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Malm/metall	Cu Zn S	

Sammendrag

1 duplikat av rapporten, som mangler kartbilag.

FOLLDAL PROJECT

(N-81-1)

Evaluation of the Ore Potential at the Grimsdalen and Grimsdalsgruva Orebodies

FOLLDAL VERK A/S - AMOCO NORWAY OIL COMPANY J.V.

March 1984

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Abstract

The report gives an evaluation of possible economic ore reserves of the massive sulfide occurences Grimsdalen and Grimsdalsgruva. All available data about diamond drilling, EM-surveys, assays etc. were compiled and presented in maps. Contoured grade-thickness maps were designed serving as a basis for the subdivision of the orebodies into blocks. The maps show that the limitation of the Grimsdalen orebody towards the west and that of the Grimsdalsgruva orebody towards the east are not proved by drilling. The total ore reserves were calculated as well as those of possible economic zones with sufficient thickness within the orebodies. Further exploration targets are outlined as further ore potential is present.

1. Introduction

This report will give an evaluation of possible economic ore reserves of two orebodies that were subject for exploration work by Folldal Verk A/S during the past decades. Apart from this, data about diamond drilling were collected from many old reports and compiled in several maps. As a result of these data contoured maps of the orebodies were designed in order to predict eventual further ore potential.

The Grimsdalen and Grimsdalsgruva orebodies are situated southwest of Folldal in the Grimsdalen valley. They belong to the large group of massive sulfide deposits that occur within the Caledonian mountain belt throughout Norway. Most of the geological investigations of this area and the description of the ore mineralogy were conducted by S.A.S. Pedersen (1977, 1979). Folldal Verk had a larger drilling program at both the occurences in the early 1970ies and late 1960ies. It was based on a Turam EM-survey conducted by NGU. At Grimsdalsgruva test mining, test ore processing, and diamond drilling dates further back as on Grimsdalen i.e. until the 1940ies. Many drill cores from Grimsdalen were described by Motys (1969-74). The ore reserves at Grimsdalen were calculated by Motys (1969) and Killi (1972).

2. Geological Setting

The Grimsdalen and Grimsdalsgruva occurences form two narrow, elongated, sheet-like orebodies descibed by Pedersen as pyritite horizons. It is not proved whether both occurences belong to the same stratigraphic horizon as they are separated by a larger fault. According to their geological setting, however, this fact is highly probable. The orebodies are hosted within Cambro-silurian volcanics of the Trondheim-nappe.

The rocks of the Grimsdalen area can be divided into three major tectono-stratigrphic units: the sparagmites, the Folla-Group, and the Mesæterhø-Group (Heim 1971, Pedersen 1979). The general strike direction of the rock units is WSW-ENE with dips between 50-70° towards NNW. In the southern part of the Grimsdalen the sparagmites, consisting of grey quartzites and meta arkoses, occur. These rocks were sedimentated as erosional products from the Precambrian peneplain during the beginning stage of the Caledonian geosyncline. They are older (Eocambrian) than the overlying rock members. The sparagmites are overlain by the rocks of the Folla-Group. The contact is a thrust contact. These rocks make up the central part of the Grimsdalen and host the ore horizon. The Folla-Group has been correlated with the Støren-Group of the central part of the Trondheim region (Vogt 1945). It consists of mafic greenschists (hosting the ore), quartz-keratophyres, and sericitic greenschists. All rock types are often interlayered by thin graphitic horizons. The whole group is seen as a product of submarine volcanism during lower Ordovician time. The contact between the rocks of the Folla-Group and those of the Mesæterhø-Group is again formed by a thrust.

The rocks of the Mesæterhø-Group have been correlated with those of the better known Gula-Group. In the Grimsdalen the rock units are formed by different types of sedimentary rocks as phyllitic mica schists, marbles, greenstone-conglomerates, and garnet-biotite schists. The stratigraphic relation between the Folla-Group and the Mesæterhø-Group

is not sure and in recent time still under discussion.

All rocks of the area have been affected by two main deformations, both characterized by greenschist to amphibolite facies conditions (Pedersen 1979).

3. Ore Mineralogy and Tectonic Control of the Ore's Position

The ore mineralogy and structural geology have only been investigated in detail at the Grimsdalen orebody(Pedersen 1979).

The ore is relatively massive and pyrite, pyrrhotite, magnetite, sphalerite, chalcopyrite, and galena constitute more than 70 % by volume (Pedersen 1979). Gangue minerals are mainly quartz and calcite with chlorite, plagioclase, and hornblende as minor constituents. Pedersen distinguished on the basis of mineral parageneses four different ore types: 1. pyrrhotite-pyrite ore, 2. magnetite-pyrrhotite-pyrite ore, 3. magnetite-pyrite ore, 4. sphalerite-pyrite ore. The dominant ore mineral is pyrite in all types. Chalcopyrite is always present in minor amounts. As minor constituents of the ore minerals are present: native gold and molybdenite as exotic inclusions in pyrite, hessite (Ag_2Te) and altaite (Pb,Te) as inclusions or at boundaries of galena, tellurobismuth (Bi_2Te_3) as inclusions in altaite, ilmenite, rutile, and cubanite.

As mentioned above, two main deformation phases affected the rocks and the ore in the Grimsdalen area. The central part of the Grimsdalen orebody roughly between grid lines 1500 V-2100 V was mostly affected by folding. Here the postion of the ore was determined by the second fold phase that created overturned, tight folds with fold axes in ENE-WSW direction. This folding process partially caused zones with local thickening of the orebody. All other parts of the orebodies seemed to have been only weakly affected by folding.

4. Results of Folldal Verks Drilling Program

Both orebodies were drilled on the basis of present outcrops and on Turam EM-surveys conducted by NGU. All sections were presented in different maps (see appendix) including data about the thickness of the ore and contents of Cu, Zn, and S.

Grimsdalen:

The Grimsdalen orebody was proved over a total length of 5.6 km. It is a narrow, sheet-like orebody, dipping about 65° towards NNW. In the central part, approx. between lines 1500 V and 2100 V the ore is folded with fold axes in ENE-WSW direction (see sections). The maximum thickness of the orebody was found in drill hole Bh 163 (line 2735 V) with 15.05 m. Usually the thickness is much lower. The ore gets thinner towards the depth. Between lines 2000 Ø and 200 V the lower limitation of the orebody was proved by three drill holes (Bh 224, 221, 203), whereas the limitation was not proved from line 200 V towards the west. Here the ore zone is getting considerably thinner towards depth.

On the basis of the drilling data (grade and thickness) contoured maps were drafted showing the orebody in a longitudinal section. The factor thickness (m) x % Cu, Zn, and S was the basis for the contouring.

The maps show two zones with stronger accumulatons of the ore: one zone is located between lines 700 Ø and 1000 V. This zone, however, could only be traced to a depth of about 100 m below surface.

A second zone with better ore grade and thickness is located from line 1500 V towards the west. The western limitation of this zone has not yet been proved by drilling as the westernmost hole was drilled on line 3600 V. The thickness of this zone is in all places more than 3 m. It is located at a depth of about 80-130 m below surface. According to the contours this zone is continueing from line 3600 V towards the depth in western direction. This zone represents the best potential for possible economic ore in the whole Grimsdalen orebody.

Grimsdalsgruva:

The orebody has been proved by drilling over a total length of 1.9 km. It is in general very narrow but has a larger extention towards the depth as the Grimsdalen orebody. It dips about 65-70° towards NW. Five holes drilled under the orebody show the lowest limitation of the ore. The extention towards the depth in the central part of the orebody, at approx. line -200 x is unclear, however.

Also for the Grimsdalsgruva orebody contoured maps were drafted using the factor thickness (m) x % Cu, Zn, and S as basis for contouring. According to these maps the best ore zone, exeeding 3 m thickness, is situated from about line -250 x towards the east. The eastern limitation of this zone was not proved by drilling. The zone is situated between about 200 m and 300 m below surface and reaches the surface in the eastern part at about line 500 x or 600 x.

5. Calculation and Discussion of Ore Reserves

The ore reserves at both occurences were calculated on the basis of the diamond drilling results. The division of the orebodies into blocks was done using the contoured grade-thickness maps for sulphur. The ore content of each block was classified as "proved ore" where much information was obtained by drilling, as "probable ore" where only a few holes were drilled, and as "possible ore" where no drilling information was available but where more ore could be expected when interpreting the contoured grade-thickness maps. The reserves of the "possible ore" should be seen more as an exploration target. The plane of the blocks was determined by planimeter. The density of the ore was determined using the content of sulphur and then calculating the content of pyrite (pyrite 5.0, quartz,calcite 2.7). The ore grade within each block and of the total ore reserves was determined using "weighted" calculations according to the different thicknesses within each block respectively the tonnages of each block. Also the average thickness of several blocks together was calculated weighted depending of the tonnages

Tab. 1: Calculation of total ore reserves at Grimsdalen

block	av.Thickness (m)	density	tons	% Cu	% Zn	% S
proved ore:						
B	2.33	3.28	560,511	0.19	1.02	13.48
C	2.63	3.89	392,984	0.33	4.00	27.68
E	4.94	3.78	1,801,964	0.31	2.77	25.14
F	15.05	3.75	564,375	0.25	2.67	24.33
G	2.85	3.89	260,533	0.38	3.29	27.57
I	1.41	3.45	521,424	0.15	1.95	17.56
L	4.28	4.02	2,159,303	0.56	2.47	30.79
M	9.20	3.73	223,054	0.47	2.12	23.86
N	2.00	4.15	49,800	0.45	1.44	33.79
O	5.53	4.43	110,241	0.40	2.79	40.19
U	11.95	3.72	466,767	0.55	0.90	23.82
total			6,644,189	0.41	2.58	27.29
probable ore:						
A'	2.33	3.28	137,268	0.19	1.02	13.48
D'	4.94	3.78	373,464	0.31	2.77	25.14
H'	2.74	3.89	255,573	0.36	3.65	27.63
K'	3.30	3.65	265,191	0.38	1.75	22.14
S'	5.93	3.83	1,011,319	0.44	1.79	26.31
P'	2.80	3.94	772,240	0.32	2.68	28.79
total			2,815,055	0.36	2.29	25.94
possible ore:						
V"	2.33	3.28	91,512	0.19	1.02	13.48
W"	2.63	3.89	86,796	0.33	4.00	27.68
X"	4.94	3.78	662,899	0.31	2.77	25.14
Y"	2.85	3.89	182,927	0.38	3.29	27.57
Z"	1.43	3.45	277,768	0.15	1.95	17.56
J"	1.87	3.37	399,903	0.17	1.49	15.52
Q"	3.30	3.65	204,920	0.38	1.75	22.14
R"	3.05	3.80	695,685	0.41	1.77	25.47
T"	1.87	3.37	173,186	0.17	1.49	15.52
total			2,775,596	0.30	2.11	22.11

Tab. 2: Calculation of total ore reserves at Grimsdalsgruva

block	av.thickness (m)	density	tons	% Cu	% Zn	% S
proved ore:						
A	2.25	4.43	51,877	0.96	1.95	38.20
B	3.23	4.40	799,425	1.12	1.36	39.44
C	2.25	4.38	264,853	0.90	1.05	39.15
D	1.51	4.33	533,280	0.67	1.58	37.84
total			1,649,435	0.93	1.40	38.84
probable ore:						
E'	2.94	4.38	1,376,250	0.97	1.37	39.07
F'	2.01	4.50	361,800	0.61	1.85	41.90
G'	2.30	3.87	261,467	0.77	0.88	27.15
I'	0.90	4.42	141,716	0.30	4.50	40.00
K'	2.30	3.87	186,365	0.77	0.88	27.15
L'	2.01	4.50	81,970	0.61	1.85	41.90
M'	3.30	4.39	90,544	0.50	2.00	39.20
O'	1.51	4.33	81,729	0.67	1.58	37.84
P'	4.90	3.45	459,605	0.46	0.60	17.50
Q'	2.30	3.87	130,733	0.77	0.88	27.15
total			3,172,179	0.76	1.40	34.18
possible ore:						
H"	0.90	4.42	151,148	0.30	4.50	40.00
N"	1.26	3.68	281,106	0.25	1.30	22.80
R"	0.90	4.42	50,968	0.30	4.50	40.00
S"	2.25	4.34	231,919	0.96	1.95	38.20
T"	3.23	4.40	488,538	1.12	1.36	39.44
U"	2.01	4.50	76,317	0.61	1.85	41.90
V"	2.30	3.87	58,413	0.77	0.88	27.15
W"	0.90	4.42	32,321	0.30	4.50	40.00
total			1,373,729	0.73	2.00	35.54

of each block. It should be stated that some incorrectnesses in the ore reserve calculations could arise as the drilling was not conducted very systematicly and the spacing between some holes is often large. In these calculations it was also assumed that the drill holes always hit the ore vertical.

First the total ore reserves, regardless thickness, were calculated. The results can be seen from Tab. 1 and Tab. 2. The total ore reserves were calculated as follows:

Grimsdalen:	tons	% Cu	% Zn	% S
proved ore	6,644,189	0.41	2.58	27.29
probable ore	2,815,055	0.36	2.29	25.94
possible ore	2,775,596	0.30	2.11	22.11
Grimsdalsgruva:				
proved ore	1,649,435	0.93	1.40	38.84
probable ore	3,172,179	0.76	1.40	34.18
possible ore	1,373,729	0.73	2.00	35.54

These reserves do not represent economic ore as the average thickness is too thin. Calculating the ore reserves of blocks or of several blocks together, with a thickness of at least 3 m one can obtain the following possibilities:

Grimsdalen:

1. Proved ore from blocks E and F:

Block	av.thickness (m)	tons	% Cu	% Zn	% S
E	4.94	1,801,964	0.31	2.77	25.14
F	15.05	564,375	0.25	2.67	24.33
total	7.35	2,366,339	0.30	2.75	24.95

2. Proved ore from blocks E and F, including probable ore from block D':

Block	av. thickness (m)	tons	% Cu	% Zn	% S
E	4.94	1,801,964	0.31	2.77	25.14
F	15.05	564,375	0.25	2.67	24.33
D'	4.94	373,464	0.31	2.77	25.14
total	7.02	2,739,803	0.30	2.75	24.97

3. Proved ore from blocks E, F, C, and G, probable ore from blocks D' and H', and possible ore from blocks X", Y", and W":

Block	av.Thickness(m)	tons	% Cu	% Zn	% S
E	4.94	1,801,964	0.31	2.77	25.14
F	15.05	564,375	0.25	2.67	24.33
D'	4.94	373,464	0.31	2.77	25.14
X"	4.94	662,899	0.31	2.77	25.14
W"	2.63	86,796	0.33	4.00	27.68
Y"	2.85	182,929	0.38	3.29	27.57
C	2.63	392,984	0.33	4.00	27.68
G	2.85	260,533	0.38	3.29	27.57
H'	2.74	255,573	0.36	3.65	27.63
total	5.62	4,581,517	0.31	2.99	25.68

4. Proved ore from blocks L, M, N, O:

Block	av.Thickness(m)	tons	% Cu	% Zn	% S
L	4.28	2,159,303	0.56	2.47	30.79
M	9.20	223,054	0.47	2.12	23.86
N	2.00	49,800	0.45	1.44	33.79
O	5.53	110,241	0.40	2.79	40.14
total	4.72	2,542,398	0.54	2.43	30.65

The silver contents in blocks E, F, and D' are probably around 15 ppm Ag. The assays of the drill cores are not complete. The gold content is probably around 0.2 ppm Au. Only very few data were available. The contents of Ag and Au are probably the same in blocks L, M, N, and O. The average Pb content at Grimsdalen is about 0.1 %.

Regarding possibilities 1.-3. and 4. one can see that two major bodies exist in Grimsdalen. The body calculated in possibility 4. is quite limited towards the depth. The body calculated in possibilities 1.-3. however, has more potential for extention towards depth with a soft plunge towards west. If the two bodies might be exploitable as additional ore for the Tverrfjellet mine has to be calculated on the basis of development costs and the possibility of processing the ore at Tverrfjellet. An advantage of the bodies is that the ore is lying close to the surface and is plunging

very gently.

Grimsdalsgruva:

The orebody at Grimsdalsgruva is in general thinner but has better grades for copper.

Inthe following example block B (proved ore), block E' (probable ore), and block T" (possible ore) were calculated as one orebody. The presence of the amount of ore in block E' should be proved by one further diamond drill hole.

Block	av.thickness(m)	tons	% Cu	% Zn	% S
B	3.23	799,425	1.12	1.36	39.44
E'	2.94	1,376,250	0.97	1.37	39.07
T"	3.23	488,538	1.12	1.36	39.44
total	3.08	2,664,213	1.04	1.37	39.25

Only at hole Bh 126 Au was analyzed averaging below 0.15 ppm Au. Very few Ag assays indicate values of around 10 ppm Ag. Pb is apparently below 0.1 % Pb.

The orebody at Grimsdalsgruva is open towards the east. Further exploration work must therefore be conducted into this direction.

6. Recommendations for Further Exploration

At both, the Grimsdalen and the Grimsdalsgruva occurences the limitation of the orebodies has not been proved by drilling. At Grimsdalen the orebody is open towards the west and at Grimsdalsgruva open towards the east. Therefore further drilling is proposed at the following locations:

Grimsdalen:

In order to prove the possible ore in blocks V", W", X", Y", and Z" at least 2 holes should be drilled on line 3800 V, one at station 350 N, and one at station 410 N with a dip of 60° towards SSE. The length of the first hole would be about 130 m that of the second about 180 m. As the Turam-EM-anomaly of the ore horizon continues until line 4200 V

(400 m further) the area in between lines 3800 V and 4200 V is an exellent exploration target. Further west of line 4200 V the anomaly was not detected because either the ore is lying too deep or it is cut off by a major fault. As several other EM-anomalies were detected west of 4200 V further towards north of the main anomaly trend, these should be investigated, too.

Grimsdalsgruva:

At this orebody the eastern limitation was not proved. In order to prove the ore in block T", a hole should be drilled on line 900 X at station 300 Y with a dip of 60° towards SE, down to about 180 m. The EM-anomaly cuts off at line 700 X, however. Therefore it has to be proved if the ore-body is possibly cut off by a fault. Furthemore the ore in block E' should be proved by a drill hole on line 0 X station 375 Y with a dip of 60° towards SE. This hole would be about 230 m deep.

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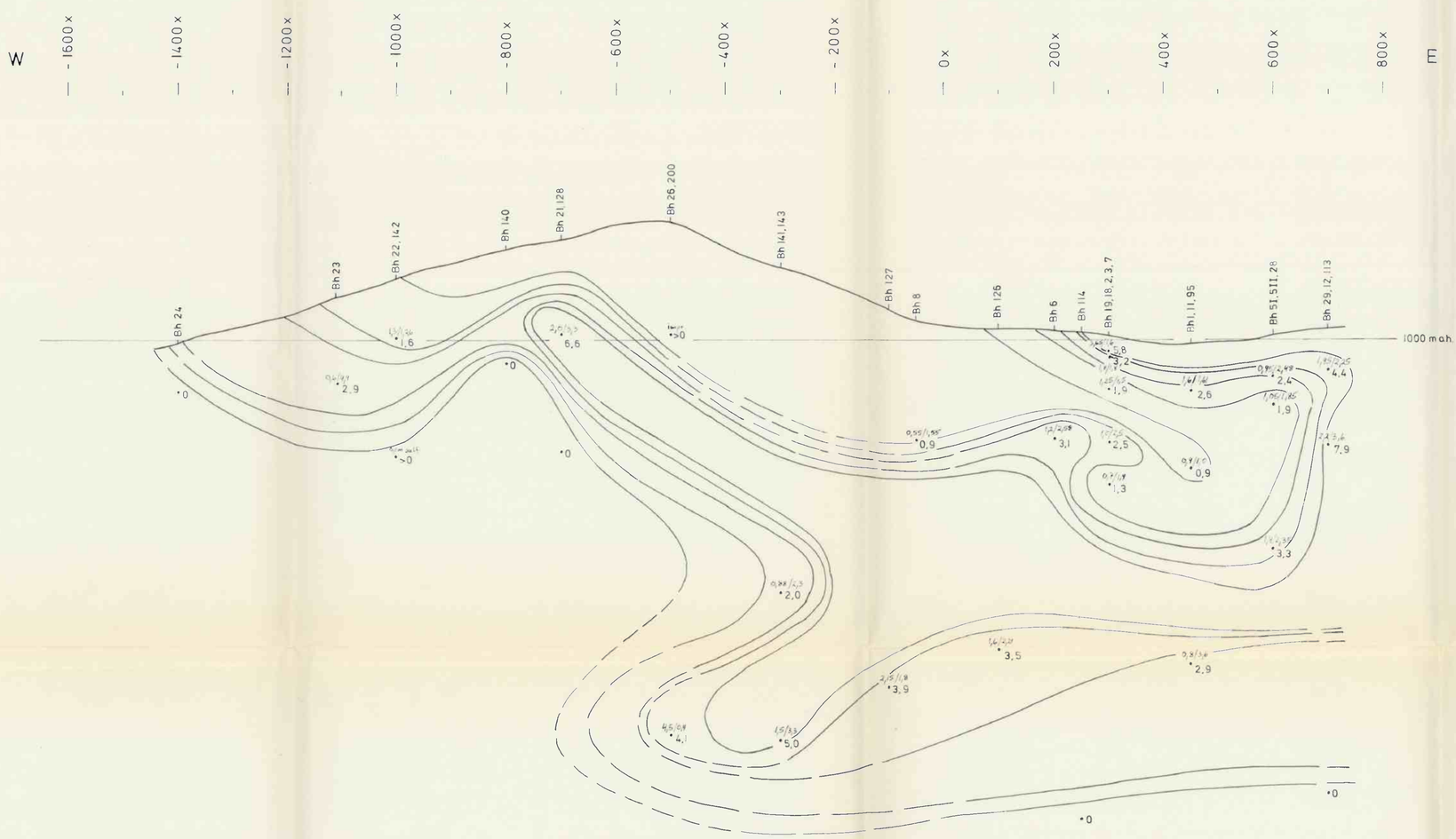
Many different Folldal Verk - reports.

Longitudinal Sections
+ Blocks / Grimsdalsgruva



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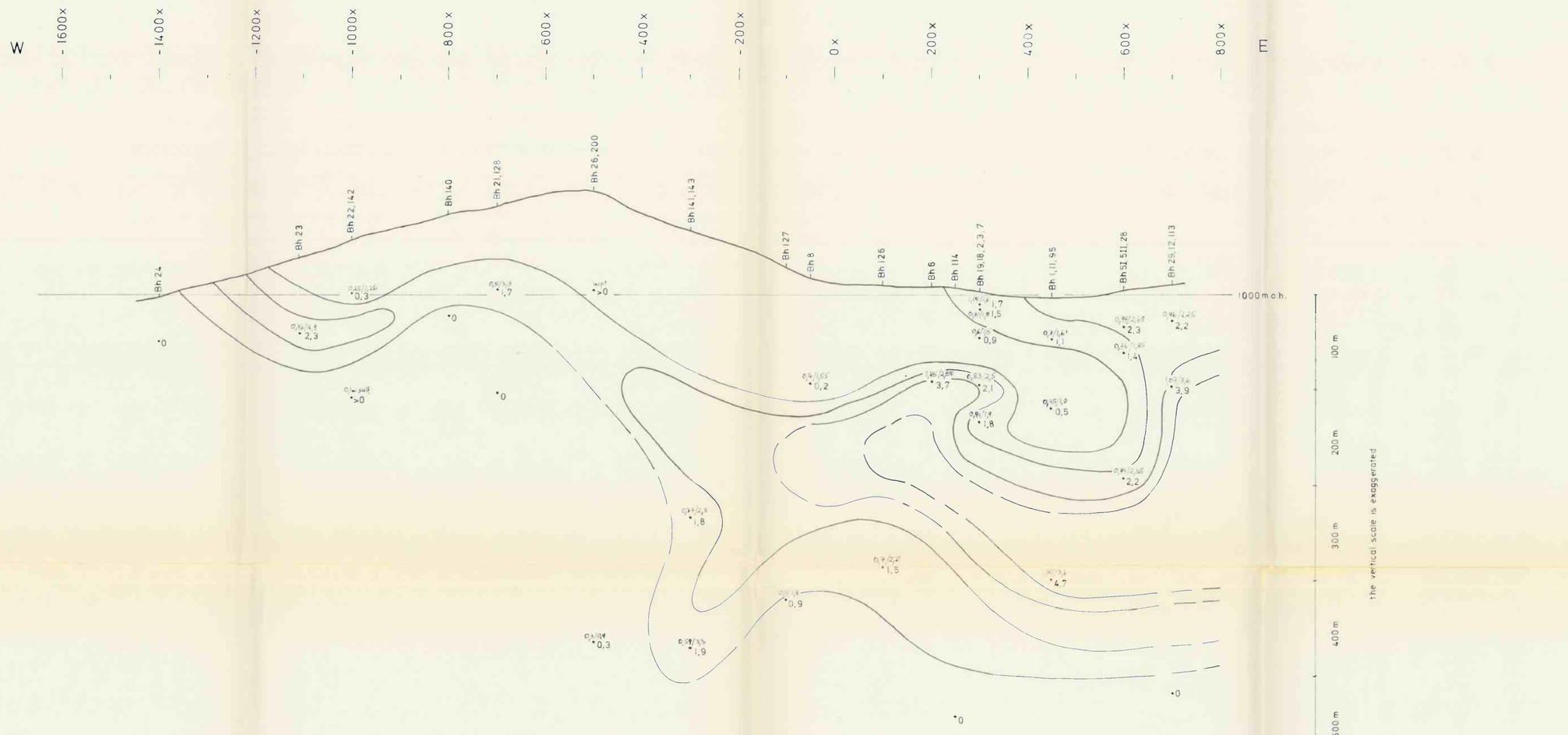
Grimsdalsgruva Orebody

Longitudinal Section

Contoured Map for Zn [% Zn × m]

Date 2/84	Scale: 1:	ÅRAUSE

A.S TOPPKUP



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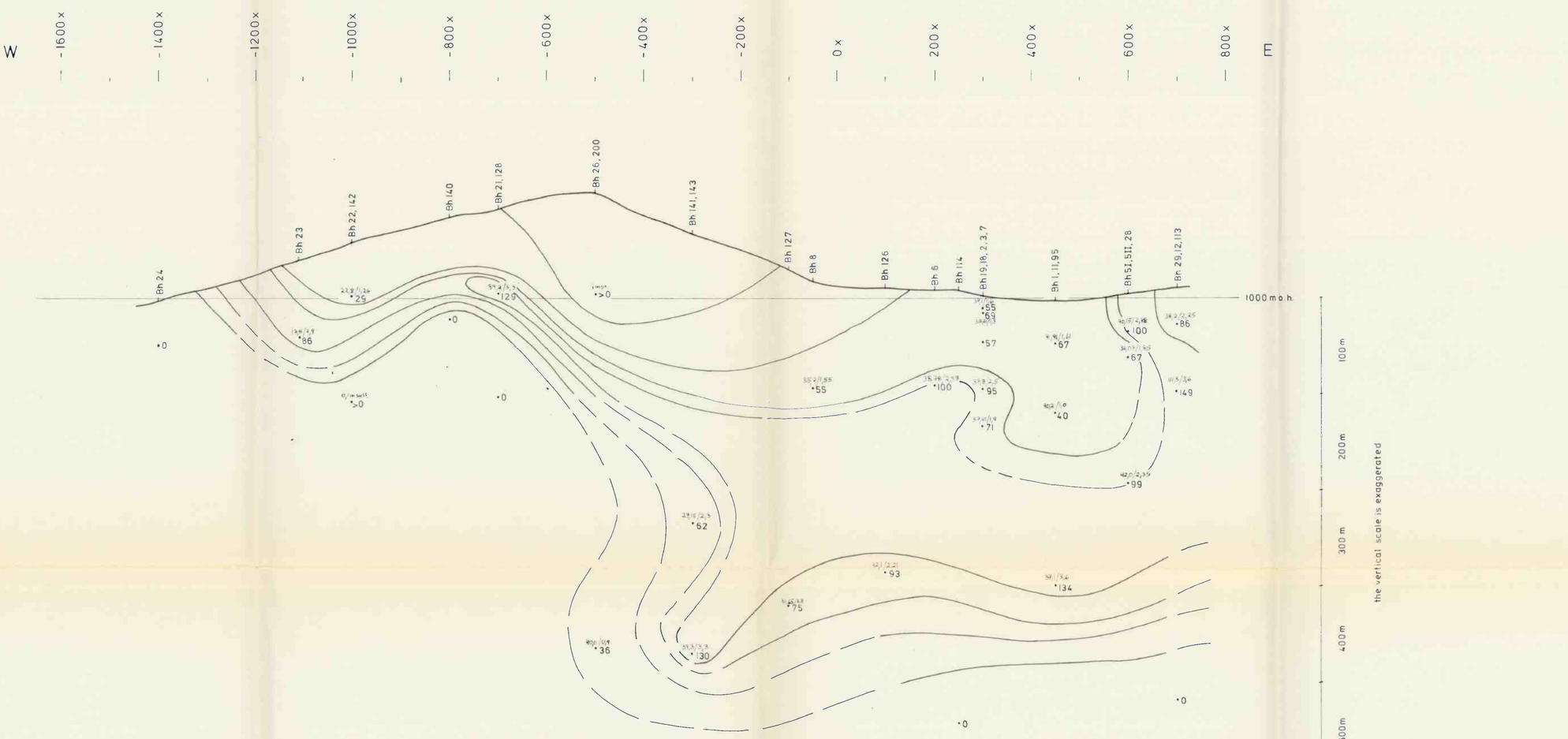
Grimsdalsgruva Orebody

Longitudinal Section

Contoured Map for Cu [% Cu x m]

Date 2/84	Scale: 1:	KRA/JSE



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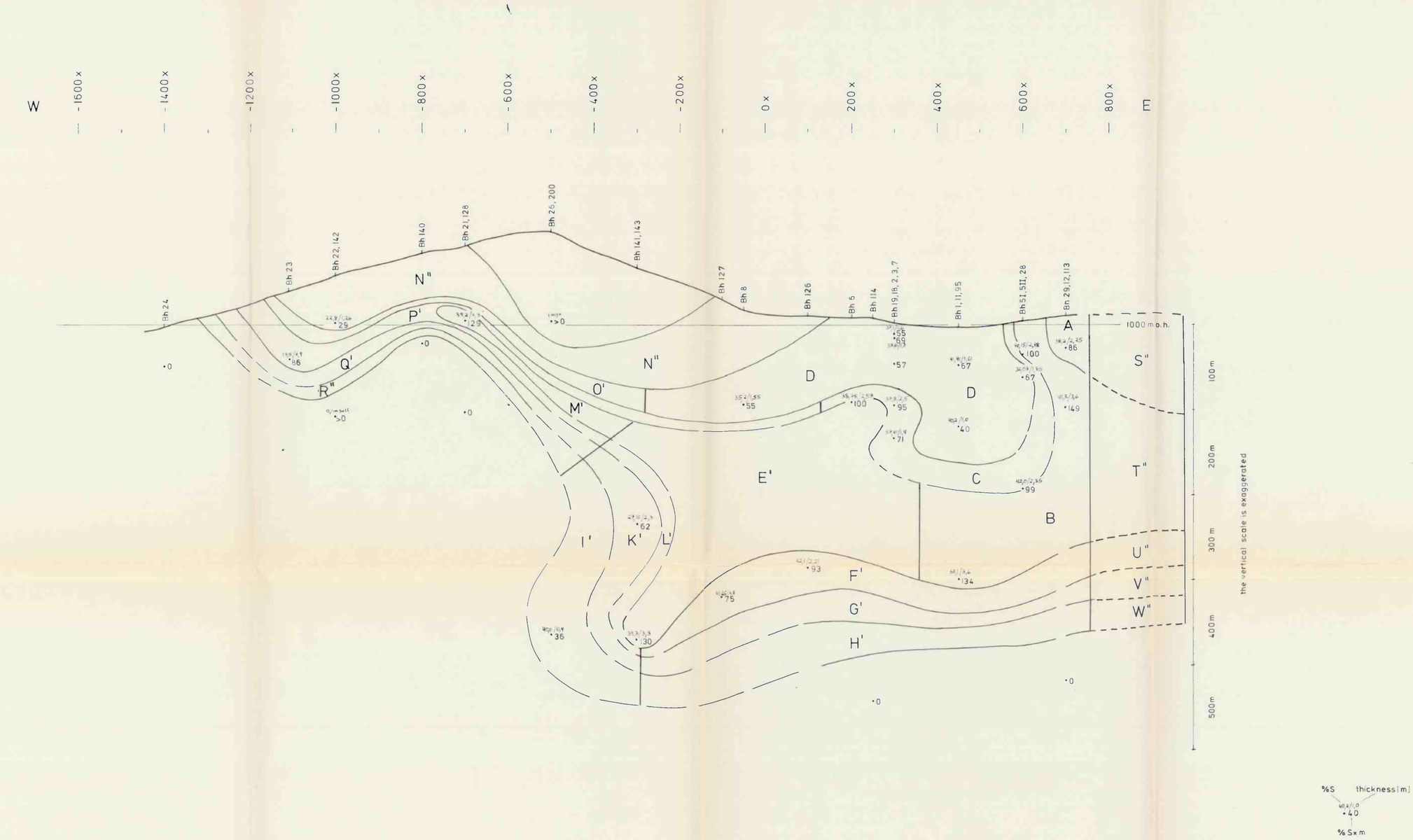
Grimsdalsgruva Orebody

Longitudinal Section

Contoured Map for S [% S × m]

Date 2/84	Scale: 1:	REVISED

A.S TOPROCH



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FOLLDAL - PROJECT N-81-1

Grimsdalsgruva Orebody

Longitudinal Section

Contoured Map for S[%S x m]
Including Blocks

Date 2/84 | Scale: 1: | FRAME

A.S TERRSCAN

Cross Sections
Grimsdalen

S

N

0 NS

100 N

200 N

EM - anomaly

300 N

Bh 161

400 N

500 N

600 N

700 N

800 N

900 m o.h.

51,00 - 54,00 = 3,00 m
0,13% Cu
0,45% Zn
1,80% S

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FOLLDAL - PROJECT N-81-1

Grimsdalen

Section 3600V
Bh 161

Date 2/84	Scale: 1:2500	H.O. Aase

A/S TORINKOPI

S

N

0 NS

100 N

200 N

EM - anomaly

300 N

Bh 168

400 N

Bh 186

500 N

Bh 187

600 N

700 N

800 N

900 m o.h.

98,40 - 100,65 = 2,25m
0,20% Cu
4,31 % Zn
24,60% S

179,40 - 182,60 = 3,20 m
0,36% Cu
3,52% Zn
30,90% S

258,25 - 259,40 = 1,15m
0,25 % Cu
4,60% Zn
33,13 % S

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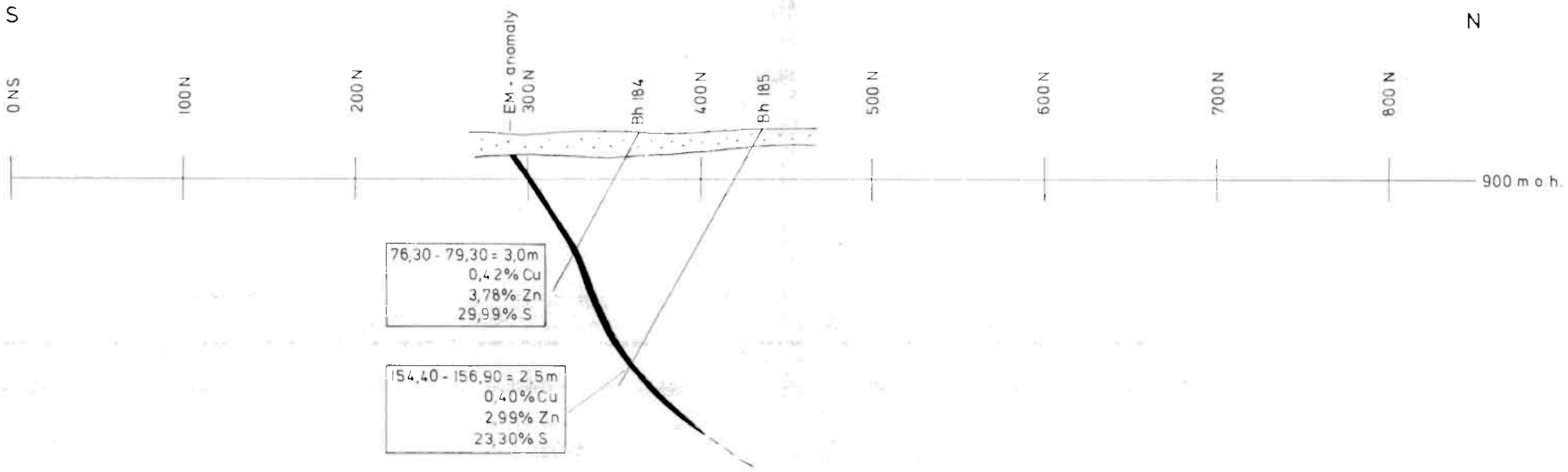
Grimsdalen

Section 3400 V
Bh 187, 186, 168

Date 1/84	Scale: 1: 2500	KRAUSE

A.S TOSKOR



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Grimsdalen

Section 3100 V

Bh 184, 185

Date 2/84	Scale: 1: 2500	

S

N

0 NS

100 N

200 N

EM - anomaly

Bh 162

Bh 166

400 N

Bh 169

500 N

Bh 180

600 N

700 N

800 N

900 m o.h.

83,35 - 87,85 = 4,5 m
0,34% Cu
3,28% Zn
25,73% S

146,40 - 153,00 = 6,6 m
0,32% Cu
2,28% Zn
20,81 % S

224,85 - 225,80 = 0,95 m
0,26% Cu
2,60% Zn
31,42% S

FOLLDAL VERK A/S - AMOCO NORWAY J.V.

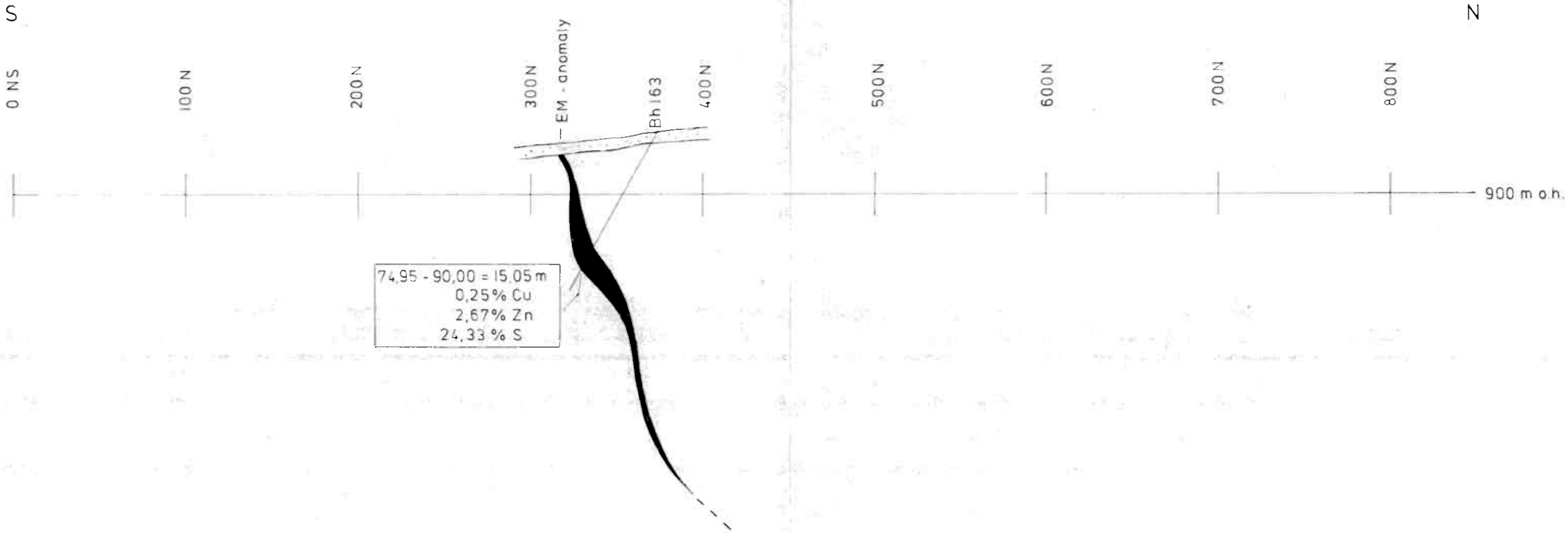
FOLLDAL - PROJECT N-81-1

Grimsdalen

Section 2900V
Bh 180, 169, 166, 162

Date 2/84	Scale: 1:2500	KRAASE

A.S TONNEKOPI



FOLLDAL VERK A/S - AMOCO NORWAY J.V.

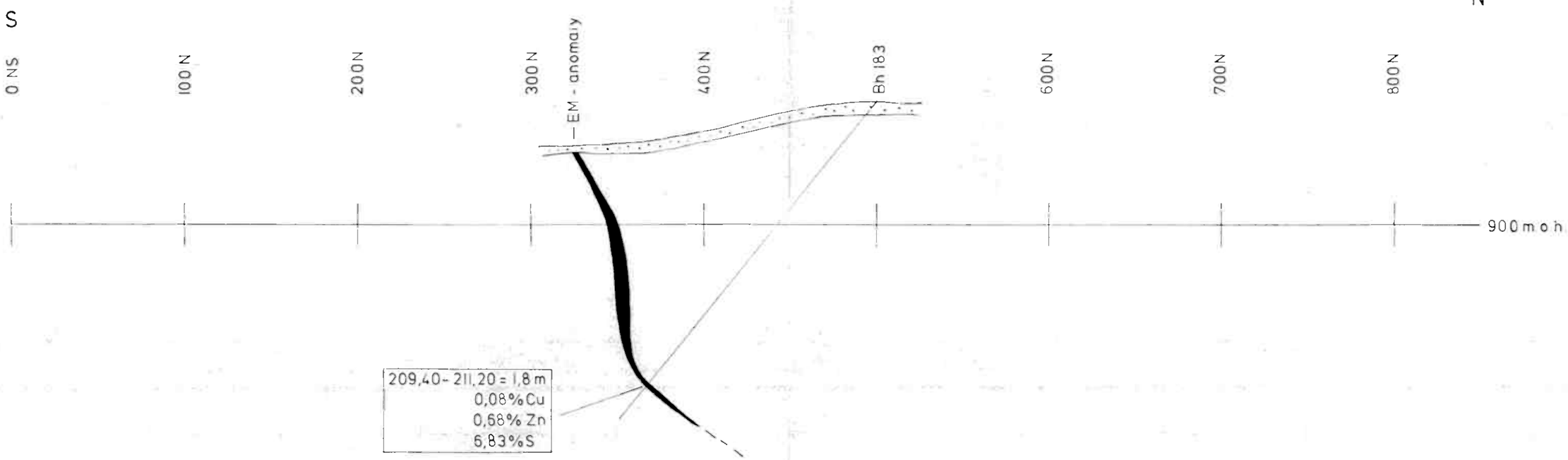
FOLLDAL - PROJECT N-81-1

Grimsdalen

Section 2735 V
Bh 163

Date 2/84	Scale: 1: 2500	KRAGE

A.S TORRKOPI



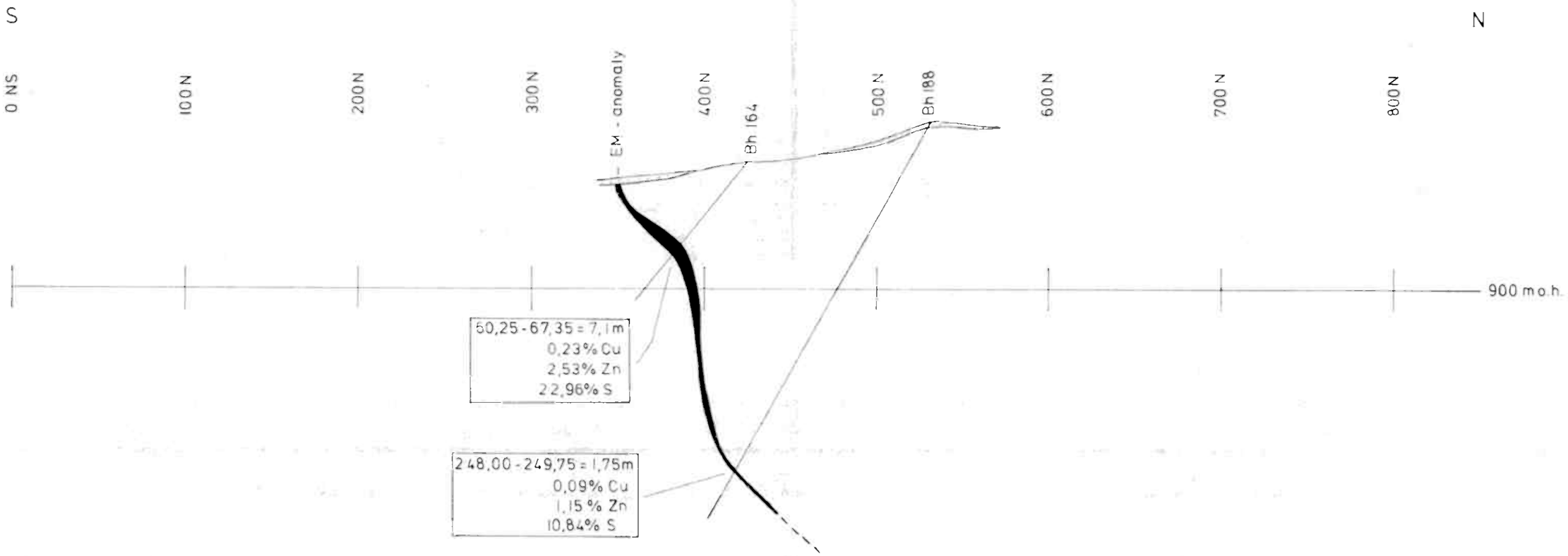
FOLLDAL VERK A/S - AMOCO NORWAY J.V.

FOLLDAL - PROJECT N-81-1

Grimsdalen

Section 2670 V
Bh 183

Date 2/84	Scale: 1:2500	HRAASE



FOLLDAL VERK A/S - AMOCO NORWAY J.V.

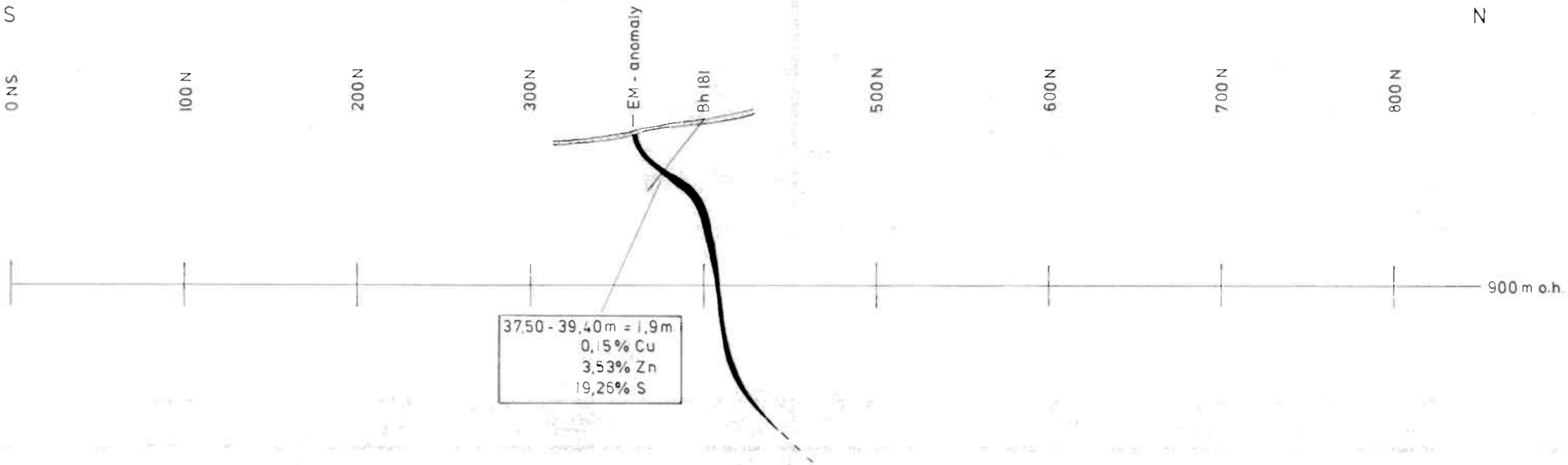
FOLLDAL - PROJECT N-81-1

Grimsdalen

Section 2500V
Bh 164, 188

Date 2/84	Scale: 1: 2500	NR 4496

A.S TORSKOP



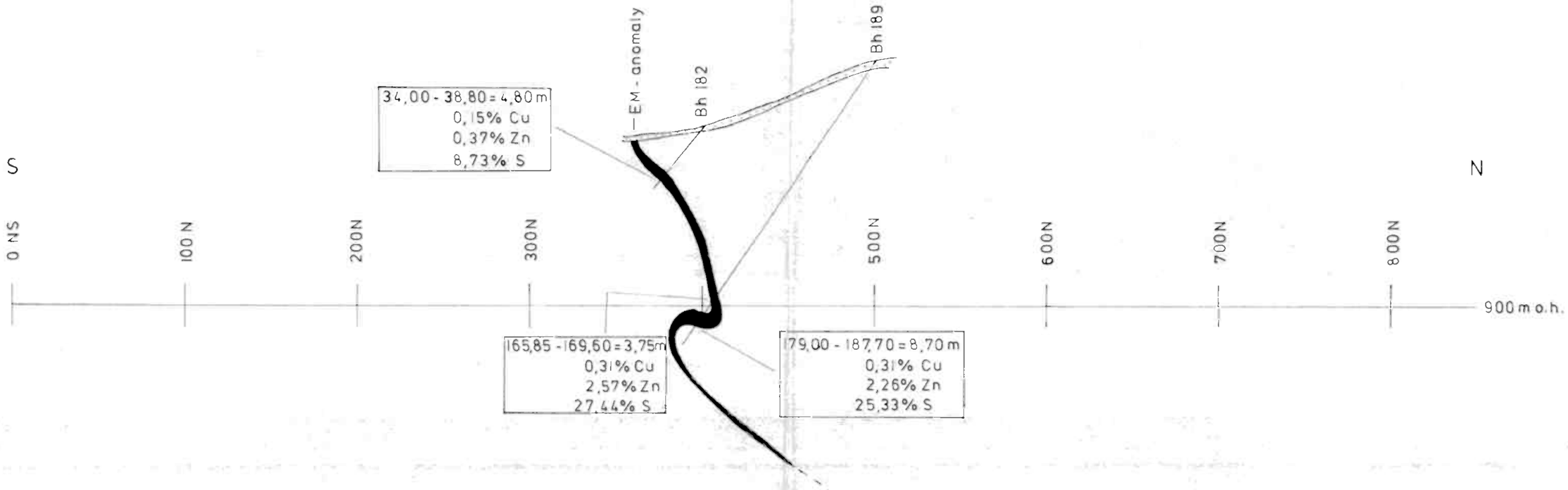
FOLLDAL VERK A/S - AMOCO NORWAY J.V.

FOLLDAL - PROJECT N-81-1

Grimsdalen

Section 2300 V
Bh 181

Date 2/84	Scale: 1: 2500	KRAUSE



FOLLDAL VERK A/S - AMOCO NORWAY J.V.

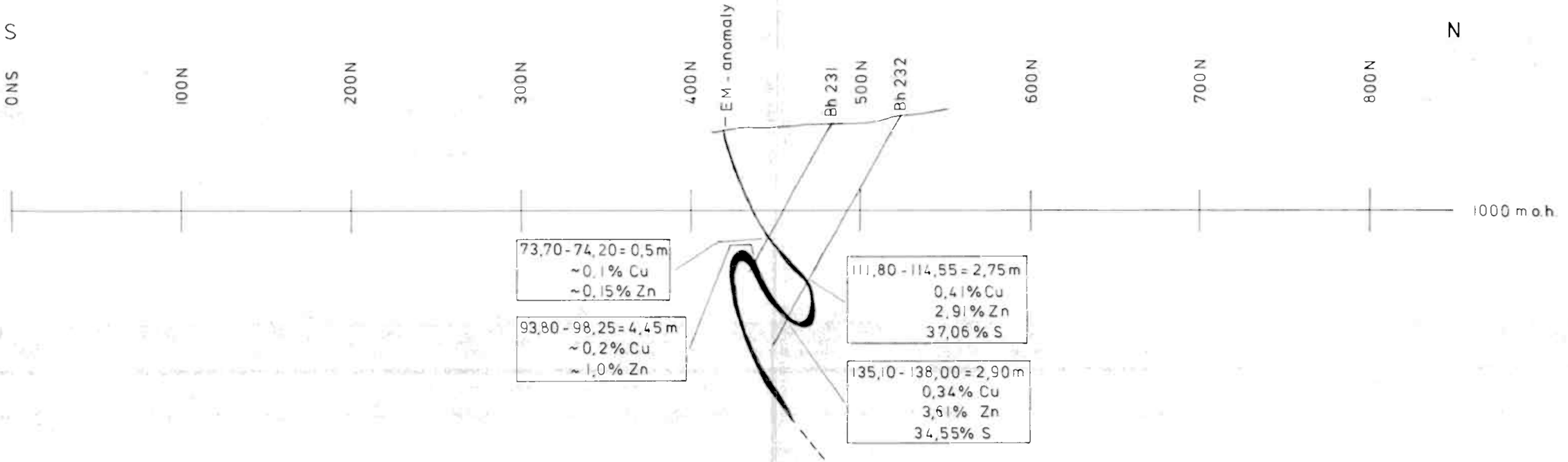
FOLLDAL - PROJECT N-81-1

Grimsdalen

Section 2100 V
Bh 182, 189

Date 2/84	Scale: 1: 2500	ARAUSF

A.S TORSKOP



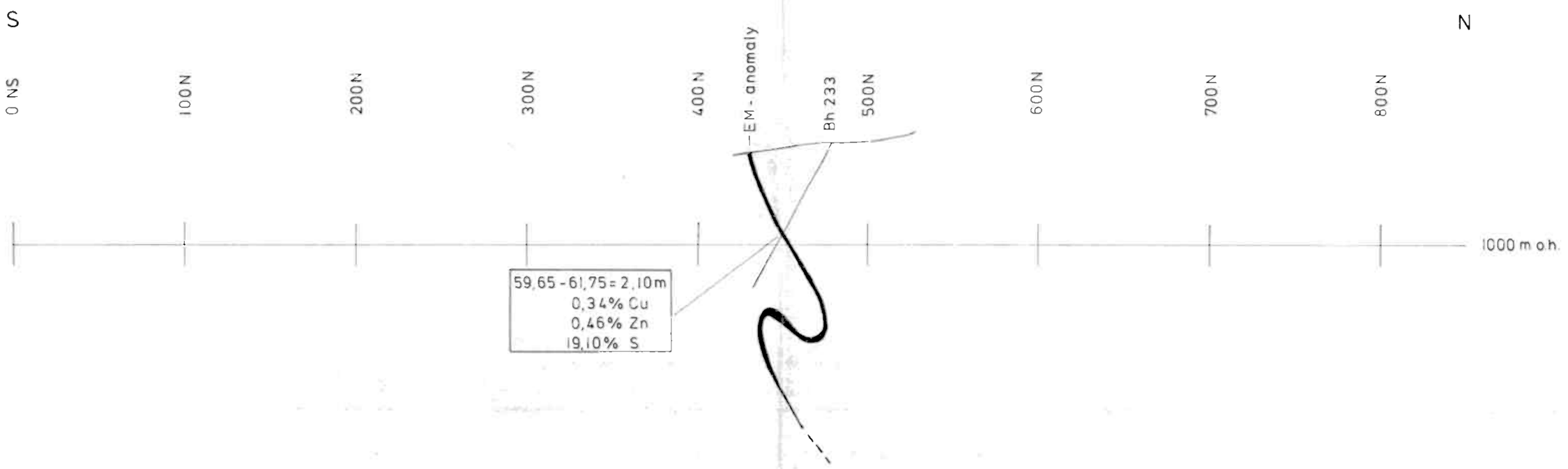
FOLLDAL VERK A/S - AMOCO NORWAY J.V.

FOLLDAL - PROJECT N-81-1

Grimsdalen

Section 1670 V
Bh 231, 232

Date 2/84	Scale: 1: 2500	KRAUSE



FOLLDAL VERK A/S - AMOCO NORWAY J.V.

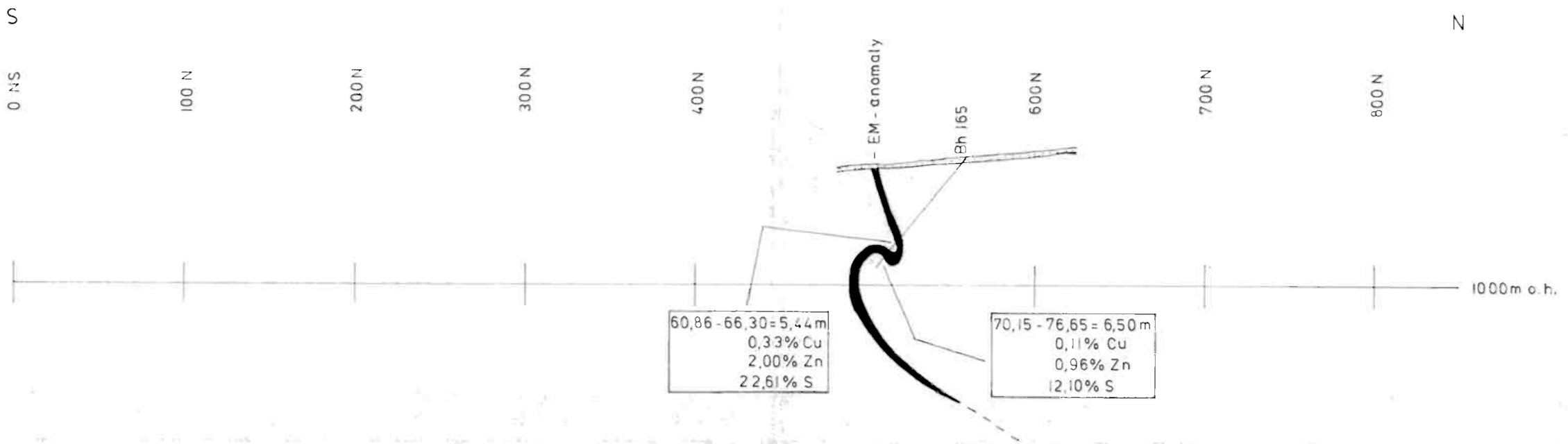
FOLLDAL - PROJECT N-81-1

Grimsdalen

Section 1525 V

Bh 233

Date 2/84	Scale: 1: 2500	KRAUSE



FOLLDAL VERK A/S - AMOCO NORWAY J.V.

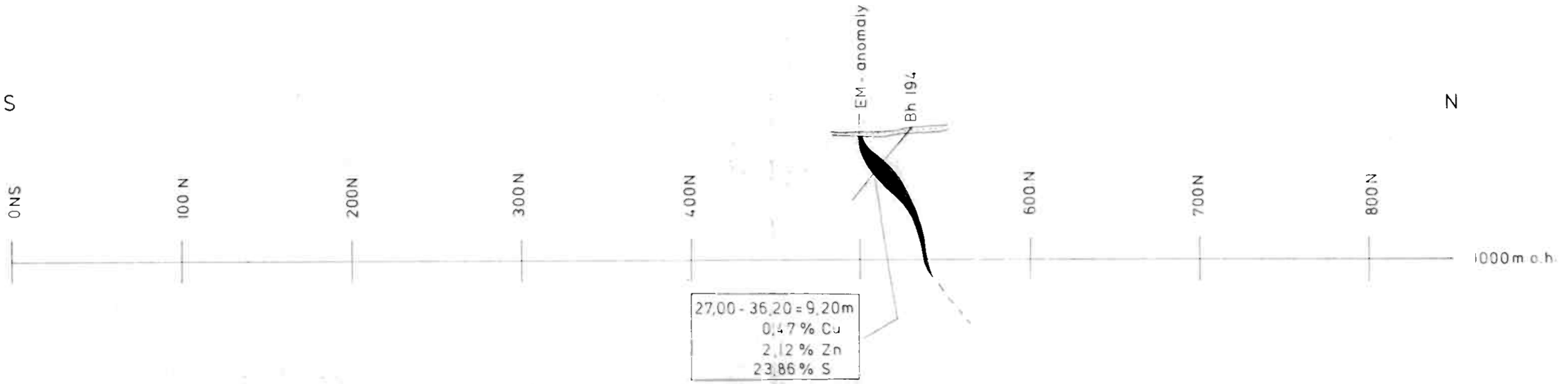
FOLLDAL - PROJECT N-81-1

Grimsdalen

Section 800V
Bh 165

Date 2/84	Scale: 1: 2500	KRAUSE

A.S TORRSCH



FOLLDAL VERK A/S - AMOCO NORWAY J.V.

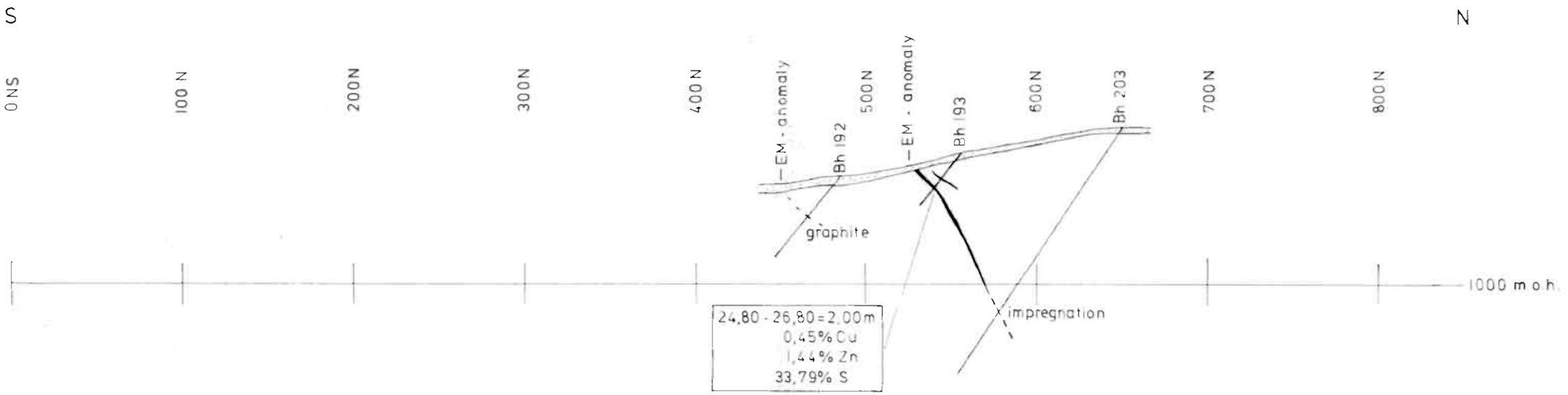
FOLLDAL - PROJECT N-81-1

Grimsdalen

Section 400V
Bh 194

Date 2/84	Scale: 1: 2500	HRAUGE

A/S TOPPKORT



FOLLDAL VERK A/S - AMOCO NORWAY J.V.

FOLLDAL - PROJECT N-81-1

Grimsdalen

Section 200 V
Bh 203, 193, 192

Date 2/84	Scale: 1: 2500	

A S TORRKOPI

S

N

0 NS

100 N

200 N

300 N

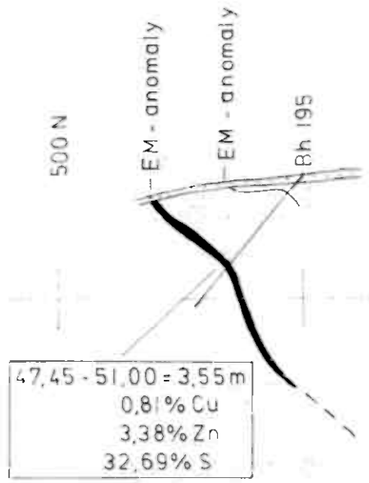
400 N

500 N

700 N

800 N

1000 m o.h.



FOLLDAL VERK A/S - AMOCO NORWAY J.V.

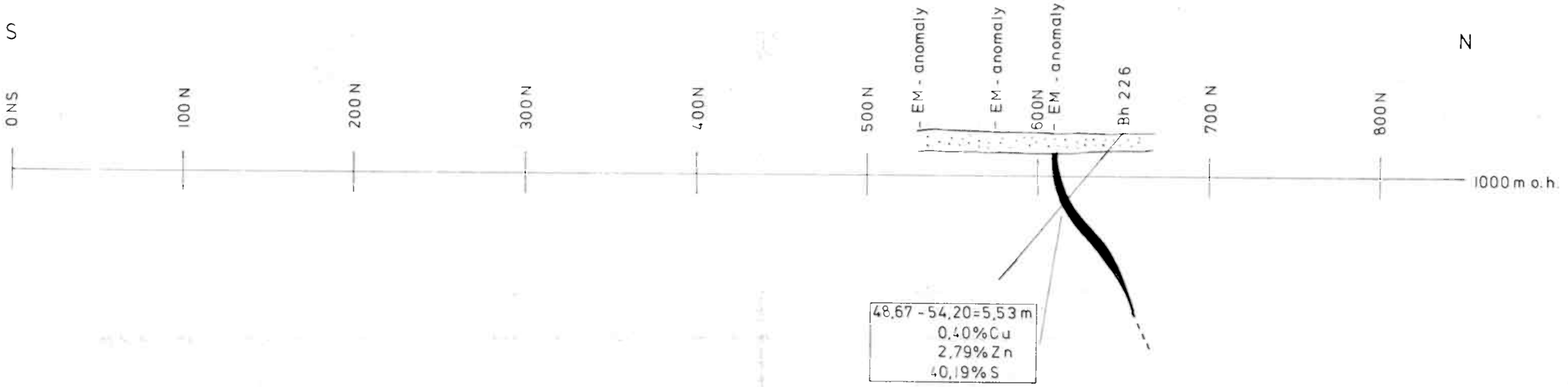
FOLLDAL - PROJECT N-81-1

Grimsdalen

Section 20 V
Bh 195

Date 2/84	Scale: 1: 2500	ÅRHAUG

A/S TORRKORI



FOLLDAL VERK A/S - AMOCO NORWAY J.V.

FOLLDAL - PROJECT N-81-1

Grimsdalen

Section 100 Ø
Bh 226

Date 2/84	Scale: 1: 2500	KRAUSE

A.S TORRKOPI

FOLLDAL VERK A/S - AMOCO NORWAY J.V.

FOLLDAL - PROJECT N-81-1

Grimsdalen

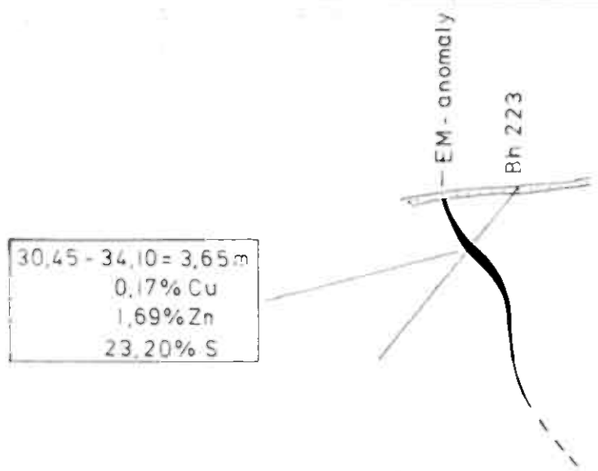
Section 700 Ø

Bh 196, 220, 221

Date 2/84	Scale: 1: 2500	HRAase

S

N



0 NS | 100 N | 200 N | 300 N | 400 N | 500 N | 600 N | 700 N | 800 N

1000 m o.h.

FOLLDAL VERK A/S - AMOCO NORWAY J.V.

FOLLDAL - PROJECT N-81-1

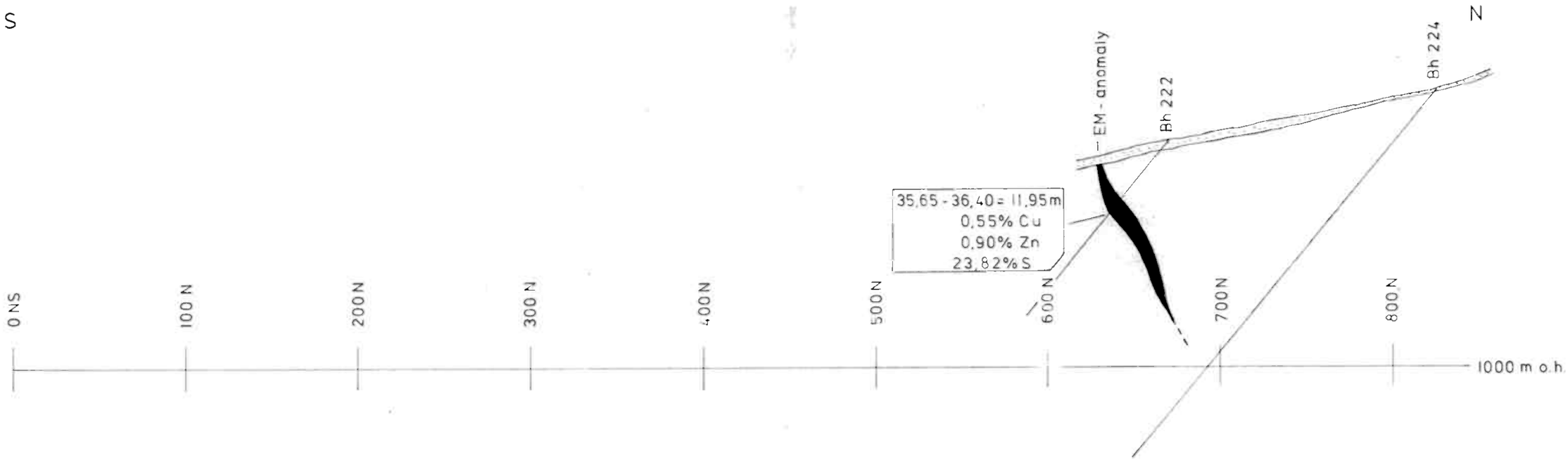
Grimsdalen

Section 1100 Ø

Bh 223

Date 2/84	Scale: 1: 2500	ARNASE

A/S TORRKOPI



FOLLDAL VERK A/S - AMOCO NORWAY J.V.

FOLLDAL - PROJECT N-81-1

Grimsdalen

Section 2000 Ø
Bh 222,224

Date 2/84	Scale: 1: 2500	ARANSE

A S TORRKOPI

Cross Sections
Grimsdalsgruva

SE

NW

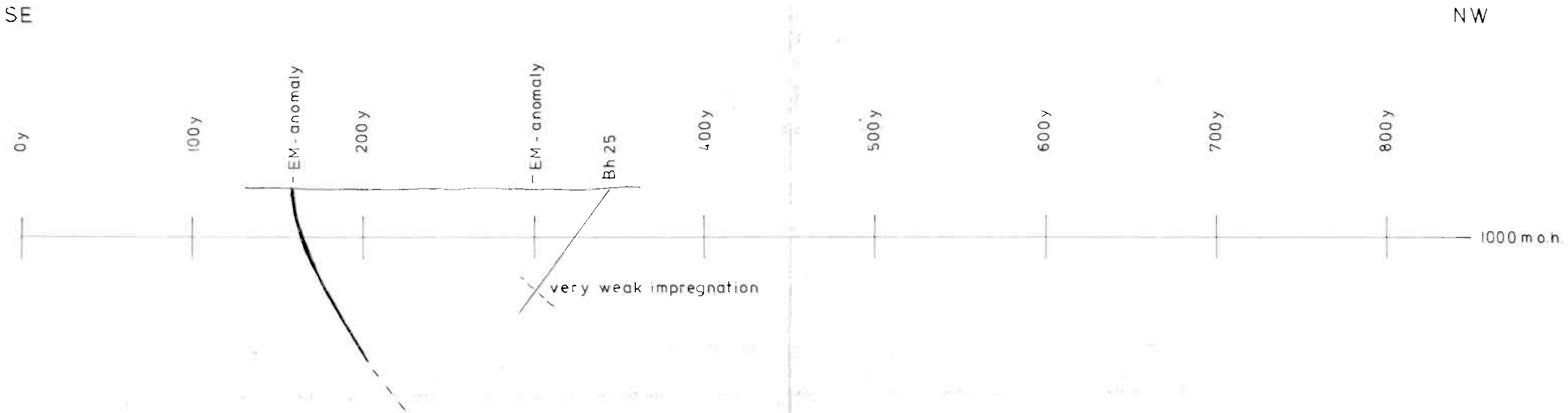
FOLLDAL VERK A/S - AMOCO NORWAY J.V.

FOLLDAL - PROJECT N-81-1

Grimsdalsgruva

Section -1400x
Bh 24

Date 2/84	Scale: 1: 2500	KRAuse



FOLLDAL VERK A/S - AMOCO NORWAY J.V.

FOLLDAL - PROJECT N - 81 - 1

Grimsdalsgruva

Section - 1215 x
Bh 25

Date 2/84	Scale 1: 2500	KRAUSE

SE

NW

FOLLDAL VERK A/S - AMOCO NORWAY J.V.

FOLLDAL - PROJECT N-81-1

Grimsdalsgruva

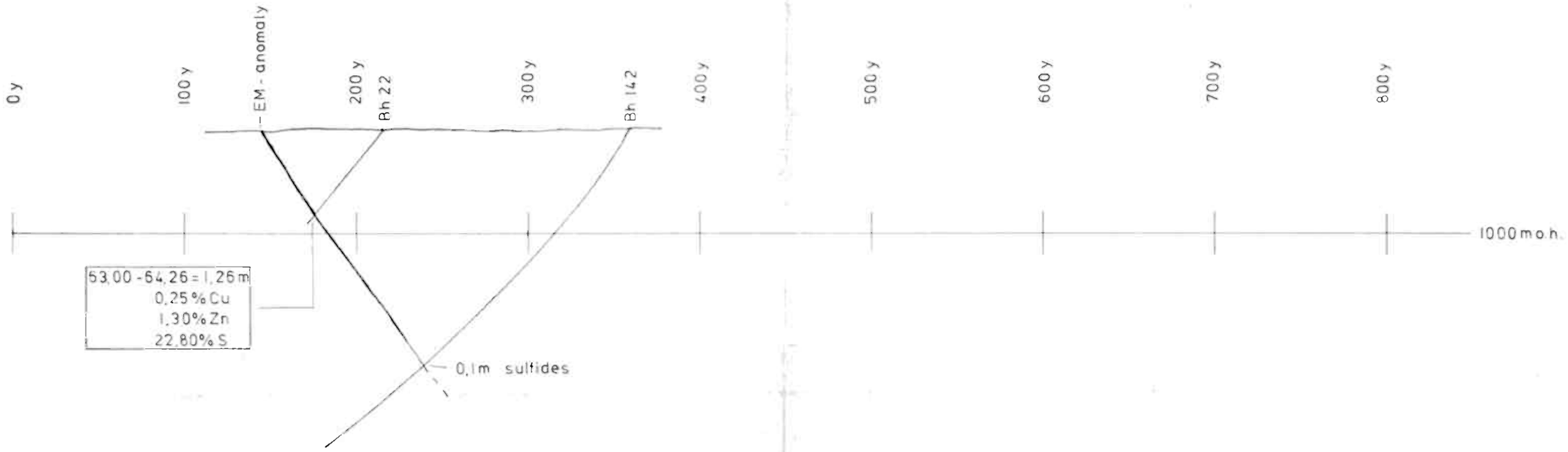
Section - 1110 x
Bh 23

Date 2/84	Scale: 1:2500	A4

A.S TORRKOPI

SE

NW



FOLLDAL VERK A/S - AMOCO NORWAY J.V.

FOLLDAL - PROJECT N-81-1

Grimsdalsgruva

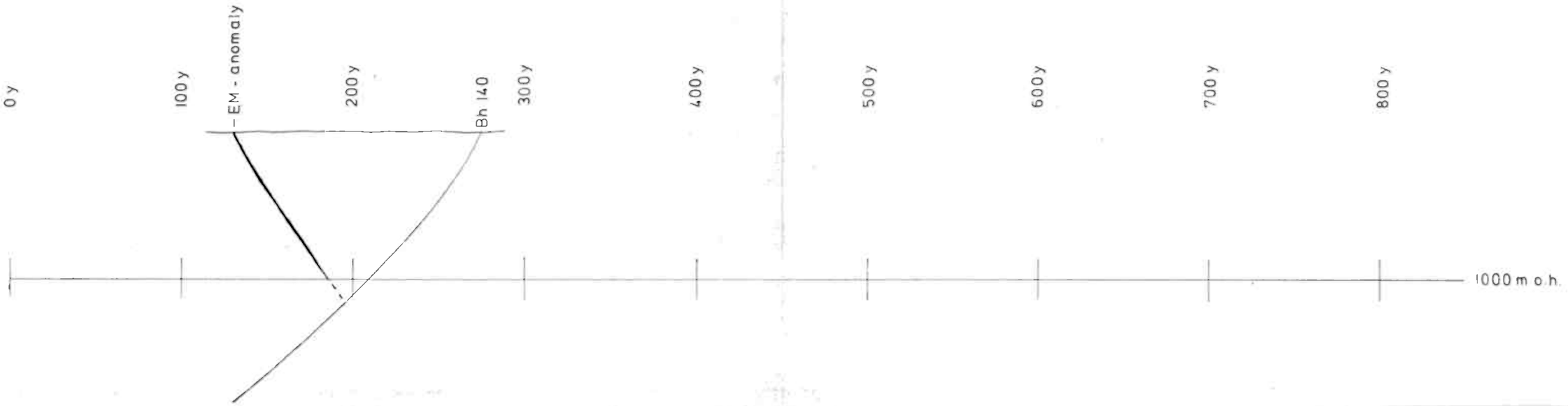
Section -1000x
Bh 22, 142

Date 2/84	Scale: 1: 2500	[illegible]

A.S TORRIKOPI

SE

NW



FOLLDAL VERK A/S - AMOCO NORWAY J.V.

FOLLDAL - PROJECT N-81-1

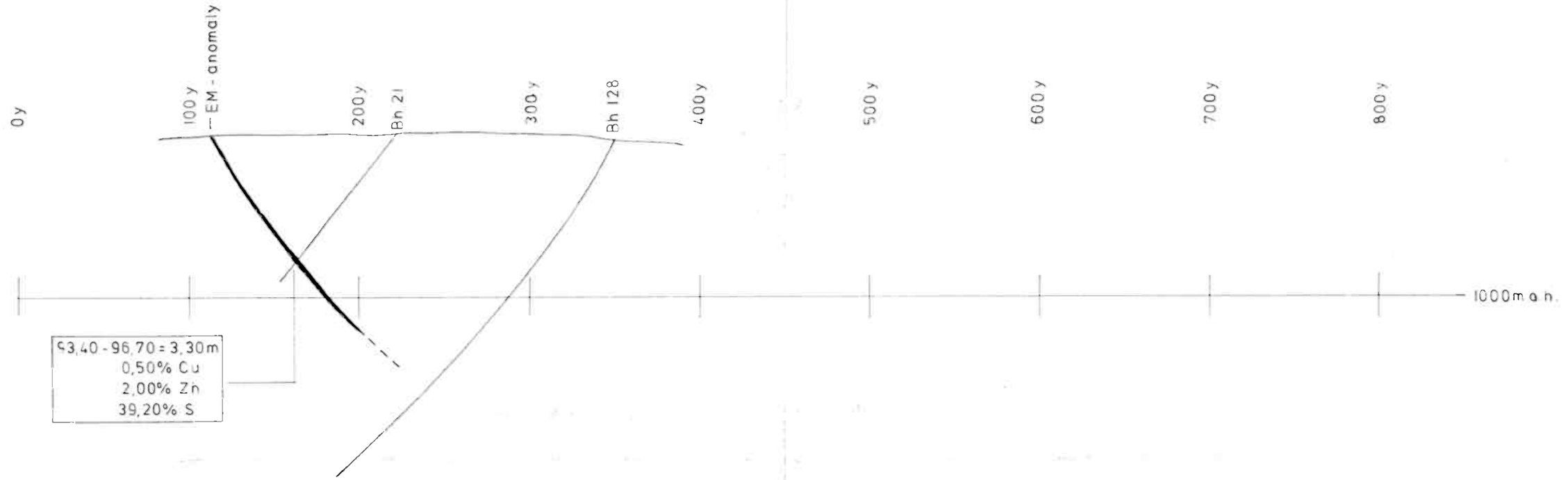
Grimsdalsgruva

Section -800x
Bh 140

Date 2/84	Scale: 1: 2500	KRAUSE

SE

NW



FOLLDAL VERK A/S - AMOCO NORWAY J.V.

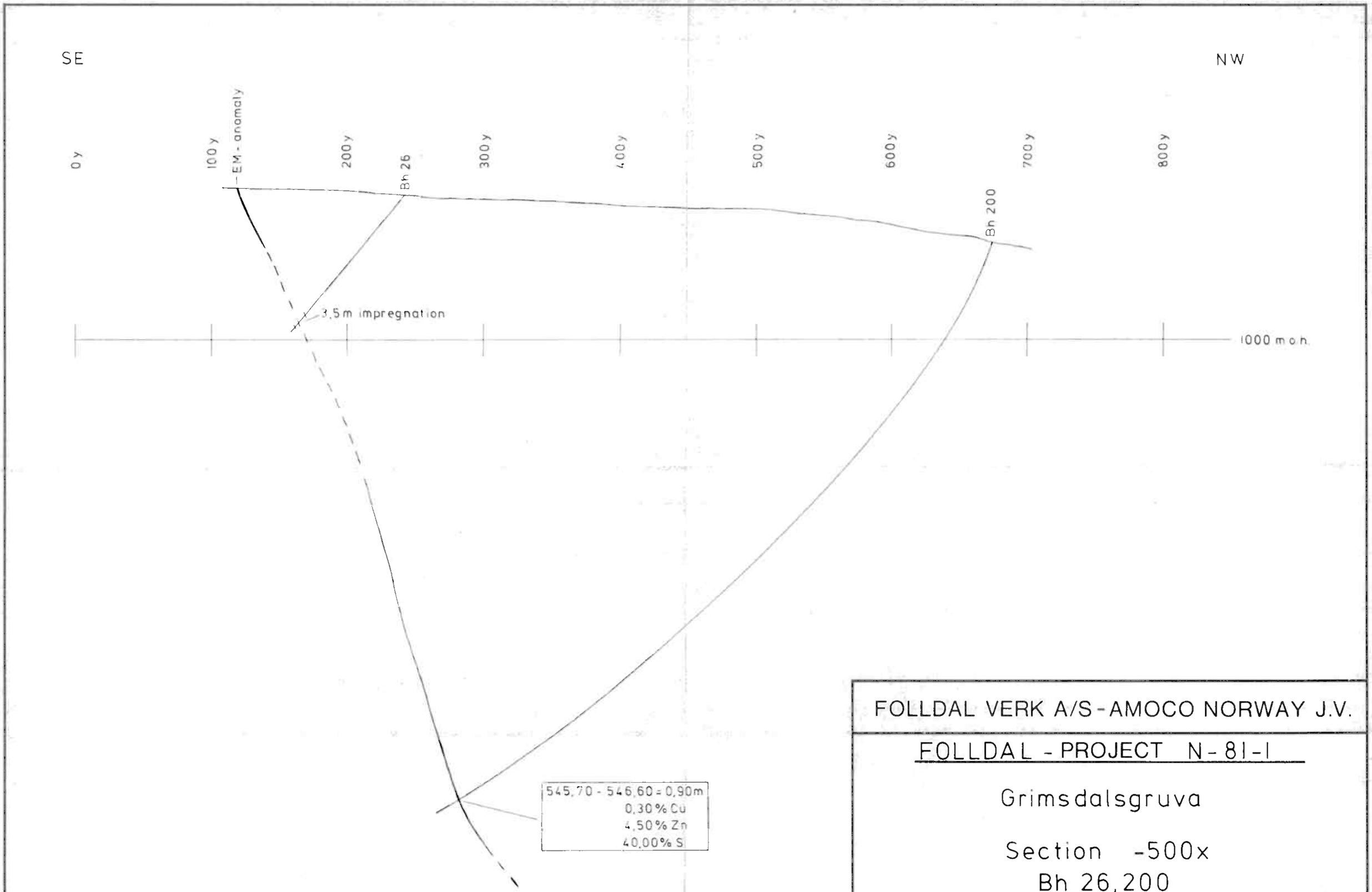
FOLLDAL - PROJECT N-81-1

Grimsdalsgruva

Section -700x
Bh 21, 128

Date 2/84	Scale: 1: 2500	KRAUSE

A.S TORRKOPI



FOLLDAL VERK A/S - AMOCO NORWAY J.V.

FOLLDAL - PROJECT N-81-1

Grimsdalsgruva

Section -500x
Bh 26,200

Date 2/84	Scale: 1:2500	

SE

NW

0 y

100 y

EM - anomaly

200 y

300 y

400 y

Bh 141

600 y

Bh 143

800 y

1000 m o.h.

373,45 - 375,75 = 2,30 m
0,77% Cu
0,88% Zn
27,15% S

555,10 - 558,40 = 3,30 m
0,59% Cu
1,50% Zn
39,3% S

FOLLDAL VERK A/S - AMOCO NORWAY J.V.

FOLLDAL - PROJECT N - 81 - 1

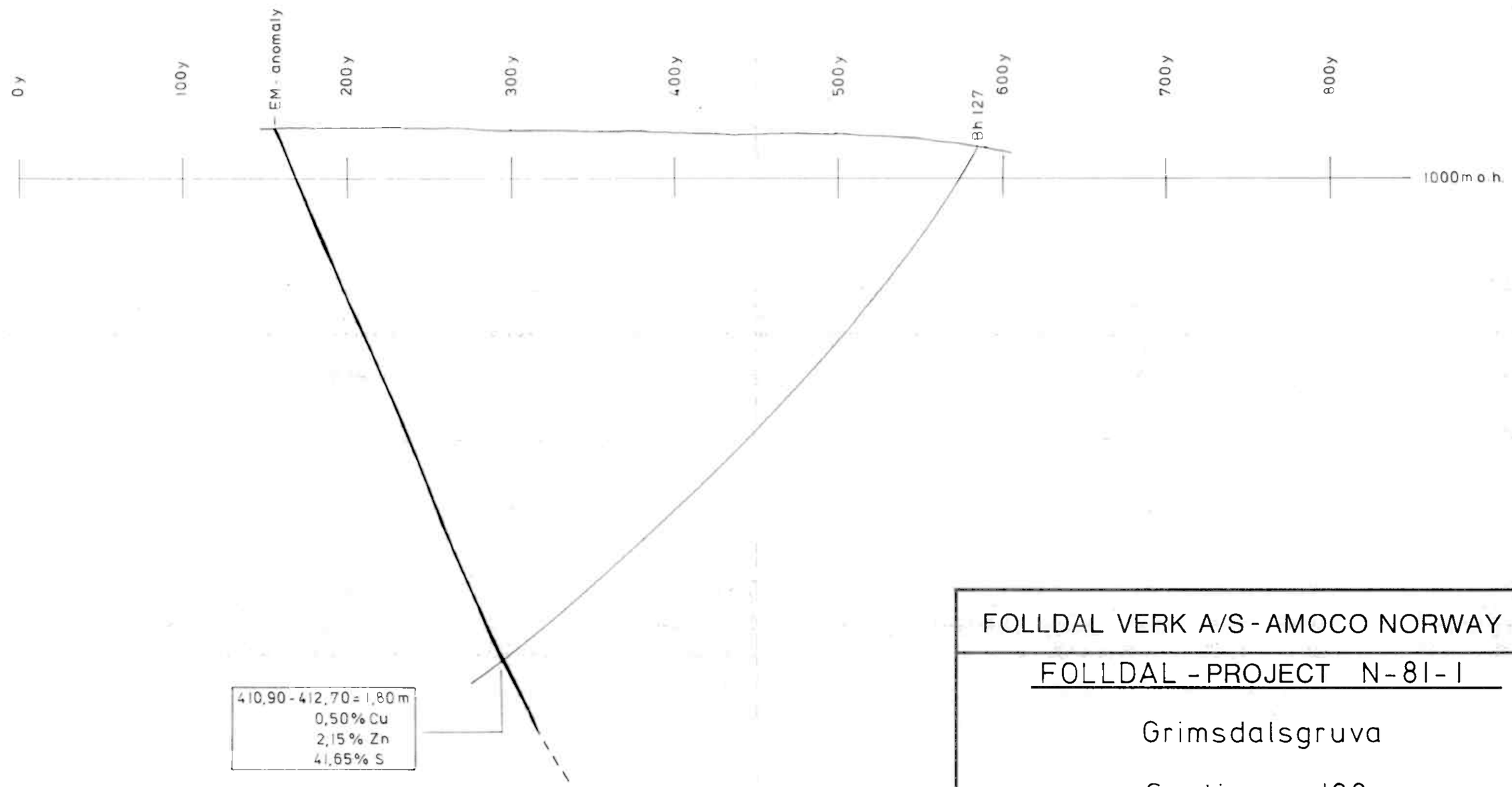
Grimsdalsgruva

Section - 300x
Bh 141, 143

Date 2/84	Scale: 1: 2500	ARAUSE

SE

NW



FOLLDAL VERK A/S - AMOCO NORWAY J.V.

FOLLDAL - PROJECT N-81-1

Grimsdalsgruva

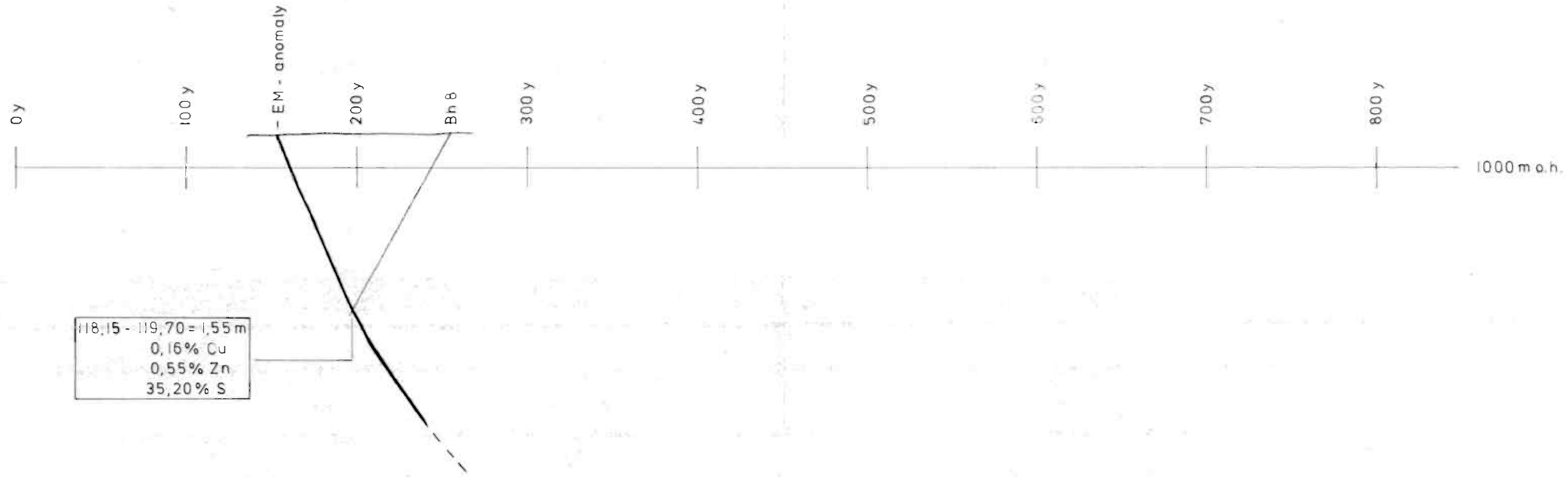
Section -100x

Bh 127

Date 2/84	Scale: 1:2500	KRAUSE

SE

NW



FOLLDAL VERK A/S - AMOCO NORWAY J.V.

FOLLDAL - PROJECT N-81-1

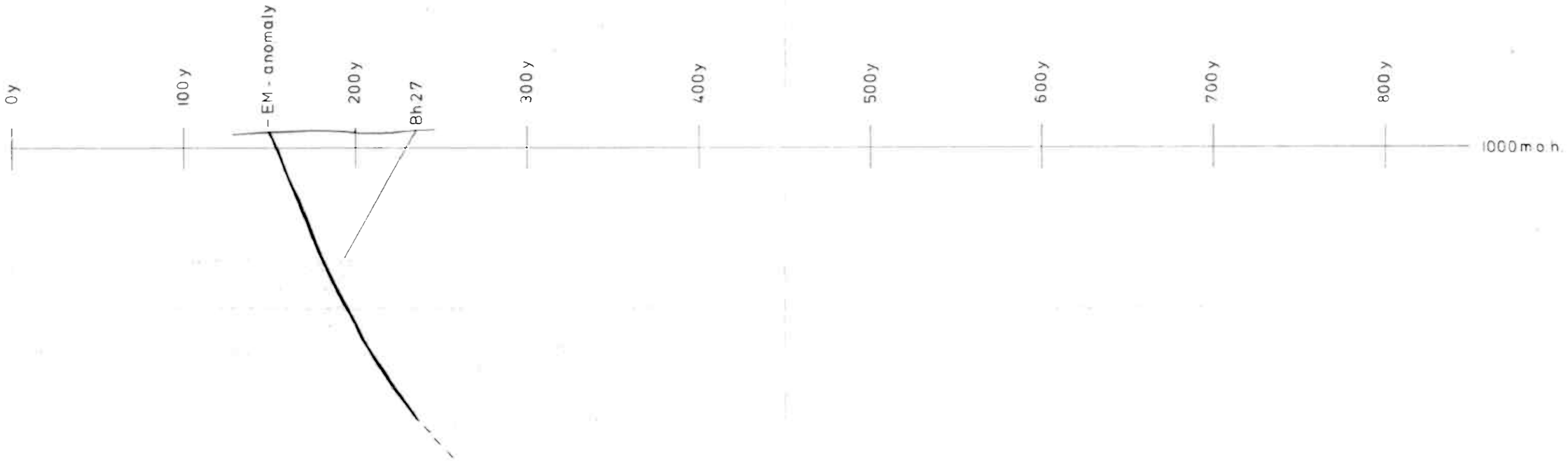
Grimsdalsgruva

Section -50x
Bh 8

Date 2/84	Scale: 1: 2500	ARANSE

SE

NW



FOLLDAL VERK A/S - AMOCO NORWAY J.V.

FOLLDAL - PROJECT N-81-1

Grimsdalsgruva

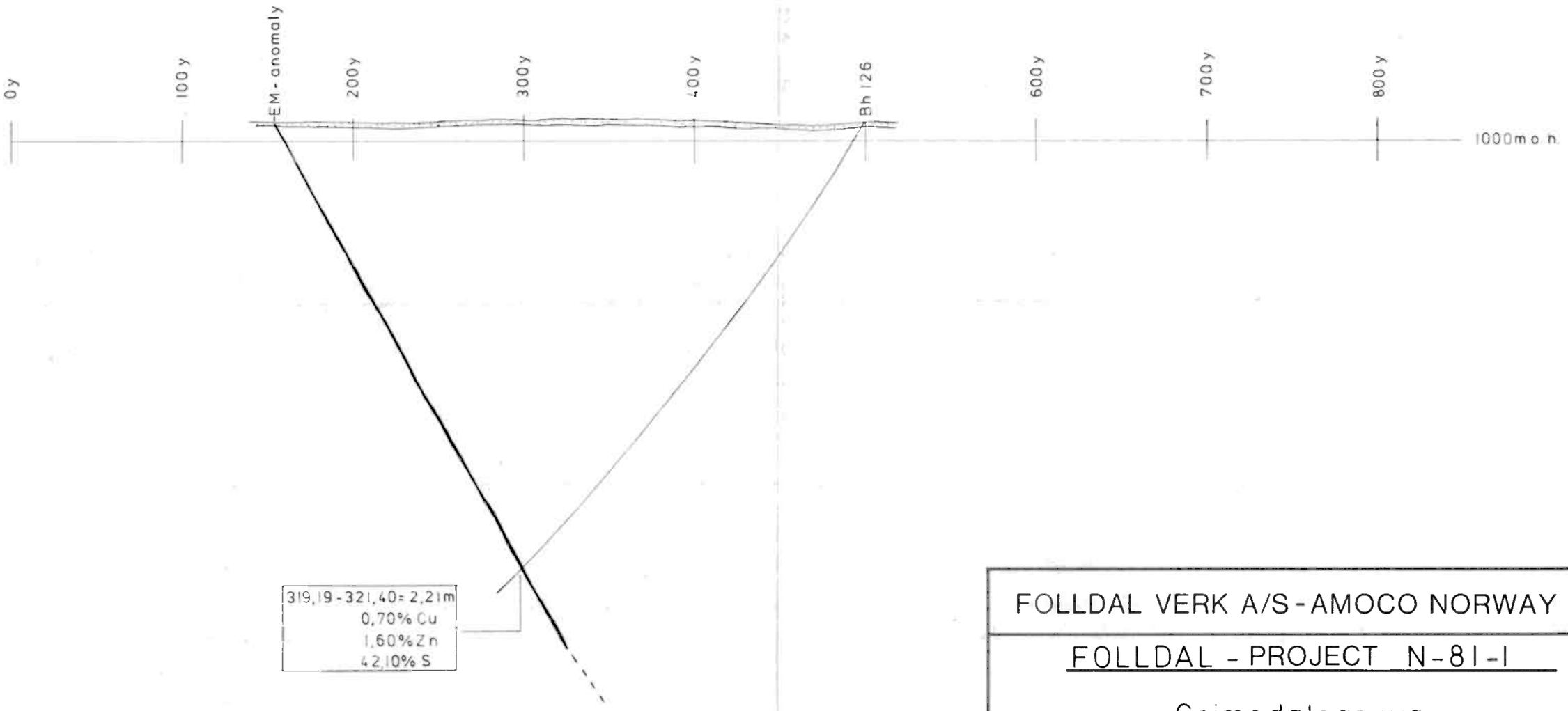
Section 35x
Bh 27

Date 2/84	Scale: 1: 2500	ÅRHAUSE

A.S TORRKOPI

SE

NW



FOLLDAL VERK A/S - AMOCO NORWAY J.V.

FOLLDAL - PROJECT N-81-1

Grimsdalsgruva

Section 100x
Bh 126

Date 2/84	Scale: 1: 2500	ARNUSE

A S TORRKOPI

SE

NW

FOLLDAL VERK A/S - AMOCO NORWAY J.V.

FOLLDAL - PROJECT N-81-1

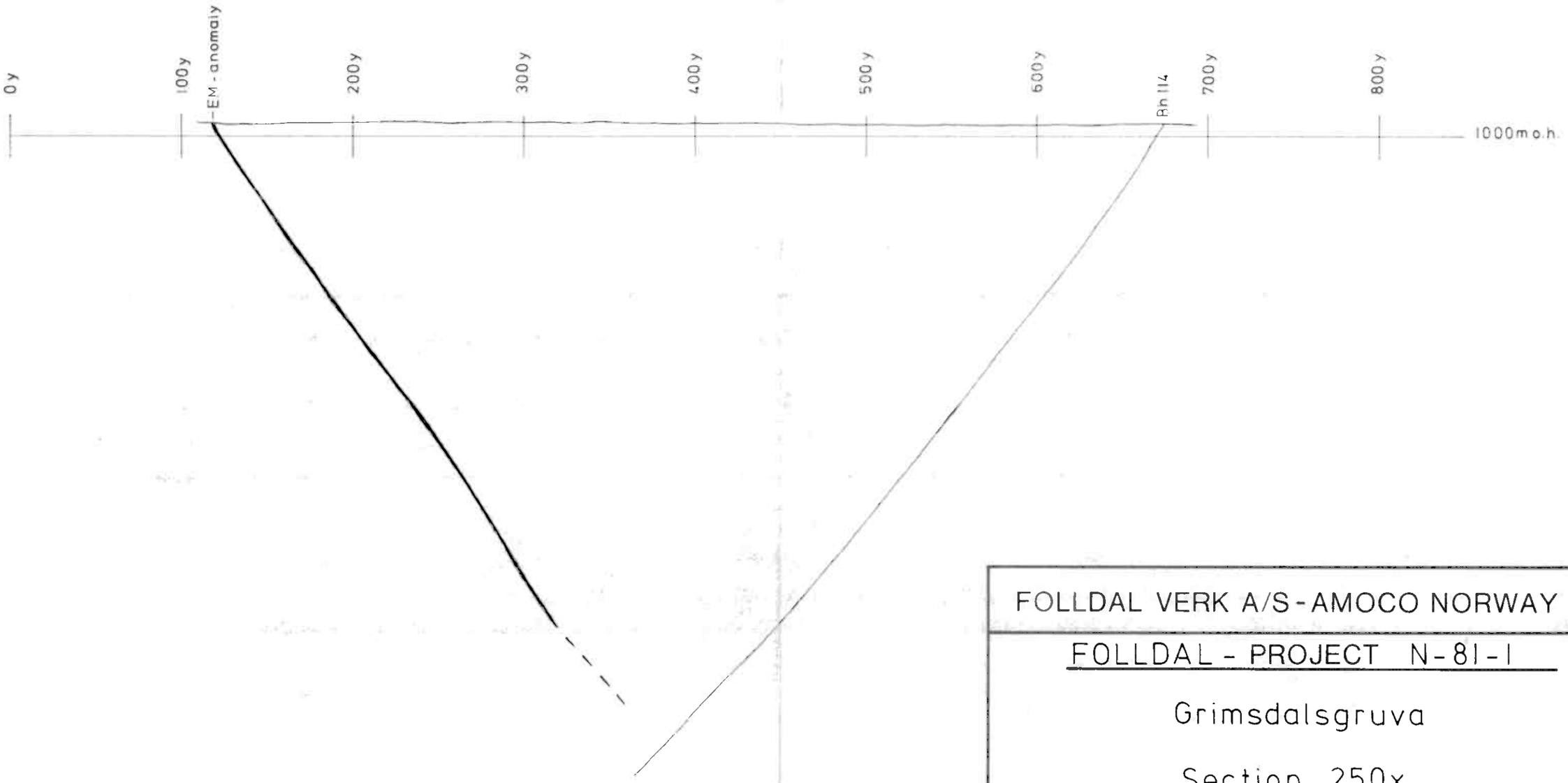
Grimsdalsgruva

Section 200x
Bh 6

Date 2/84	Scale: 1: 2500	HRAUSE

SE

NW



FOLLDAL VERK A/S - AMOCO NORWAY J.V.

FOLLDAL - PROJECT N-81-1

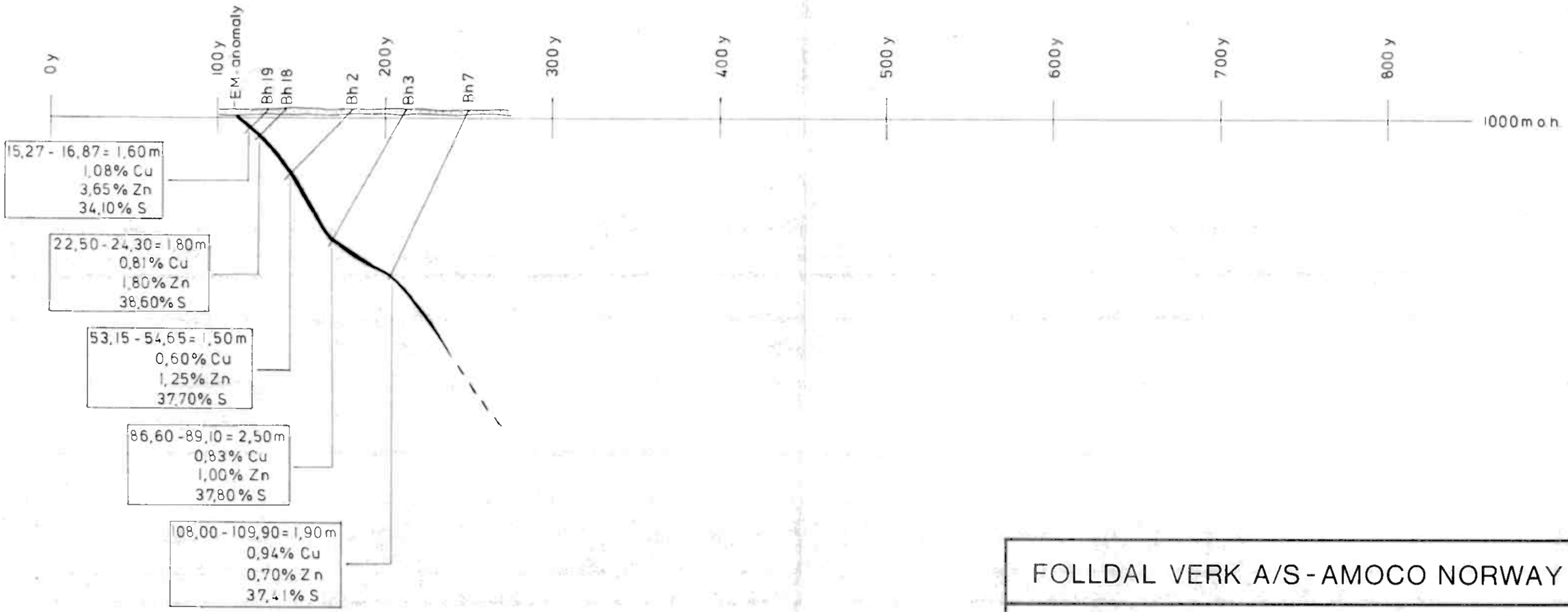
Grimsdalsgruva

Section 250x
Bh 114

Date 2/84	Scale: 1: 2500	KRAUSE

SE

NW



FOLLDAL VERK A/S - AMOCO NORWAY J.V.

FOLLDAL - PROJECT N-81-1

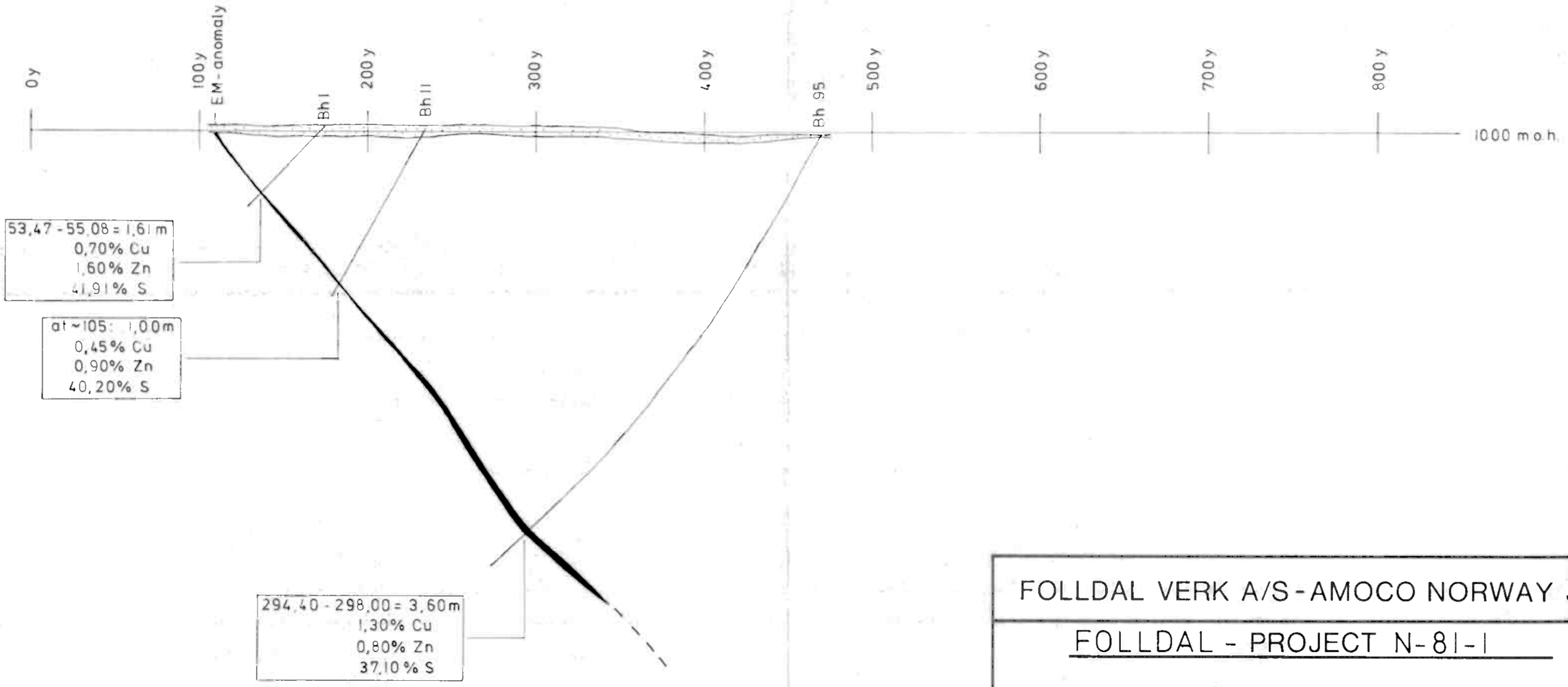
Grimsdalsgruva

Section 300x
Bh 2,3,7,18,19

Date 2/84	Scale: 1:2500	HRAUSE

SE

NW



FOLLDAL VERK A/S - AMOCO NORWAY J.V.

FOLLDAL - PROJECT N-81-1

Grimsdalsgruva

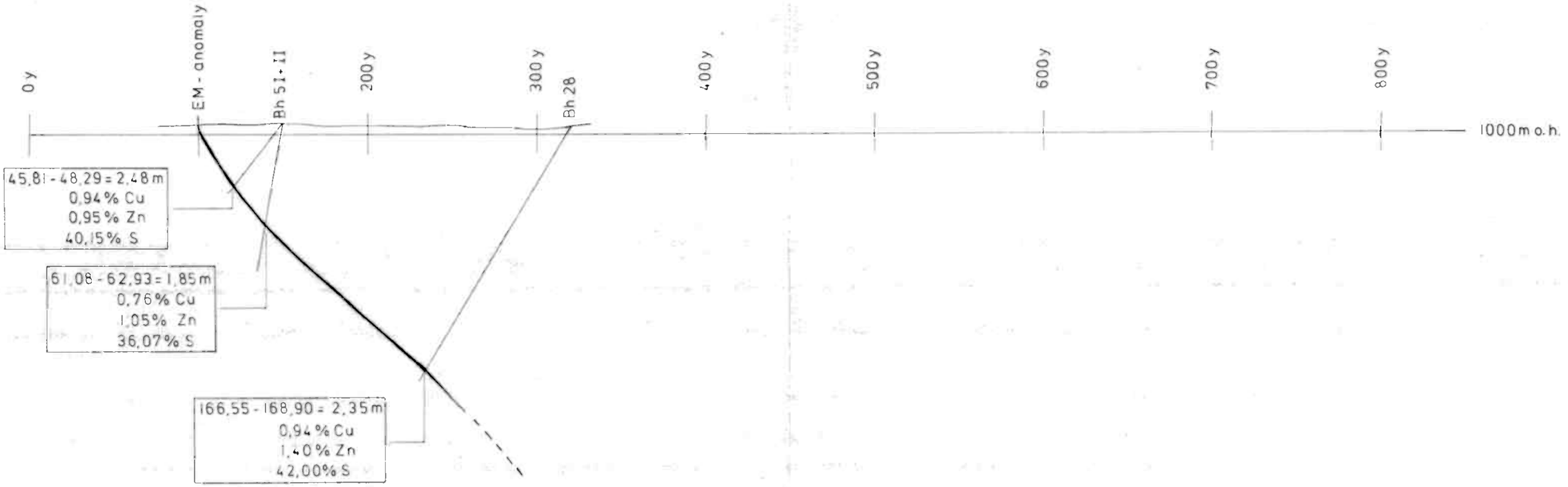
Section 450 x
Bh I, II, 95

Date 2/84	Scale: 1: 2500	ARKIV

A.S TORRKOPI

SE

NW



FOLLDAL VERK A/S - AMOCO NORWAY J.V.

FOLLDAL - PROJECT N-81-I

Grimsdalsgruva

Section 600x

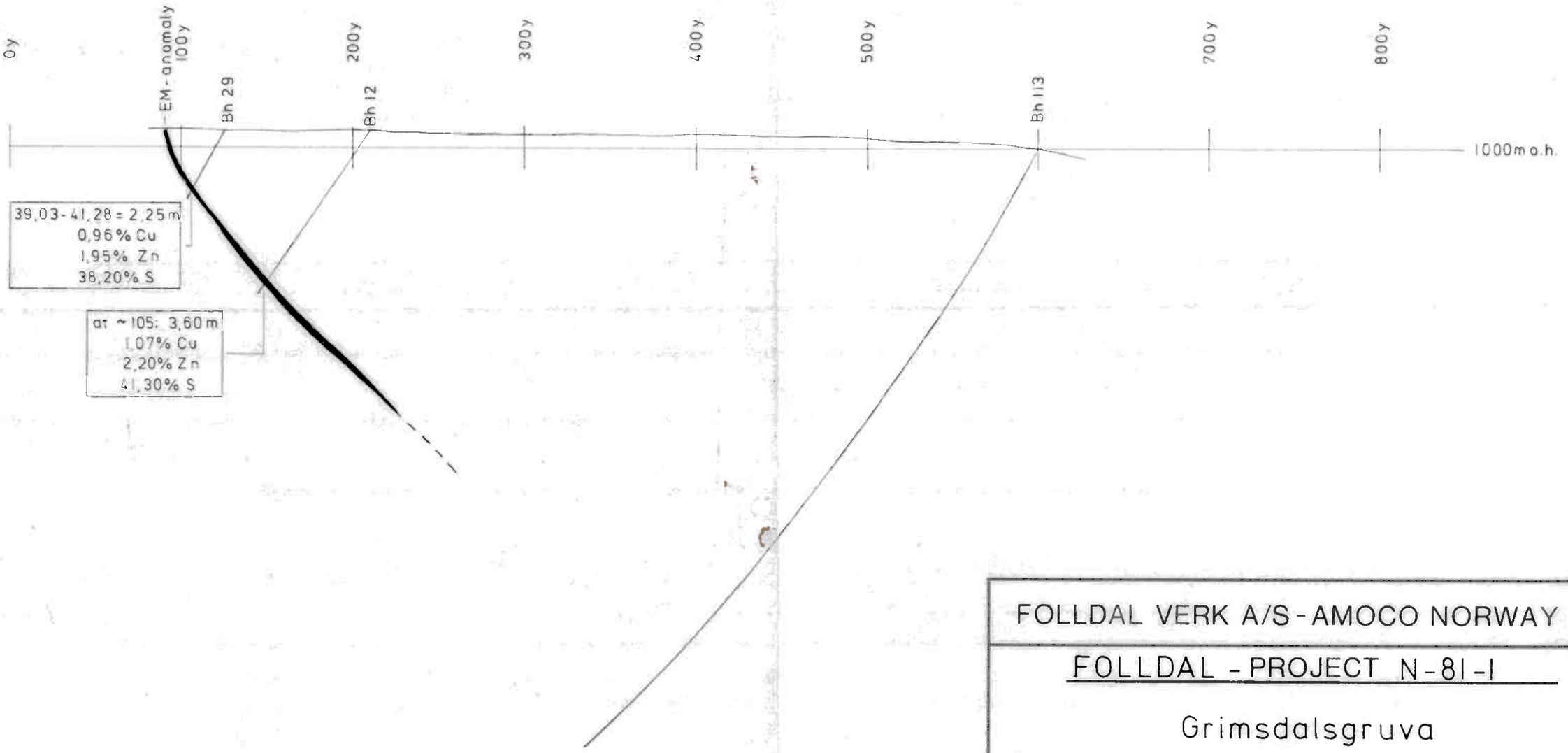
Bh 5I+II, 28

Date 2/84	Scale: 1: 2500	KRAUSE

A.S TORRICH

SE

NW



FOLLDAL VERK A/S - AMOCO NORWAY J.V.

FOLLDAL - PROJECT N-81-1

Grimsdalsgruva

Section 700 x

Bh 12, 29, 113

Date 2/84	Scale: 1: 2500	