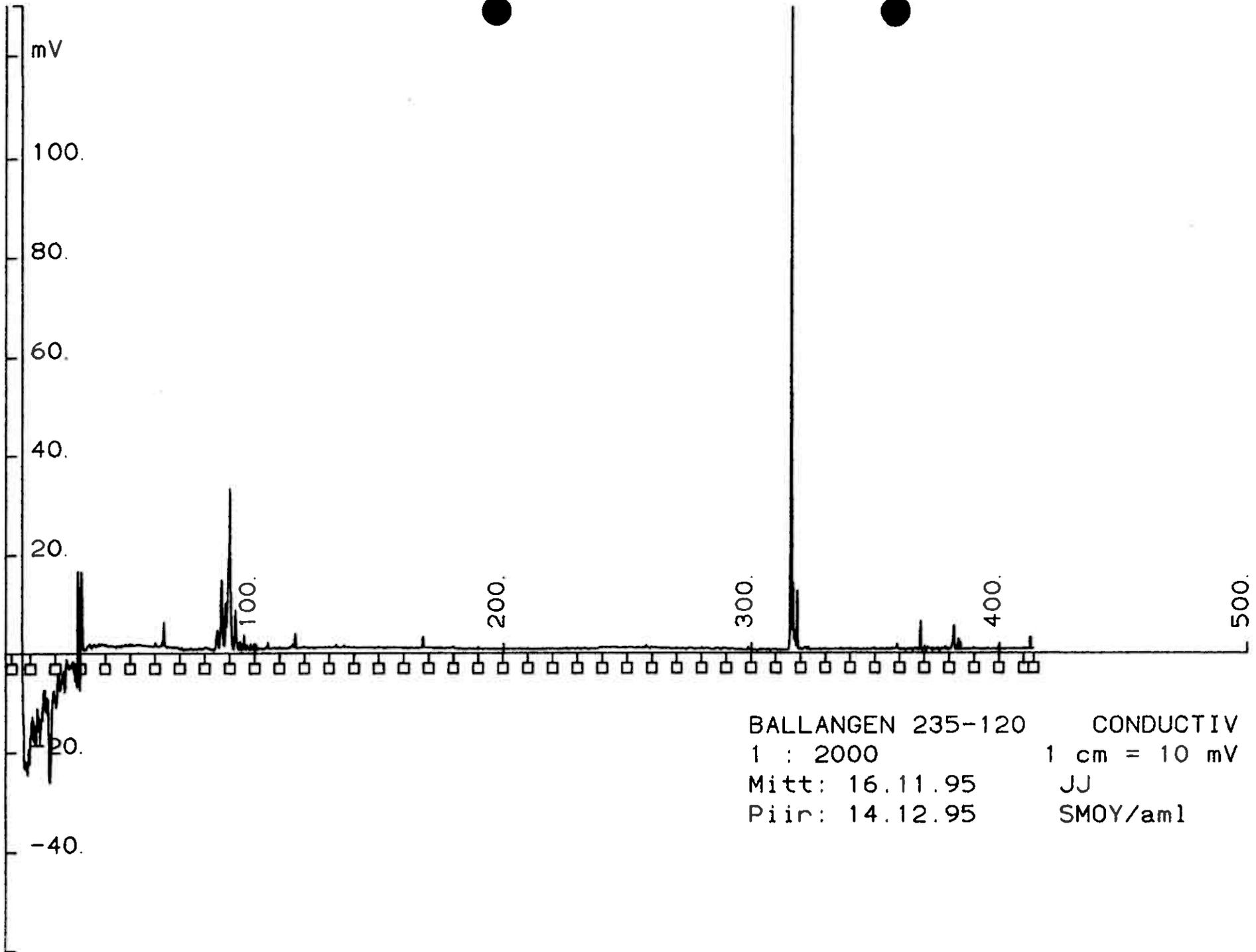
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 Nikkel og Olivin AS
 Re 7040 Hz
 December 1995 SMOY
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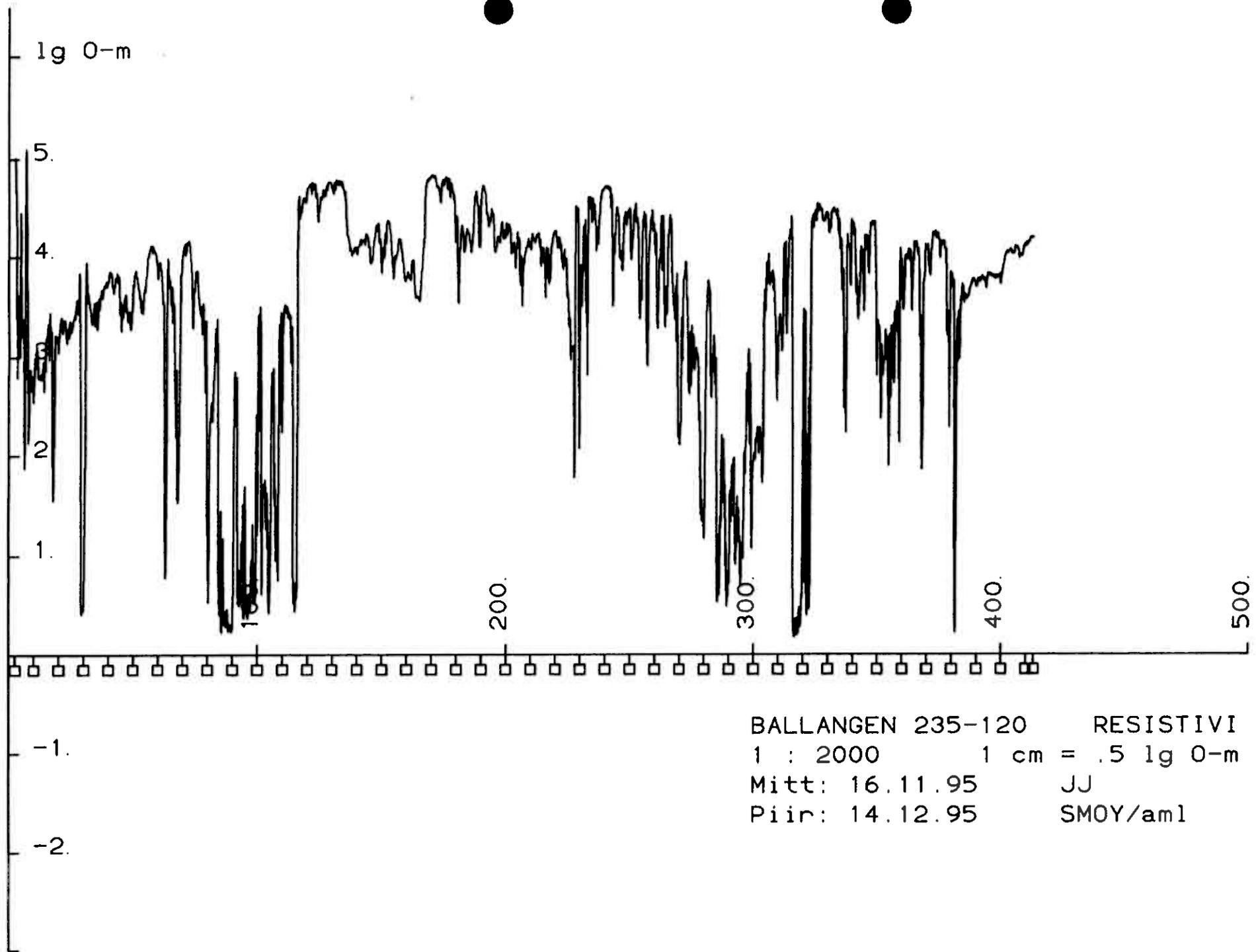


ELECTROMAGNETIC SURVEY
BALLANGEN NORWAY
Nikkel og Olivin AS
Im 7040 Hz
December 1995 SMOY
1: 5000



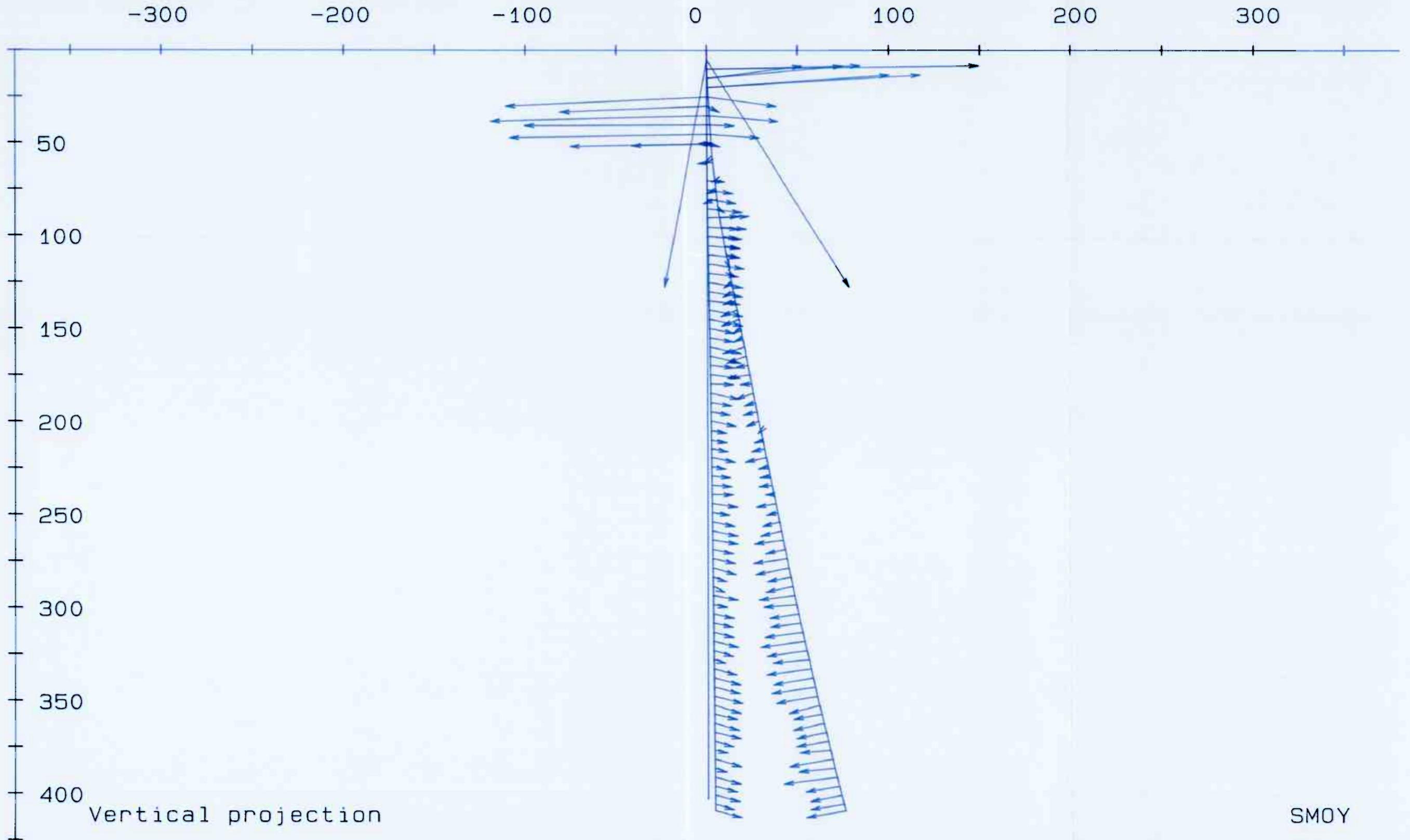




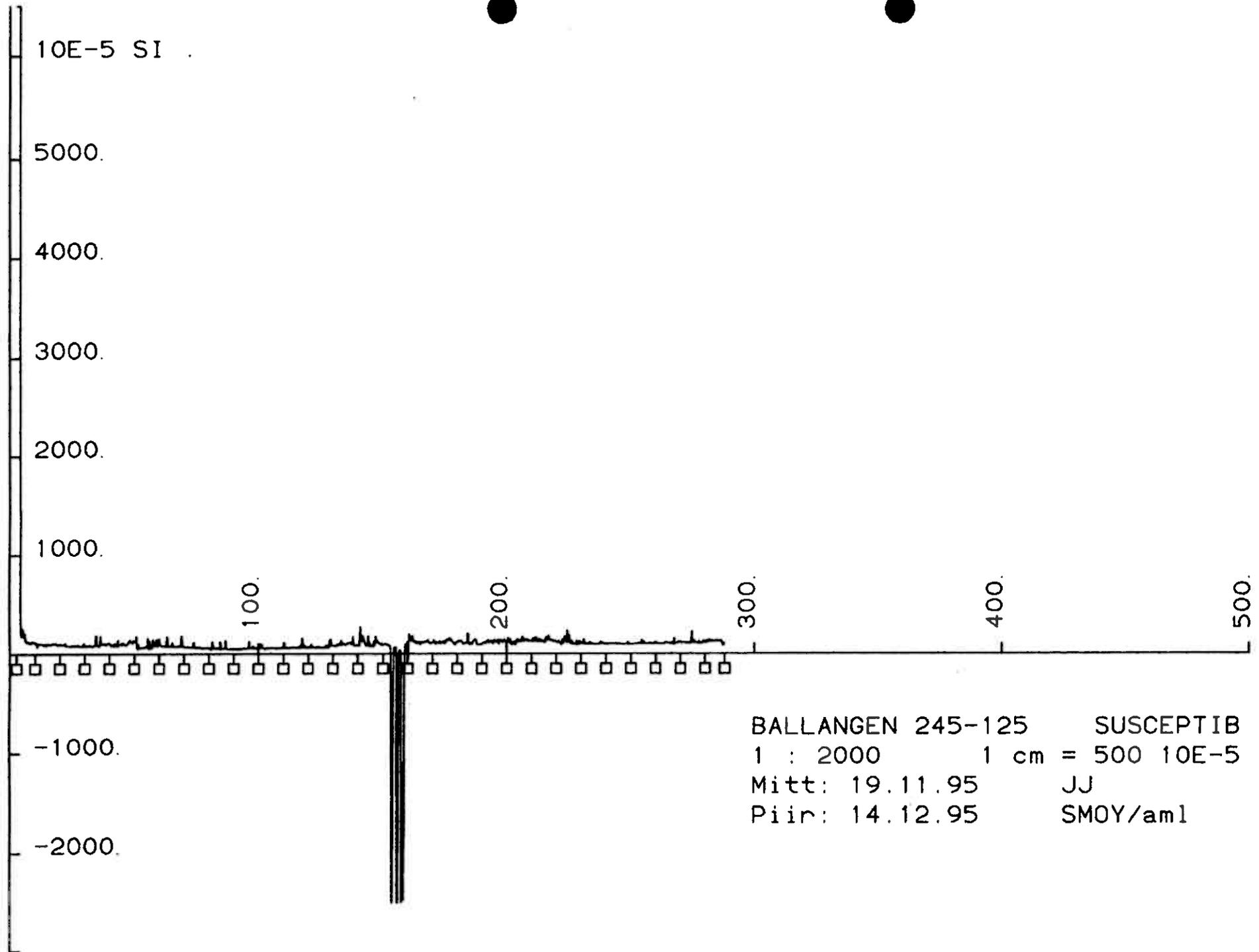


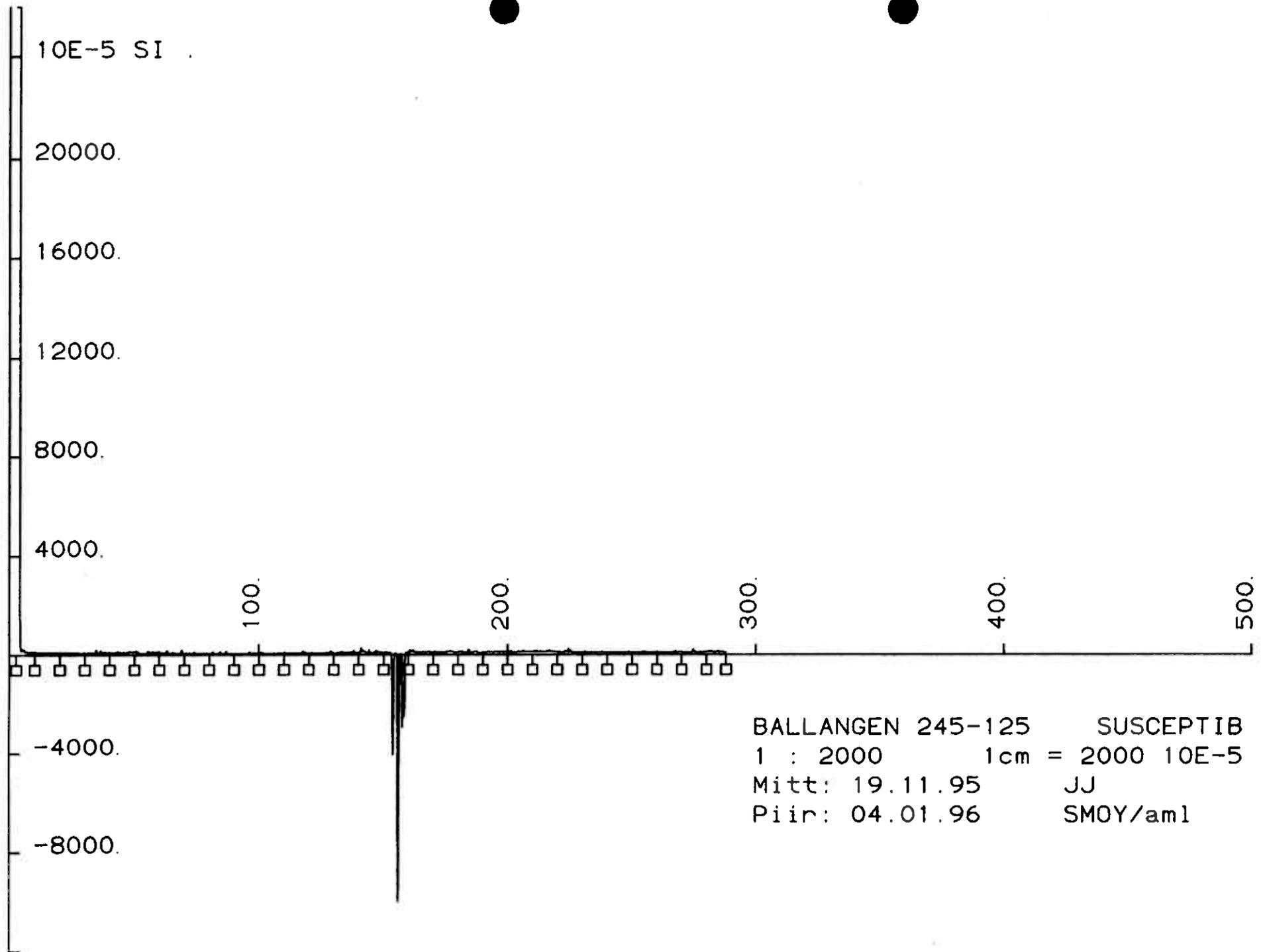
BALLANGEN HOLE 235-120
Magnetic field 52650 nT

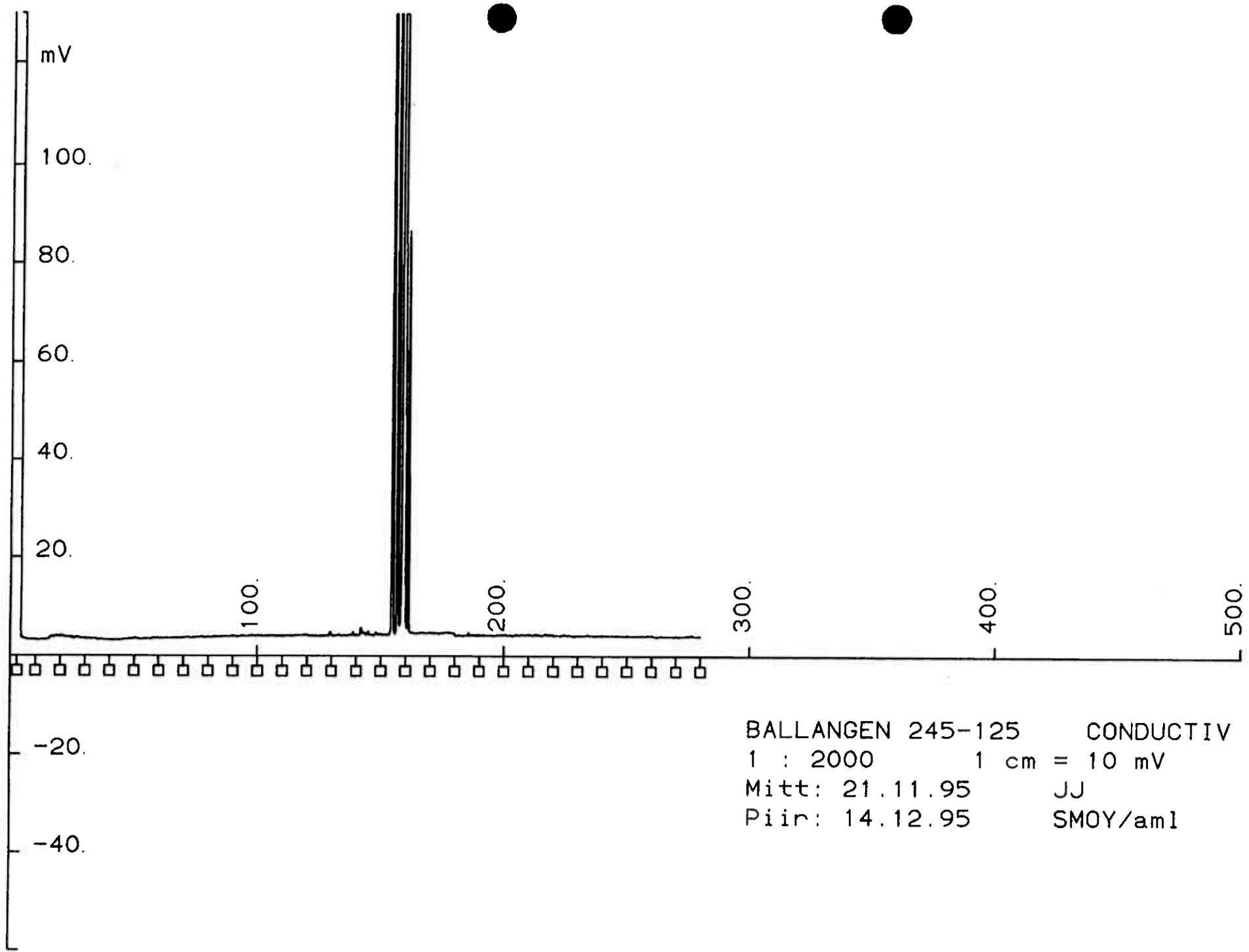
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INK=76.4° DEG= 0.0° 2000 nT/cm

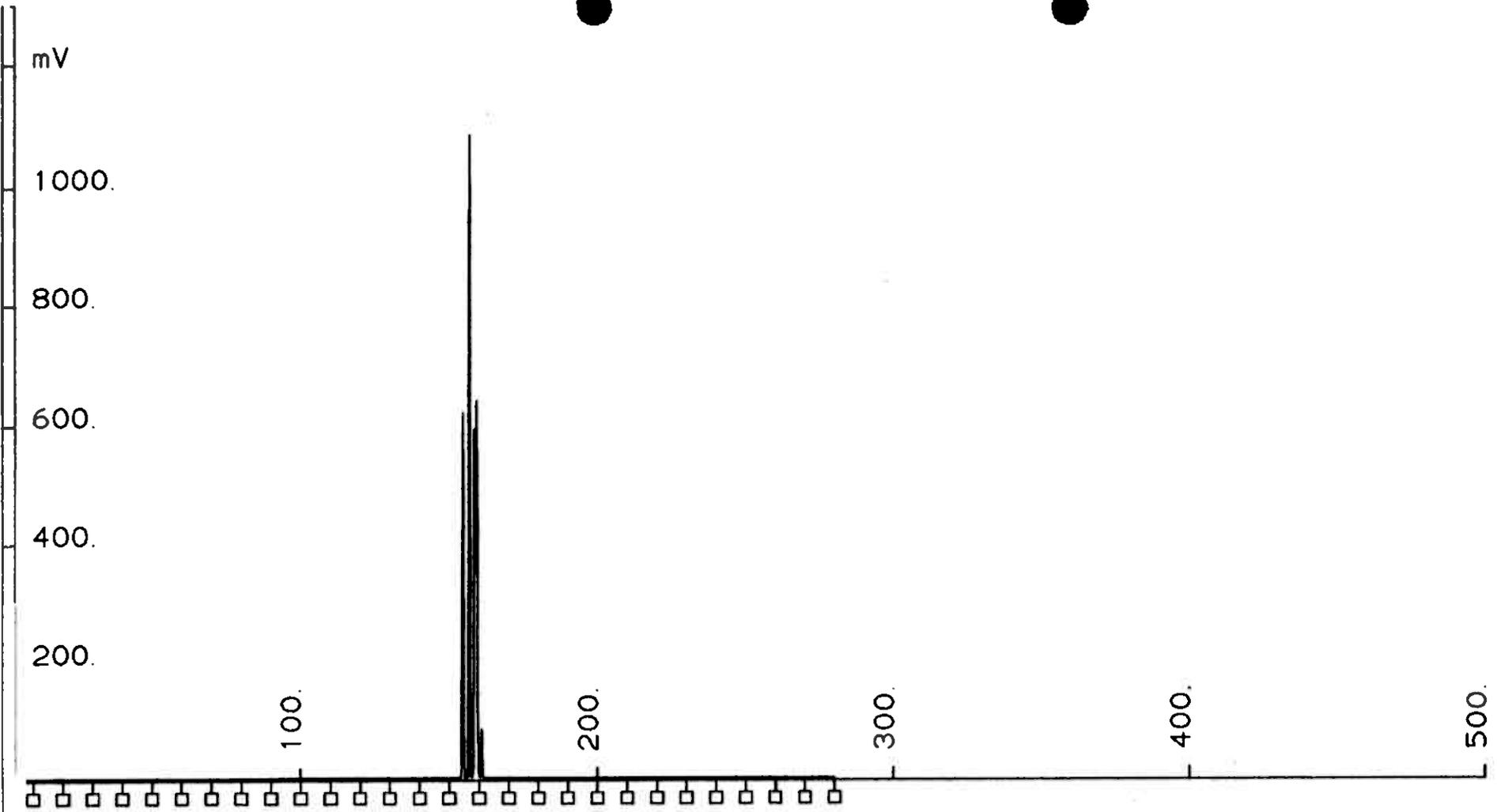


SMOY



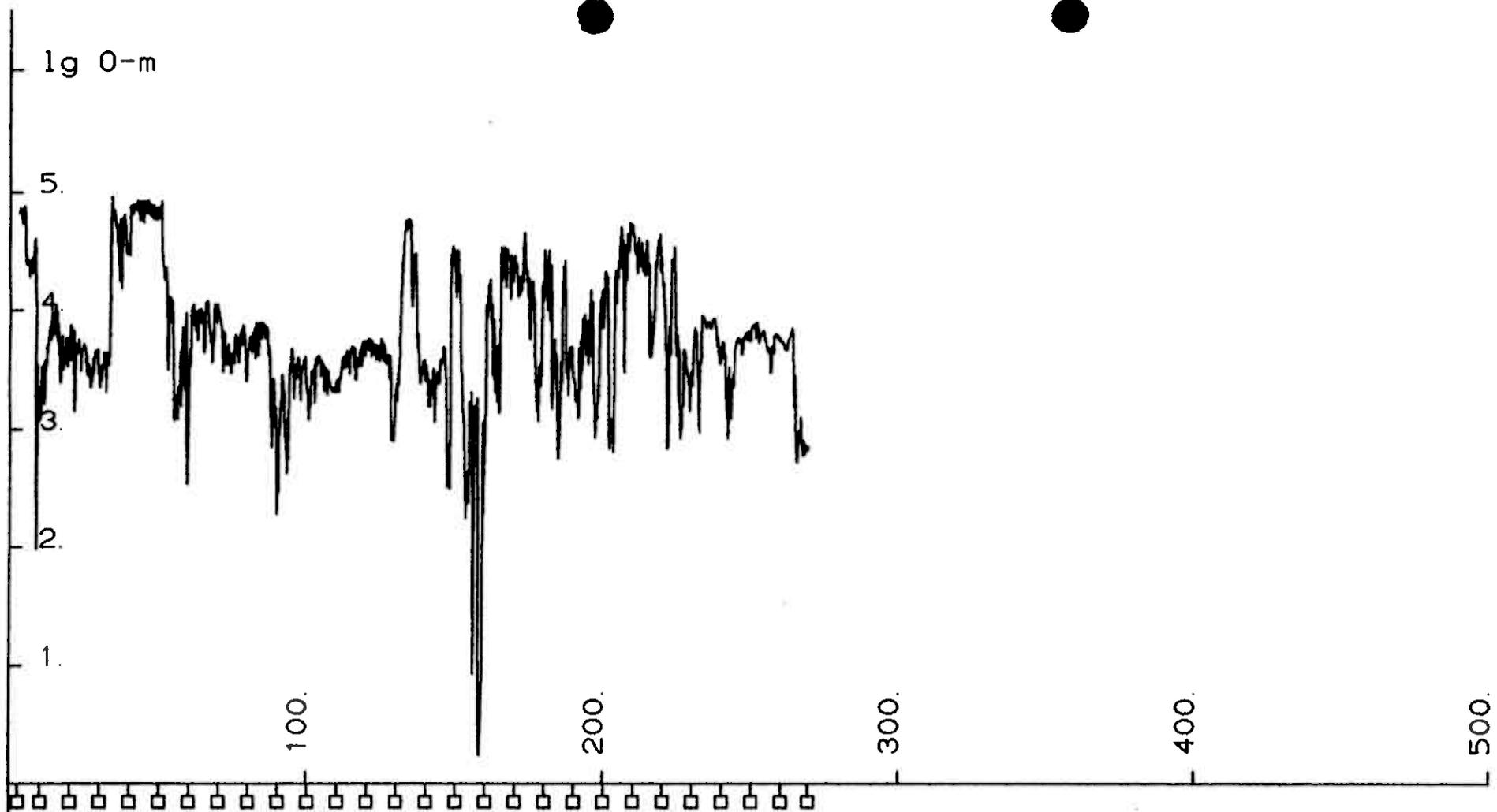






-200.
-400.

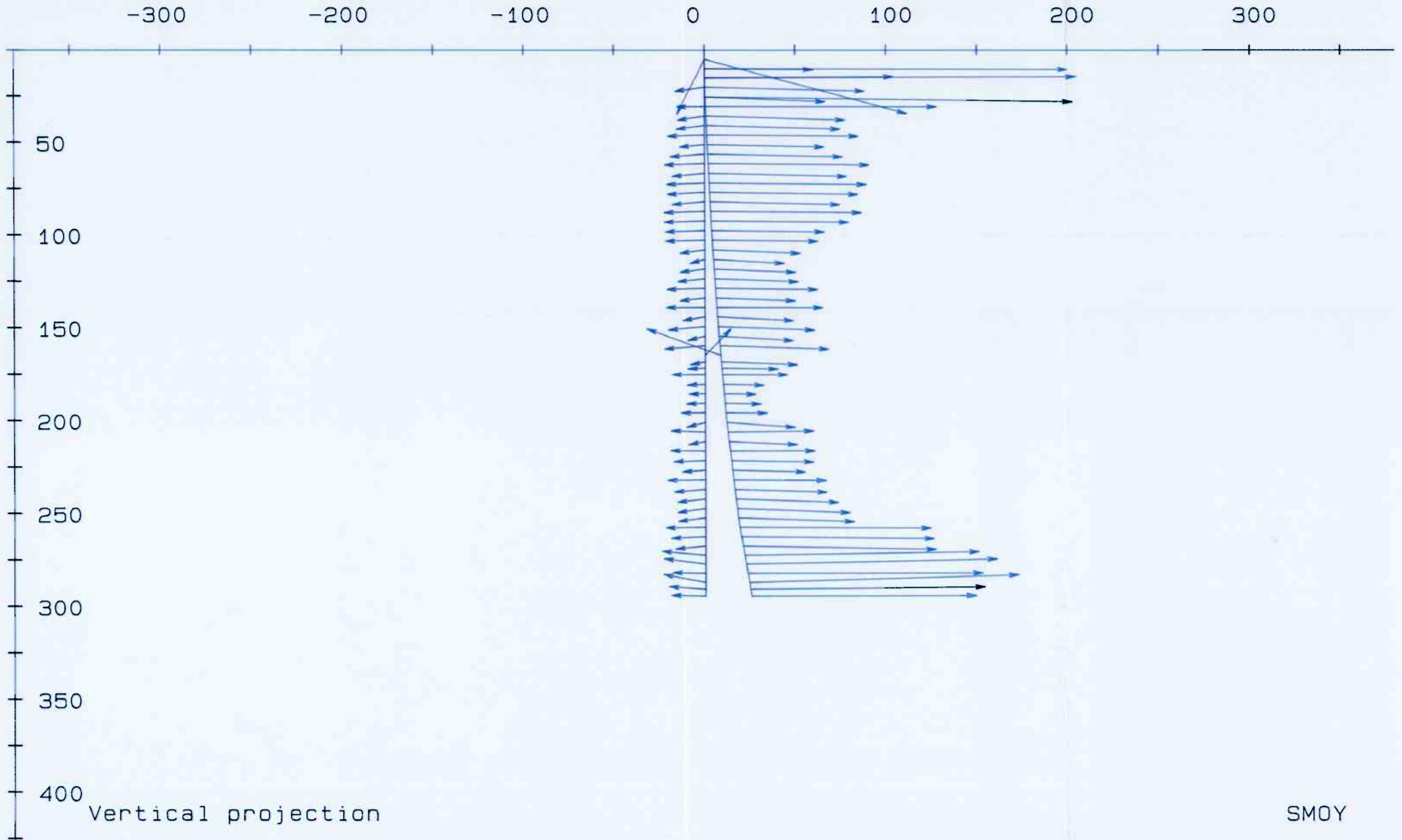
BALLANGEN 245-125 CONDUCTIV
1:2000 1 cm=100 mV
Mitt: 21.11.95 JJ
Piir: 04.01.96 SMOY/aml

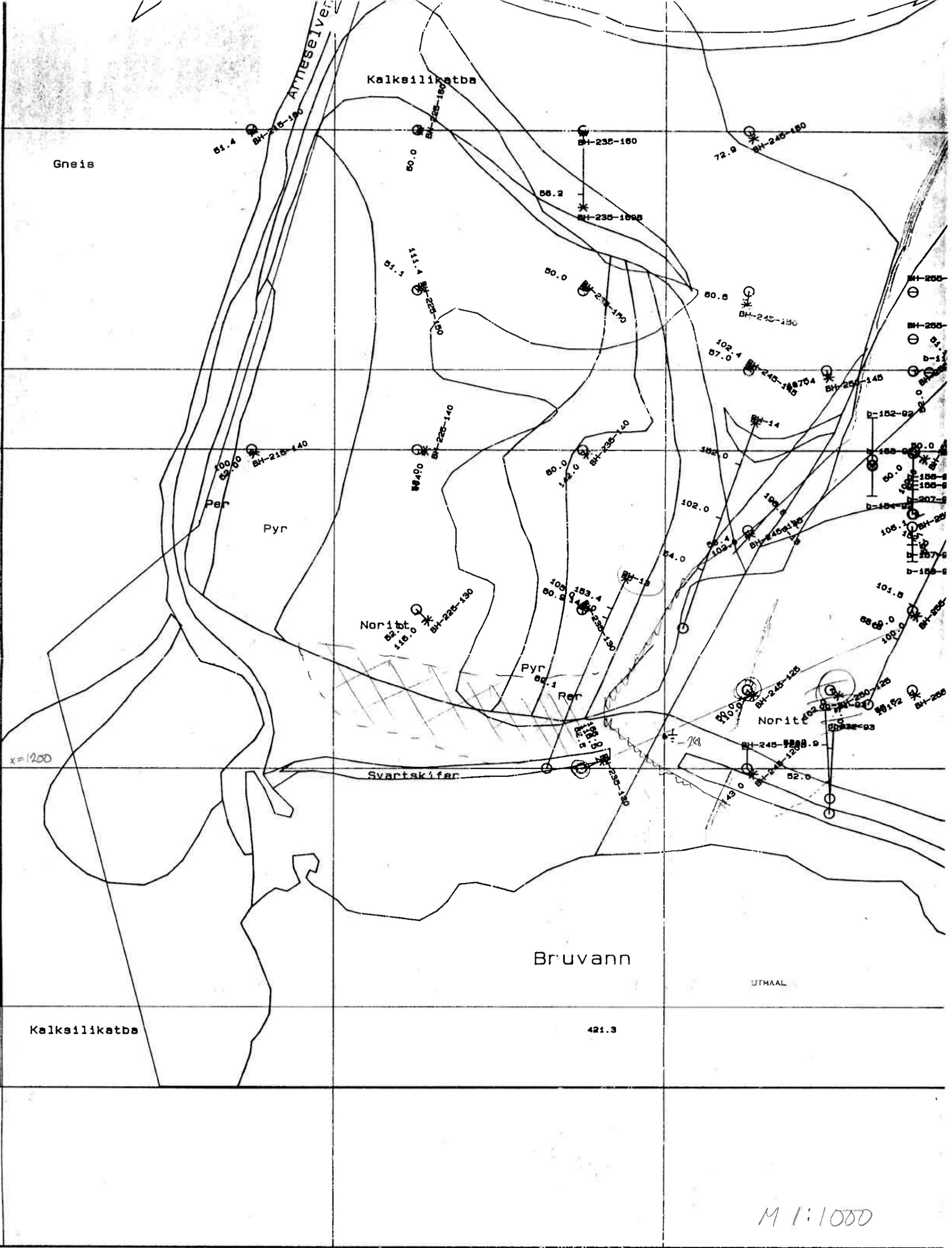


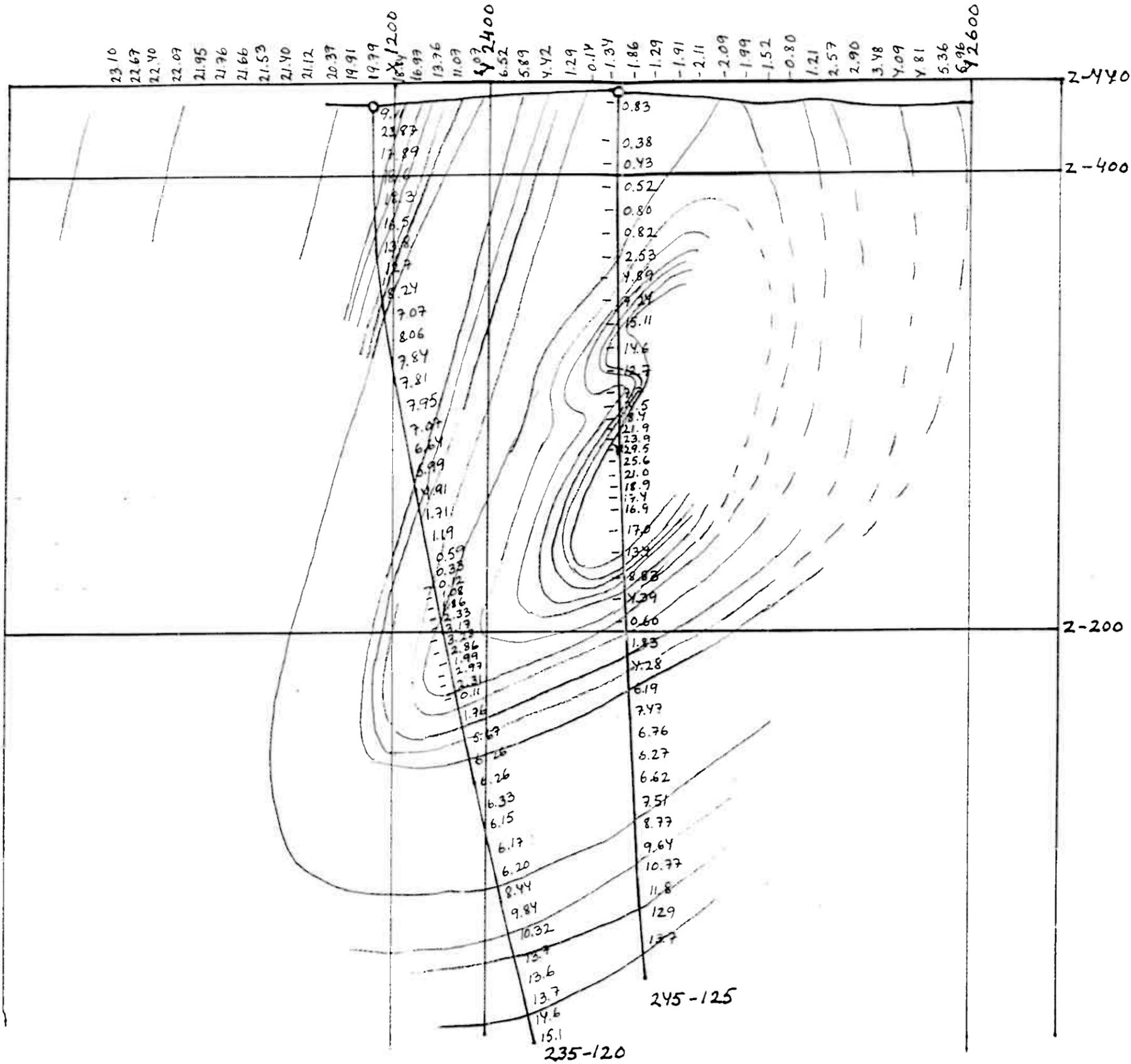
BALLANGEN 245-125 RESISTIVI
 1 : 2000 1 cm = .5 lg 0-m
 Mitt: 19.11.95 JJ
 Piir: 14.12.95 SMOY/aml

BALLANGEN HOLE 245-125
Magnetic field 52650 nT

DIP=90.0° DEG=131.8° 1:2000
INK=76.4° DEG=0.0° 2000 nT/cm

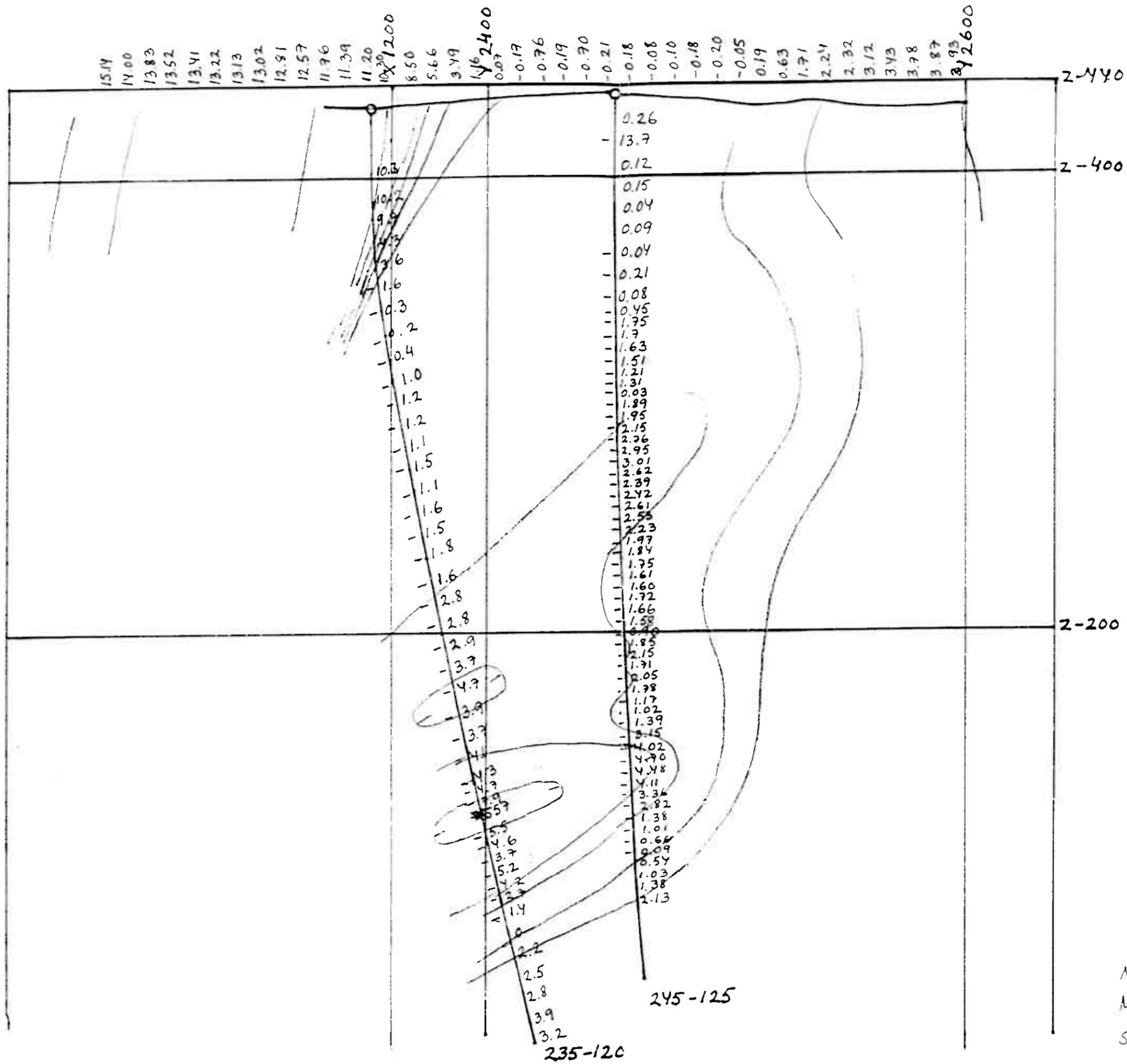




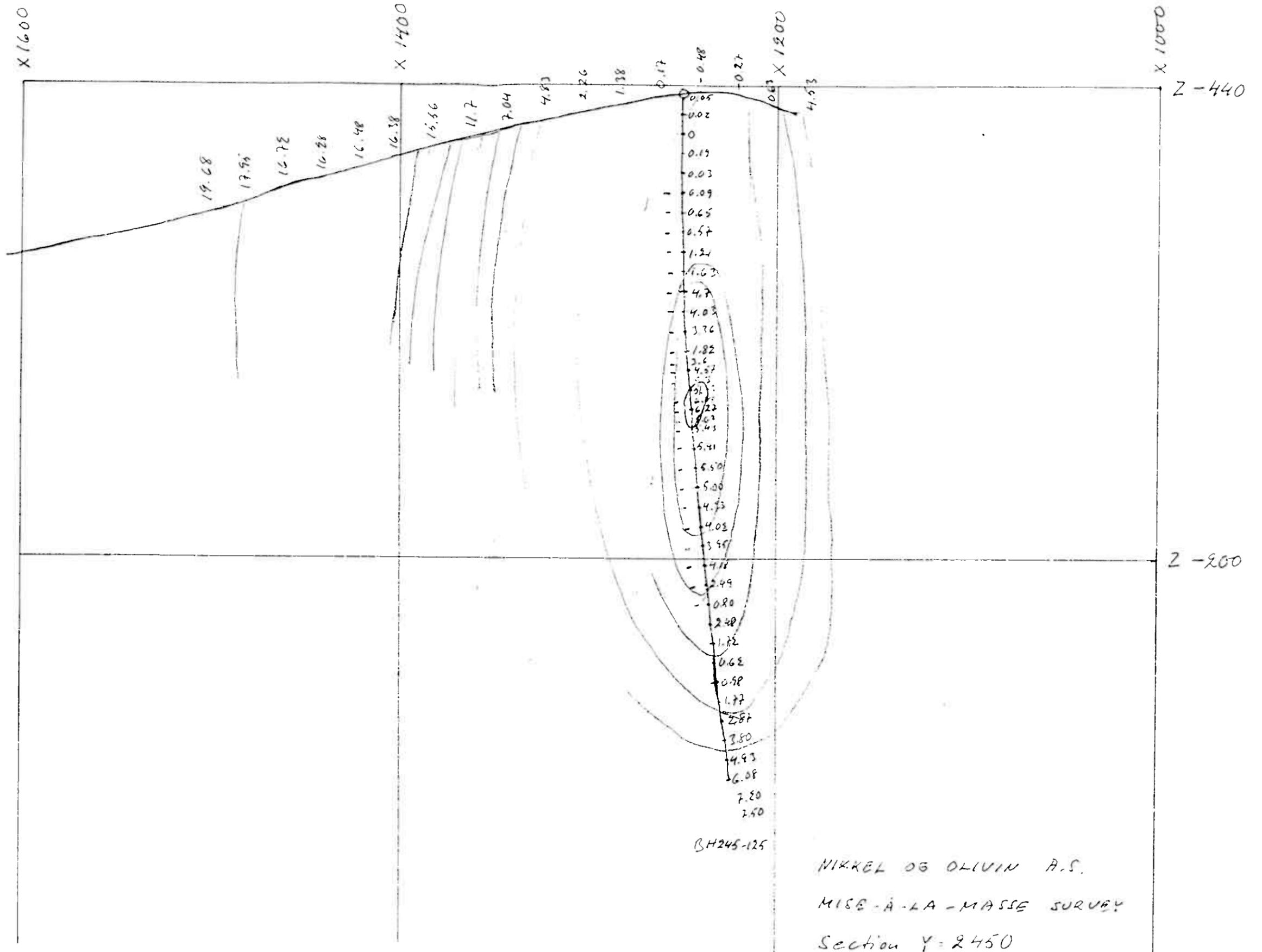


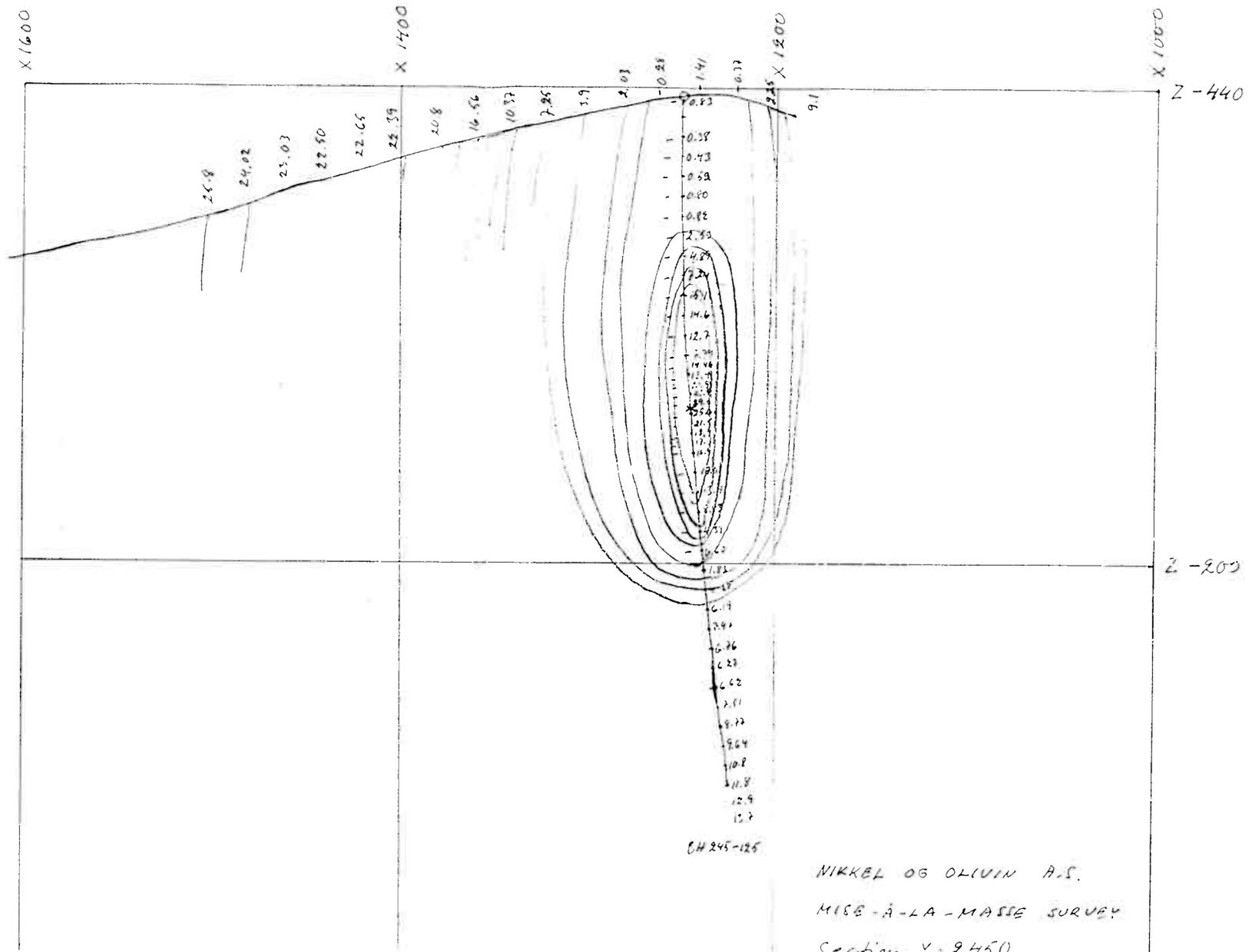
NIKKEL OG OLIVIN A.S.
 MISE-A'-LA-MASSE SURVEY
 Section BH 235-120 68.80°
 1:2000

— ±

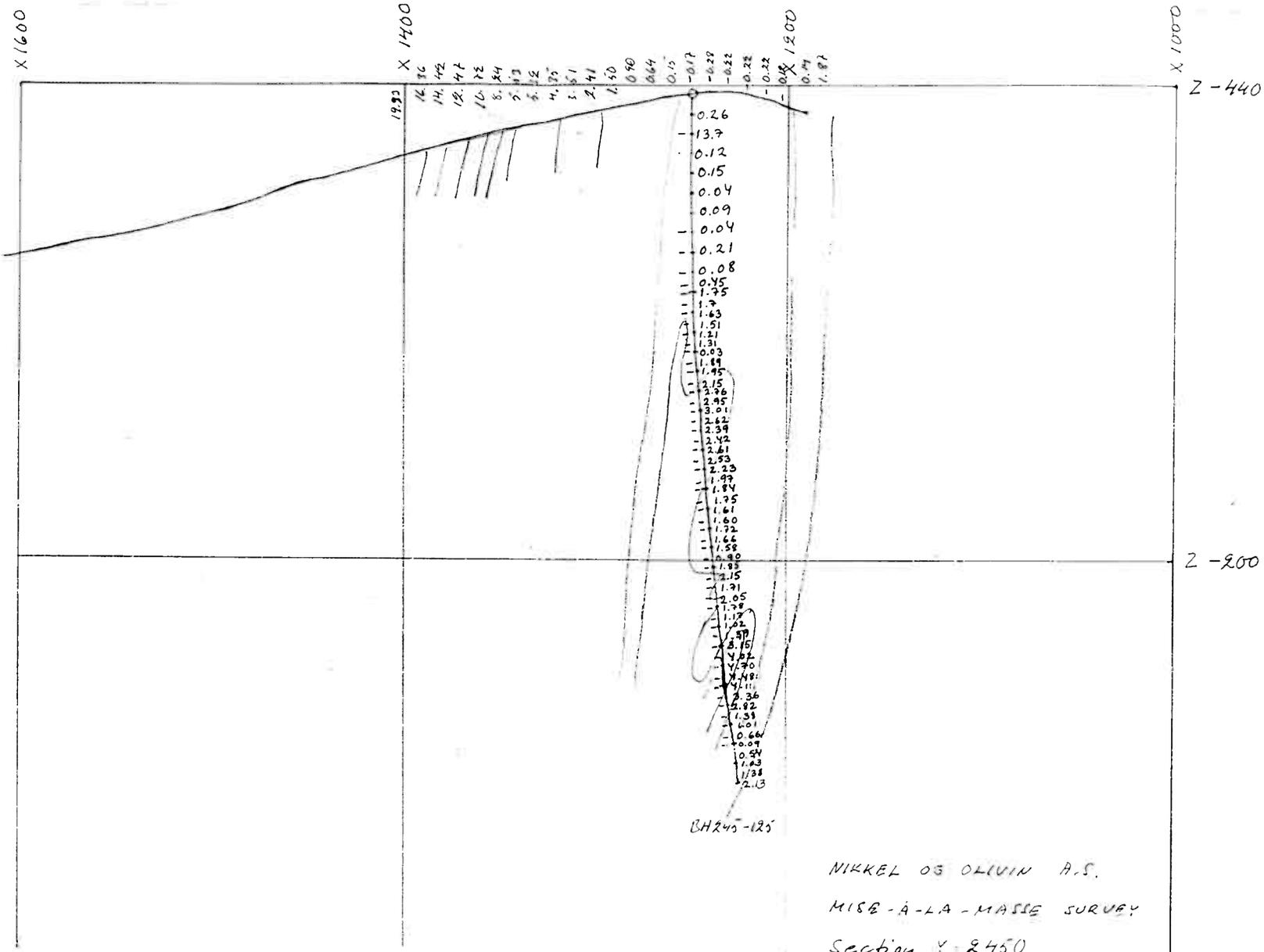


NIKKEL OG OLIVIN A.S.
 MISE - A' - LA - MASSE SURVEY
 Section BH 235-120 68.80"
 1:2000
 — ± BH 235-120 / 315.5 m





NIKKEL OG OLIVIN A.S.
 MISE-A-LA-MAISE SURVEY
 Section Y-2450
 1:2000
 - 1/4 BH 245-125 / 157.5m



NIKKEL OG OLVIN A.S.
 MISE-À-LA-MASSÉ SURVEY
 Section Y-2450
 1:2000
 - ± BH 235-120 / 315.5m