Bergvesenet

Postboks 3021, 7002 Trondheim

Rapportarkivet

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Falconbridge	Sul 139-7-71			

Tittel

Report on induced polarization and magnetic survey - Mykleåsen grid. Evje-Iveland 1971.

Forfatter	Dato	Bedrift
F Nixon	1971	Sulfidmalm A/S

Kommune	Fylke	Bergdistrikt	1: 50 000 kartblad	1: 250 000 kartblad
Evje og Hornnes	Aust-Agder	Østlandske	15123	Mandal

Fagområde	Dokument type	Forekomster
Geofysikk	Rapport	Mykleåsen Flåt gruve
Råstofftype	**Emneord**	
Malm/metall	Ni Cu	

Sammendrag

Mangler:
Bilag 2, geologisk kart med stikningsnett og anomaliene.
Bilag 5, Magnetisk annomalikart.
Bilagene 6-15, Individuelle IP plott med merkede og nummererte annomalier.

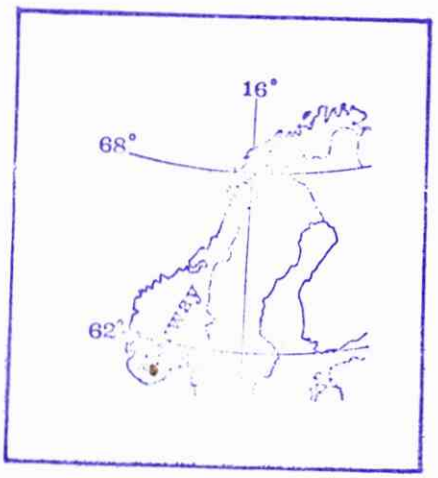
FOR FALCONBRIDGE NIKKELVERK A/S

A/S SULFIDMALM

PROJECT 905-7.

REPORT ON AN INDUCED POLARIZATION AND MAGNETIC SURVEY - MYKLEÅSEN GRID. 1971.

F. NIXON



SUMMARY OF PERVIOUS WORK

1) The area in question lies in close proximity to the now abandoned Flaat Nickel Mine which between 1889 and 1946 produced 2,7 m.t. of 0,75% Ni. Sulfidmalm have mapped the area in detail and carried out magnetic, soil sampling and EM surveys in an area to the south of the mine. These surveys all gave fairly negative results although some soil anomalies were picked up. Working on the assumption that the mined ore body might have a southerly extension at depth, a drill hole was put down in 1970. A total length of 808 m was drilled without encountering sulphides of significance.

2) WORK CARRIED OUT

The I.P. survey was carried out using a McPhar Variable Frequency Unit (Model P.660) with operating frequencies of 0,3 and 5 cps. McPhar supplied one operator (A.K. Wood), Sulfidmalm being responsible for supplying the rest of the four man crew. The grid lines were chained by local help hired by Sulfidmalm. The project was supervised and co-ordinated by the writer.

Interpretation of the results has been undertaken by D.B.Sutherland, Chief Geophysicist, Falconbridge Nickel Mines Ltd.

The following profiles were run:

Line	Dipole separation	E/W Extension	Total length
50 S	50 m	0 -650W	650 m
150 S	50 m	200E-650W	850 m
250 S	50 m	200E-850W	1050 m
250 S	25 m	225E-700W	925 m
350 S	50 m	200E-750W	950 m
450 S	50 m	480E-700W	1180 m
450 S	25 m	150W-875W	725 m
550 S	50 m	0 -750 W	750 m
650 S	50 m	0 -750 W	750 m
750 S	50 m	0 -750 W	750 m
		Total line km	8.550 km

A magnetometer survey was carried out by L. Nessvoll of Sulfidmalm using a McPhar M700 Fluxgate magnetometer. The mag. survey was run in the same grid lines as the I.P. with fill in lines so that the maximum distance between profiles was 50 m. A total of 10,4 profile-kms were measured with approx. 1200 readings.

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3) RESULTS

The anomalies discovered have been divided into 3 classes. Class 1 - anomalies being the strongest and most interesting anomalies, class 3 being the weakest.

In the following table the anomalies are numbered and their location and class given.

LIST OF ANOMALIES - MYKLEÅSEN GRID

No.	Line	Dipoles	E/W Coordinates	Class
1	50 S	50 m	200 W - 250 W	3
2	50 S	50 m	325 W	Possibly 3
3	150 S	50 m	50 W - 100 W	2
4	150 S	50 m	250 W - 300 W	2
5	150 S	50 m	350 W - 425 W	2
6	250 S	50 m	300 W - 350 W	3
7	250 S	50 m	425 W - 475 W	2
8	250 S	50 m	525 W - 600 W	3
9	250 S	25 m	400 W - 425 W 425 W - 450 W	2 3
10.	250 S	25 m	500 W - 525 W	1
11	250 S	25 m	565 W - 585 W	3
12	350 S	50 m	350 W - 400 W	2
13	350 S	50 m	475 W - 500 W	2
14	350 S	50 m	560 W - 590 W	3
15	450 S	50 m	140 E - 160 E	3
16	450 S	50 m	150 W - 225 W	3
17	450 S	50 m	250 W - 300 W	3
18	450 S	50 m	325 W - 375 W	3
19	450 S	50 m	500 W - 550 W	3
20	450 S	25 m	280 W - 320 W	2
21	450 S	25 m	350 W - 375 W 375 W - 425 W	2 3
22	450 S	25 m	510 W - 550 W	2
23	550 S	50 m	200 W - 300 W	3
24	550 S	50 m	460 W - 500 W 500 W - 550 W	3 2

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No.	Line	Dipoles	E/W Coordinates	Class
25	550 S	50 m	600 W - 650 W	2
26	650 S	50 m	150 W - 190 W	2
27	650 S	50 m	250 W - 350 W	2
28	650 S	50 m	450 W - 550 W	3
29	750 S	50 m	475 W - 550 W	2
			550 W - 625 W	3

The magnetic data is presented as an isomnomaly map in scale 1: 1.000.

4) INTERPRETATION

D.B. Sutherland's verbal and written comments to the writer have been incorporated into this section.

The striking thing about the Mykleåsen data is the very high frequency effects as compared with the other grids in this area. On 50 m dipoles the local anomalies are usually only two or three times greater than the high background anomalies, and judging from the 50 m data these anomalies may represent quite small variations in a broad zone of fairly continous response. However, positive P.F.E. increases are apparent on all the anomalies obtained in detailing lines 250 S and 450 S with 25 m dipoles. This is probably because the dipole length is closer to the width of the sources. There are no larger changes in M.F. with the shorter dipoles, but the observed increases suggest confined zones of increased metallic content rather than slight variations in a broad source, these small variations may have an important significance. Nevertheless, it is difficult to show any of the 50 m responses as strong anomalies since they are usually only two to three times local background and the contour patterns are not well developed. Furthermore line to line correlation is difficult, although contoured N = 1 metal factor values show in some cases fairly good correlation between two lines, the general trend of these anomalies being slightly east of north.

In general the I.P. responses obtained are to the west of the base line, between line 50 S and 750 S and covering a broad E/W zone of up to 600 m in extension. No significant I.P. effects were picked up over the mined ore body.

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The magnetic survey outlined a broad area of negative values in the same broad area as the I.P. responses. This negative area contains magnetic high "islands" and gamma values vary considerably over short distances.

Most of the I.P. anomalies are associated with magnetic lows.

The rock in the area is hornblende diorite which varies in composition and texture. This rock is known to contain magnetite in some places up to 5%. The general strike is N/S with dips to the east. The magnetic map confirms this roughly N/S trend. These diorite rocks are cut by pegmatites which form north south trending ridges, some of these pegmatites locally contain magnetite and molybdenum, and pyrite have been noted in the contact zone of one pegmatite. Some ofthe I.P. anomalies fall in the general region of pegmatites.

Because of the type of anomalies obtained and a consideration of the geological and magnetic data, there is a possibility that the I.P. anomalies are being caused by local concentrations of magnetite in the diorite.

A short description of the anomalies follows.

Anomaly 1

This indicates a weak shallow source centered on 225 W. The metal factor values are about two times background. The anomaly is situated in a magnetic low, no outcrops in the vicinity.

Anomaly 2

This is a possible weak shallow source centered on 325 W. The magnetic values in this area are positive, but less than 500 gamma.

Anomaly 3

This is a weak anomaly with a shallow source and represents a weak increase in a very extensive background. Associated with negative gamma values.

Anomalies 4 and 5

Instead of two zones as shown on the plan map and I.P. plot, this might represent one zone instead of two, with a near vertical source. This single source would be centered on a definate mag low.

Anomaly 6, 7, 8, 9, 10, 11.

Small increases on a high background and could represent a small improvement in metallic content. Anomalies 6 and 7 might possibly

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represent one source instead of two. This line (250 S) was detailed with 25 m dipoles. Anomaly 6 showed a slight increase in M.F. values. Anomaly 9 (anomaly 7 on 50 m) shows some increase in M.F. values and indicates that there is some depth to the best portion of the source.

Anomaly 8, when detailed on 25 m, seems to split into two definite sources: - anomalies 10 and 11. Anomaly 10 shows an approximate increase of 3 times 50 m data and indicates a narrow shallow source. This anomaly is associated with a negative mag. area.

Anomaly 11 indicates a narrow source some 50 m deep. This anomaly is located near a fairly large pegmatite which contains coarse magnetite clumps. Magnetic values here are between 0 and + 1000 gamma.

Anomalies 12 and 13

These indicate narrow shallow improvements over background, only being 50% higher than background. Anomaly 12 is located on a negative magnetic anomaly whereas anomaly 13 is located on a positive (+ 1500 gamma) anomaly.

Anomaly 14

Indicates a shallow narrow, weak source.

Anomaly 15

Small, shallow anomaly located on east side of the ore body, associated with outcrops of pegmatite and ore diorite.

Anomalies 16, 17, 18, 19, 20, 21, 22.

All the anomalies are located on line 450 S, Nos. 17, 16, 18 and 19 being obtained on 50 m spreads, Nos. 20, 21 and 22 on 25 m spreads.

The anomalies obtained with 50 m data, all represent small increases on a very high backgroundd and may indicate a small increase of metallic content. All are associated with definite magnetic negative areas.

On 25 m spreads there are definite positive P.F.E. increases indicating zones of increased metallic content rather than slight variations in a broad source. Anomaly 20 is well developed, contains source 25 m + deep. Interesting anomaly.

The interpretation of anomaly 21 is difficult, the response being complex.

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Anomalies 23, 24, 25.

Small increases on background. 24 and 25 might be one source instead of two. Anomalies 24 and 25 are located on the eastern margins of the diorite complex.

Anomaly 26

This indicates a narrow source with a possible higher metallic content than others of these anomalies. Is interesting in that it lies to the east of the broad mag. low.

Anomaly 27

Indicates a wide source 100 m wide and shallow.

Anomaly 28

Indicates a weak broad source. Located at the eastern margins of the diorite.

Anomaly 29

Indicates a complex source that may improve with depth. P.F.E's are positive, but patterns are broad. Located on diorite contact.

5) RECOMMENDATIONS AND CONCLUSIONS

The association of most of the anomalies with distinct magnetic features together with the fact that the host rock (hornblende diorite) is known in some parts to be greatly enriched in magnetite leads to the fact that some of these I.P. might reflect magnetite concentration.

On the 50 m data it is difficult to show any of the responses as streng anomalies, but nevertheless all of the moderate responses are worthy of further consideration, particularly with a mine nearby. There seems to be some correlation with mag., but little confirmation with EM is anticipated from the resistivity levels of the wider sources. However, E.M. confirmation of the narrower indications such as 400 W on line 250 S and 150 W on line 650 S would enchance their importance. It is recommended that this EM work is carried out.

A geochemical soil sampling program is in hand to test the obtained IP anomalies. Results to date suggest that there is only partial correlation between the I.P. and soil results.

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Because of the proximity of Europe's one time largest nickel mine, it is recommended that these anomalies are followed up by some EM work and drilling. A Winkie type drill will be sufficient to test most of the anomalies.

LIST OF ENCLOSURES

1) Location map showing area of survey.

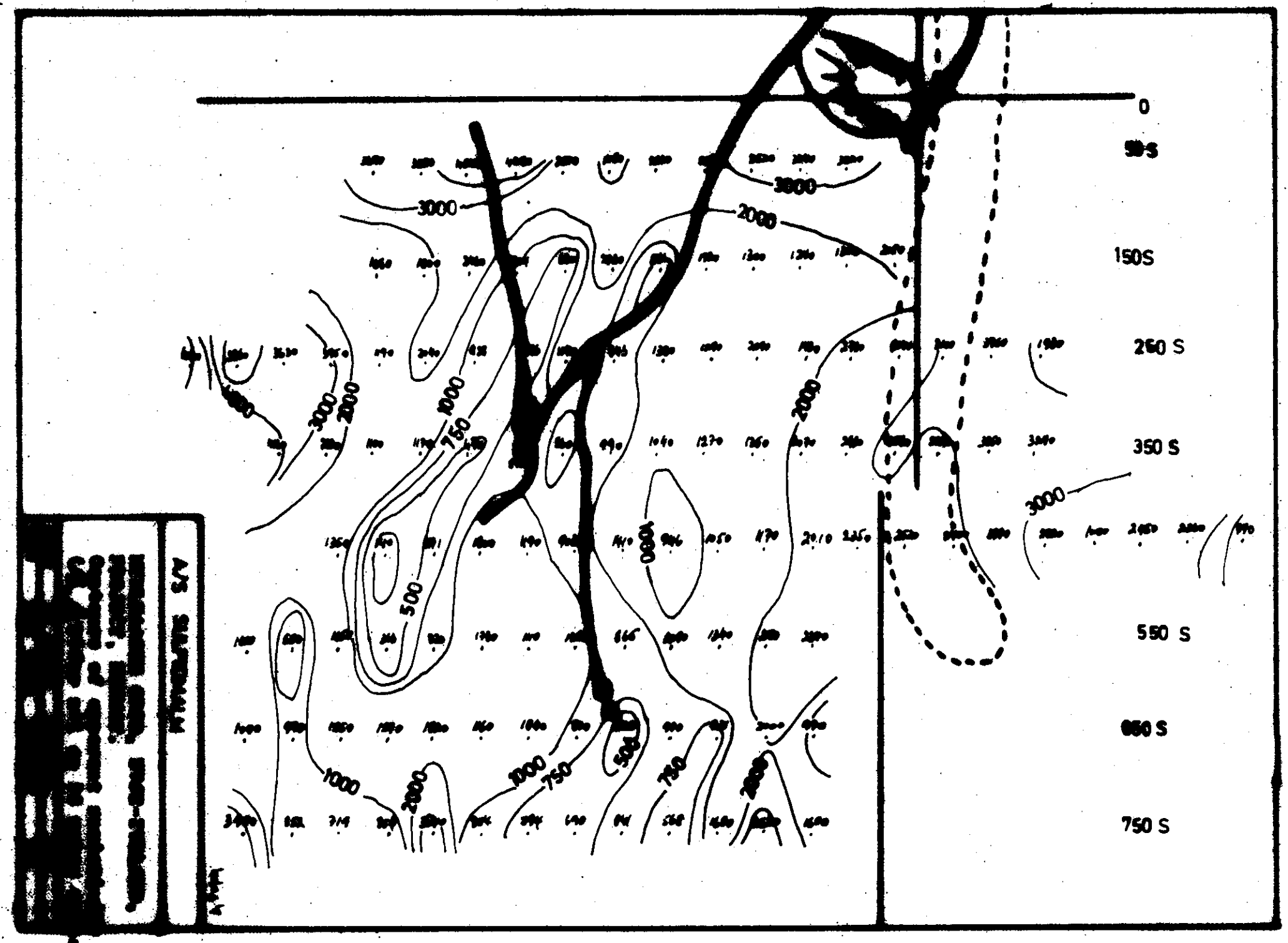
2) Geological map of Mykleåsen with grid lines and anomalies plotted and numbered. 1: 5.000.

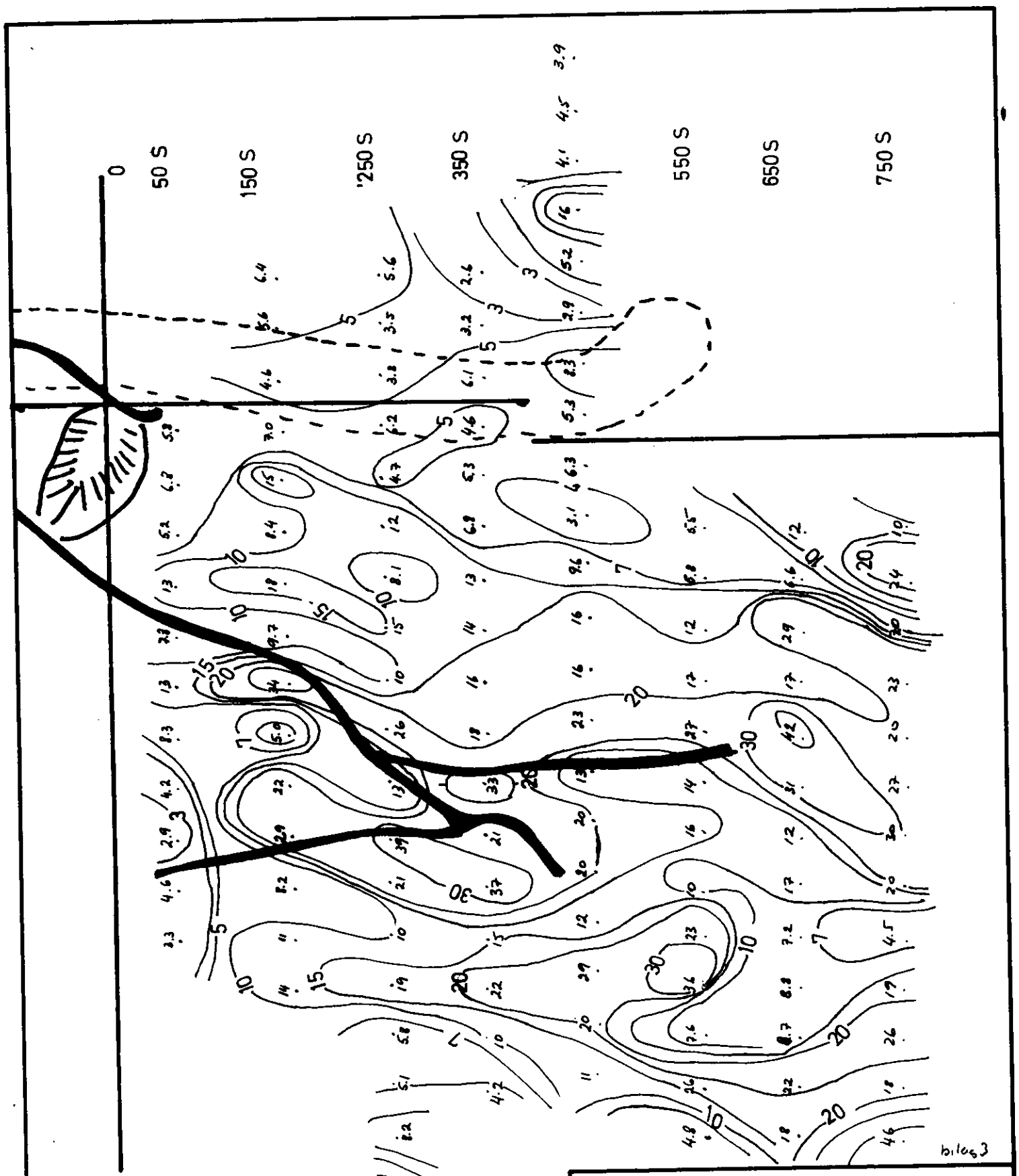
3) Transparent overlay showing contours of metal factors at N = 1 on 50 m dipoles. 1: 5.000.

4) Transparent overlay showing contours of apparent resistivity for N = 1 on 50 m dipoles.

5) Magnetic anomaly map 1: 1000.

6-15) Individual I.P. plots with anomalies marked and numbered.

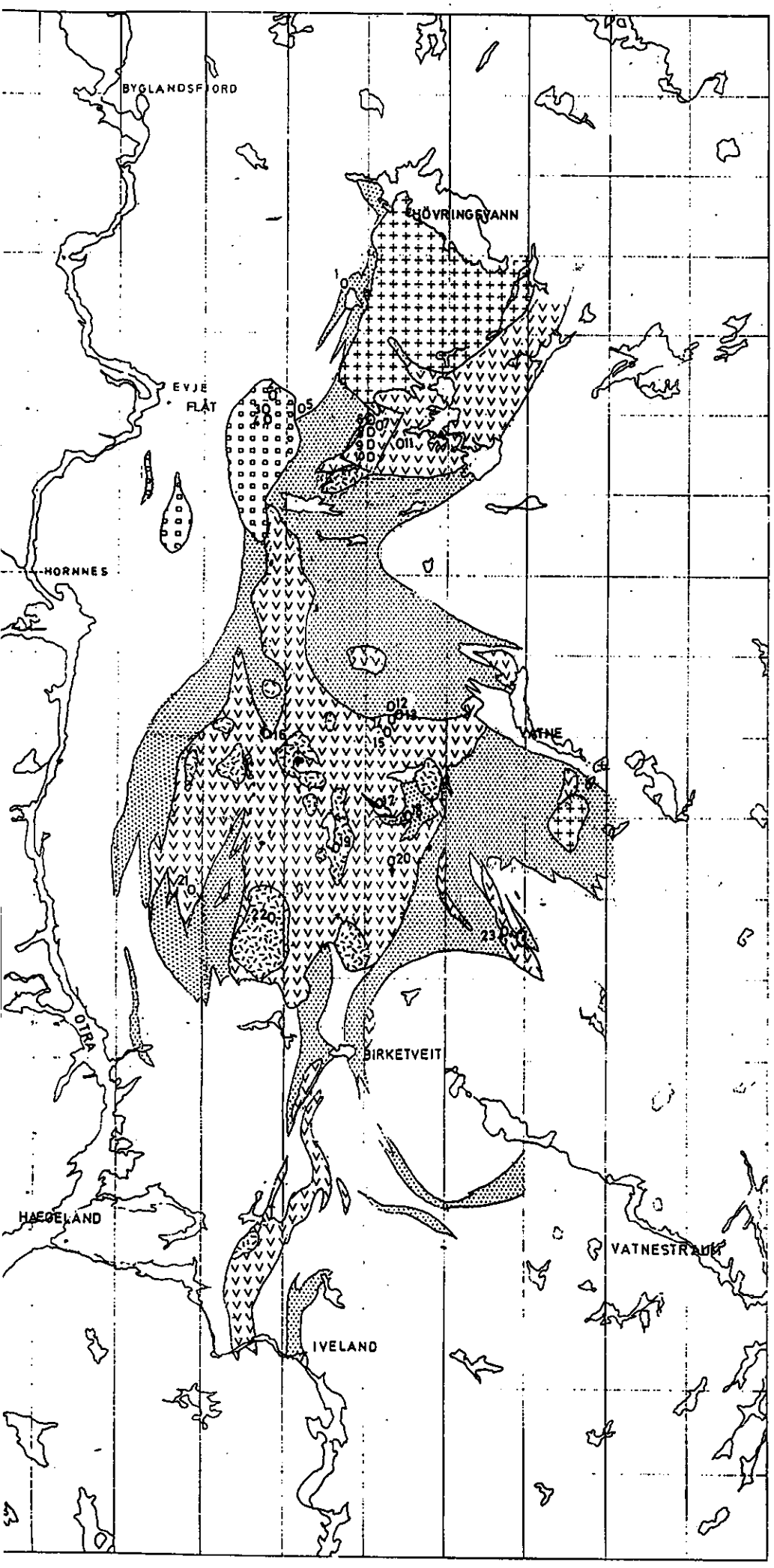

0
50 S
150S
250 S
350 S
550 S
650 S
750 S
3000
2000
1000
750
500
2000
3000



FALCONBRIDGE NICKEL MINES LTD.

MYKLEAASEN GRID, EVJE-IVELAND PROJECT, NORWAY - Contours of Metal Factors at n= 1 on 50 metre spreads.

SCALE	1: 5,000	DRAWN	FN
DATE	MAY 1971	TRACED	RS



EVJE-IVELAND ARE

- GRANITIC AND DIORITIC GNEISS
- AMPHIBOLITE FOLIATED AND MASSI
- HORNBLENDE GNEISS
- GABBRO
- HORNBLENDE DIORITE
- ULTRABASIC
- GRANITE

1 st. AAR..AU PROSPECT
2 FLATERYGD "
3 FLÅT MINE
4 MYKLEÅSEN PROSPECT
5 STABBESTEN "
6 HESTÅSEN "
7 LANGTJERN "
8 LOMTJERN "
9 GULREGN "
10 BYTTINGSMYR "
11 VIKSTÖL "
12 N. PAASCHE "
13 S. PAASCHE "
14 BEKKEN "
15 ORREKNAPPEN "
16 LITJERN "
17 KLEPPTJERN "
18 EPTEVASSMYR "
19 MÖLLAND (hydrothermal)
20 HAALAND "
21 LANDAAS "
22 SKRIPELAND "
23 ELSHAUGEN

AAVITSLANDSHEIA GRID AREA

0 1 2 3 4 5KM

B C D E F G H I

EVJE-IVELAND AREA

BYGLANDSFJORD
HÖVRINGSVANN
EVJE
FLÅT
HORNNES
VATNE
OTRA
BIRKETVEIT
HAEGELAND
IVELAND
VATNESTRAUM

GRANITIC AND DIORITIC GNEISS
AMPHIBOLITE FOLIATED AND MASSIVE VARIETIES
HORNBLENDE GNEISS
GABBRO
HORNBLENDE DIORITE
ULTRABASIC
GRANITE

1	st. AAFLAU	PROSPECT
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3	FLÅT MINE	
4	MYKLEÅSEN	PROSPECT
5	STABBESTEN	"
6	HESTÅSEN	"
7	LANGTJERN	"
8	LOMTJERN	"
9	GULREGN	"
10	BYTTINGSMYR	"
11	VIKSTÖL	"
12	N. PAASCHE	"
13	S. PAASCHE	"
14	BEKKEN	"
15	ORREKNAPPEN	"
16	LITJERN	"
17	KLEPPTJERN	"
18	EPTEVASSMYR	"
19	MÖLLAND	"
20	HAALAND	"
21	LANDAAS	"
22	SKRIPELAND	"
23	ELSHAUGEN	

AAVITSLANDSHEIA GRID AREA.

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1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19

A B C D E F G H I J