Bergvesenet

Postboks 3021, 7002 Trondheim

Rapportarkivet

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Falconbridge	Sul 420-76-20	Sulfidmalm A/S		

Tittel

Investigations in the Kvikne region, 1976.
Geophysical survey and diamond drilling in the Olkar grid.

Forfatter	Dato	Bedrift
R Sivertsen F. Nixon	1976	Sulfidmalm A/S

Kommune	Fylke	Bergdistrikt	1: 50 000 kartblad	1: 250 000 kartblad
Tynset	Hedmark	Østlandske	16203	Røros

Fagområde	Dokument type	Forekomster
Geofysikk Boring	Rapport	Olkar
Råstofftype	**Emneord**	
Malm/metall	Cu Ni	

Sammendrag

A/S SULFIDMALM

INTER-OFFICE MEMORANDUM

Date: 28th March, 1977

To: Falconbridge Nikkelverk A/S

cc: R. Jahnsen, W. D. Harrison, H. T. Berry, F. Nixon, R. Sivertsen

From: J. B. Gammon

Subject:

Report No. 420/76/20. Olkar area, Kvikne.

Please find attached our report on investigations at the Olkar showing in 1976. The presence of Ni mineralization was confirmed but this seems to be of such erratic distribution and poor Ni:S ratio that no further work is warranted.

J B Gammon.

MOTTATT 31. 03. 77				BESV.	ARK.
X	ADM. DIR.		PROD. SJEF		
	ASS. DIR.		EL. LYSEAVD.		
	ADM. SJEF		M. L. AVD.		
	SKIPN. AVD.		R. & SM. AVD.		
	INNKJ. AVD.		EL. TEKN. AVD.		
	REGNSK. AVD.		INSTR. AVD.		
	PERSONALDIR.		MEK. AVD.		
	FORSKN. DIR.		PROSJ. AVD.		
X	R. Jahnsen				
3	SAKSBEARB.			Svar dato	

FOR FALCONBRIDGE NIKKELVERK A/S
A/S SULFIDMALM

Project 905-20

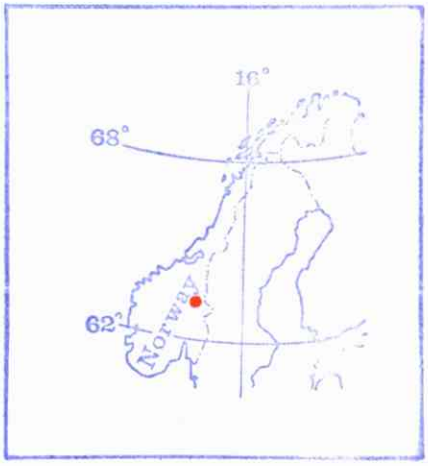
INVESTIGATIONS IN THE KVIKNE REGION 1976

Geophysical survey and diamond drilling in the Olkar grid.

By

R. Sivertsen

F. Nixon



Report No. 420/76/20

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Enclosures:

SUMMARY AND CONCLUSIONS

1. The Olkar showing,which was discovered to be nickel bearing in 1975,lies in a metagabbroic body enclosed by mica schist of Cambrian age.

2. Work carried out at Olkar this year:

   a) VLF-EM-survey (inst. Paulsen)

   b) Magnetic survey (inst. Scintrex MP2)

   c) Geological mapping and prospecting

   d) Drilling

3. Results:

   a) Both the VLF- and the mag.- anomaly arising out of the survey have a trend which is parallel to the main lineation direction. This is the same as for the other known bodies in the Kvikne area.

   b) Coincident mag. and VLF.

   c) During the drill programme several metagabbro lenses were intersected. Some of them contained sulphides as massive bands of po, cpy, pn. The bands vary in thickness between a few cm up to 2 m.

d) No strike length has been proved.

e) The Ni/S ratio in the mineralization is unfavourable.

4. No further work is considered in 1977.

INTRODUCTION

Olkar mine is situated in the river Orkla approx. 1 km south of Kvikne.

The location of the mine,so close to the river,caused much trouble. An attempt to lead the river away from the ore bearing horizon by digging a channel failed, and the mine was abandoned and is now completely inaccessable.

This mine was reported to be the richest in the area in copper.

On the dumps rich ore from depth can be seen.

In hand specimen the host rock can be seen to be composed of amphibole and plagioclase impregnated with chalcopyrite and pyrrhotite.
Grab samples (1975) assayed:

	Ni	Cu	S	
1.20.75	0.64	0.37	9.9	dump
40.20.75	1.5	1.6	23.6	outcrop
41.20.75	0.55	0.29	3.8	outcrop

GEOLOGY

The main rock units in the area are various schists (some graphitic), trondhjemite and metagabbro. The outcrops of these in the surveyed area are shown on the accompanying 1:5000 geological map.

The metagabbro containing the ore is enclosed in schists and graphitic units and has been intruded by trondhjemitic dykes. Strong deformation has obliterated the original relations between metagabbro and enclosing rocks.

Both from the drill sections and from geological mapping, it is indicated that the rocks have suffered strong deformation much as folding, shearing and also strong development of boudinage. This has probably caused the distribution of metagabbro and mineralization.

GEOPHYSICS

The following surveys were carried out:

1. VLF-EM measurements (Paulsen unit)

2. Magnetic " (Scintrex MP2)

The results are presented on the accompanying maps.

Complicating for both the magnetic survey and the VLF survey are graphitic zones, a series of fences, telegraph lines and general man-made pollution.

The VLF survey gave a long linear anomaly of varying intensity with a general NW-SE direction.

The magnetic picture is dominated by a central zone that is in part coincident with the VLF zone and also has varying intensity. In general both VLF and mag. anomaly are coincident with the lineation direction.

DIAMOND DRILLING

On the basis of the geophysical survey a short diamond drilling programme was planned and carried out to test the anomaly.

Different bands of metagabbro some with massive bands of sulphides are considered to be the anomaly cause.

The drilling was carried out by Terranor. Six holes were drilled with a total length of 269.9 m.

All assays have been carried out at Falconbridge Nikkelverk lab. Kristiansand.

Drill log data together with drill sections are enclosed.

The best intersection was in DDH2 - 1.78% Ni, 1.03% Cu over 1.5 m.

PROPERTY:

SUMMARY AND DIAMOND DRILLING RESULTS

LOCATION	HOLE NO	BEARING	DIP	LENGTH	MINERALIZATION						REMARKS
					FROM	TO	LENGHT	%Ni	%Cu	%S	
0/0	1	Vertical	90	61.4 m	5.85	7.0	1.15 m	0.47	0.09	7.3	Dissemination
					14.3	15.25	0.95 m	1.7	1.03	27.0	Massive
1.8S/15E	2	Vertcal	90	42.4 m	14.0	15.5	1.5 m	1.78	1.18	22.5	Massive
3.0N/27W	3	Vertical	90	32.6 m	22.0	23.0	1.0 m	0.38	0.17		
0/45.7W	4	Vertical	90	39.3 m	33.0	33.45	0.95 m	1.33	1.29	23.0	Massive

A/s SULFIDMALM

DIAMOND DRILL RECORD

LOCATION: 0/0 BEARING: DIP: 90 HOLE NO: 1 SHEET NO: 1

LOGGED BY: R. Sivertsen STARTED: 11.8.76 PROPERTY Olkar

CASING: 3.5 m FINISHED: 12.8.76 Kvikne

CORE SIZE: 35 m TESTS (CORRECTED):

From	To		Description
0	3.0		Overburden
3.0	5.15		Banded schist with basic/ultrabasic fragments.
			Some po & cp stringers.
5.15	5.85		Fine gr. trondhjemite dyke.
5.85	8.20		Deformed metagabbro with sulphide stringers and blebs
			o-cp. pn. 6.6-6.7 massive po
8.20	9.00		Sheared schist zone
9.00	10.10		Banded schist
10.10	10.80		Highly deformed metagabbro, weakly mineralized
10.80	12.30		Fine gr. schistose trondhjemite
12.30	14.30		Banded schist alternating with colc-silicate bands
14.30	15.30		Strongly deformed metagabbro.
			14.35-15.15 massive sulphides po. 1-1.5% cp.
			1% pn - small but visible
15.30	30.00		Deformed quartz-plag. biotite schist
30.00	41.40		Deformed metagabbro with sulphide stringers
41.40	61.50		Banded schist in part graphitic
	61.50		End of hole

A/S SULFIDMALM

PROPERTY: OLKAR

HOLE NO: 1

SAMPLE	FROM	TO	LENGTH m	ASSAY			ROCK TYPE/MINERALIZATION
				%Ni	%Cu	%S	
20/215	5.85	7	1.15 m	0.47	0.09	7.3	Massive
20/216	7.0	8.2	1.2 m	0.1	0.01		Dissemination
20/217	10.1	10.8	0.7 m	0.05	0.04		"
20/218	14.3	15.25	0.95 m	1.7	1.03	27.0	Massive
20/219	30	31	1.0 m	0.02	0.02		Dissemination
20/220	31	32	1.0 m	0.2	0.2		"
20/221	32	33	1.0 m	0.01	0.01		"
20/222	33	34	1.0 m	0.15	0.03		"
20/223	34	35	1.0 m	0.06	0.08		"
20/224	35	36	1.0 m	0.16	0.09		"
20/225	36	37	1.0 m	0.01	0.01		"
20/226	37	38	1.0 m	0.13	0.02		"
20/227	38	39	1.0 m	0.02	0.01		"
20/228	39	40	1.0 m	0.1	0.01		"
20/229	40	41.4	1.4 m	0.03	0.02		"

A/s SULFIDMALM

DIAMOND DRILL RECORD

LOCATION: 1.85/15W BEARING: DIP: 90 HOLE NO: 2 SHEET NO: 1

LOGGED BY: R.S. STARTED: PROPERTY Olkar

CASING: FINISHED: Kvikne

CORE SIZE: TESTS (CORRECTED):

From	To		Description
0	3.0		Overburden
3.00	3.40		Fine gr. trondhjemite
3.40	13.00		Banded schist
13.00	15.50		Deformed metagabbro, sulphides - stringers and blebs
			containing po, cp and pn are visible throughout
			13-14 m 5%
			14-15 m 50%
			15-16 m 50%
			massive from 14.50-15.50
15.50	22.70		Banded quartz mica schist with graphite
22.70	38.40		Highly deformed rock - possible metagabbro.
			Some specks and stringers of po
38.40	39.00		Fine gr. trondhjemite
39.00	42.40		Banded schist with graphite
	42.40		End of hole

A/S SULFIDMALM

PROPERTY: OLKAR

HOLE NO: 2

SAMPLE	FROM	TO	LENGTH m	ASSAY			ROCK TYPE/MINERALIZATION
				%Ni	%Cu	%S	
20/244	13.0	14.0	1.0 m	0.14	0.47		
	14.0	15.5	1.5 m	1.78	1.18	22.5	Massive

A/s SULFIDMALM

DIAMOND DRILL RECORD

LOCATION: 3.0N/27W BEARING: DIP: 90 HOLE NO: 3 SHEET NO: 1

LOGGED BY: R.S. STARTED: PROPERTY Olkar Kvikne

CASING: FINISHED:

CORE SIZE: TESTS (CORRECTED):

From	To		Description
0	3.5		Overburden
3.5	3.75		Metagabbro, 2-3% sulphides dominantly po
3.75	5.05		Banded schist 4.8 cm - 1cm massice po
5.05	13.90		Metagabbro - sulphide specks
13.90	14.50		Coarse gr. trondhjemite
14.50	15.40		Metagabbro - sulphides 5% po. cp, pn occurring mainly as crystal aggregates 0.5-1.0 cm and a weak dissemination.
15.40	22.50		Highly deformed schistose rock with some highly deformed basic bands. Sulphides mainly specks, but from 22.30-22.50 massive bands with po, cp, pn.
22.50	32.60		Banded quartz-biotite schist with graphite
	32.60		End of hole.

A/S SULFIDMALM

PROPERTY: OLKAR

HOLE NO: 3

SAMPLE	FROM	TO	LENGTH m	ASSAY			ROCK TYPE/MINERALIZATION
				%Ni	%Cu	%S	
20/246	5.05	6.0	0.95	0.09	0.02		
20/247	6	7	1.0	0.04	0.03		
20/248	7	8	1.0	0.05	0.01		
20/249	8	9	1.0	0.03	0.02		
20/250	9	10	1.0	0.06	0.02		
20/251	10	11	1.0	0.01	0.01		
20/252	11	12	1.0	0.07	0.01		
20/253	12	13	1.0	0.01	0.01		
20/254	13	13.9	0.9	0.08	0.01		
20/255	22	23	1.0	0.38	0.17		

A/s SULFIDMALM

DIAMOND DRILL RECORD

LOCATION: 0/45.7 W BEARING: DIP: 90 HOLE NO: 4 SHEET NO: 1

LOGGED BY: R.S. STARTED: PROPERTY OLKAR

CASING: FINISHED: KVIKNE

CORE SIZE: TESTS (CORRECTED):

From	To		Description
0	4.15		Overburden.
4.15	11.60		Banded quartz-biotite schist.
11.60	19.40		Inter-layered banded schist with layers and lenses of metagabbroic to ultrabasic rock type. Sulphides po. cp. as specks and blebs.
19.40	33.95		Metagabbro - highly deformed. Sulphides po.(cp.pn.) mainly as stringers ll to schistosity but also as 0.5 - 3.0 mm crystal aggregates with random distribution and orientation. 33 - 33.95 - 60 - 70% po. 1.5%cp. 1-1.5% pn.
33.95	35.50		Banded schist.
35.50	35.95		Metagabbro with sulphide specks.
35.95	39.30		Banded schists.
	39.30		End of hole.

A/S SULFIDMALM

PROPERTY: OLKAR

HOLE NO: 4

SAMPLE	FROM	TO	LENGTH m	ASSAY			ROCK TYPE/MINERALIZATION
				%Ni	%Cu	%S	
20/230	19.4	21	1.6	0.08	0.01		Metagabbro
20/231	21	22	1.0	0.02	0.02		"
20/232	22	23	1.0	0.07	0.01		"
20/233	23	24	1.0	0.02	0.02		"
20/234	24	25	1.0	0.06	0.01		
20/235	25	26	1.0	0.02	0.03		
20/236	26	27	1.0	0.09	0.05		
20/237	27	28	1.0	0.02	0.02		
20/238	28	29	1.0	0.07	0.01		
20/239	29	30	1.0	0.01	0.02		
20/240	30	31	1.0	0.09	0.01		
20/241	31	32	1.0	0.03	0.02		
20/242	32	33	1.0	0.10	0.03		
20/243	33	33.95	0.95	1.33	1.29	23.0	Massive

A/s SULFIDMALM

DIAMOND DRILL RECORD

LOCATION: 0/60W BEARING: DIP: 90 HOLE NO: 5 SHEET NO: 1

LOGGED BY: R.S. STARTED: PROPERTY OLKAR

CASING: FINISHED: KVIKNE

CORE SIZE: TESTS (CORRECTED):

From	To		Description
0	2.0		Overburden
2.0	10.70		Banded quartz-biotite schist
10.70	17.70		Interlayered banded quartz biotite schist and med. grained trondhjemites
17.70	23.50		Highly deformed banded quartz biotite schist
23.50	24.40		Medium grained Trondhjemite
24.40	32.40		Banded quartz-biotite schist
32.40	32.50		Metagabbro?? mixed with med. grained trondhjemites and fragments and bands of schists. Some sulphides in gabbro 34-35 m. 4-5% po. little cp - pn.
35.5	41.70		Banded quartz-biotite schist
	41.70		End of hole

A/S SULFIDMALM

PROPERTY: HOLE NO:

SAMPLE	FROM	TO	LENGTH m	ASSAY			ROCK TYPE/MINERALIZATION
				%Ni	%Cu	%S	
20/256	32.4	33	0.6	0.02	0.02		Metagabbro
20/257	33	34	1.0	0.08	0.01		
20/258	34	35	1.0	0.05	0.02		
20/259	35	35.5	0.5	0.09	0.01		

A/s SULFIDMALM

DIAMOND DRILL RECORD

LOCATION: 150N/122W BEARING: DIP: 90 HOLE NO: 6 SHEET NO: 1

LOGGED BY: R.S. STARTED: PROPERTY OLKAR KVIKNE

CASING: FINISHED:

CORE SIZE: TESTS (CORRECTED):

From	To		Description
0	2.00		Overburden
2.00	11.05		Banded quartz-biotite schist with calc. silicate layers.
11.05	12.10		Quartz-biotite schist - graphite layers
12.10	14.10		Quartz-biotite schist with lenses and bands of metagabbroic/ultrabasic origin. In some of the basic bands - sulphides 2-5%.
14.10	52.50		Banded quartz-biotite schists.
	52.50		End of hole

A/S SULFIDMALM

PROPERTY: Olkar

HOLE NO: 6

SAMPLE	FROM	TO	LENGTH m	ASSAY			ROCK TYPE/MINERALIZATION
				%Ni	%Cu	%S	
20/260	12.1	13	0.9	0.13	0.02		Metagabbro
20/261	13	14.1	1.1	0.14	0.04		"

GEOLOGICAL MAP OF THE TRONDHEIM REGION

GEOLOGISK KART OVER TRONDHEIMSFELTET

1:500000

COMPILED BY FR.CHR.WOLFF AFTER:
SAMMENTEGNET AV FR.CHR.WOLFF ETTER:

T.BIRKELAND, C.W.CARSTENS, H.CARSTENS, J.CHALOUPSKY, G.GRAMMELTVEDT, F.FEDIUK, M.FIŠERA, S.FOSLIE, J.FÆRDEN, A.HAUGEN, H.HEIM, P.HOLMSEN, H.J.KISCH, GHR.OFTEDAHL, J.PEACEY, Z.PELC, D.ROBERTS, I.J.RUI, G.SCHAAR, A.SIEDLECKA, S.SIEDLECKI, T.STRAND, TH.VOGT, FR.CHR.WOLFF.

LEGEND
TEGNFORKLARING

RÖRAGEN BEDS (DEVONIAN)
RÖRAGENFELTET (DEVON)

- CONGLOMERATE AND SHALE
  KONGLOMERAT OG SKIFER

SLÅGÅN GROUP – HORG GROUP (SILURIAN)
SLÅGÅNGRUPPEN – HORGGRUPPEN (SILUR)

- DARK SHALE AND SANDSTONE
  MÖRK SKIFER OG SANDSTEIN

KJÖLHAUGEN GROUP – RÖROS GROUP – UPPER HOVIN GROUP (UPPER ORDOVICIAN)
KJÖLHAUGGRUPPEN RÖROSGRUPPEN ÖVRE HOVINGRUPPEN (ÖVRE ORDOVICIUM)

- PHYLLITE, METAGRAYWACKES, WITH INCREASING AMOUNTS OF BIOTITE, HORNBLEND AND GARNET TOWARDS THE SOUTHEAST, PARTLY CONGLOMERATIC
  FYLLITT, METAGRÅVAKKER MED ÖKENDE MENGDER AV BIOTITT, HORNBLENDE OG GRANAT MOT SYDÖST, DELVIS KONGLOMERATISK
- POLYGENOUS CONGLOMERATE
  POLYMIKT KONGLOMERAT

SULÅMO GROUP – LOWER HOVIN GROUP (MIDDLE ORDOVICIAN)
SULÅMOGRUPPEN UNDRE HOVINGRUPPEN (MIDTRE ORDOVICIUM)

- DARK SHALE AND RHYOLITE TUFF IN WEST, GREENSTONE IN EAST
  MÖRK SKIFER OG RHYOLITT TUFF I VEST, GRÖNNSTEN I ÖST
- GREY CALCAROUS SANDSTONE AND GREY TO DARK PHYLLITE
  GRÅ KALKHOLDIG SANDSTEIN OG GRÅ TIL MÖRK FYLLITT
- HÖLONDA, TROMSDALEN, BRENNA AND SIMILAR LIMESTONES
  HÖLONDA, TROMSDALEN, BRENNA OG LIGNENDE KALKSTEINER
- VENNA, STOKKVOLA, LILLE FUNDSJÖ AND SIMILAR CONGLOMERATES
  VENNA, STOKKVOLA, LILLE FUNDSJÖ OG LIGNENDE KONGLOMERATER

FUNDSJÖ GROUP – STÖREN GROUP (LOWER ORDOVICIAN)
FUNDSJÖGRUPPEN – STÖRENGRUPPEN (UNDRE ORDOVICIUM)

- GREENSTONES AND QUARTZKERATOPHYRES
  GRÖNNSTENER OG KVARTSKERATOFYRER
- GRANODIORITIC GNEISS
  GRANODIORITTISK GNEISS

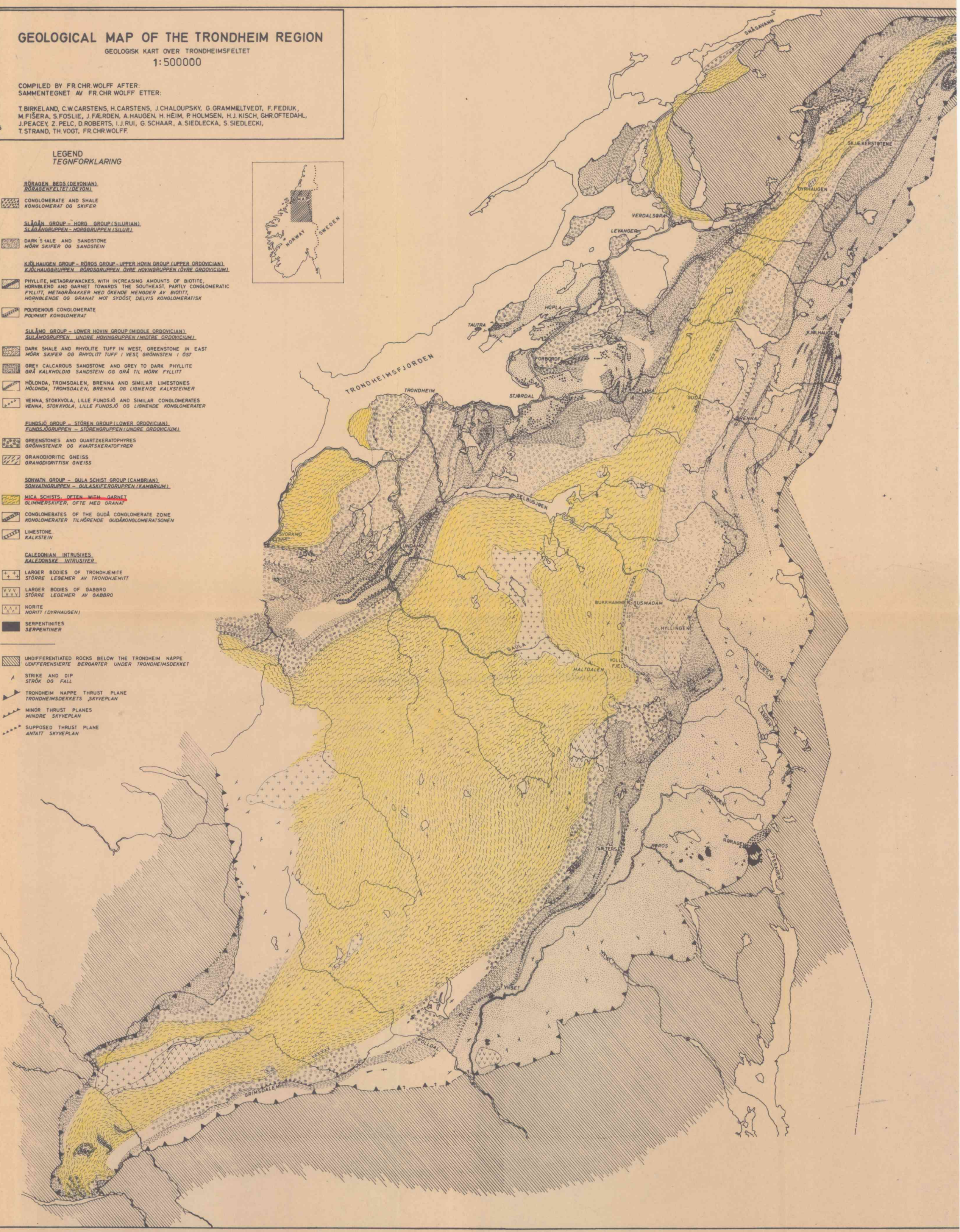
SONVATN GROUP – GULA SCHIST GROUP (CAMBRIAN)
SONVATNGRUPPEN – GULASKIFERGRUPPEN (KAMBRIUM)

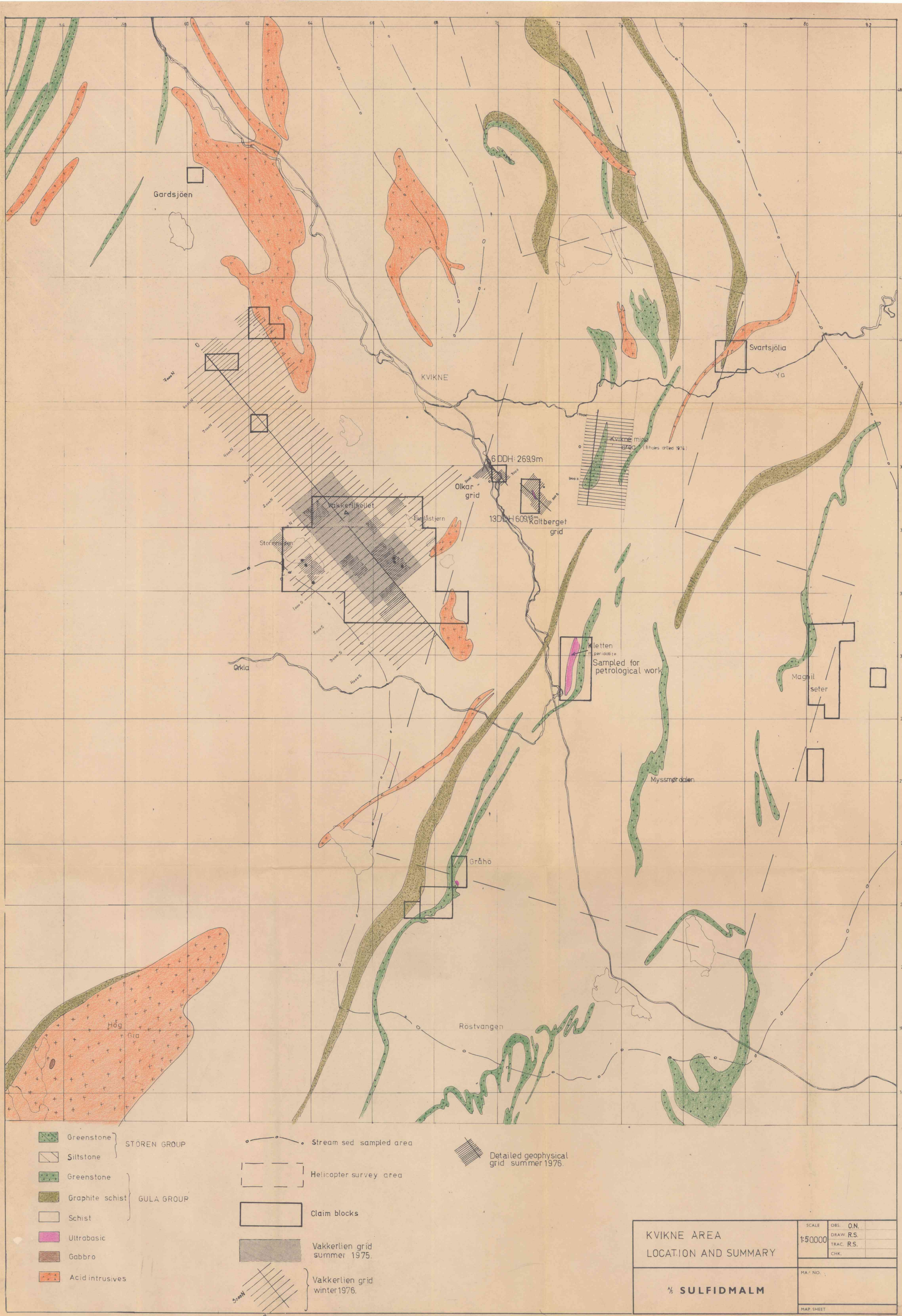
- MICA SCHISTS, OFTEN WITH GARNET
  GLIMMERSKIFER, OFTE MED GRANAT
- CONGLOMERATES OF THE GUDÅ CONGLOMERATE ZONE
  KONGLOMERATER TILHÖRENDE GUDÅKONGLOMERATSONEN
- LIMESTONE
  KALKSTEIN

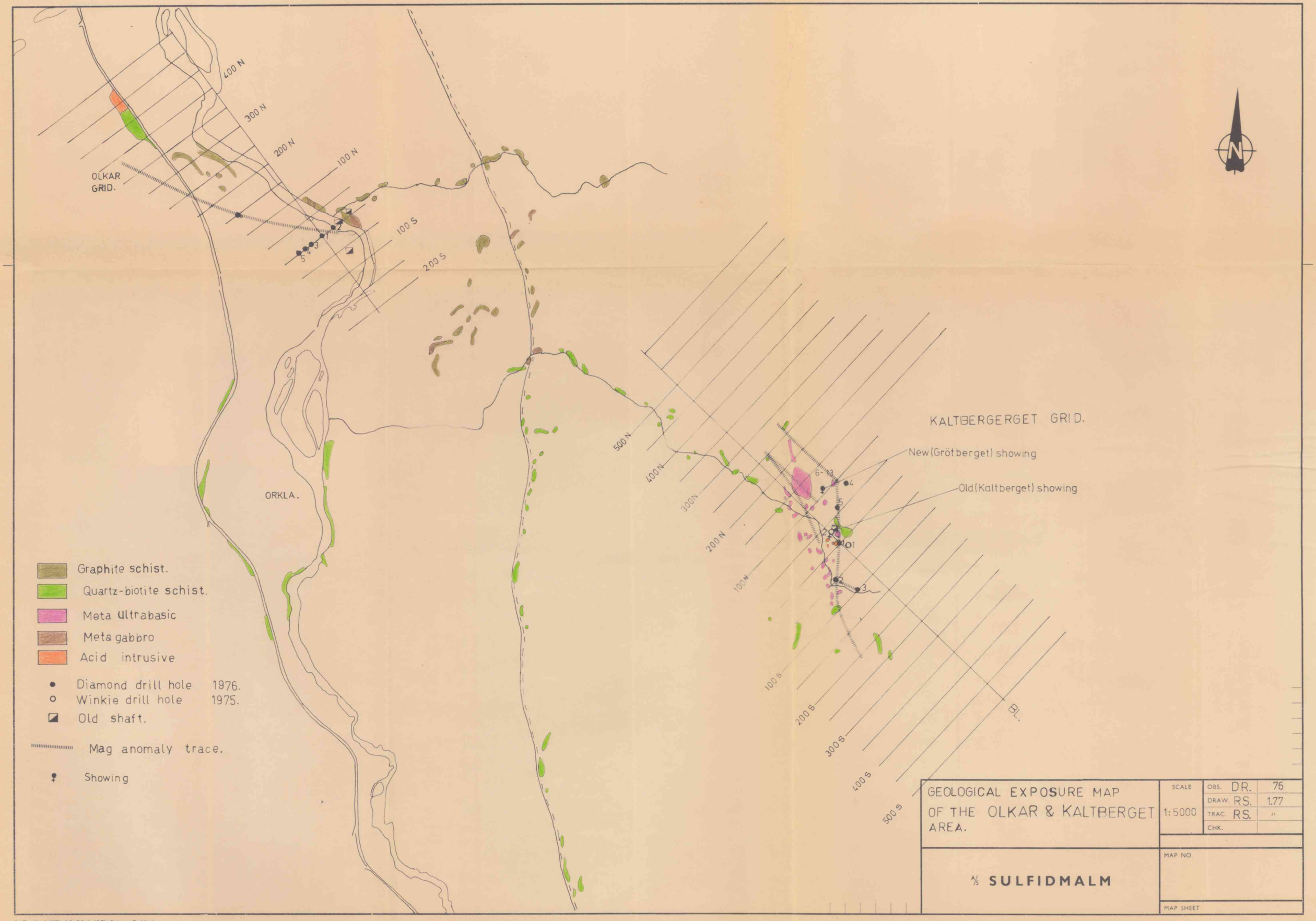
CALEDONIAN INTRUSIVES
KALEDONSKE INTRUSIVER

- LARGER BODIES OF TRONDHJEMITE
  STÖRRE LEGEMER AV TRONDHJEMITT
- LARGER BODIES OF GABBRO
  STÖRRE LEGEMER AV GABBRO
- NORITE
  NORITT (DYRHAUGEN)
- SERPENTINITES
  SERPENTINER

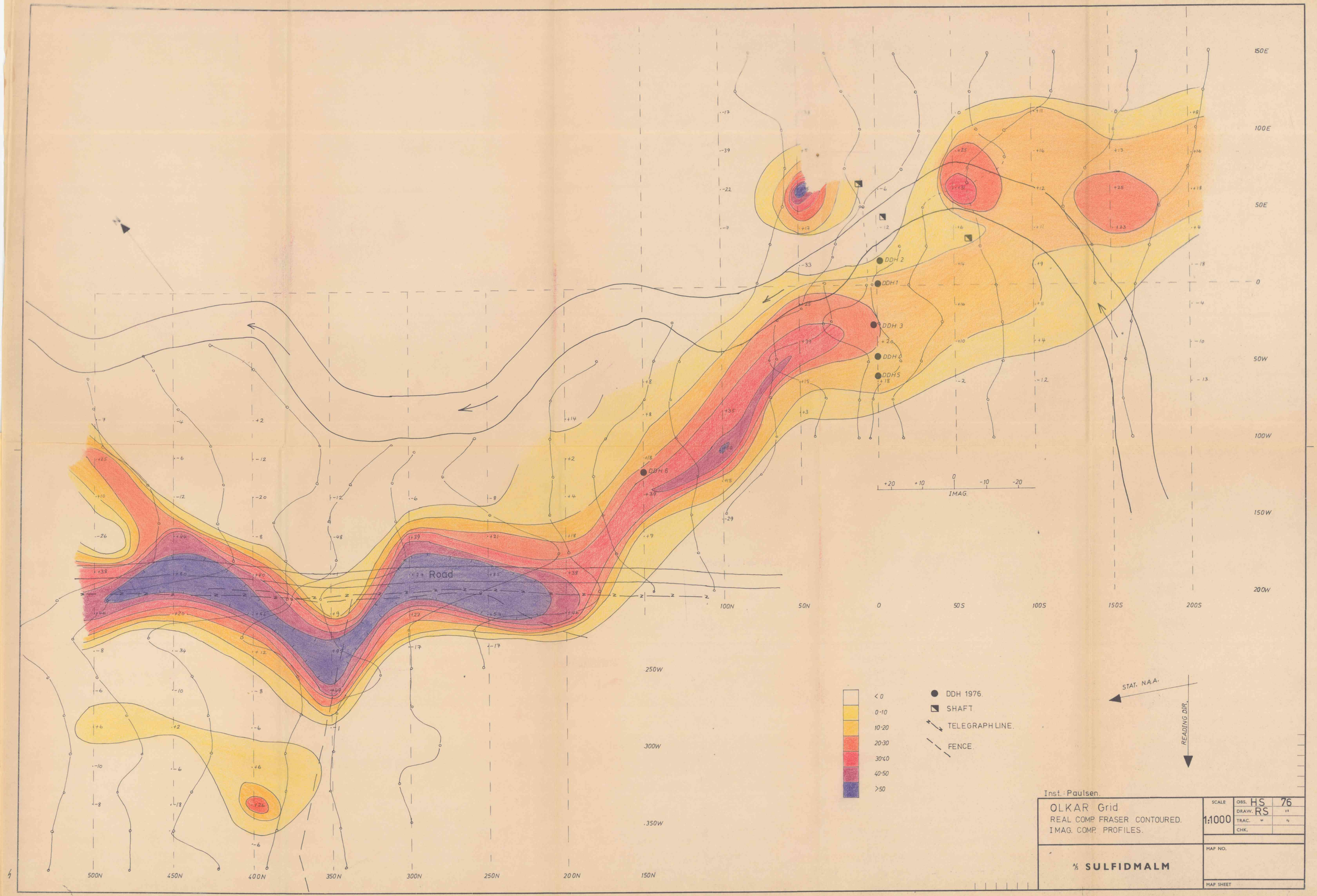
- UNDIFFERENTIATED ROCKS BELOW THE TRONDHEIM NAPPE
  UDIFFERENSIERTE BERGARTER UNDER TRONDHEIMSDEKKET
- STRIKE AND DIP
  STRÖK OG FALL
- TRONDHEIM NAPPE THRUST PLANE
  TRONDHEIMSDEKKETS SKYVEPLAN
- MINOR THRUST PLANES
  MINDRE SKYVEPLAN
- SUPPOSED THRUST PLANE
  ANTATT SKYVEPLAN



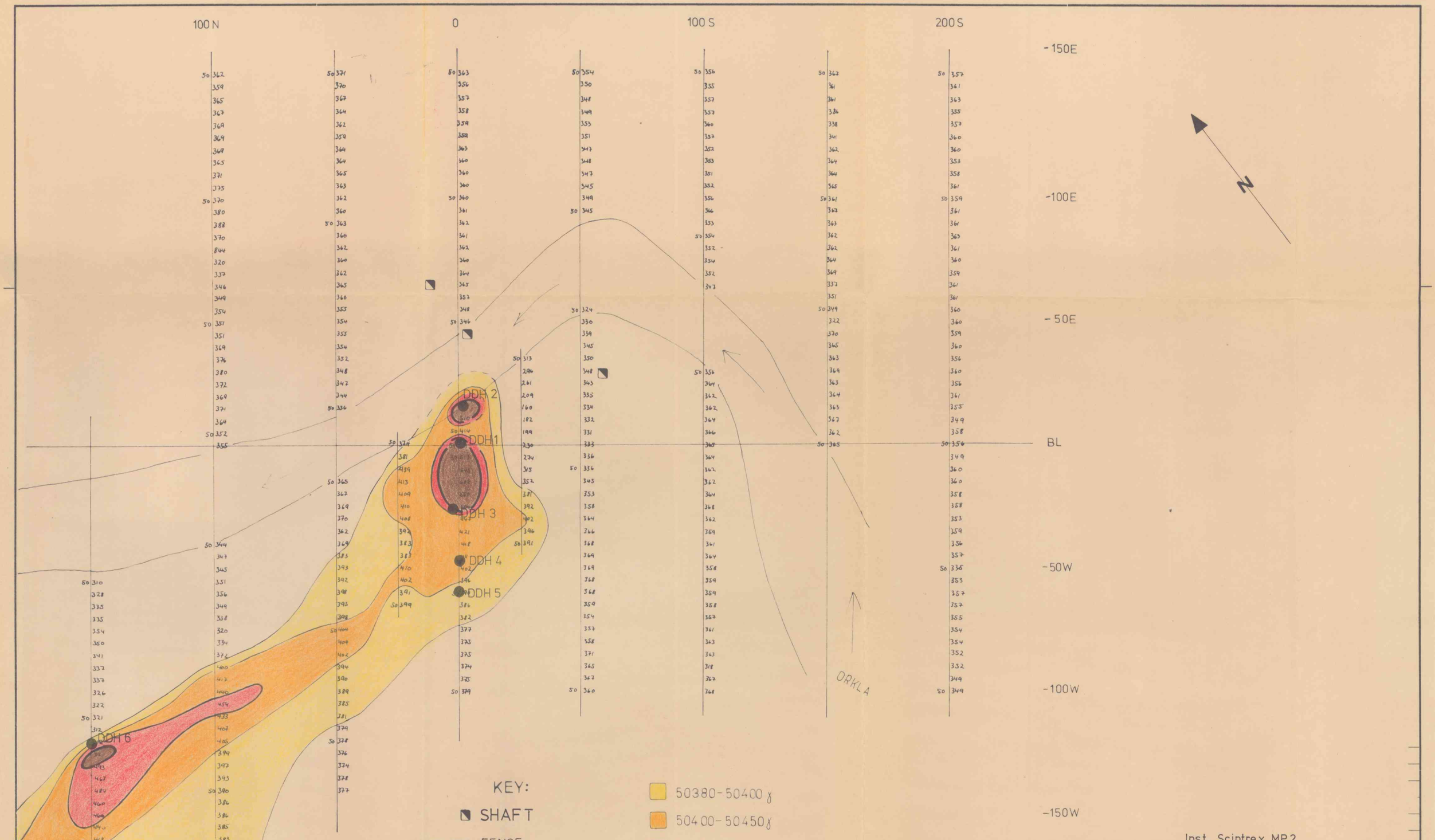

Gardsjöen
KVIKNE
Svartsjölia
Ya
Kvikne mine area (8 holes drilled 1974)
6 DDH: 269,9m
Olkar grid
13 DDH 609,95m
Kaltberget grid
Vakkerlifjellet
Fuglåstjern
Stormsjøen
Kletten
m. peridotite
Sampled for petrological work
Magnil seter
Orkla
Myssmørdalen
Gråhö
Röstvangen
Hög
Gia
Greenstone
Siltstone
STÖREN GROUP
Greenstone
Graphite schist
Schist
GULA GROUP
Ultrabasic
Gabbro
Acid intrusives
Stream sed sampled area
Helicopter survey area
Claim blocks
Vakkerlien grid summer 1975.
Vakkerlien grid winter 1976.
Detailed geophysical grid summer 1976.
KVIKNE AREA
LOCATION AND SUMMARY
SCALE 1:50000
OBS. O.N.
DRAW. R.S.
TRAC. R.S.
CHK.
MAP NO.
MAP SHEET
SULFIDMALM

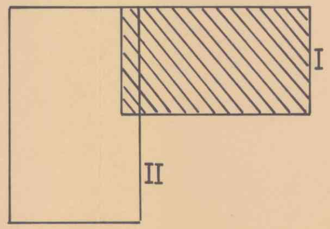


A.s Tørrkopi. 2000. A 2. E 9 gl. 10-71. Sentrum Trykkeri.



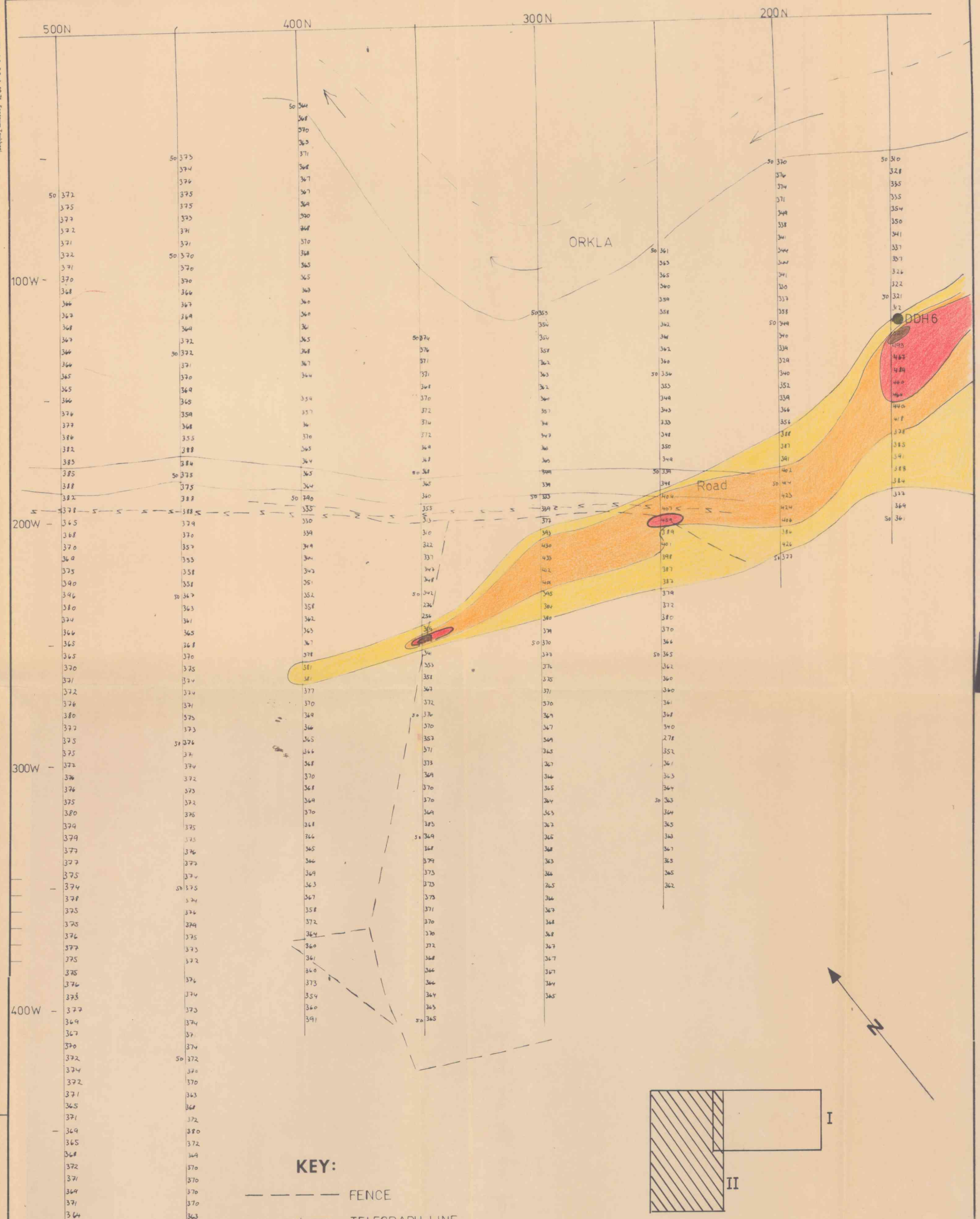
A.s Terrkopi. 3000. A.1. E 9 gl. 10-71. Sentrum Trykkeri.





Inst. Scintrex MP2

OLKAR grid Contoured magnetic map	SCALE 1:1000	OBS. F.H	7-76
		DRAW. R S	7-76
		TRAC. R S	7-76
		CHK.	
⅛ SULFIDMALM	MAP NO.		
	MAP SHEET		



KEY:

— — — — FENCE

—ϟ—ϟ— TELEGRAPH LINE

50380-50400 γ

50400-50450 γ

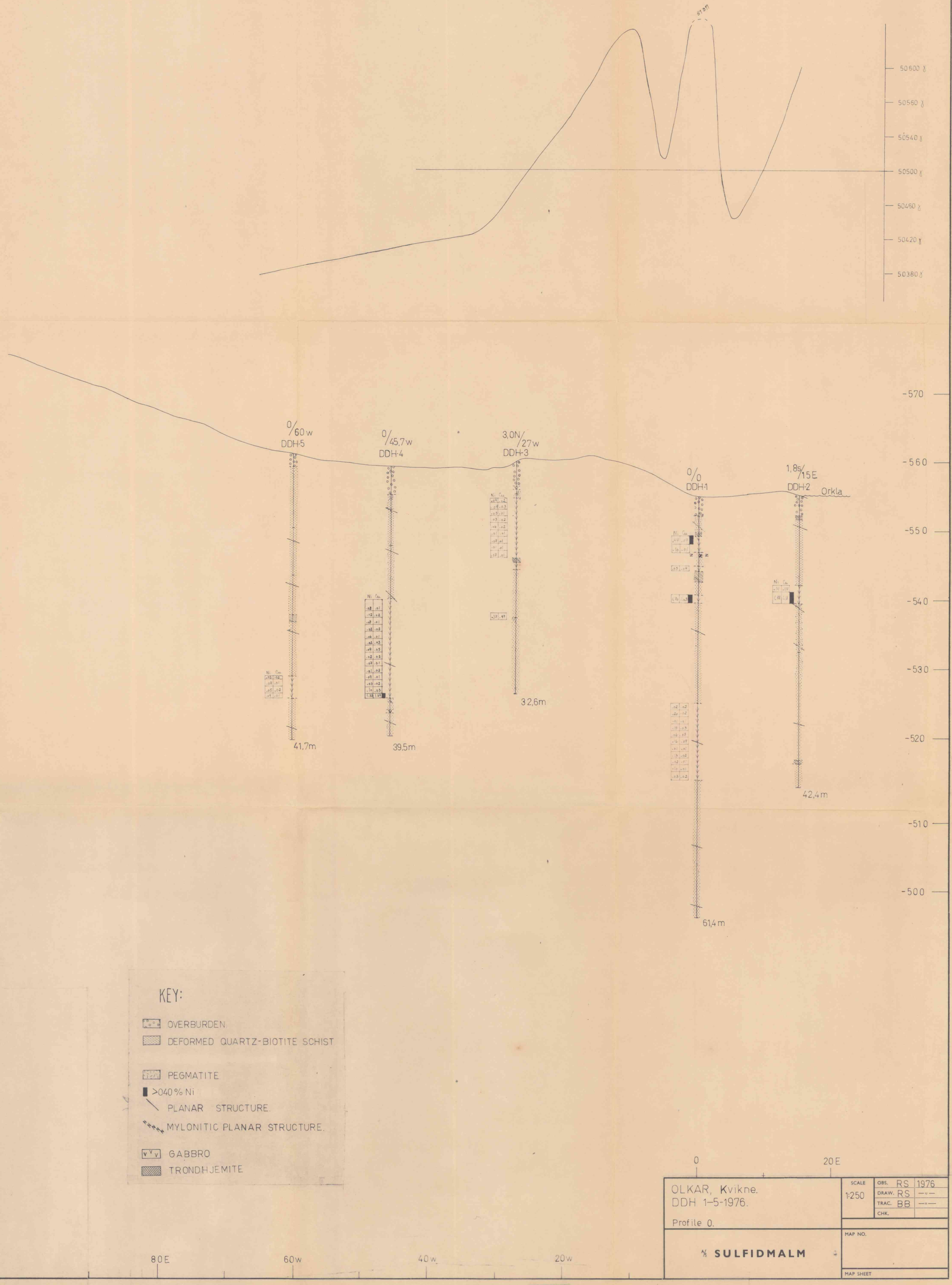
50450-50500 γ

>50500 γ

Inst. Scintrex MP2

OLKAR grid Contoured magnetic map.	SCALE 1:1000	OBS. FiH	7-76
		DRAW. RS	7-76
		TRAC. RS/BB	8-76
		CHK.	
⅛ SULFIDMALM	MAP NO.		
	MAP SHEET		

A.s Terrkopi 3000. A.1. E 9 gl. 10-71. Sentrum Trykkeri.



A.s Tørrkopi. 2000. A 2. E 9 gl. 10-71. Sentrum Trykkeri.