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Tittel

Norway - Rai´tevarre. 1994 year end report

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Boring Geologi	Rapport	Rai´tevarri Raitevarre
Råstofftype	**Emneord**	
Malm/metall	Au Cu Pb Zn Ag Co	

Sammendrag

Rapporten, som er på engelsk, beskriver resultatet etter vinterboring av 9 hull på tilsammen 813 m, basert på egne geologiske og geofyske undersøkelser og sammenstilling av eldre data. Det mest oppløftende borhullet RHR 06/94 førte bare 0,178% Cu over 4.95m eller 126,5m med 0.069% Cu og 36,5 ppb Au. Beste gullverdi fant man i hull RHR 03/94 som viste 4m med 0,056% Cu og 0,53 g/t Au.
Det absolutt beste resultatet fra tidligere boringer viste 20,5m med 0,44% Cu - ingen Au-analyser og 42m med 0,28% Cu, 36 ppb Au.
RTZ´s borprogram har så langt utelukket opptreden av en "RTZ-scale" kobber-gullforekomst i Rai´tevarri området Sammen med den usikre politiske situasjonen knyttet til eiendomsretten til land og vann i denne delen av Norge har man besluttet å ikke fortsette undersøkelsene og lar rettighetene falle i det fri.

Rapporten er fyldig og godt utstyrt med fargebilag, slik som geologiske og geofysiske kart samt detaljerte borlogger og er levert i tre eksemplarer

NORWAY - RAI'TEVARRI
1994 YEAR END REPORT

by Jim Coppard
October 1994

Distribution: Bristol Files
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RAI'TEVARRI REPORT

SUMMARY

To test the possibility of economically viable Aitik style copper-gold mineralisation at Rai'tevarri; 9 scout DDH's totalling 813 metres were drilled between 5 April and 4 May 1994 on a combination of IP anomalies, geochemically anomalous zones and favourable structural settings. RTZ's drilling programme did not enhance Cu and Au values already returned from previous drilling campaigns, indicating that the Rai'tevarri area is host to substantial, but sub economic, copper and gold mineralisation. RTZ's most encouraging diamond drill hole RHR 06/94 returned copper grades of 0.178% Cu over 4.95 metres, with the complete 126.5 metres returning 0.069% Cu and 36.5 ppb Au. Maximum results from previous drilling programmes returned values of 20.5 metres at 0.44% Cu - no gold assay, and 42 metres at 0.28% Cu, 36 ppb Au. RTZ's drilling campaign has precluded the possibility of an RTZ scale deposit existing in the Rai'tevarri area. Taking this in conjunction with the delicate political situation with regards to land rights in this area of Norway, it is recommended that no further work be carried out on the Rai'tevarri licence area and the Rai'tevarri mutings be allowed to lapse.

1. INTRODUCTION

1.1 Location

Rai'tevarri is situated approximately 30 km southwest of Karasjok in Finnmark County, northern Norway (Figure 1). The prospect covers an area of approximately 20 km^2 covered by the southern margin of map sheet 2033 IV (Iesjakka) and the northern margin of map sheet 2033 III (Baeivasgied'di). The area is gently undulating (180 metres to 360 metres) with rounded hills and extensive flat areas. During the drilling programme snow cover was complete with thicknesses ranging from 20 cm to in excess of 2 metres. Typical daytime temperatures ranged between - 5°C and 15°C.

1.2 Access

Access to the Rai'tevarri prospect area in the winter/spring is by a 4-wheel drive vehicle from Karasjok, along tarmac and dirt roads to Myrskog; followed by a snow mobile journey along the recognised winter track. Total journey time approximately 1 hour 45 minutes.

1.3 Objectives of the Rai'tevarri Winter/Spring 1994 Programme

The 1994 winter/spring Rai'tevarri programme was designed to:

a) Confirm the validity of the NGU gradient array IP data.

b) Drill 10 x 100 metre scout DDH's on a combination of IP anomalies, geochemical anomalies and favourable structural settings; in order to ascertain the economic potential of the Rai'tevarri area.

1.4 Tenure

The 60 Rai'tevarri mutings, for copper and gold, covering an area of 18 km^2 were issued to Rio Holdings Norway A/S (RTZ's Norwegian subsidiary) in 1993 (see Figure 2). These exclusive mutings are valid for a maximum of seven years, requiring yearly renewals.

1.5 Environmental

There are no restricted areas within the Rai'tevarri mutings with regard to protected species of flora or fauna or historical sites etc.

All relevant permissions were obtained for both work and access to the Rai'tevarri prospect. The Environmental Officer of the Karasjok Kommune - Ingolf Balto was informed and consulted at all stages during the project.

No irreparable damage to flora or fauna occurred in the Rai'tevarri area.

A minor (±2 litre) oil spillage occurred during the drilling of RHR 05/94 (see Plates 1 and 2). Action was taken by RTZ personnel to remove the majority of the oil, with the remaining oil isolated to prevent further contamination. Total clearance of the spillage has been undertaken.

The local and regional environmental authorities visited all the drill sites at Rai'tevarri on the 4 July 1994, and have sent an official letter to Rio Holdings Norway A/S stating how pleased they were with the clean-up (cutting of damaged trees) and how limited damage to the ground vegetation actually was. Full details of this visit are presented in Aspro Prospektering A/S report see Appendix 4.

A comprehensive selection of photographs of the Rai'tevarri prospect are also shown in Appendix 4.

1.6 Public Relations

A comprehensive drill site visit was made by Mr Kjell Saether (Mayor), Mr Svein Haussen (Chief of Police) and Mr Ingolf Balto (Environmental Officer) of Karasjok Kommune on the evening of 25 April 1994. Present and previous drill sites, areas of interest etc, were visited to show what impact the 1994 drilling campaign was having and would have on the Rai'tevarri area. Mr Ole Henrik Magga (President of the Sami Parliament) made an unexpected visit to RHR 06/94 in order to hand over a letter of protest, protesting against all exploration activities within the Sami areas of Norway.

Following the cessation of the drilling programme, an environmental monitoring visit was made by Mr Kjell Saether, Mr Ingolf Balto, Mr Steinar Schanke (County of Finnmark Officer), Ms Ragnhild Nystad (Sametinget), Mr Bjarne Lieungh (Mining Office) and Mr Samuel Anti (Reindeer Pasture District 17/18 - officer) to show the limited impact of RTZ's 1994 drilling and previous drilling programmes have had on the Rai'tevarri area.

2. EXPLORATION STATISTICS

Diamond Drilling:	9 DDH's were drilled by Terje Holman Diamond Drilling A/S of Kautokeino, Norway. Total meterage drilled, using a combination of Diamec 251 and 262's drillings was 813 metres.
Lithogeochemical Sampling:	A total of 240 core samples were taken. In addition a single rock grab sample was collected. 233 samples were sent to Anamet Services (a division of RTZ Technical Services Ltd) for Au, Cu, Ag, Zn & Pb analysis (results shown in Appendix 1).
Geophysics:	8 lines totalling 9.15 km of Dipole-Dipole array IP were run over the Rai'tevarri area, and appeared successful in detecting disseminated sulphides (full details are given in Appendix 3). A single 450 metre line of magnetics was run over a portion of line E2 (full details are given in Appendix 3).
Time Distribution:	A total of 83 man days were spent by RTZ personnel on geophysics and supervision of the drilling programme during the period April and May 1994 (including mobilisation and demobilisation). A further 81 man days were spent on collating, digitising and interpreting the results.
Personnel:	J Beswick, J Coppard, C Harris and S Swatton are RTZ M&E geologists; B Røsholt is an Aspro Prospektering A/S geologist; M Jones is a contract geologist and G Findlay a contract geophysicist.

3. GEOLOGY

3.1 Regional Geology

The rocks found at Rai'tevarri are located within the Karasjok Greenstone Belt, a metamorphosed supracrustal package of Lower Proterozoic age (approximately 2,085 Ma). The Karasjok Greenstone Belt is a portion of a more extensive supracrustal belt which extends from the Hammerfest district in northwest Norway through northeast Sweden, northern Finland and central Karelia.

3.2 Local Geology

The rocks at Rai'tevarri have been tentatively placed in the Iddjar'ri Group which comprises of a monotonous sequence of amphibolites and meta-sandstones/amphibolite schist and gneisses of both the Bakkilvaari and Gallebaike Formations.

The geology at Rai'tevarri is poorly understood due to extremely limited outcrop and limited drilling. The Rai'tevarri Geology Map (Figure 2) outside of the drilled area, is primarily based on geophysical interpretation.

A stratigraphic column incorporating all the rock units seen at Rai'tevarri is shown in Figure 3 and a cross section based on a combination of field observations, previous data and NGU reports is shown in Figure 4.

Local terminology of the rock units is preferred in the area. Hence the prospective, Rai'tevarri Schist/Gneiss as determined by the author, is roughly the equivalent to the Gallebaike Formation and parts of the Bakkilvaari Formation (as determined by Often 1985).

The Rai'tevarri Schist/Gneiss is generally composed of hornblende, quartz, biotite, plagioclase, ±chlorite, ±graphite, ±pyrrhotite, ±pyrite, ±chalcopyrite of varying proportions. Grain size varies from fine grained, through to coarse, and commonly exhibits a sucrose texture. Colour varies from a pale cream/brown through to a dark green/brown, depending on the respective quartz and amphibole content. Sulphide content generally ranges between 1-1.5%. A distinctive marker horizon, 1-1.5 metres thick, of graphitic schists is located in the upper third of the Rai'tevarri Schist/Gneiss. This graphitic unit is an excellent EM conductor, and has been used to map the extent of the prospective package.

3.3 Structure

Structural studies by the NGU indicate that the main portion of the Rai'tevarri rock package is folded into a broad anticline that plunges 10-20° to the southeast. On the northern limb of the fold the amphibolites are extensively thrusted as are the basal gneisses. Geophysical evidence indicates that a major structure follows the Noai'ddatjakka river, offset by a series of northeast trending faults.

3.4 Metamorphism

Metamorphism in the Rai'tevarri area varies between green schist and amphibolite grade.

4. MINERALISATION

Within the Rai'tevarri Schist/Gneiss mineralisation occurs as both disseminations and veinlets (cleavage parallel and crosscutting). The predominant sulphides are pyrrhotite and pyrite which occur ubiquitously throughout the package and range up to 20% in total rock volume.

Chalcopyrite is often intimately associated with pyrrhotite (as seen in RHR 06/94), but is not dependent on the total percentage content of pyrrhotite.

The crosscutting and cleavage parallel veinlets are found throughout the mineralised package but are not as common as the disseminated style of mineralisation. These veinlets are commonly <2 mm in diameter and can comprise just sulphides, or a combination of sulphides and quartz+carbonate+chlorite.

At this point it is worth mentioning that highest grades reported for the Rai'tevarri area are for copper from a float boulder 2% Cu, and for gold 9 g/t from an unspecified drill core interval.

5. DRILLING

This year's drilling programme was designed to test a combination of untested NGU IP anomalies, IP anomalies located by RTZ, geochemical anomalies and favourable structural settings, with drill sites shown in Figure 5. Drilling commenced on 6 April and ceased on 4 May (due to environmental restrictions). Diamec 262 and Diamec 251 were the drilling rigs used by Terje Holman Diamond Drilling A/S in Rai'tevarri providing 47 mm (TXT) and 42 mm (TT wireline) core. Variable weather conditions during April, combined with technical problems, restricted total drilled metreage to 813 metres.

Summary borehole logs for RHR 01/94-RHR 09/94 are given in Appendix 2. Drill sections showing general geology, sampling intervals, gold and copper results are shown in Figures 6, 7, 8 and 9.

Results from the previous Sydvaranger and Fodall Volk drilling show a scattering of mineralisation, with maximum copper and gold intersections returned from the area of mutated vegetation. Best intersection values were:-

BH5 - 20.5 m	0.43% Cu, no Au assay
BH3 - 42.0 m	0.28% Cu, 36 ppb Au
BH7 - 106.0 m	0.172% Cu, no Au assay

Analytical results from this year's drilling programme are given in Appendix 1. RTZ's drilling results did not increase the copper and gold values previously returned.

RHR 06/94 (the most promising hole) contained characteristic visible chalcopyrite in combination with pyrrhotite and minor pyrite mineralisation over its entire 126.3 metre length. RHR 06/94 returned the highest copper grades, with best intersection of:-

√ 29.0 m - 33.95 m	0.178% Cu, 97 ppb Au
6.0 m - 126.3 m	0.0685% Cu, 36.5 ppb Au

Maximum gold values were returned from RHR 03/94, with a best intersection of:-

√ 60.0 m - 64.0 m	0.056% Cu, 0.53 g/t Au

6. FINANCE

Audited expenses (see Appendix 5) incurred during the Rai'tevarri programme have been broken down into sections, as required by the Norwegian Government, and are as follows:-

(£1 = 10.582 Nkr)

	£	Nkr
Diamond drilling	35,426	374,881
Establishment, removal and clearing up	9,346	98,897
Norwegian project consultants	3,490	36,926
Geophysics	10,388	109,927
Personal transport, vehicles and field equipment	4,398	46,536
Analysis	5,103	54,006
Travelling, drawing, reports and misc.	38,707	409,596
Total	**£106,858**	**Nkr 1,130,769**

7. CONCLUSIONS AND RECOMMENDATIONS

RTZ's 1994 drilling programme confirmed the presence of extensive low grade copper and gold mineralisation in the Rai'tevarri area by drill testing a combination of IP anomalies, geochemical anomalies and favourable structural settings. The 1994 overall results combined with those of previous years drilling campaigns preclude the possibility of an RTZ scale copper-gold deposit existing in the Rai'tevarri area. Due to a combination of the sub economic values returned and the delicate political situation with regards to land rights in this area of Norway, no further work is recommended and the mutings should be allowed to lapse.

Jim Coppard

FIGURES

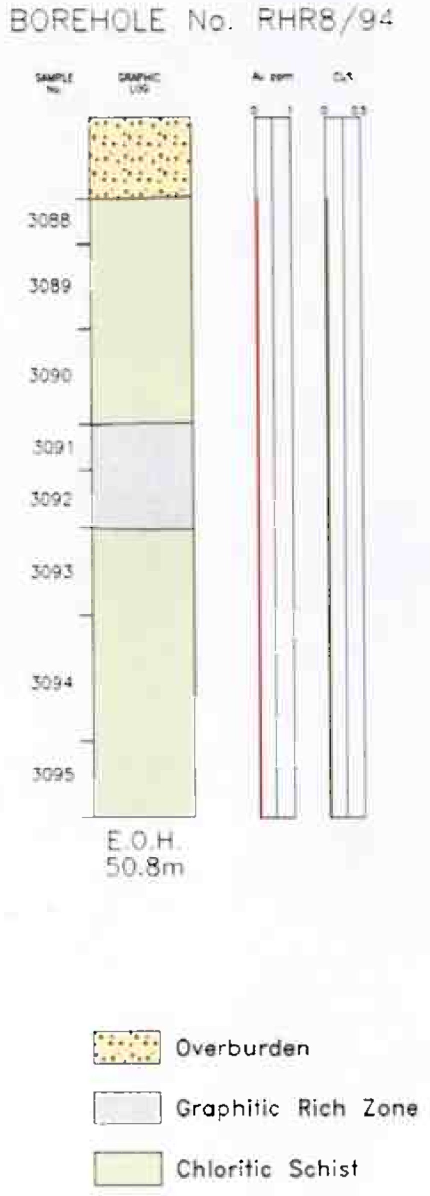

Figure 8

RTZ MINING AND EXPLORATION LIMITED			
NORWAY Raitevarri RTZ 1994 Drilling General Geology-Sampling Intervals Gold and Copper Values from RHR-8/94			
PROJECTION: NONE		FILE: D:\NORWAY\RHR8-94	
AUTHOR: J.COPPARD	OPERATOR: S.A HEATH	REVISION DATE: 14-07-94	FIGURE: 8

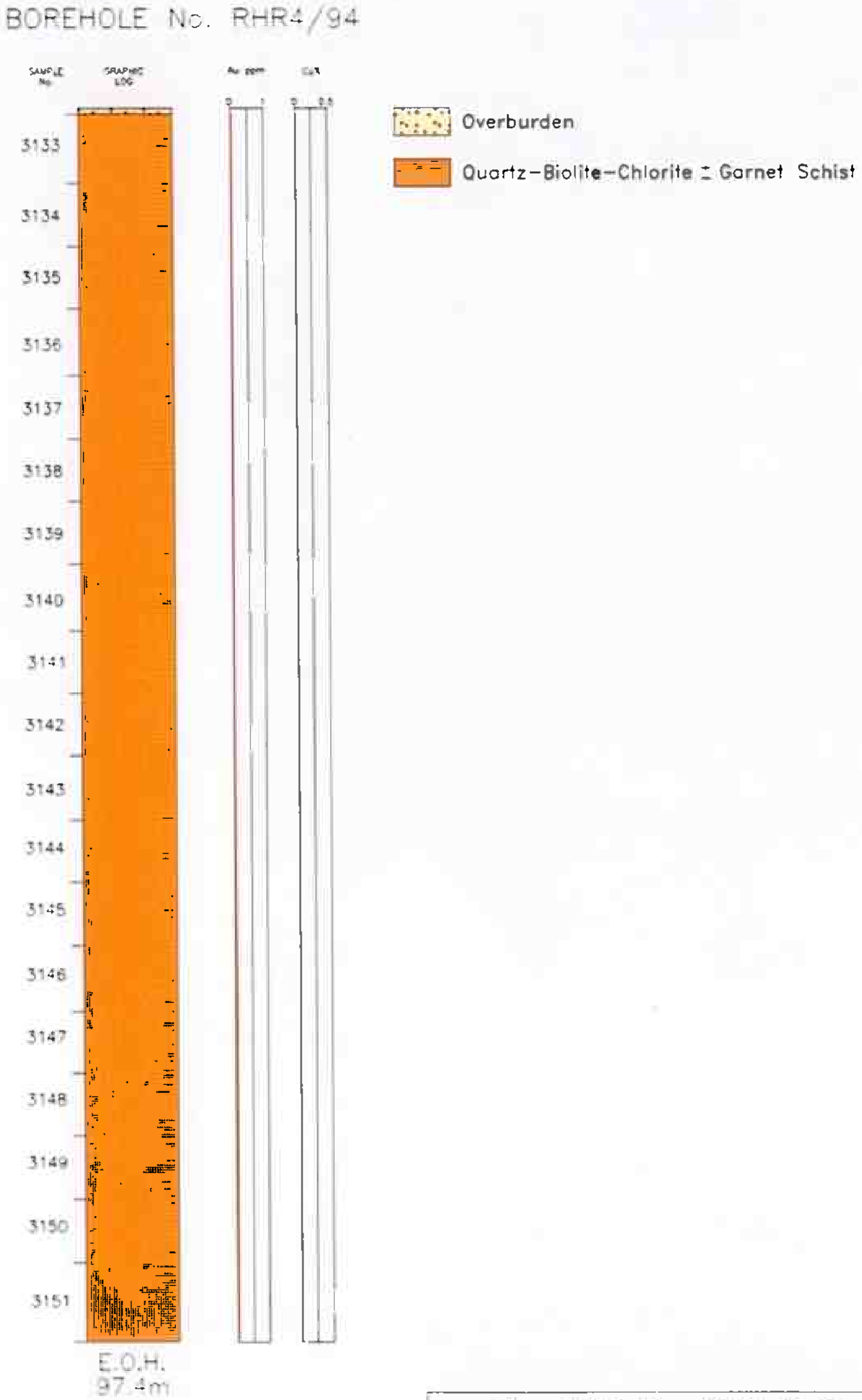

Figure 9

RTZ MINING AND EXPLORATION LIMITED

NORWAY

Raitevarri RTZ 1994 Drilling
General Geology-Sampling Intervals
Gold and Copper Values from RHR-4/94

PROJECTION: NONE		FILE:	D:\NORWAY\RHR4-94
AUTHOR: J.COPPARD	OPERATOR: S.A.HEATH	REVISION DATE: 14-07-94	FIGURE: 9

PHOTOGRAPHS

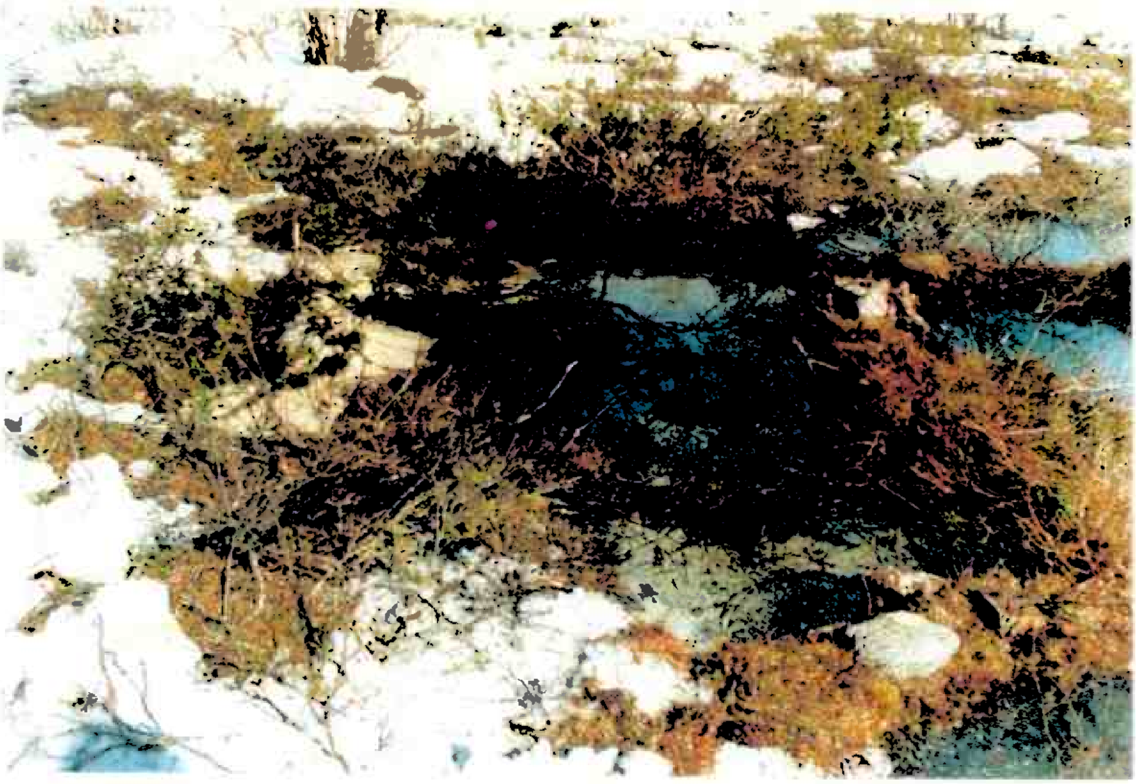

Photo 1

Photo 2

Extent of minor oil spill at RHR5 prior to clean up operations

Photographs 1 & 2

APPENDIX 1

A COMPLETE SET OF SAMPLE DESCRIPTIONS AND ANALYTICAL RESULTS FROM THE 1994 RAI'TEVARRI DRILLING PROGRAMME

RAITEVARRI - NORWAY 1994 SAMPLES

Sample No Prefix N-35	Mapsheet/ Scale	Location (co-ords)	Sample Type	Width		Lithology and Description	Elements						Others	Comments
				From	To		Au ppb	Cu ppm	Pb ppm	Zn ppm	Ag g/t	Co ppm		
2051	Iesjakka 1:50,000	41850 7686350	Rock Grab			Raitevarri Gneiss/schist - Malachite	277	2000	5	51	2.3	7		Extensive malachite staining
2052	Iesjakka 1:50,000	RHR6/94	Core	30.0	31.0	Raitevarri Gneiss/schist	186	2030	7	68	3.9	26		Pyrr + Cpy (dissm & veinlets)
2053	Iesjakka 1:50,000	RHR6/94	Core	121.0	122.0	Raitevarri Gneiss/schist (coarser grained)	54	930	5	55	2.7	43		Pyrr + minor Cpy
2054	Iesjakka 1:50,000	RHR6/94	Core	6.0	9.2	Green Chloritic schist	11	390	2	63	<0.1	74		Minor Pyrr ± Cpy
2055	Iesjakka 1:50,000	RHR6/94	Core	9.2	10.5	Qtz, Amphibole schist (gneiss Raitevarri)	11	830	8	38	<0.1	101		Pyrr + minor Cpy
2056	Iesjakka 1:50,000	RHR6/94	Core	10.5	11.9	Qtz, Amphibole schist (gneiss Raitevarri)	50	530	3	35	<0.1	37		Pyrr + Cpy
2057	Iesjakka 1:50,000	RHR6/94	Core	11.9	13.0	Qtz, Amphibole schist more siliceous	47	770	4	26	<0.1	71		Pyrr + Cpy
2058	Iesjakka 1:50,000	RHR6/94	Core	13.0	15.0	Qtz, Amphibole schist siliceous blebs-rounded	22	440	4	23	<0.1	46		Pyrr ± Cpy
2059	Iesjakka 1:50,000	RHR6/94	Core	15.0	16.75	Qtz, Amphibole schist less siliceous	26	390	2	39	<0.1	29		Pyrr + Py ± Cpy
2060	Iesjakka 1:50,000	RHR6/94	Core	16.75	16.9	15 cm wide altered Qtz vein	14	650	3	35	<0.1	49		Py + Pyrr ± Cpy
2061	Iesjakka 1:50,000	RHR6/94	Core	16.9	18.55	Raitevarri schist/gneiss silicified in part	7	370	3	29	<0.1	28		Minor Pyrr ± Cpy
2062	Iesjakka 1:50,000	RHR6/94	Core	18.55	20.15	Raitevarri schist/gneiss x-cut by pyrite rich siliceous veins	8	320	4	28	<0.1	32		Py + Pyrr ± Cpy
2063	Iesjakka 1:50,000	RHR6/94	Core	20.15	22.40	Raitevarri schists/gneiss	8	450	3	27	<0.1	30		Pyrr + monor Cpy
2064	Iesjakka 1:50,000	RHR6/94	Core	22.4	24.0	Raitevarri schists/gneiss	23	830	2	44	<0.1	52		Pyrr + Cpy + Py
2065	Iesjakka 1:50,000	RHR6/94	Core	24.0	25.0	Raitevarri schists/gneiss	32	920	2	50	<0.1	57		Pyrr + Cpy
2066	Iesjakka 1:50,000	RHR6/94	Core	25.0	26.0	Raitevarri schists/gneiss	24	730	3	33	<0.1	57		Pyrr + Cpy
2067	Iesjakka 1:50,000	RHR6/94	Core	26.0	27.0	Raitevarri schists/gneiss	20	780	3	26	0.1	48		Pyrr + Cpy
2068	Iesjakka 1:50,000	RHR6/94	Core	27.0	28.0	Raitevarri schists/gneiss slightly coarser grained	33	640	3	39	<0.1	37		Pyrr + Cpy
2069	Iesjakka 1:50,000	RHR6/94	Core	28.0	29.0	Raitevarri schists/gneiss slightly coarser grained	24	430	2	44	<0.1	22		Pyrr + Py ± Cpy
2070	Iesjakka 1:50,000	RHR6/94	Core	29.0	30.0	Raitevarri schists/gneiss slightly coarser grained	38	1240	2	53	0.1	25		Pyrr ± Py ± Cpy
2071	Iesjakka 1:50,000	RHR6/94	Core	31.0	31.75	Raitevarri schists/gneiss slightly coarser grained	152	1470	4	58	0.6	37		Pyrr + Cpy

RAITEVARRI - NORWAY 1994 SAMPLES

Sample No Prefix N-35	Mapsheet/ Scale	Location (co-ords)	Sample Type	Width		Lithology and Description	Elements						Others	Comments
				From	To		Au ppb	Cu ppm	Pb ppm	Zn ppm	Ag g/t	Co ppm		
2072	Iesjakka 1:50,000	RHR6/94	Core	31.75	31.95	Multiphase Qtz vein	84	900	14	24	0.2	10		Pyrr + Cpy in 1st phase
2073	Iesjakka 1:50,000	RHR6/94	Core	31.95	33.39	Raitevarri schist/gneiss silicified in part	83	2400	3	61	0.2	52		Pyrr + Py + Cpy
2074	Iesjakka 1:50,000	RHR6/94	Core	33.39	33.95	Raitevarri schist/gneiss silicified with chlorite	39	1290	2	50	0.4	34		Pyrr + Cpy + Py
2075	Iesjakka 1:50,000	RHR6/94	Core	33.95	35.55	Raitevarri schist/gneiss silicified with chlorite	12	390	2	31	<0.1	14		Minor Pyrr ± Cpy ± Py
2076	Iesjakka 1:50,000	RHR6/94	Core	35.3	37.3	Amphibolite with x-cutting Qtz veins	9	290	3	54	<0.1	22		VM sulphides
2077	Iesjakka 1:50,000	RHR6/94	Core	37.3	38.3	Raitevarri schist/gneiss with minor chloritic units	92	1590	2	53	0.3	46		Pyrr + Cpy ± Py
2078	Iesjakka 1:50,000	RHR6/94	Core	38.3	39.45	Raitevarri schist/gneiss and amphibolite	6	63	1	19	<0.1	8		Pyrr ± Cpy
2079	Iesjakka 1:50,000	RHR6/94	Core	39.45	41.5	Raitevarri gneiss with chlorite & Qtz veins	10	380	2	30	<0.1	22		Pyrr ± Cpy ± Py
2080	Iesjakka 1:50,000	RHR6/94	Core	41.5	42.6	Raitevarri gneiss with silicified in part	18	530	3	33	0.1	72		Pyrr ± Cpy
2081	Iesjakka 1:50,000	RHR6/94	Core	42.6	44.85	Raitevarri gneiss with silicified in part	24	750	2	36	0.1	50		Pyrr ± Cpy
2082	Iesjakka 1:50,000	RHR6/94	Core	44.85	45.5	Raitevarri gneiss with silicified in part	21	1600	2	21	0.3	68		Cpy + Pyrr ± Py
2083	Iesjakka 1:50,000	RHR6/94	Core	45.5	48.0	Fined grained siliceous Raitevarri gneiss	46	710	3	41	0.1	37		Pyrr + Py ± Cpy
2084	Iesjakka 1:50,000	RHR6/94	Core	48.0	49.5	Fined grained siliceous Raitevarri gneiss	26	620	2	41	<0.1	51		Py + Pyrr ± Cpy
2085	Iesjakka 1:50,000	RHR6/94	Core	49.5	49.7	20 cm zone of Qtz veining in fine grained Raitevarri gneiss	12	850	1	36	0.1	35		Pyrr + Cpy
2086	Iesjakka 1:50,000	RHR6/94	Core	49.7	51.0	Fined grained siliceous Raitevarri gneiss	11	430	2	29	<0.1	22		Pyrr + Cpy + Py
2087	Iesjakka 1:50,000	RHR6/94	Core	51.0	51.4	Fined grained siliceous Raitevarri gneiss	22	6200	3	105	0.4	42		Pyrr + Cpy + Py (Cpy veinlet)
2088	Iesjakka 1:50,000	RHR6/94	Core	51.4	52.75	Fined grained siliceous Raitevarri gneiss	13	650	3	38	<0.1	18		Pyrr + Py + Cpy
2089	Iesjakka 1:50,000	RHR6/94	Core	52.75	54.3	Chloritic Raitevarri schist/gneiss	11	820	2	84	<0.1	57		± Pyrr ± Py ± Cpy
2090	Iesjakka 1:50,000	RHR6/94	Core	54.3	57.45	Chlortic Raitavarri schist/gneiss	28	460	3	37	<0.1	17		± Pyrr ± Py ± Cpy
2091	Iesjakka 1:50,000	RHR6/94	Core	57.8	59.1	Chloritic Raitevarri shcist/gneiss	87	1380	2	55	0.3	15		± Pyrr ± Py ± Cpy
2092	Iesjakka 1:50,000	RHR6/94	Core	59.1	60.25	Amphibolite	12	240	2	64	<0.1	33		

RAITEVARRI - NORWAY 1994 SAMPLES

Sample No Prefix N-35	Mapsheet/ Scale	Location (co-ords)	Sample Type	Width From	Width To	Lithology and Description	Elements Au ppb	Cu ppm	Pb ppm	Zn ppm	Ag g/t	Co ppm	Others	Comments
2093	Iesjakka 1:50,000	RHR6/94	Core	60.25	64.75	Mish-Mash of Raitevarri schists/chloritic schist	29	580	8	44	0.1	24		Py + Pyrr ± Cpy
2094	Iesjakka 1:50,000	RHR6/94	Core	64.75	65.75	Raitevarri schist/gneiss with chlorite	132	2280	2	37	0.8	47		Py + Pyrr + Cpy
2095	Iesjakka 1:50,000	RHR6/94	Core	65.75	67.0	Raitevarri gneiss/schist with chlorite	58	1150	3	30	0.3	48		Py + Pyrr + Cpy
2096	Iesjakka 1:50,000	RHR6/94	Core	67.0	70.0	Raitevarri gneiss/schist with chlorite	31	380	4	34	<0.1	22		Py + Pyrr ± Cpy
2097	Iesjakka 1:50,000	RHR6/94	Core	70.0	73.0	Raitevarri gneiss/schist & calcite	14	184	3	37	<0.1	18		Py + Pyrr ± Cpy
2098	Iesjakka 1:50,000	RHR6/94	Core	73.0	76.0	Hornblende biotite gneiss	22	208	3	32	<0.1	16		Very minor Pyrr + Py
2099	Iesjakka 1:50,000	RHR6/94	Core	76.0	78.0	Alternating amphibolite hornblende mica gneiss & chloritic schist	48	530	3	64	0.2	34		Py + Pyrr + Cpy
2100	Iesjakka 1:50,000	RHR6/94	Core	78.0	80.0	Raitevarri gneiss/schist & chloritic schist	28	580	2	27	<0.1	38		Pyrr + Py + Cpy
3001	Iesjakka 1:50,000	RHR6/94	Core	80.0	81.0	Raitevarri gneiss/schist	74	1860	3	32	0.5	73		Pyrr + Py + Cpy
3002	Iesjakka 1:50,000	RHR6/94	Core	81.0	82.0	Raitevarri gneiss/schist	54	940	2	17	0.1	50		Pyrr + Py + Cpy
3003	Iesjakka 1:50,000	RHR6/94	Core	82.0	83.0	Raitevarri gneiss/schist	15	420	2	15	<0.1	27		Pyrr + Py + Cpy
3004	Iesjakka 1:50,000	RHR6/94	Core	83.0	84.0	Raitevarri gneiss/schist	68	1430	2	24	0.1	22		Pyrr + Py + Cpy
3005	Iesjakka 1:50,000	RHR6/94	Core	84.0	85.0	Silicified in part Raitevarri schist	62	1400	1	30	0.1	26		Pyrr + Py + Cpy
3006	Iesjakka 1:50,000	RHR6/94	Core	85.0	86.0	Garnefiferous Raitevarri schist/gneiss	29	680	1	27	<0.1	26		Pyrr + Py + Cpy
3007	Iesjakka 1:50,000	RHR6/94	Core	86.0	87.0	Garnefiferous Raitevarri schist/gneiss with chlorite	99	750	1	29	<0.1	22		Pyrr + Py + Cpy
3008	Iesjakka 1:50,000	RHR6/94	Core	87.0	88.0	Raitevarri schist/gneiss silicified with chlorites	20	340	3	22	<0.1	29		Pyrr + Py + Cpy
3009	Iesjakka 1:50,000	RHR6/94	Core	88.0	88.85	Well silicified Raitevarri schist/gneiss	27	1340	3	23	0.0	30		Pyrr + Py + Cpy
3010	Iesjakka 1:50,000	RHR6/94	Core	88.85	90.0	Well silicified Raitevarri schist/gneiss	23	420	3	26	<0.1	20		Noticeable reduction in sulphides
3011	Iesjakka 1:50,000	RHR6/94	Core	90.0	91.0	Well silicified Raitevarri schist/gneiss	9	360	3	24	<0.1	19		Py + Pyrr + Cpy
3012	Iesjakka 1:50,000	RHR6/94	Core	91.0	92.0	Well silicified Raitevarri schist/gneiss	14	182	3	29	<0.1	23		Py + minor Pyrr ± Cpy
3013	Iesjakka 1:50,000	RHR6/94	Core	92.0	93.0	Well silicified Raitevarri schist/gneiss	9	740	2	20	<0.1	41		Pyrr + Py + Cpy

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Sample No Prefix N-35	Mapsheet/ Scale	Location (co-ords)	Sample Type	Width		Lithology and Description	Elements						Others	Comments
				From	To		Au ppb	Cu ppm	Pb ppm	Zn ppm	Ag g/t	Co ppm		
3014	Iesjakka 1:50,000	RHR6/94	Core	93.0	95.0	Raitevarri schist	74	890	2	31	<0.1	15		Pyrr + Py ± Cpy
3015	Iesjakka 1:50,000	RHR6/94	Core	95.0	97.0	Mixture of schists, chloritic schists etc	13	490	2	40	<0.1	31		Py + Pyrr + Cpy
3016	Iesjakka 1:50,000	RHR6/94	Core	97.0	99.25	Chlrotic Raitevarri schist, silicified in part	69	620	1	42	<0.1	26		Pyrr + Py ± Cpy
3017	Iesjakka 1:50,000	RHR6/94	Core	99.25	99.45	White Quartz vein	13	800	1	2	0.2	30		Pyrr + minor Cpy
3018	Iesjakka 1:50,000	RHR6/94	Core	99.45	101.0	Silicified Raitevarri schist	20	340	2	29	<0.1	18		Pyrr + Py + Cpy
3019	Iesjakka 1:50,000	RHR6/94	Core	101.0	102.5	Qtz - chlorite schist/gneiss	20	202	2	27	<0.1	18		Very minor Pyrr + Py
3020	Iesjakka 1:50,000	RHR6/94	Core	102.5	104.0	Slightly finer grained	15	580	2	37	<0.1	32		Pyrr + Py + Cpy
3021	Iesjakka 1:50,000	RHR6/94	Core	104.0	106.0	Raitevarri schist with chlorite	37	240	1	27	<0.1	29		Py + Pyrr ± Cpy
3022	Iesjakka 1:50,000	RHR6/94	Core	106.0	108.0	Raitevarri schist with chlorite	23	260	3	23	<0.1	32		Pyrr + Py ± Cpy
3023	Iesjakka 1:50,000	RHR6/94	Core	108.0	109.0	Raitevarri schist with chlorite	37	400	2	26	<0.1	24		Py + Pyrr + Cpy
3024	Iesjakka 1:50,000	RHR6/94	Core	109.0	110.0	Raitevarri schist with chlorite	55	280	2	20	0.1	27		Py + Pyrr ± Cpy
3025	Iesjakka 1:50,000	RHR6/94	Core	110.0	113.0	Raitevarri schist with chlorite	55	490	2	26	<0.1	32		Py + Pyrr ± Cpy
3026	Iesjakka 1:50,000	RHR6/94	Core	113.0	114.0	Raitevarri schist with chlorite	36	300	2	26	<0.1	21		Pyrr + Py + Cpy
3027	Iesjakka 1:50,000	RHR6/94	Core	114.0	117.0	Raitevarri schist with chlorite	61	490	1	22	<0.1	39		Py + minor Pyrr
3028	Iesjakka 1:50,000	RHR6/94	Core	117.0	119.0	Raitevarri schist with chlorite	60	660	2	21	<0.1	45		Py + Pyrr
3029	Iesjakka 1:50,000	RHR6/94	Core	119.0	120.0	Raitevarri schist with chlorite well silicified in parts	83	650	2	21	<0.1	25		Py + Pyrr + Cpy
3030	Iesjakka 1:50,000	RHR6/94	Core	120.0	121.0	Finer grained drop in chlorite content	61	540	1	33	<0.1	40		Py + Pyrr ± Cpy
3031	Iesjakka 1:50,000	RHR6/94	Core	122.0	122.95	Finer grained drop in chlorite content	50	510	1	30	<0.1	26		Py + Pyrr ± Cpy
3032	Iesjakka 1:50,000	RHR6/94	Core	122.95	124.0	Coarser grained Qtz-garnet chlorite schist	99	720	2	24	<0.1	27		Pyrr + Py ± Cpy
3033	Iesjakka 1:50,000	RHR6/94	Core	124.0	125.0	Coarser grained Qtz-garnet chlorite schist	42	102	3	26	<0.1	13		Py + Pyrr ± Cpy
3034	Iesjakka 1:50,000	RHR6/94	Core	125.0	126.30 (EOH)	Coarser grained Qtz-garnet chlorite schist	20	139	2	23	<0.1	14		Py + Pyrr ± Cpy

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Sample No Prefix N-35	Mapsheet/ Scale	Location (co-ords)	Sample Type	Width From m	Width To m	Lithology and Description	Elements Au ppb	Cu ppm	Pb ppm	Zn ppm	Ag g/t	Co ppm	Others	Comments
3035	Iesjakka 1:50,000	RHR2/94	Core	4.9	5.2	Amphibolite	9	13	4	61	0.2			Barren
3036	Iesjakka 1:50,000	RHR2/94	Core	5.2	8.0	Raitevarri schist/gneiss	12	111	5	52	0.1			Pyrr + Py ± Cpy
3037	Iesjakka 1:50,000	RHR2/94	Core	8.0	10.7	Raitevarri schist/gneiss	7	420	3	57	0.2			Pyrr + Py ± Cpy
3038	Iesjakka 1:50,000	RHR2/94	Core	10.7	12.5	Chloritic Raitevarri schist/gneiss	66	330	3	55	0.4			Py + Pyrr + Cpy
3039	Iesjakka 1:50,000	RHR2/94	Core	12.5	14.4	Raitevarri schist/gneiss	31	210	2	54	0.2			Pyrr + Py ± Cpy
3040	Iesjakka 1:50,000	RHR2/94	Core	14.4	16.7	Silicified in-part-garnetiferous Raitevarri schist	54	118	2	67	0.2			Py + Pyrr + Cpy
3041	Iesjakka 1:50,000	RHR2/94	Core	16.7	19.3	Biotite-chlorite schist-garnetiferous	7	98	2	65	0.3			Very minor sulphides
3042	Iesjakka 1:50,000	RHR2/94	Core	19.3	25.3	Raitevarri schist/gneiss	6	198	3	80	0.4			Pyrr + Py ± Cpy
3043	Iesjakka 1:50,000	RHR2/94	Core	25.3	26.5	Fractured and veined zone	11	230	1	65	0.2			Pyrr + Py ± Cpy
3044	Iesjakka 1:50,000	RHR2/94	Core	26.5	28.3	Banded Raitevarri schist	5	159	2	61	0.2			Pyrr + Py + Cpy
3045	Iesjakka 1:50,000	RHR2/94	Core	28.3	31.4	Garnetiferous banded Raitevarri schist	7	50	1	64	0.2			minor Pyrr + Py ± Cpy
3046	Iesjakka 1:50,000	RHR2/94	Core	31.4	34.5	Silicified quartz biotite schist	<5	77	3	54	0.2			minor Pyrr + Py ± Cpy
3047	Iesjakka 1:50,000	RHR2/94	Core	34.5	38.0	Raitevarri schist minor garnets	<5	91	5	77	0.2			minor Pyrr + Py ± Cpy
3048	Iesjakka 1:50,000	RHR2/94	Core	38.0	41.0	Raitevarri schist minor garnets	40	155	3	106	0.2			Py + Pyrr ± Cpy
3049	Iesjakka 1:50,000	RHR2/94	Core	41.0	44.0	Raitevarri schist minor garnets	8	26	3	92	0.2			Py + Pyrr ± Cpy
3050	Iesjakka 1:50,000	RHR2/94	Core	44.0	46.7	Raitevarri schist silicified in part	10	65	6	103	0.2			minor Py + Pyrr spot of Cpy
3051	Iesjakka 1:50,000	RHR2/94	Core	46.7	49.3	Riatevarri schist silicified in part	19	36	3	128	0.3			± Pyrr ± Py
3052	Iesjakka 1:50,000	RHR2/94	Core	49.3	49.55	same as 3050 fractures filled with sulphides	57	1010	2	147	0.6			up to 10% Pyrr + Py + Cpy
3053	Iesjakka 1:50,000	RHR2/94	Core	49.55	54.25	same as 3050 bleached in part	62	90	3	82	0.2			± Py ± Pyrr
3054	Iesjakka 1:50,000	RHR2/94	Core	54.25	58.11	Banded Raitevarri schist bleached and siliciferous	7	25	3	92	0.2			very minor sulphides
3055	Iesjakka 1:50,000	RHR2/94	Core	58.10	61.0	Silicified-chloritic Raitevarri schist	<5	14	3	143	0.2			Py + Pyrr ± Cpy

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Sample No Prefix N-35	Mapsheet/ Scale	Location (co-ords)	Sample Type	Width		Lithology and Description	Elements						Others	Comments
				From m	To m		Au ppb	Cu ppm	Pb ppm	Zn ppm	Ag g/t	Co ppm		
3056	Iesjakka 1:50,000	RHR2/94	Core	61.0	64.8	Less silicified chloritic Raitevarri schist	12	51	6	650	0.2			Py + Pyrr ± Cpy
3057	Iesjakka 1:50,000	RHR2/94	Core	64.8	68.8	Mildly silicified Qtz-chlorite-biotite schist	15	95	6	430	0.2			Pyrr + Py ± Cpy
3058	Iesjakka 1:50,000	RHR2/94	Core	68.8	71.6	Mildly silicified Qtz-chlorite-biotite schist	<5	37	4	480	0.2			Pyrr + Py ± Cpy
3059	Iesjakka 1:50,000	RHR2/94	Core	71.6	76.8	silicified banded Qtz-biotite-chlorite schist	<5	24	4	350	0.2			minor Py + Pyrr
3060	Iesjakka 1:50,000	RHR2/94	Core	76.8	81.2	Biotite-Qtz-chlorite schist silicified in part	<5	16	3	122	0.2			Pyrr + Py
3061	Iesjakka 1:50,000	RHR2/94	Core	81.2	85.5	Biotite-Qtz-chlorite schist silicified in part	<5	107	4	430	0.4			Pyrr + Py
3062	Iesjakka 1:50,000	RHR2/94	Core	85.5	88.5	Garnetiferous chlorite schist silicified in part	<5	88	7	260	0.3			Py + Pyrr up to 3%
3063	Iesjakka 1:50,000	RHR2/94	Core	88.5	92.5	Garnetiferous chlorite schist silicified in part	17	108	9	154	0.1			Py ± Pyrr spots of Cpy
3064	Iesjakka 1:50,000	RHR2/94	Core	92.5	96.5	Garnetiferous chlorite schist silicified in part	<5	115	4	184	<0.1			Py + Pyrr ± Sph
3065	Iesjakka 1:50,000	RHR2/94	Core	96.5	100.5	Garnetiferous chlorite schist silicified in part	<5	73	4	67	0.1			Py + Pyrr
3066	Iesjakka 1:50,000	RHR2/94	Core	100.5	104.25	Garnetiferous chlorite shcist silicified in part	<5	86	4	65	0.1			Py + Pyrr
3067	Iesjakka 1:50,000	RHR2/94	Core	104.25	107.25 (EOH)	Raitevarri schist/gneiss garnetiferous	10	117	5	41	<0.1			Pyrr + Py + Cpy
3068	Iesjakka 1:50,000	RHR7/94	Core	5.9	7.8	Graphic schist	<5	177	3	260	<0.1			Py ± Pyrr ± Sph
3069	Iesjakka 1:50,000	RHR7/94	Core	7.8	8.7	Qtz chlorite schist silicified fractured and weathered	<5	115	6	340	<0.1			Fe Oxides
3070	Iesjakka 1:50,000	RHR7/94	Core	8.7	11.7	Raitevarri schist/gneiss ± garnets	<5	21	2	128	0.1			Barren
3071	Iesjakka 1:50,000	RHR7/94	Core	11.7	16.85	Garnetiferous biotite-chlorite amphibole schist	<5	48	3	116	<0.1			V minor Pyrr
3072	Iesjakka 1:50,000	RHR7/94	Core	16.85	17.62	Garnetiferous biotite-chlorite amphibole schist	12	98	1	143	0.1			± sulphides
3073	Iesjakka 1:50,000	RHR7/94	Core	18.37	20.5	Garnetiferous biotite-chlorite amphibole schist	<5	39*	2	57	0.1			Barren
3074	Iesjakka 1:50,000	RHR7/94	Core	20.5	24.65	Silicified replacement of Qtz-mica-schist	<5	142	2	19	0.1			Up to 10% Py + Pyrr
3075	Iesjakka 1:50,000	RHR7/94	Core	24.65	29.10	Coarse grained garnet biotite-chlorite schist	<5	107	1	60	<0.1			minor Pyrr + Py ± Cpy
3076	Iesjakka 1:50,000	RHR7/94	Core	29.10	33.0	Qtz-chlorite-biotite ± garnets schist	<5	138	3	46	<0.1			minor Py ± Pyrr

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Sample No Prefix No -35	Mapsheet/ Scale	Location (co-ords)	Sample Type	Width From m	Width To m	Lithology and Description	Elements Au ppb	Cu ppm	Pb ppm	Zn ppm	Ag g/t	Co ppm	Others	Comments
3077	Iesjakka 1:50,000	RHR7/94	Core	33.0	37.0	Qtz-chlorite-biotite ± garnet schist	<5	70	4	40	<0.1			very minor Pyrr + Py
3078	Iesjakka 1:50,000	RHR7/94	Core	37.0	41.0	Qtz-chlorite-biotite ± garnet schist	<5	52	2	39	<0.1			very minor Pyrr + Py
3079	Iesjakka 1:50,000	RHR7/94	Core	41.0	45.0	Fine grained chlorite-Qtz-mica-amphibole schist, vuggy in part and ferruginised veinlets	<5	46	1	47	<0.1			very minor Pyrr + Py
3080	Iesjakka 1:50,000	RHR7/94	Core	45.0	49.55	Fine grained chlorite-Qtz mica amphibole schist, vuggy in part and ferruginised veinlets	<5	68	1	58	0.1			± sulphides
3081	Iesjakka 1:50,000	RHR7/94	Core	49.55	51.55	Med grained Qtz chlorite mica schist	<5	90	2	35	<0.1			Pyrr + Py ± Cpy
3082	Iesjakka 1:50,000	RHR7/94	Core	51.55	56.0	Qtz-amphibole-chlorite-mica schist	<5	26	2	40	0.1			± Pyrr ± Py
3083	Iesjakka 1:50,000	RHR7/94	Core	56.0	61.0	Qtz-amphibole-chlorite-mica schist	<5	29	2	27	0.1			± Pyrr ± Py
3084	Iesjakka 1:50,000	RHR7/94	Core	61.0	65.60	Qtz-amphibole-chlorite-mica schist	<5	10	2	25	0.2			± Pyrr ± Py
3085	Iesjakka 1:50,000	RHR7/94	Core	65.6	68.65	Qtz-amphibole-chlorite-mica schist	20	60	<1	26	0.1			Pyrr ± Py ± Cpy
3086	Iesjakka 1:50,000	RHR7/94	Core	68.65	72.30	Qtz-amphibole chlorite-mica schist ± garnets	<5	20	2	33	<0.1			minor Pyrr ± Py ± Cpy
3087	Iesjakka 1:50,000	RHR7/94	Core	72.30	75.0 EOH	Chlorite-Qtz Mica schist	<5	240	1	29	0.1			Pyrr ± Py ± Cpy
3088	Iesjakka 1:50,000	RHR8/94	Core	6.1	9.25	chlorite amphibole qtz schist	<5	96	6	150	0.1			Core loss 6.9-8.1m weathered sulphides?
3089	Iesjakka 1:50,000	RHR8/94	Core	9.7	15.6	chlorite-amphibole-mica schist	<5	95	6	84	0.1			very minor Py ± Pyrr
3090	Iesjakka 1:50,000	RHR8/94	Core	15.6	22.35	Gnt chlorite-amphibole mica ± Qtz schist, silicious veining II to cleavage	<5	87	3	88	0.1			very minor Py ± Pyrr
3091	Iesjakka 1:50,000	RHR8/94	Core	22.35	25.35	Graphitic in part silicified chlorite-mica schist ± garnets	17	175	4	43	0.3			Pyrr + Py up to 10%
3092	Iesjakka 1:50,000	RHR8/94	Core	26.5	29.8	Graphitic in part silicified chlorite mica schist ± garnets	<5	188	3	81	0.2			Up to 10% Pyrr ± Py
3093	Iesjakka 1:50,000	RHR8/94	Core	30.0	36.0	chloritic schist	<5	87	<1	49	0.1			± Pyrr
3094	Iesjakka 1:50,000	RHR8/94	Core	36.0	45.15	chloritic schist	<5	68	1	47	<0.1			± Pyrr
3095	Iesjakka 1:50,000	RHR8/94	Core	45.15	50.8 EOH	Chlorite mica ± Qtz schist	5	147	2	47	0.1			± Pyrr
3096	Iesjakka 1:50,000	RHR1/94	Core	66.0	66.4	silicified Qtz amphibole mica gneiss	65	550	<1	37	0.1			Disseminated Cpy only
3097	Iesjakka 1:50,000	RHR1/94	Core	66.40	68.60	silicified Qtz amphibole-mica gneiss	23	360	<1	36	<0.1			minor Cpy

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Sample No Prefix N-35	Mapsheet/ Scale	Location (co-ords)	Sample Type	Width From m	Width To m	Lithology and Description	Elements Au ppb	Cu ppm	Pb ppm	Zn ppm	Ag g/t	Co ppm	Others	Comments
3098	Iesjakka 1:50,000	RHR1/94	Core	68.60	68.74	Silicified Qtz-amphibole mica gneiss	179	2600	2	47	0.3	0.3		Disseminated Cpy
3099	Iesjakka 1:50,000	RHR6/94	Groove	64.75	65.75	Comparing Core & Groove sampling	188	2900	<1	38	1.4	1.4		Groove repeat of 2094
3100	Iesjakka 1:50,000	RHR6/94	Groove	30.0	31.0	Comparing Core & Groove sampling	107	2400	1	65	1.0	1.0		Groove repeat of 2052
3101	Iesjakka 1:50,000	RHR6/94	Groove	31.0	31.75	Comparing Core & Groove sampling	210	2060	<1	59	0.1	0.1		repeat of 2071
3102	Iesjakka 1:50,000	RHR6/94	Groove	31.95	33.39	Comparing Core & Groove sampling	82	1750	<1	49	0.2	0.2		repeat of 2073
3103	Iesjakka 1:50,000	RHR6/94	Groove	29.0	30.0	Comparing Core & Groove sampling	34	1960	<1	55	0.1	0.1		repeat of 2070
3104	Iesjakka 1:50,000	RHR9/94	Core	13.5	18.0	Qtz amphibole biotite ± chlorite ± garnet schist/gneiss	<5	37	<1	63	<0.1	<0.1		Pyrr + Py
3105	Iesjakka 1:50,000	RHR9/94	Core	18.0	19.3	Fracture zone Fe Oxides-graphitic in part	<5	370	7	194	0.3	0.3		Py + Pyrr
3106	Iesjakka 1:50,000	RHR9/94	Core	19.3	25.0	Qtz amphibole mica chlorite schist/gneiss	6	39	2	82	<0.1	<0.1		minor Py + Pyrr
3107	Iesjakka 1:50,000	RHR9/94	Core	25.0	29.3	Qtz amphibole mica chlorite schist/gneiss	<5	53	1	92	<0.1	<0.1		minor Py + Pyrr
3108	Iesjakka 1:50,000	RHR9/94	Core	29.3	30.97	Banded siliceous Qtz chlorite mica ± garnets gneiss & sulphides	<5	97	3	97	0.1	0.1		3% Pyrr + Py
3109	Iesjakka 1:50,000	RHR9/94	Core	30.97	32.5	Banded siliceous Qtz-chlorite-grahpite ± garnets gneiss and sulphides	112	134	<1	62	0.3	0.3		up to 10% Pyrr + Py
3110	Iesjakka 1:50,000	RHR9/94	Core	32.5	37.0	Qtz-amphibole-chlorite-garnet-schist	17	31	1	65	0.1	0.1		V minor Py + Pyrr
3111	Iesjakka 1:50,000	RHR9/94	Core	37.0	41.0	Chloritic amphibole mica schist	<5	43	<1	65	<0.1	<0.1		minor Py + Pyrr
3112	Iesjakka 1:50,000	RHR9/94	Core	41.0	46.0	Chloritic amphibole mica schist	<5	57	<1	67	<0.1	0.1		minor Pyrr + Py
3113	Iesjakka 1:50,000	RHR9/94	Core	46.0	51.0	Chloritic amphibole mica schist	<5	34	<1	64	0.1	<0.1		minor Pyrr + Py
3114	Iesjakka 1:50,000	RHR9/94	Core	51.0	56.3 EOH	Coarse grained chlorite-amphibole-mica-garnets schist	<5	87	1	47	<0.1	0.2		minor Pyrr + Py
3115	Iesjakka 1:50,000	RHR1/94	Core	1.5	3.0	Coarse grained chlorite amphibole mica garnets schist	77	169	4	66	0.1	0.1		Good Py + Pyrr ± Cpy
3116	Iesjakka 1:50,000	RHR1/94	Core	3.0	8.0	Coarse grained chlorite amphibole mica garnets schist	86	68	4	72	<0.1	<0.1		Py + Pyrr
3117	Iesjakka 1:50,000	RHR1/94	Core	8.0	13.0	Qtz chlorite amphibole garnet schist gneiss	12	111	4	119	<0.1	<0.1		Pyrr + Py ± Cpy
3118	Iesjakka 1:50,000	RHR1/94	Core	13.0	19.0	Qtz chlorite amphibole garnet schist/gneiss	22	122	3	55	0.1	0.1		minor Py + Pyrr ± Cpy

RAITEVARRI - NORWAY 1994 SAMPLES

Sample No Prefix N-35	Mapsheet/ Scale	Location (co-ords)	Sample Type	Width From m	To m	Lithology and Description	Elements Au ppb	Cu ppm	Pb ppm	Zn ppm	Ag g/t	Co ppm	Others	Comments
3119	Iesjakka 1:50,000	RHR1/94	Core	19.0	25.0	Qtz chlorite amphibole schist gneiss + garnets	<5	111	3	49	0.1			Pyrr + Py ± Cpy
3120	Iesjakka 1:50,000	RHR1/94	Groove	25.0	29.8	Siliceous biotite amphibole ± chlorite schist/gneiss	<5	41	3	73	<0.1			minor Py + Pyrr
3121	Iesjakka 1:50,000	RHR1/94	Groove	29.8	31.0	Chloritic hornblende schist	16	460	4	46	0.1			minor Py + Pyrr
3122	Iesjakka 1:50,000	RHR1/94	Groove	31.0	37.0	Siliceous mica-amphibole-schist	5	91	2	33	<0.1			Py + Pyrr ± Cpy
3123	Iesjakka 1:50,000	RHR1/94	Groove	37.0	43.0	Siliceous mica-amphibole schist	<5	46	3	32	0.1			minor Pyrr + Py
3124	Iesjakka 1:50,000	RHR1/94	Groove	43.0	49.0	Siliceous mica amphibole schist	27	117	2	63	<0.1			minor Pyrr + Py
3125	Iesjakka 1:50,000	RHR1/94	Core	49.0	55.0	Siliceous mica-amphibole schist	8	56	3	33	<0.1			minor Pyrr + Py
3126	Iesjakka 1:50,000	RHR1/94	Core	55.0	61.0	Siliceous mica amphibole schist	<5	260	3	72	0.1			minor Pyrr + Py
3127	Iesjakka 1:50,000	RHR1/94	Core	61.0	66.0	Siliceous mica amphibole schist	<5	63	5	51	0.1			minor Pyrr + Py
3128	Iesjakka 1:50,000	RHR1/94	Core	68.75	73.0	Silicified amphibole biotite chlorite gneiss/schist	9	187	3	30	<0.1			minor Pyrr + Py
3129	Iesjakka 1:50,000	RHR1/94	Core	73.0	79.0	Silicified amphibole biotite chlorite gneiss schist	14	235	9	50	<0.1			minor Pyrr + Py
3130	Iesjakka 1:50,000	RHR1/94	Core	79.0	85.0	Silicified amphibole biotite chlorite gneiss schist	<5	64	6	34	<0.1			Minor Pyrr + Py
3131	Iesjakka 1:50,000	RHR1/94	Core	85.0	90.0	Siliceous Qtz mica chlorite schist	<5	33	2	37	<0.1			minor Pyrr + Py
3132	Iesjakka 1:50,000	RHR1/94	Core	90.0	74.3 EOH	Siliceous Qtz-mica chlorite schist	<5<5	20	3	23	<0.1			minor Pyrr + Py
3133	Iesjakka 1:50,000	RHR4/94	Groove	1.0	6.0	Qtz chlorite mica amphibole schist gneiss	<5<5	230	10	260	<0.1			± sulphides
3134	Iesjakka 1:50,000	RHR4/94	Groove	6.0	11.0	Qtz chlorite mica amphibole schist gneiss	18	137	11	310	<0.1			± sulphides
3135	Iesjakka 1:50,000	RHR4/94	Groove	11.0	16.0	Qtz chlorite mica amphibole schist gneiss	27	135	12	260	<0.1			± sulphides
3136	Iesjakka 1:50,000	RHR4/94	Groove	16.0	21.0	Qtz chlorite mica amphibole schist gneiss	47	190	8	121	<0.1			± sulphides
3137	Iesjakka 1:50,000	RHR4/94	Groove	21.0	26.0	Qtz chlorite mica amphibole schist gneiss	15	123	6	111	<0.1			± sulphides
3138	Iesjakka 1:50,000	RHR4/94	Groove	26.0	31.0	Qtz chlorite mica amphibole schist gneiss	28	198	5	118	<0.1			± sulphides
3139	Iesjakka 1:50,000	RHR4/94	Groove	31.0	36.0	Qtz chlorite mica amphibole schist gneiss	12	111	3	89	<0.1			± sulphides

RAITEVARRI - NORWAY 1994 SAMPLES

Sample No Prefix N-35	Mapsheet/ Scale	Location (co-ords)	Sample Type	Width From m	Width To m	Lithology and Description	Elements Au ppb	Cu ppm	Pb ppm	Zn ppm	Ag g/t	Co ppm	Others	Comments
3140	Iesjakka 1:50,000	RHR4/94	Groove	36.0	41.0	Qtz, chlorite-mica amphibole schist/gneiss	<5	104	10	160	<0.1			± sulphides
3141	Iesjakka 1:50,000	RHR4/94	Groove	41.0	46.0	Qtz, chlorite-mica-amphibole schist/gneiss	<5	116	5	99	<0.1			± sulphides
3142	Iesjakka 1:50,000	RHR4/94	Groove	46.0	51.0	Qtz, chlorite-mica-amphibole schist gneiss	<5	42	5	76	<0.1			± sulphides
3143	Iesjakka 1:50,000	RHR4/94	Groove	51.0	56.0	Qtz, chlorite-mica-amphibole schist gneiss	<5	43	3	51	<0.1			± sulphides
3144	Iesjakka 1:50,000	RHR4/94	Groove	56.0	61.0	Qtz, chlorite-mica-amphibole schist gneiss	<5	36	4	77	<0.1			± sulphides
3145	Iesjakka 1:50,000	RHR4/94	Groove	61.0	66.0	Qtz, chlorite-mica-amphibole schist gneiss	<5	51	3	68	<0.1			± sulphides
3146	Iesjakka 1:50,000	RHR4/94	Groove	66.0	71.0	Qtz, chlorite-mica-amphibole schist gneiss	<5	20	3	98	<0.1			± sulphides
3147	Iesjakka 1:50,000	RHR4/94	Groove	71.0	76.0	Qtz, chlorite-mica-amphibole schist gneiss including a 40 cm graphitic zone	6	115	5	250	<0.1			Py ± Pyrr
3148	Iesjakka 1:50,000	RHR4/94	Groove	76.0	81.0	Qtz, chlorite-mica-amphibole schist gneiss including a 20cm graphite zone	6	134	5	230	0.1			Py + Pyrr
3149	Iesjakka 1:50,000	RHR4/94	Groove	81.0	86.0	Qtz, chlorite-mica-amphibole schist gneiss including a 15 cm graphitic zone	11	102	4	250	0..1			minor Py
3150	Iesjakka 1:50,000	RHR4/94	Groove	86.0	91.0	Qtz, chlorite-mica-amphibole schist gneiss including a 10cm graphitic zone	13	100	3	190	<0.1			± sulphides
3151	Iesjakka 1:50,000	RHR4/94	Core	91.0	96.4 EOH	Qtz chlorite amphibole mica schist	15	64	4	191	0.1			± sulphides
3152	Iesjakka 1:50,000	RHR5/94	Core	9.8	12.9	Qtz amphibole sericite chlorite schist	96	910	3	60	0.1			Py ± Pyrr ± Cpy
3153	Iesjakka 1:50,000	RHR5/94	Core	12.9	13.15	Qtz amphibole sericite chlorite schist	293	1170	2	64	0.3			1% Py + Cpy
3154	Iesjakka 1:50,000	RHR5/94	Core	13.15	15.0	Qtz amphibole sericite chlorite schist	175	1140	3	62	0.3			1% Py + bleb of Cpy
3155	Iesjakka 1:50,000	RHR5/94	Core	15.0	18.0	Qtz amphibole sericite chlorite schist	179	470	2	46	0.2			Py
3156	Iesjakka 1:50,000	RHR5/94	Core	18.0	22.0	Amphibole chlorite Qtz sericite schist	43	166	2	88	0.1			Py + Pyrr
3157	Iesjakka 1:50,000	RHR5/94	Core	22.0	26.0	Qtz amphibole chlorite biotite sericite garnetiferous schist	33	82	2	51	<0.1			Py + Pyrr
3158	Iesjakka 1:50,000	RHR5/94	Core	26.0	30.0	Amphibole chlorite qtz schist	42	101	1	49	<0.1			Py
3159	Iesjakka 1:50,000	RHR5/94	Core	30.0	35.0	Qtz chlorite amphibole biotite garnetiferous schist	24	43	3	39	<0.1			Py + Pyrr
3160	Iesjakka 1:50,000	RHR5/94	Core	35.0	39.0	Qtz chlorite amphibole biotite garnetiferous schist	25	67	2	36	<0.1			Py

RAITEVARRI - NORWAY 1994 SAMPLES

Sample No Prefix N-35	Mapsheet/ Scale	Location (co-ords)	Sample Type	Width		Lithology and Description	Elements						Others	Comments
				From m	To m		Au ppb	Cu ppm	Pb ppm	Zn ppm	Ag g/t	Co ppm		
3161	Iesjakka 1:50,000	RHR5/94	Core	39.0	44.0	Qtz chlorite amphibole biotite sericite ± garnets schist/gneiss	88	118	2	36	0.1			Py
3162	Iesjakka 1:50,000	RHR5/94	Core	44.0	459.0	Qtz chlorite amphibole biotite sericite ± garnets schist/gneiss	81	58	3	37	<0.1			Py + Pyrr
3163	Iesjakka 1:50,000	RHR5/94	Core	49.0	54.0	Qtz chlorite amphibole biotite sericite ± garnets schist/gneiss	114	28	3	30	<0.1			Py + Pyrr
3164	Iesjakka 1:50,000	RHR5/94	Core	54.0	59.0	Qtz chlorite amphibole biotite sericite ± garnets schist/gneiss	129	60	3	2	0.1			Py ± Pyrr
3165	Iesjakka 1:50,000	RHR5/94	Core	59.0	64.0	Qtz chlorite amphibole biotite sericite ± garnets schist/gneiss	171	103	3	36	0.1			Py ± Pyrr
3166	Iesjakka 1:50,000	RHR5/94	Core	64.0	69.0	Qtz chlorite amphibole biotite sericite ± garnets schist/gneiss	176	77	4	43	0.1			Py ± Pyrr
3167	Iesjakka 1:50,000	RHR5/94	Core	69.0	74.0	Qtz chlorite amphibole biotite sericite ± garnets schist/gneiss	85	92	4	45	<0.1			Py ± Pyrr
3168	Iesjakka 1:50,000	RHR5/94	Core	74.0	79.0	Qtz chlorite amphibole biotite sericite ± garnets schist/gneiss	274	80	4	55	<0.1			Py ± Pyrr
3169	Iesjakka 1:50,000	RHR5/94	Core	79.0	84.0	Qtz chlorite amphibole biotite sericite ± garnets schist/gneiss	83	86	4	44	0.1			Py ± Pyrr
3170	Iesjakka 1:50,000	RHR5/94	Core	84.0	89.0	Qtz chlorite amphibole biotite sericite ± garnets schist/gneiss	27	66	3	65	0.1			Py ± Pyrr
3171	Iesjakka 1:50,000	RHR5/94	Core	89.0	92.0	Qtz chlorite amphibole biotite sericite ± garnets schist/gneiss	26	178	3	51	0.2			Py ± Py ± Cpy
3172	Iesjakka 1:50,000	RHR5/94	Core	92.0	97.0	Qtz chlorite amphibole biotite sericite ± garnets schist/gneiss	52	118	3	89	0.1			Py + Pyrr
3173	Iesjakka 1:50,000	RHR5/94	Core	97.0	101.5 EOH	Qtz chlorite amphibole biotite sericite ± garnets schist/gneiss	21	109	25	101	0.1			Py ± Pyrr
3174	Iesjakka 1:50,000	RHR3/94	Core	60.0	61.0	Qtz feldspar-biotite amphibolic ± chlorite schist/gneiss	302	1450	3	54	0.2			Pyrr + Py + Cpy
3175	Iesjakka 1:50,000	RHR3/94	Core	61.0	64.0	Qtz feldspar biotite amphibolic ± chlorite schist gneiss	610	740	3	50	0.1			Pyrr + Py Cpy
3176	Iesjakka 1:50,000	RHR3/94	Core	64.0	67.0	Qtz feldspar biotite - amphibolic ± chlorite schist gneiss	94	350	3	41	0.1			minor Pyrr + Py ± Cpy
3177	Iesjakka 1:50,000	RHR3/94	Core	58.0	60.0	Qtz feldspar biotite amphibolic ± chlorite schist/gneiss	73	440	3	37	0.2			minor Pyrr + Py ± Cpy
3178	Iesjakka 1:50,000	RHR3/94	Core	56.0	58.0	Qtz feldspar biotite amphibolic ± chlorite schist/gneiss	86	310	3	43	<0.1			Py + Pyrr ± Cpy
3179	Iesjakka 1:50,000	RHR3/94	Core	84.0	86.0	Qtz feldspar biotite amphibolic ± chlorite schist/gneiss	296	670	3	24	0.1			Pyrr + Py ± Cpy
3180	Iesjakka 1:50,000	RHR3/94	Core	86.0	88.0	Qtz feldspar biotite amphibolic ± chlorite schist gneiss	300	520	3	19	0.1			Pyrr + Py ± Cpy
3181	Iesjakka 1:50,000	RHR3/94	Core	1.7	7.0	Qtz feldspar biotite amphibolitic ± chlorite schist gneiss	<5	175	3	26	<0.1			minor Py ± Pyrr

RAITEVARRI - NORWAY 1994 SAMPLES

Sample No Prefix N-35	Mapsheet/ Scale	Location (co-ords)	Sample Type	Width		Lithology and Description	Elements						Others	Comments
				From m	To m		Au ppb	Cu ppm	Pb ppm	Zn ppm	Ag g/t	Co ppm		
3182	Iesjakka 1:50,000	RHR3/94	Core	7.0	12.0	Qtz feldspar biotite amphibole chlorite schist/gneiss	15	174	3	28	<0.1			Py
3183	Iesjakka 1:50,000	RHR3/94	Core	12.0	17.0	Qtz feldspar biotite amphibole chlorite schist/gneiss	11	211	3	24	<0.1			Py
3184	Iesjakka 1:50,000	RHR3/94	Core	17.0	22.0	Qtz feldspar biotite amphibole chlorite schist/gneiss	11	102	2	17	<0.1			Py + minor Cpy bleb
3185	Iesjakka 1:50,000	RHR3/94	Core	22.0	27.0	Qtz feldspar biotite amphibole chlorite schist/gneiss	41	330	2	21	<0.1			Py
3186	Iesjakka 1:50,000	RHR3/94	Core	27.0	33.0	Qtz feldspar biotite amphibole chlorite schist/gneiss	30	310	2	30	0.1			Py
3187	Iesjakka 1:50,000	RHR3/94	Core	33.0	38.0	Qtz feldspar biotite amphibole chlorite schist/gneiss	13	270	2	18	<0.1			Py
3188	Iesjakka 1:50,000	RHR3/94	Core	38.0	43.0	Qtz feldspar biotite amphibole chlorite schist/gneiss	30	160	3	24	0.1			Py
3189	Iesjakka 1:50,000	RHR3/94	Core	43.0	49.0	Qtz feldspar biotite amphibole chlorite schist/gneiss	24	153	3	33	0.1			Py
3190	Non - Raitevarri Sample													Adrians Sample
3191	Iesjakka 1:50,000	RHR3/94	Core	49.0	56.0	Qtz feldspar biotite amphibole chlorite schist/gneiss	141	244						minor Py
3192	Iesjakka 1:50,000	RHR3/94	Groove	67.0	72.0	Qtz feldspar biotite amphibole chlorite schist/gneiss	79	177						minor Py
3193	Iesjakka 1:50,000	RHR3/94	Groove	72.0	78.0	Qtz feldspar biotite amphibole chlorite schist/gneiss	47	195						minor Py
3194	Iesjakka 1:50,000	RHR3/94	Groove	78.0	84.0	Qtz feldspar biotite amphibole chlorite schist/gneiss	146	281						minor Py
3195	Iesjakka 1:50,000	RHR3/94	Groove	88.0	93.0	Qtz feldspar biotite amphibole chlorite schist/gneiss	106	341						minor Py
3196	Iesjakka 1:50,000	RHR3/94	Groove	93.0	99.0	Qtz feldspar biotite amphibole chlorite schist/gneiss	56	138						minor Py
3197	Iesjakka 1:50,000	RHR3/94	Groove	99.0	104.60 EOH	Qtz feldspar biotite amphibole chlorite schist/gneiss	88	138						minor Py

APPENDIX 2

SUMMARY DRILL LOGS FOR RHR 01 - RHR 09

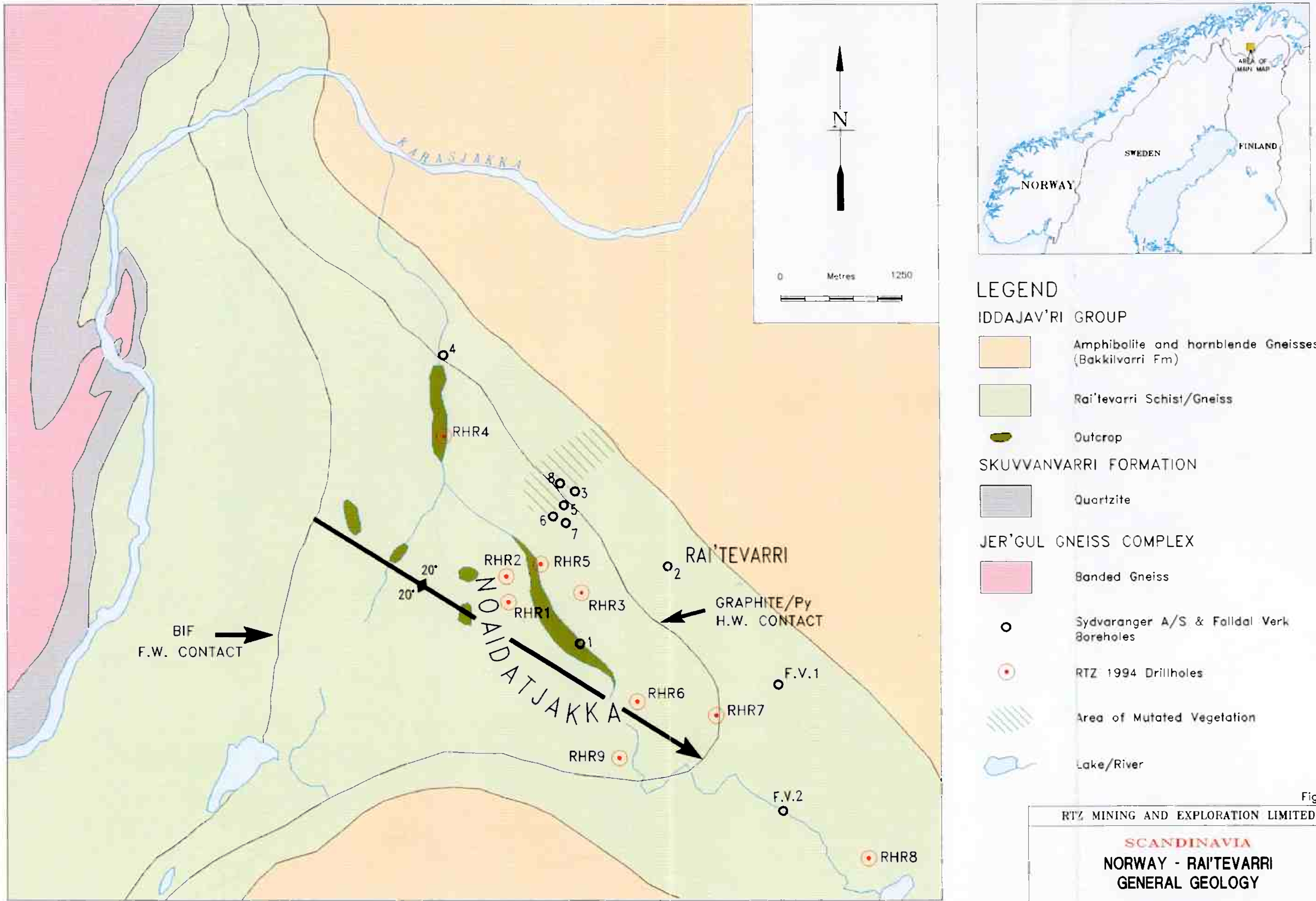


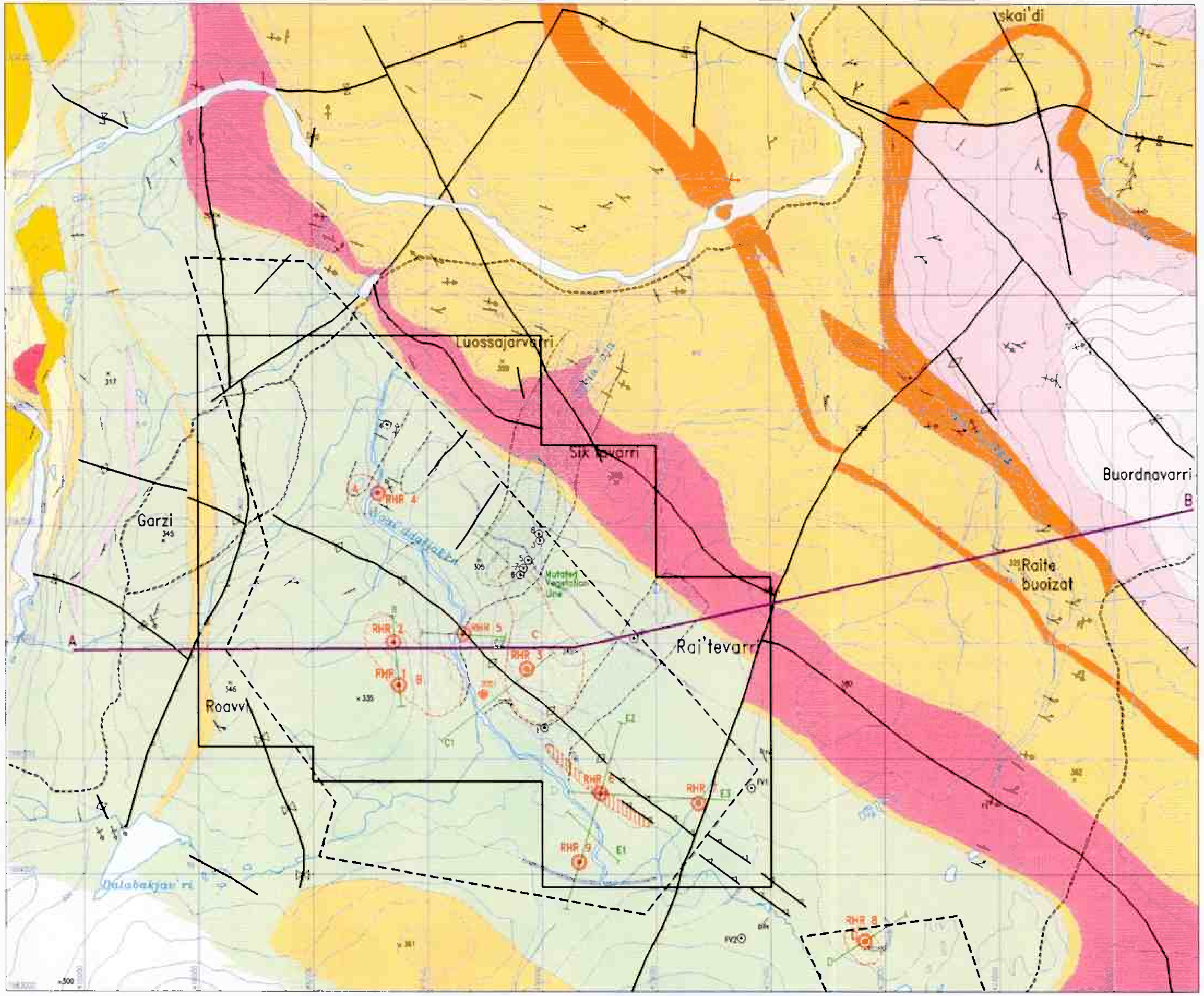
Figure 1

RTZ MINING AND EXPLORATION LIMITED

SCANDINAVIA

NORWAY - RAI'TEVARRI
GENERAL GEOLOGY

PROJECTION: NONE		FILE: D:\NORWAY\RAIGE001	
AUTHOR: J.COPPARD	OPERATOR: T.DEVEREUX	REVISION DATE: 15-07-94	FIGURE: 1



N

0 Metres 1000

SCALE 1 : 40,000

LEGEND

- Areas of interest based on NGU IP results.
- RTZ IP lines
- >100ppm Cu in soils/till
- RHR 8 — RTZ 1994 Drill Holes
- Distinct topographic feature with Malachite Staining
- 8 — Drill Hole (Sydvaranger and Folldal Verk)
- Rock Grab
- Fault
- Fault (down throw side)
- Fault (with inferred down throw side)
- Syncline
- Inferred Syncline
- Anticline
- Inferred Anticline
- Tracks
- x 335 — Spot Height (m)
- Contours (m)
- Lakes – Rivers
- Contacts :–
  - Definite
  - Inferred Probable
  - Inferred Possible
- Dip/Strike
- R.T.Z. Licence Boundary
- NGU IP Survey Area
- Approximate area of mutated vegetation
- A–B — Cross-Section

LITHOLOGIES

- CHLORITE SCHIST : with quartz, carbonate, amphibole gneiss and quartz biotite gneiss and psammitic intercalations.
- QUARTZ BIOTITE SCHIST : with carbonate, psammitic, amphibole gneiss and quartz carbonate chlorite schist intercalations.
- MICROCLINE GRANITE GNEISS : amphibole gneiss or amphibolite
- GRANODIORITE or TONALITE GNEISS : (showing ductile deformation)
- AMPHIBOLITE : (banded amphibolite and locally amphibole gneiss, locally mafic meta-volcanics).
- BASAL CONGLOMERATE : carbonate, quartz, feldspar, quartzite
- MICA SCHIST : with varying amounts of quartz, kyanite : metasedimentary.
- RAI'TEVARRI SCHIST/GNEISS: Amphiole, Biotite, Dominantly metasedimentary ± Graphite; Amphiole, Quartz, Biotite, Chlorite with Graphite in the hanging wall (Graphite Schist)
- GRANITE : foliated.
- KOMATIITES

Figure 2

RTZ MINING AND EXPLORATION LIMITED

SCANDINAVIA

RAI'TEVARRI GEOLOGY MAP
FINNMARK, NORWAY
IESJAKKA SHEET 2033 IV

PROJECTION: UTM 35		FILE: SCANDIA\NORWAY\RAITEVAR\RAISTR01	
AUTHOR: J.COPPARD	OPERATOR: T.D./L.D.	REVISION DATE: 25-05-94	FIGURE: 2

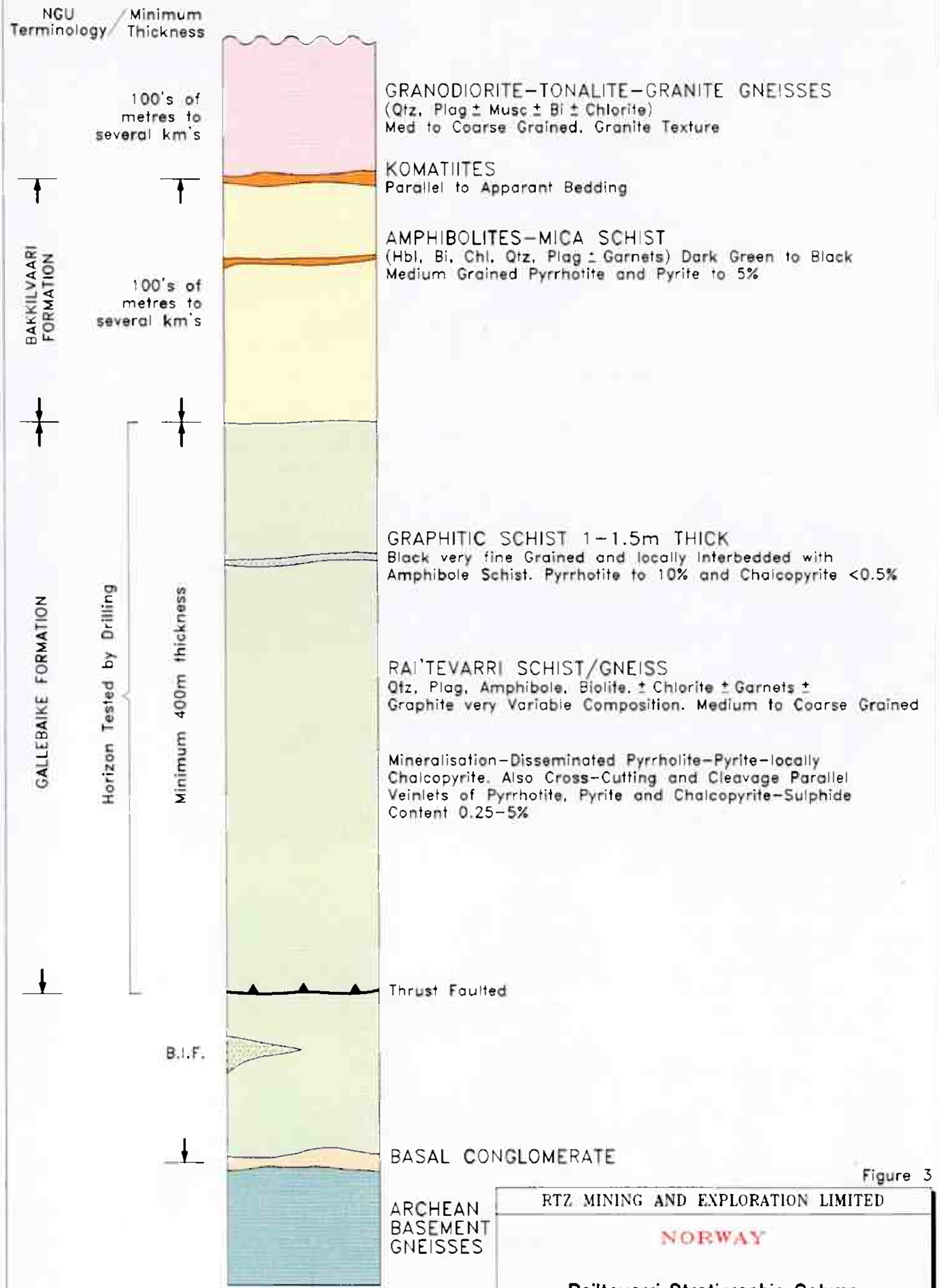


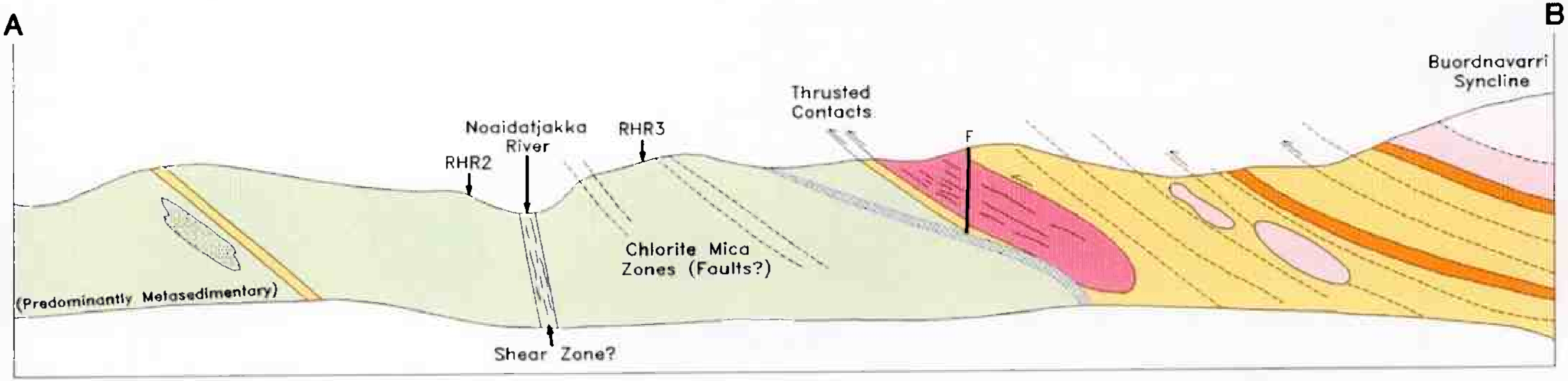
Figure 3

RTZ MINING AND EXPLORATION LIMITED

NORWAY

Rai'tevarri Stratigraphic Column

PROJECTION: NONE		FILE: D:\NORWAY\RAI-COLU	
AUTHOR: J.COPPARD	OPERATOR: S.A.HEATH	REVISION DATE: 12-07-94	FIGURE: 3



LEGEND

- Rai'tevarri Schist/Gneiss
- Amphibolite : (banded amphibolite and locally amphibole gneiss, locally mafic meta-volcanics)
- Mica Schist : with varying amounts of quartz, kyanite : metasedimentary
- Komatiites
- Granodiorite or Tonalite Gneiss : (showing ductile deformation)
- Microcline Granite Gneiss:amphibole gneiss or amphibolite
- Graphite Schist
- Buried Bif (predominantley metasedimentary)

Figure 4

RTZ MINING AND EXPLORATION LIMITED			
NORWAY			
Simplified Cross Section A-B Rai'tevarri			
PROJECTION NONE		FILE: D:\NORWAY\RAI-X1	
AUTHOR: J COPPARD	OPERATOR: S.A.HEATH	REVISION DATE: 12-07-94	FIGURE: 4

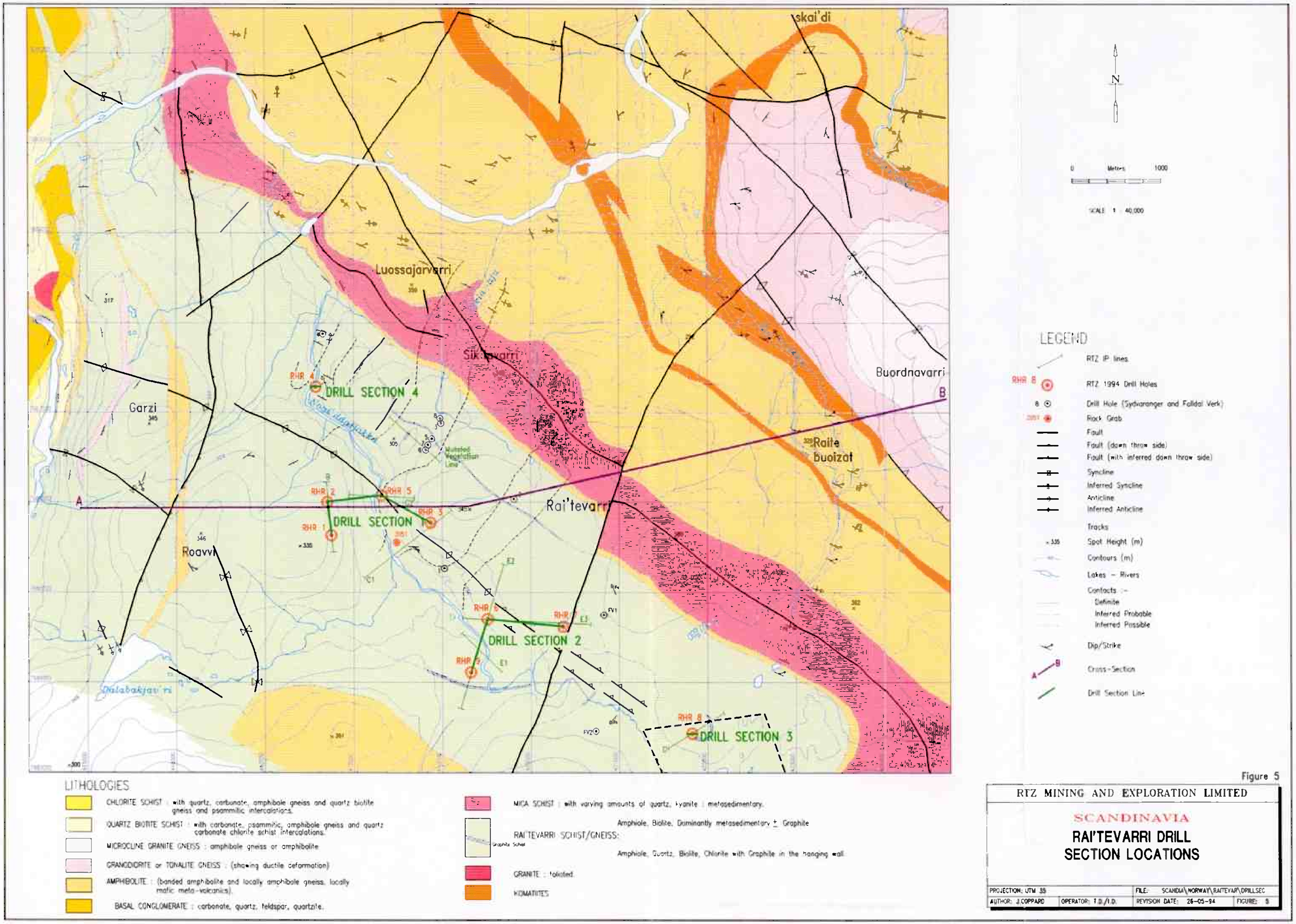
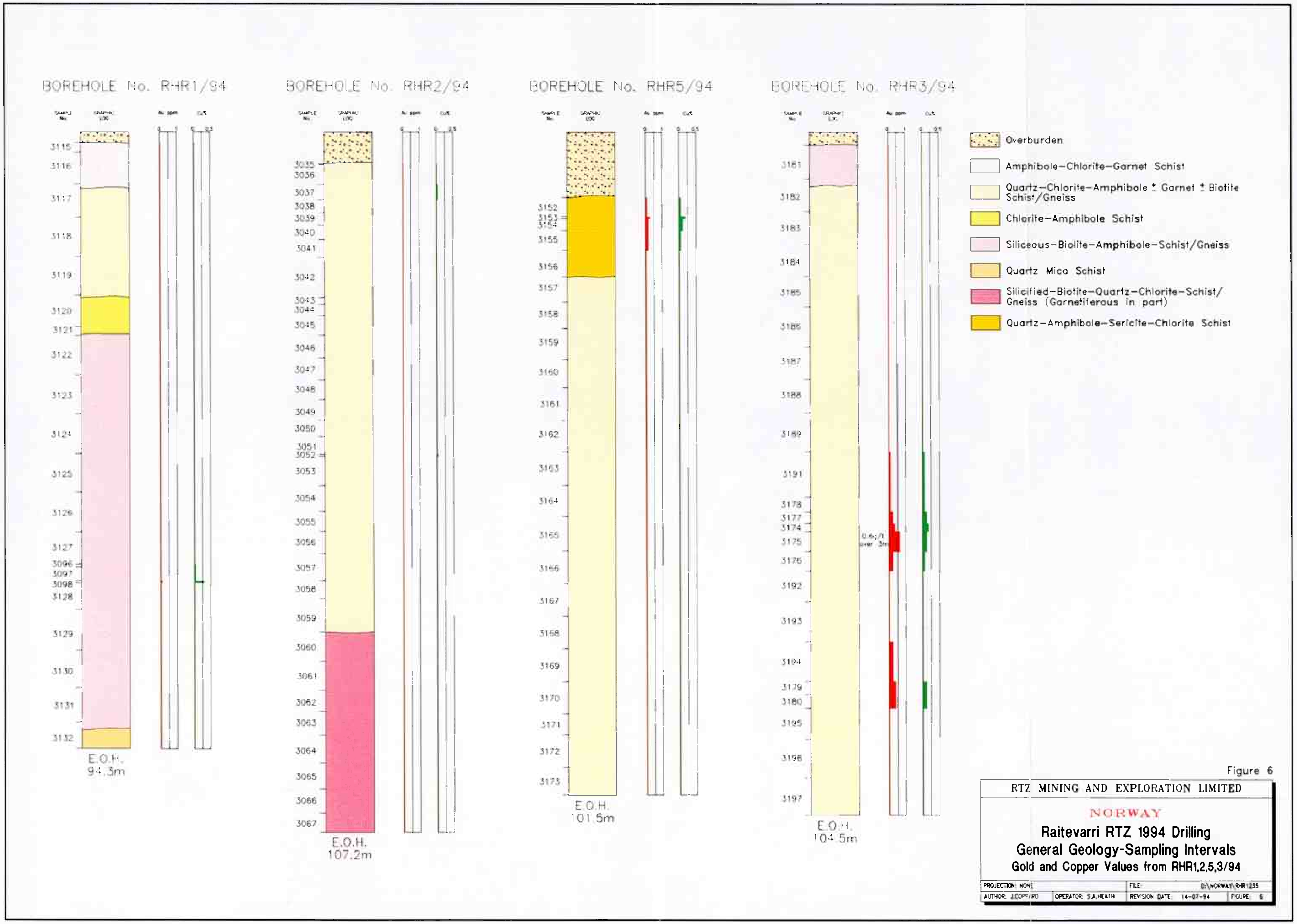

skai'di
Luossajarvarri
Sik'tevarri
Buordnavarri
Raite buoizat
Rai'tevarri
Garzi
Roavvi
Dalabakjav'ri
Mutated Vegetation Line
RHR 1
RHR 2
RHR 3
RHR 4
RHR 5
RHR 6
RHR 7
RHR 8
RHR 9
DRILL SECTION 1
DRILL SECTION 2
DRILL SECTION 3
DRILL SECTION 4
A
B
N
0 Metres 1000
SCALE 1 : 40,000
LEGEND
RTZ IP lines
RTZ 1994 Drill Holes
Drill Hole (Sydvaranger and Folldal Verk)
Rock Grab
Fault
Fault (down throw side)
Fault (with inferred down throw side)
Syncline
Inferred Syncline
Anticline
Inferred Anticline
Tracks
Spot Height (m)
Contours (m)
Lakes – Rivers
Contacts :-
Definite
Inferred Probable
Inferred Possible
Dip/Strike
Cross-Section
Drill Section Line
LITHOLOGIES
CHLORITE SCHIST : with quartz, carbonate, amphibole gneiss and quartz biotite gneiss and psammitic intercalations.
QUARTZ BIOTITE SCHIST : with carbonate, psammitic, amphibole gneiss and quartz carbonate chlorite schist intercalations.
MICROCLINE GRANITE GNEISS : amphibole gneiss or amphibolite
GRANODIORITE or TONALITE GNEISS : (showing ductile deformation)
AMPHIBOLITE : (banded amphibolite and locally amphibole gneiss, locally mafic meta-volcanics).
BASAL CONGLOMERATE : carbonate, quartz, feldspar, quartzite.
MICA SCHIST : with varying amounts of quartz, kyanite : metasedimentary.
RAI'TEVARRI SCHIST/GNEISS:
Amphiole, Biotite, Dominantly metasedimentary ± Graphite
Graphite Schist
Amphiole, Quartz, Biotite, Chlorite with Graphite in the hanging wall
GRANITE : foliated.
KOMATIITES
RTZ MINING AND EXPLORATION LIMITED
SCANDINAVIA
RAI'TEVARRI DRILL SECTION LOCATIONS
PROJECTION: UTM 35
FILE: SCANDIA\NORWAY\RAITEVAR\DRILLSEC
AUTHOR: J.COPPARD
OPERATOR: T.D./I.D.
REVISION DATE: 26-05-94
FIGURE: 5

Figure 5


BOREHOLE No. RHR1/94
E.O.H. 94.3m
BOREHOLE No. RHR2/94
E.O.H. 107.2m
BOREHOLE No. RHR5/94
E.O.H. 101.5m
BOREHOLE No. RHR3/94
0.6g/t over 3m
E.O.H. 104.5m
Overburden
Amphibole–Chlorite–Garnet Schist
Quartz–Chlorite–Amphibole ± Garnet ± Biotite Schist/Gneiss
Chlorite–Amphibole Schist
Siliceous–Biotite–Amphibole–Schist/Gneiss
Quartz Mica Schist
Silicified–Biotite–Quartz–Chlorite–Schist/Gneiss (Garnetiferous in part)
Quartz–Amphibole–Sericite–Chlorite Schist
Figure 6
RTZ MINING AND EXPLORATION LIMITED
NORWAY
Raitevarri RTZ 1994 Drilling
General Geology-Sampling Intervals
Gold and Copper Values from RHR1,2,5,3/94

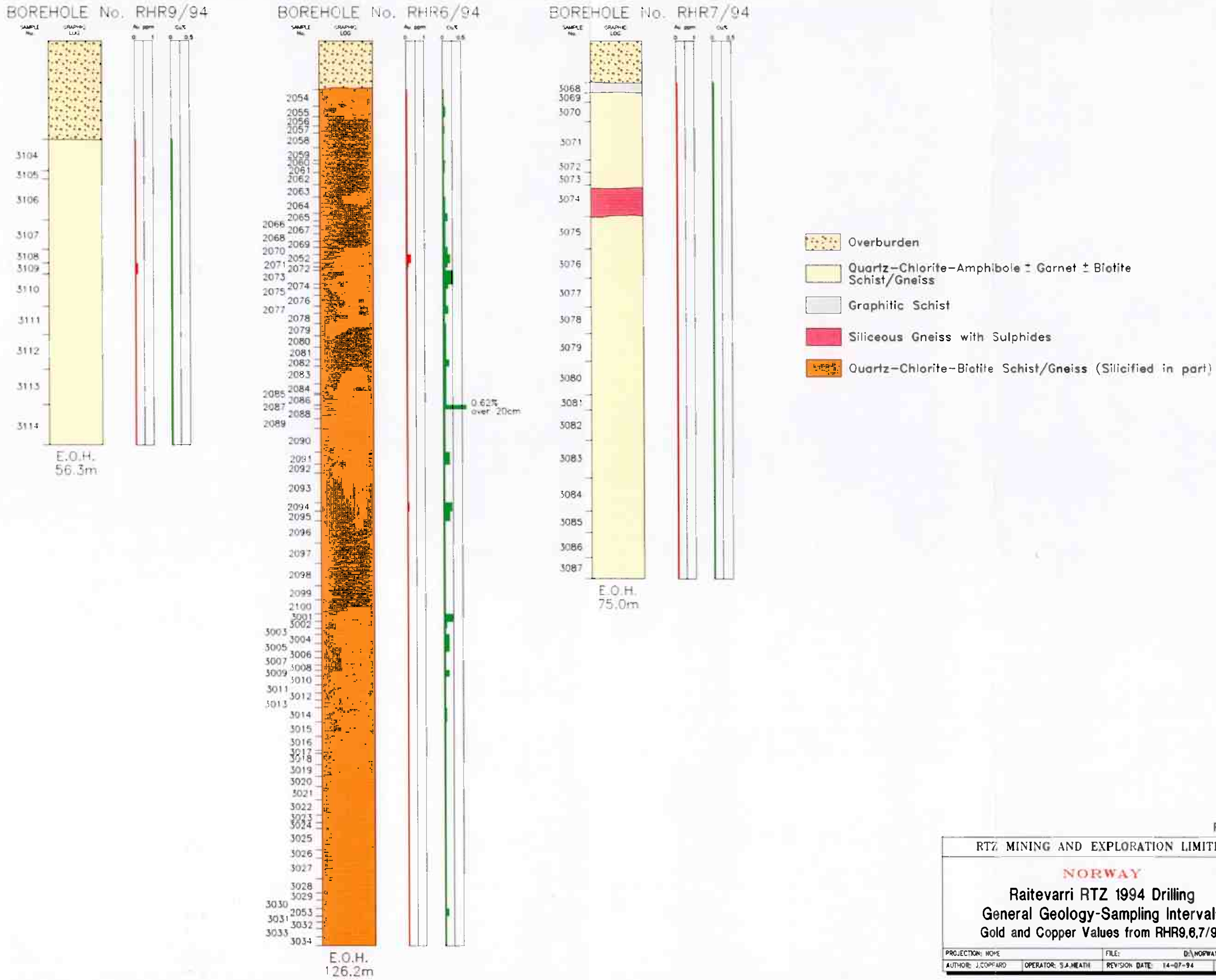


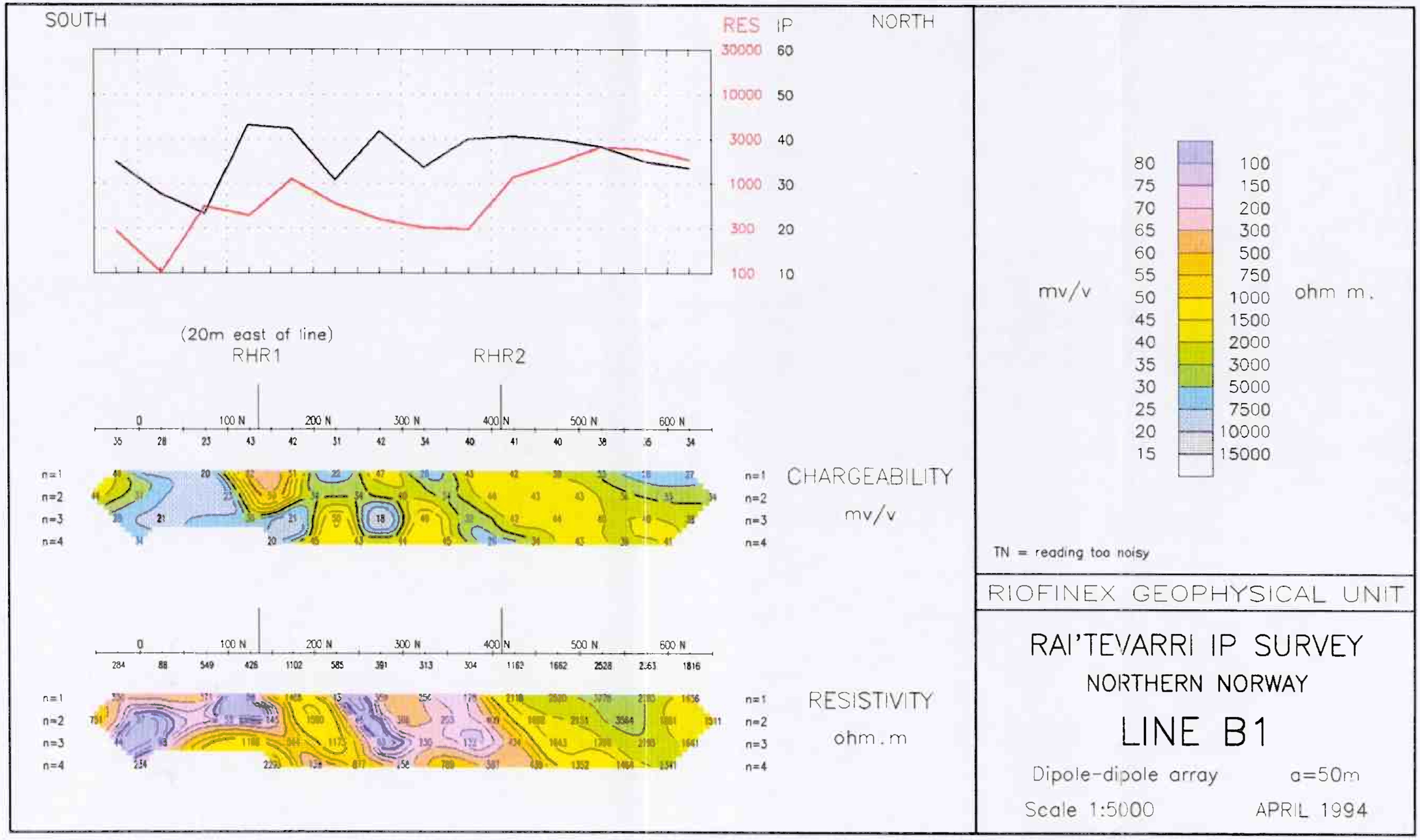
Figure 7

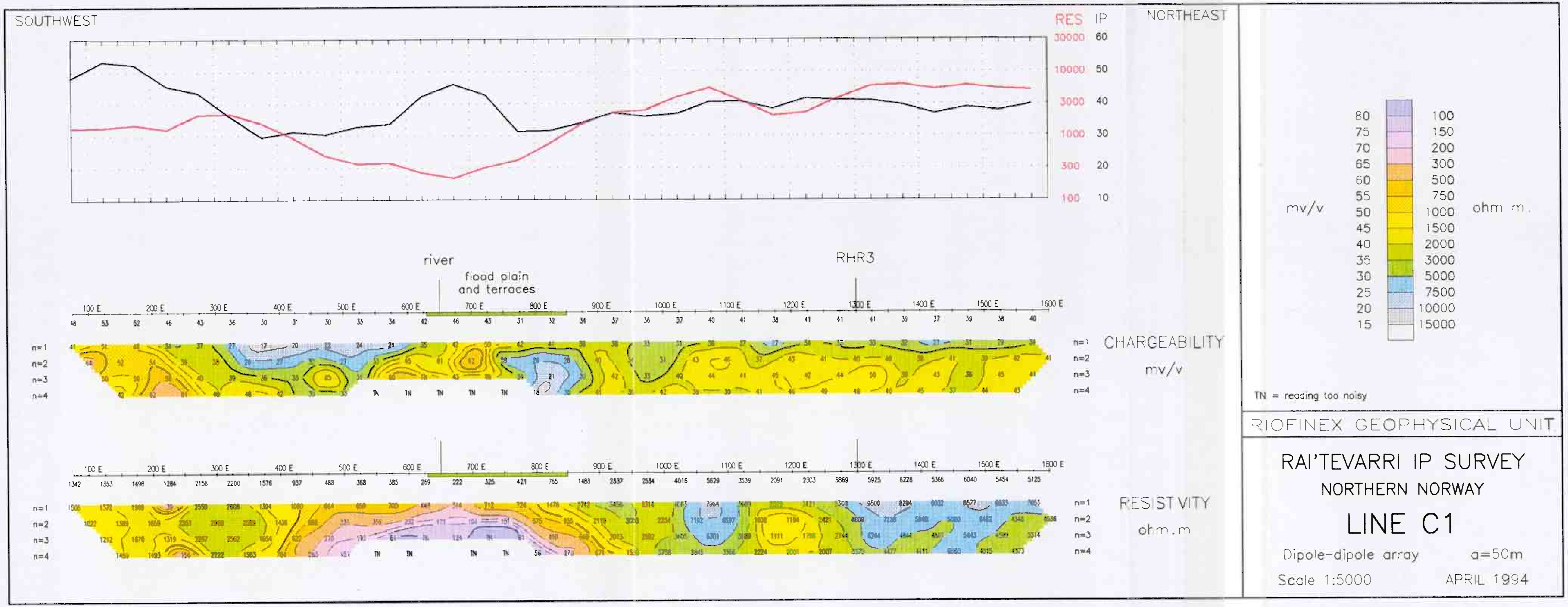
RTZ MINING AND EXPLORATION LIMITED

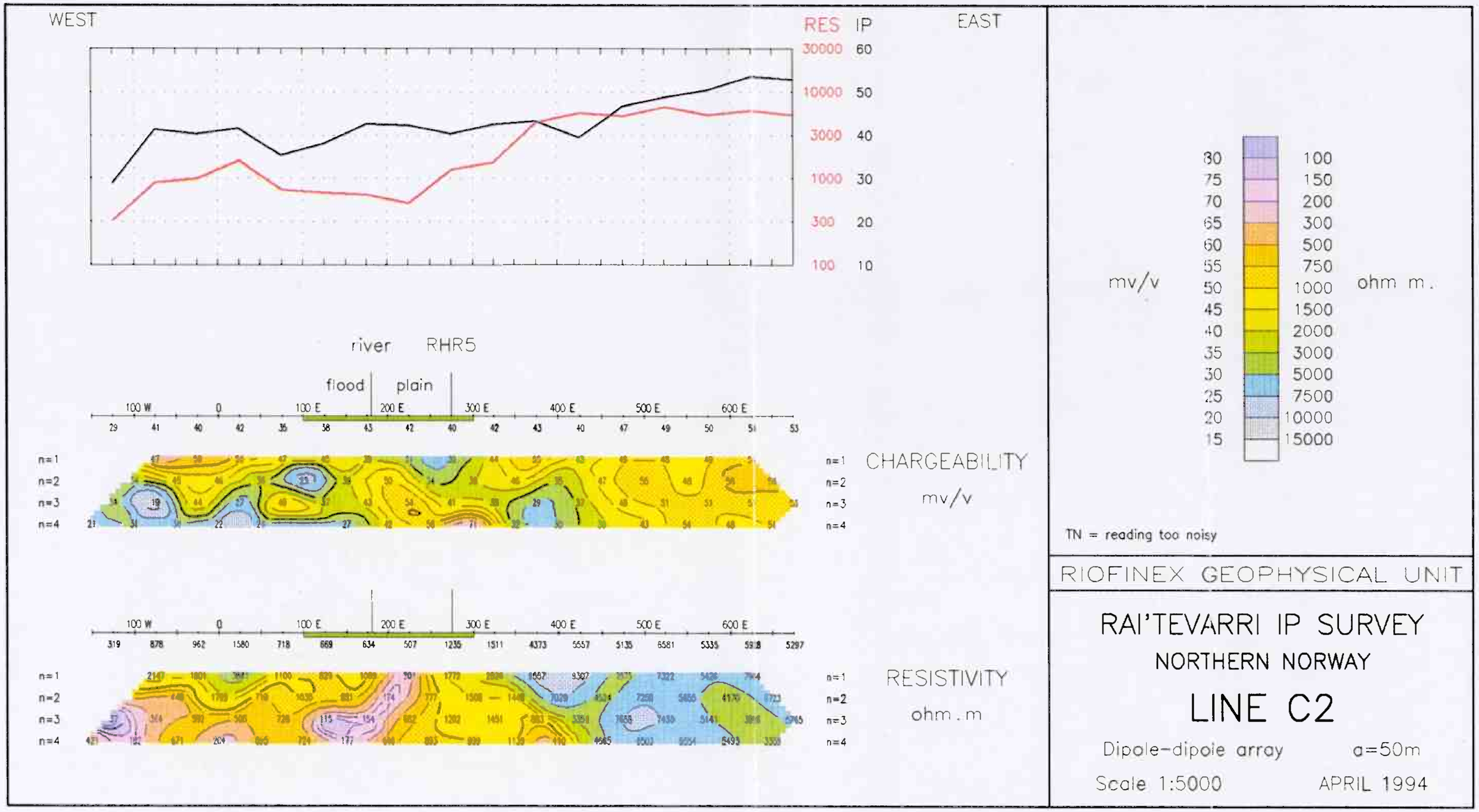
NORWAY

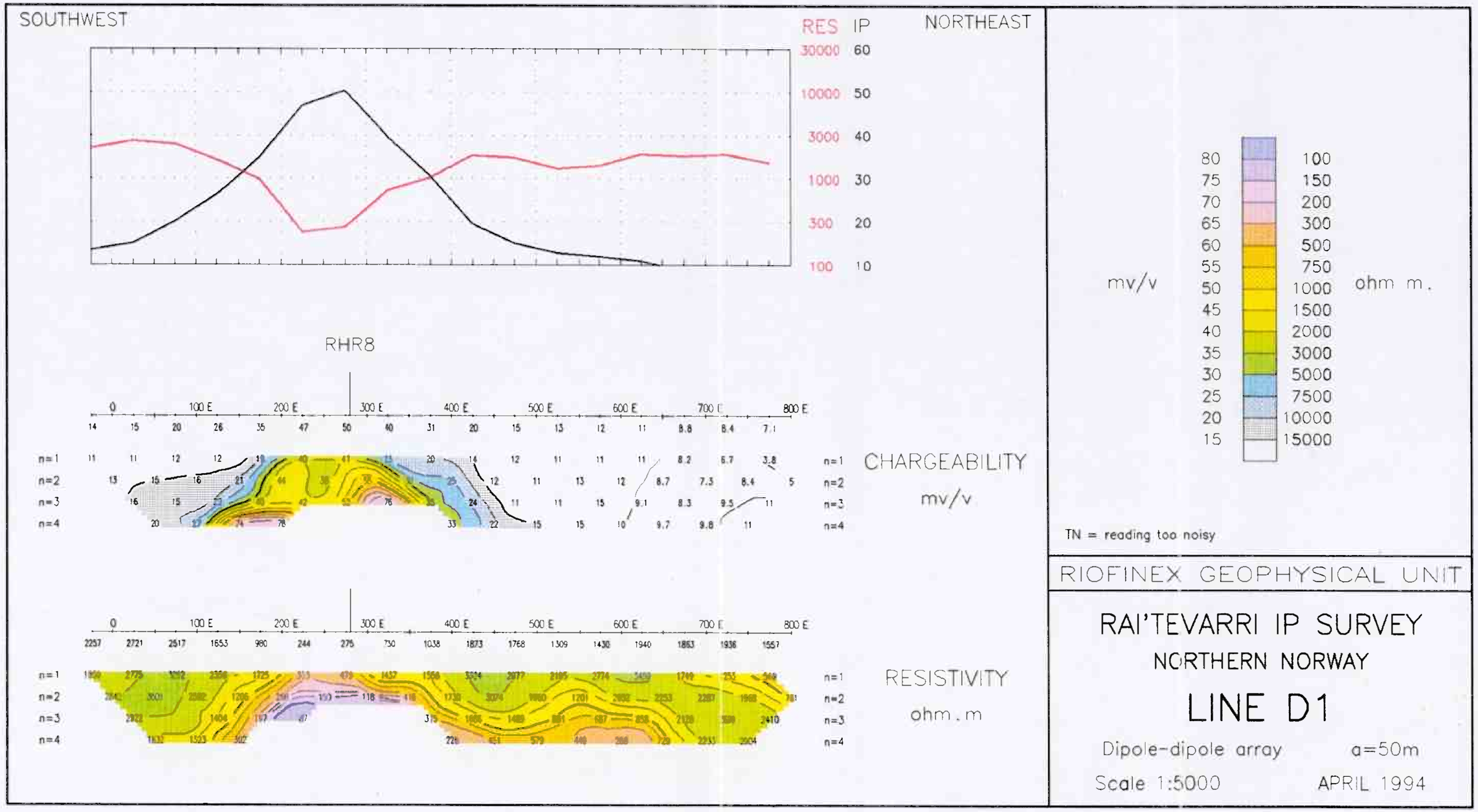
Raitevarri RTZ 1994 Drilling
General Geology-Sampling Intervals
Gold and Copper Values from RHR9,6,7/94

PROJECTION: NONE		FILE:	D:\NORWAY\RHR679
AUTHOR: J.COPPARD	OPERATOR: S.A.HEATH	REVISION DATE: 14-07-94	FIGURE: 7


SOUTH
NORTH
RES IP
30000 60
10000 50
3000 40
1000 30
300 20
100 10
(20m east of line)
RHR1
RHR2
0
100 N
200 N
300 N
400 N
500 N
600 N
n=1
n=2
n=3
n=4
CHARGEABILITY
mv/v
RESISTIVITY
ohm.m
mv/v
ohm m.
80 100
75 150
70 200
65 300
60 500
55 750
50 1000
45 1500
40 2000
35 3000
30 5000
25 7500
20 10000
15 15000
TN = reading too noisy
RIOFINEX GEOPHYSICAL UNIT
RAI'TEVARRI IP SURVEY
NORTHERN NORWAY
LINE B1
Dipole-dipole array a=50m
Scale 1:5000 APRIL 1994


SOUTHWEST
NORTHEAST
RES
IP
30000 60
10000 50
3000 40
1000 30
300 20
100 10
river
flood plain
and terraces
RHR3
100 E
200 E
300 E
400 E
500 E
600 E
700 E
800 E
900 E
1000 E
1100 E
1200 E
1300 E
1400 E
1500 E
1600 E
n=1
n=2
n=3
n=4
CHARGEABILITY
mv/v
RESISTIVITY
ohm.m
TN
mv/v
ohm m.
80 100
75 150
70 200
65 300
60 500
55 750
50 1000
45 1500
40 2000
35 3000
30 5000
25 7500
20 10000
15 15000
TN = reading too noisy
RIOFINEX GEOPHYSICAL UNIT
RAI'TEVARRI IP SURVEY
NORTHERN NORWAY
LINE C1
Dipole-dipole array
a=50m
Scale 1:5000
APRIL 1994


WEST
EAST
RES
IP
30000 60
10000 50
3000 40
1000 30
300 20
100 10
river
RHR5
flood
plain
100 W
0
100 E
200 E
300 E
400 E
500 E
600 E
29 41 40 42 35 38 43 42 40 42 43 40 47 49 50 51 53
n=1
n=2
n=3
n=4
CHARGEABILITY
mv/v
319 878 962 1580 718 669 634 507 1235 1511 4373 5557 5135 6581 5335 5918 5297
RESISTIVITY
ohm.m
mv/v
80 75 70 65 60 55 50 45 40 35 30 25 20 15
100 150 200 300 500 750 1000 1500 2000 3000 5000 7500 10000 15000
ohm m.
TN = reading too noisy
RIOFINEX GEOPHYSICAL UNIT
RAI'TEVARRI IP SURVEY
NORTHERN NORWAY
LINE C2
Dipole-dipole array
a=50m
Scale 1:5000
APRIL 1994



RIOFINEX GEOPHYSICAL UNIT

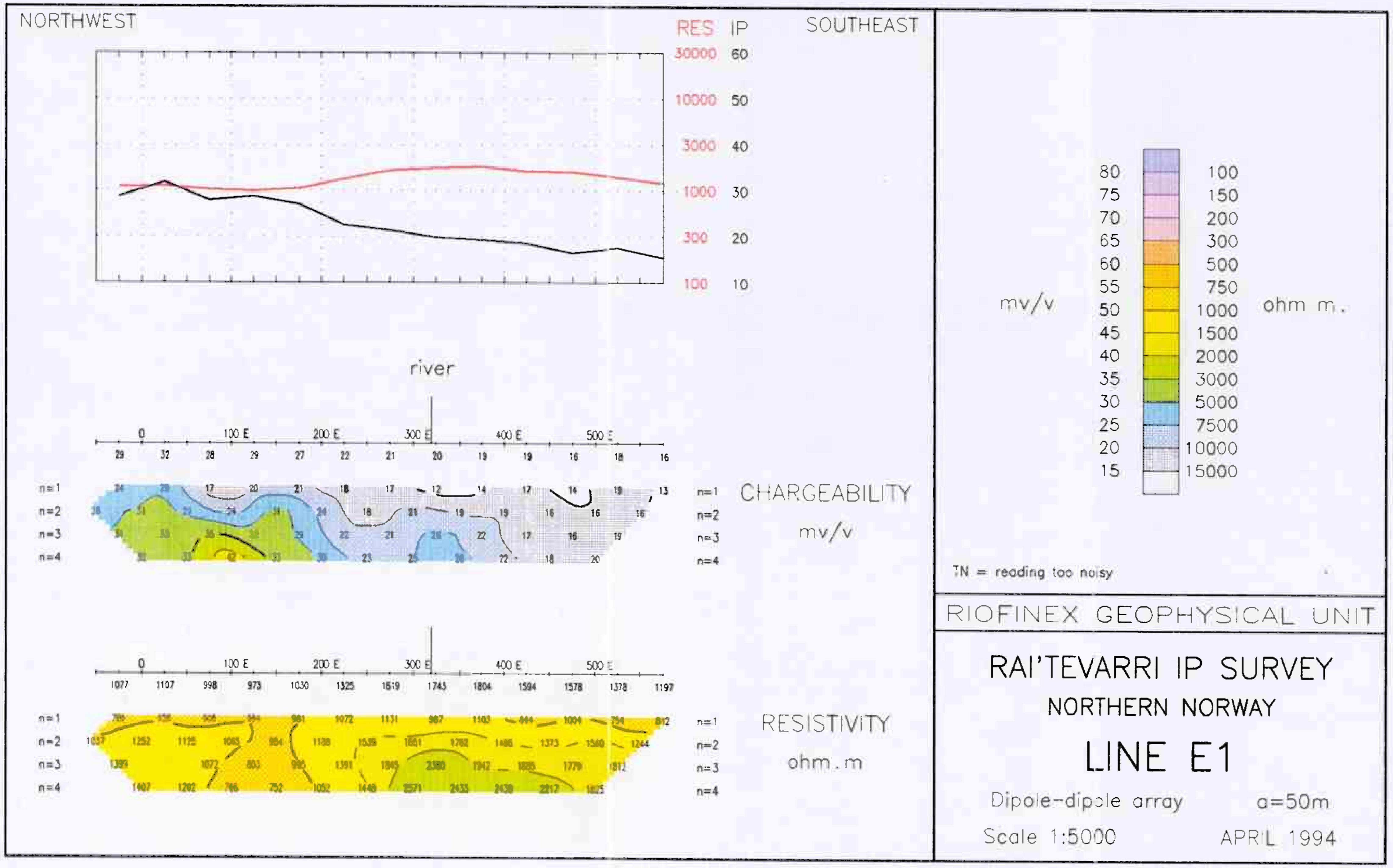
RAI'TEVARRI IP SURVEY

NORTHERN NORWAY

LINE D1

Dipole-dipole array a=50m

Scale 1:5000 APRIL 1994



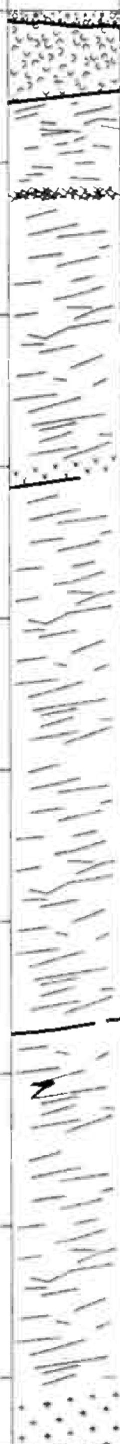
NORTHWEST
RES IP
SOUTHEAST
30000 60
10000 50
3000 40
1000 30
300 20
100 10
river
0
100 E
200 E
300 E
400 E
500 E
n=1
n=2
n=3
n=4
CHARGEABILITY
mv/v
RESISTIVITY
ohm.m
mv/v
ohm m.
80 75 70 65 60 55 50 45 40 35 30 25 20 15
100 150 200 300 500 750 1000 1500 2000 3000 5000 7500 10000 15000
TN = reading too noisy
RIOFINEX GEOPHYSICAL UNIT
RAI'TEVARRI IP SURVEY
NORTHERN NORWAY
LINE E1
Dipole-dipole array
a=50m
Scale 1:5000
APRIL 1994

BOREHOLE LOG

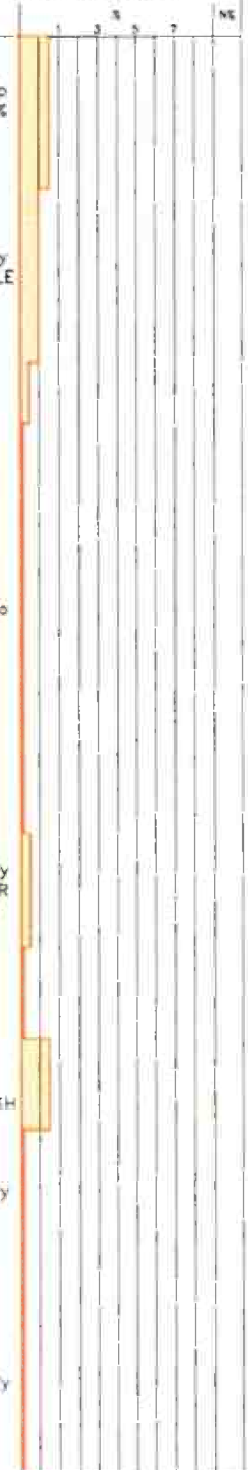
SUMMARY LOG : SPS\BR\MJ — RAITEVARRI — BOREHOLE No. RHR01/94

Columns: COREBOX No. | MAGNETIC SUSCEPTIBILITY SI UNITS x10⁻⁴ | RECOVERY % | METRES | GRAPHIC LOG | (description) | ALTERATION | SULPHIDE MINERALISATION: TYPE, % (1, 3, 5, 7), NS

RECOVERY %: OVERALL >98%



Metres	Description	Alteration	Sulphide type
	0.0–1.5m O/B		
	1.5–7m AMPH–CHL–GNT;COARSE AMPH+GNT		Py Po <0.5% CPY
	7–25m Qz–CHL–Hbl–GNT SCHIST		
10	FRAC ZONE		
			Po Py V.LITTLE CPY
20			
	29–31m CHl–Hbl SCHIST		
30	31–67m SILICEOUS MICA–Hbl SCHIST		
	31–37m Po Py–V.MINOR CPY		Py Po
40			
50			
	57.90m SPECKS OF CPY		Po Py MINOR CPY
60			
	66–68.7m CPY RICH ZONE		
	67–91m Bi–CHL SCHIST	DISS CPY NO ASSCC Py UPTO 4% CPY OVER 10cm LENGTH V MINOR Po	
70	FRAC WITH Po–CPY ?GAL		Po Py
80	81.2m DROP IN SILICA CONTENT–INC IN HBl+CHL		
	CPY+Po+Py IN CLEAV\\STRINGERS		Po Py
90	91–94.3m Qz–MICA SCHIST		



E.O.H. 94.3m

CPY SEEN DOMINANTLY IN TOP 25m & IN INTERVAL 50–70m

BOREHOLE LOG

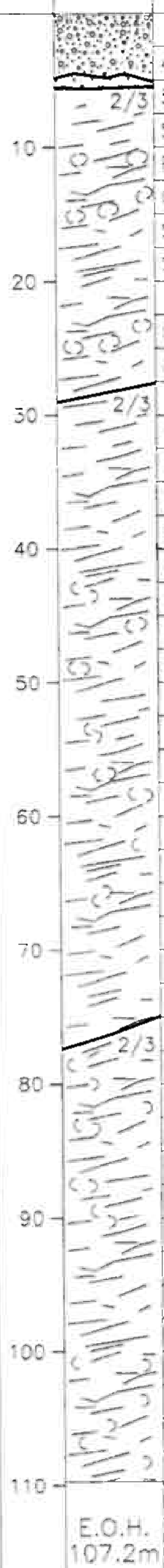
SUMMARY LOG : SPS

RAITEVARRI

BOREHOLE No. RHR02/94

COREBOX No. | DRILLED LENGTH | RECOVERY % | METRES | GRAPHIC LOG | ALTERATION | SULPHIDE MINERALISATION

RECOVERY: OVERALL >98%



4.9–5.2m AMPHIBOLITE

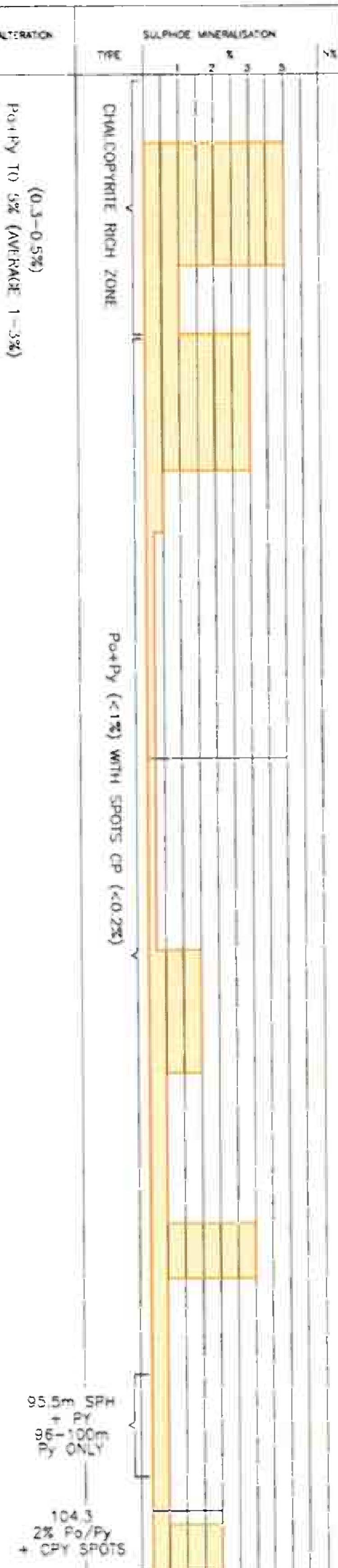
5.2–28m–ACT,Bi,Qz,CHL SCHIST
SULF Po–Py–CPY 1–5%
Po:Py RATIO 10:1
CPY ± 0.3–0.5%
SULF IN X-CUT VEINLETS, IN
SILICFIED ZONES AND IN THE CLEAVAGE

MINOR GARNETS LOCALLY IN
MORE CHL/Bi RICH ZONES

28–76.8m–Bi,Qz,ACT,CHL,GNT SCHIST
SIMILAR TO 5.2–28m WITH
LESS SULPHIDES
Po+Py (1:1??) <1.0%
WITH OCCASIONAL SPOTS CPY
<0.3%
CPY ASSOC WITH SULPHIDES +
ZONES OF LESS GARNET

76.8–E.O.H. Bi,Qz,CHL,GNT SCHIST
WITH OCCASIONAL SPOTS
OF CPY
TOTAL SULF CONTENT <1.0%
(AVERAGE ± 0.5%)
ONE SPOT OF SPH ASSOC WITH
Py AT 95.5m
MAIN DIFFERENCE TO ABOVE
UNIT IS SLIGHTLY MORE
GARNET RICH AND SLIGHTLY MORE
Hb/CHL RICH

ALTERATION: Po+Py TO 5% (AVERAGE 1–3%) (0.3–0.5%)



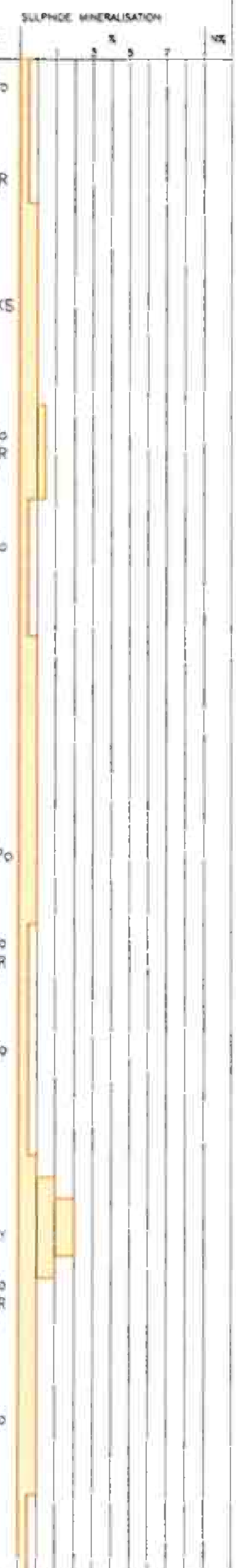
BOREHOLE LOG

SUMMARY LOG : MJ

RAITEVARRI

BOREHOLE No. RHR03/94

COREBOX No.	DRILLED LENGTH	RECOVERY %	METRES	GRAPHIC LOG		ALTERATION	SULPHIDE MINERALISATION TYPE
		OVERALL >98%			-1.7 O/B		Py Po
				3	1.7-8.2 Qz-Bi-Hbl SCHIST		
			10	2/3	8.2-E.O.H. SILICIC ACTIN-Bi SCHIST ± CHL ± MINOR R'GRADE GNT's		MINOR CPY
					BLEBBY CONC OF 5 IN MORE MAFIC BANDS		Py Po CPY SPECKS
			20		SMALL FISSURES AND Fe OXIDES		
					FRAC CORE AND Fe OXIDES		
					V. MINOR CPY SPECK		Py Po MINOR CPY
			30		FRAC. ZONE		Py Po
					FRAC. ZONE		
			40				Py
							Py
			50				
					58m MINOR CPY WITH Py AND Po		Py MINOR Po
			60		64m THIN Qz VEIN AND Po Py CPY		Py Po MINOR CPY
					68.02m VEINLET AND Py Po CPY		Py>Po
			70		73m SILICA FLOODING		
							Py
			80				Py ? CPY
					CPY REPLACING Po IN MANY PLACES		Py Po MINOR CPY
			90				
							Py Po
			100		SULPHIDES DECREASING		Py
				E.O.H. 104.5m	MINOR CPY AT TOP AND 60-90m		

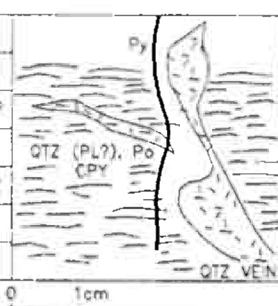


BOREHOLE LOG

SUMMARY LOG : SPS | RAITEVARRI | BOREHOLE No. RHR04/94

Recovery %: OVERALL >98%

METRES	DESCRIPTION	ALTERATION	SULPHIDE MINERALISATION
	0–0.5m O/B		
	0.5–97.4m–CHLORITE–BIOTITE,Qz		
	SCHIST,LOCALLY GRANETIFEROUS		
	<0.2% SULF,CPY PREDOMINANTLY		
10	ASSOCIATED WITH PYRRHOTITE		
	Po:Py RATIO APPROX 1:1 THROUGHOUT		
	HOLE		
	CPY <0.1%		
20			
30	28.2m CC??	28.2m SPOTS CC OR	
	28.8m SPOTS CPY ASSOC WITH Po	GRAPHITE IN SILICIC LAYERS	
	32.5m SPOTS CPY ASSOC WITH Po	28.8m NARROW BAND Po+MINOR SPOTS Py	SPOT CPY WITH Po
40	38–45m RKS SLIGHTLY MORE CHLORITIC		
	41.9m–INTERGROWN CROSS-CUTTING VEINLET		
	OF Po+Py		
	41.7–41.9m MINOR CHLORITISED FAULT ZONE		
50		SPOT CPY 48.5m	
	57.8–58m MINOR FAULT ZONE WITH ASSOCIATED		
60	CHLORITISED GARNETS		
	62.0–E.O.H. ROCKS BECOME VERY	SPOT CPY 61.5m	
	SLIGHTLY MORE CHLORITE		
	OVERALL		
70	71.6m–QUARTZ FLOODING		
80	80.9m		
	X-CUTTING		
	RELATIONSHIP		
	SHOWING Py		
90	TO BE LATER		
100	E.O.H. 97.4m		



BOREHOLE LOG

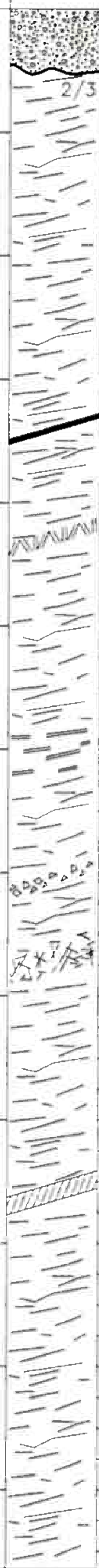
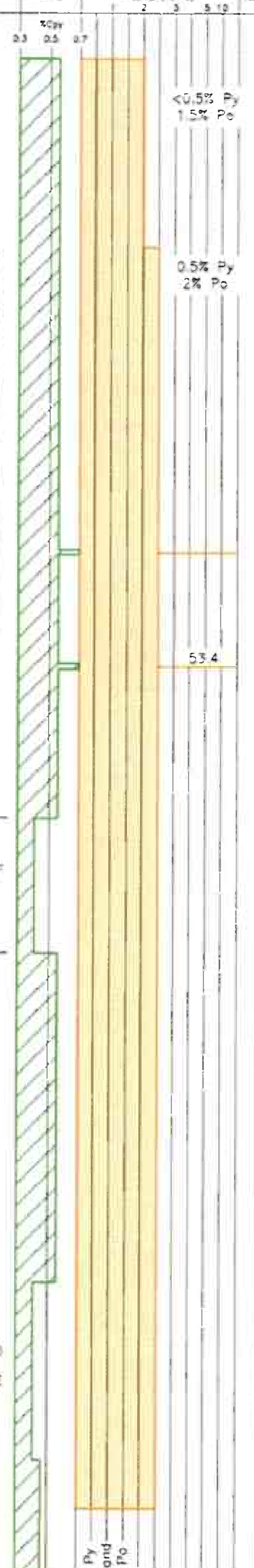
SUMMARY LOG : MJ

RAITEVARRI

BOREHOLE No. RHR05/94

COREBOX No.	DRILLED LENGTH	RECOVERY %	METRES	GRAPHIC LOG	DESCRIPTION	ALTERATION	SULPHIDE MINERALISATION TYPE
		OVERALL >98%			0-9.8m O/B		
					9.8m-22m		
			10		Qtz-AMPH SCHIST-MINOR CHL AND SERICITE		
				2	SOME SILICA VEINING		Py Po CPY MINOR CPY
					13-13.2m 0.3% Cu	LOCALLY 5-10% PoPy OVER 5cm	
					14.6m Po-CPY BLEBS		
			20	3	22-101.5 E.O.H Qtz-AMPH-CHI-SER±SCHIST	GNTS	
							Po ± Py
					ABUNDANT FRESH ACTINOLITE LATHS		
			30				NO CPY VIS.
					INCREASE IN SERICITE		
							Py&Po
					FRACTURE ZONE		
			40	2/3	MORE SILICIC;Qtz-AMPH SCHIST ± CHL ± SER		
							Py Po
			50				MINOR CPY SPECKS +Py
					50.9m SILICA FLOODING & COARSE Py AGGREGATES		
						Po INC @57m	Py>Po
			60		FRACTURE ZONE		Py+Po
					66.7m Qtz-CHL VEIN WITH LOCAL Py TO 2%		
			70		71.6-72.1m COARSER ACTIN AND INC IN SERICITE		Py>Po
					72.1m BECOMES MORE SILICIC		
					74m Py IN VEIN		
			80		76m INC IN SERICITE		
							Py
					80.6-101.5m FINE GRAIN CHL RICH ZONE		
					MINOR CPY SPECKS GROWN IN SOME OF Po		CPY Po
			90		AS GO DOWN LESS FRESH ACTIN-MORE MICAS		
					92-95m INC IN CHI/Hbl-FINE GRAIN CHLORITE		
					97-97.5m AS 92-95m		Py Po
					98.5-99m AS 92-95m		
			100				
				E.O.H. 101.5m		IN GENERAL <0.3% SULPHIDES	

SUMMARY LOG : SPS | RAITEVARRI | BOREHOLE No. RHR06/94

COREBOX No.	DRILLED LENGTH	RECOVERY %	METRES	GRAPHIC LOG		ALTERATION	SULPHIDE MINERALISATION %
		OVERALL >98%	0–126.2				

0/B–6.6m

6.6–126.3m QUARTZ–CHLORITE–MICA SCHIST

2–3% SULPHIDES (<0.5%Py)

0.3–0.6%Cpy (CROSS-CUTTING AND IN CLEAVAGE)

CLEAVAGE 75–85° TO CORE AXIS

33.2–34m CHLORITE ZONE

45.3–45.4m–20% Po,0.5% CPY

50.9m QUARTZ FLOODING

71.5m–SMALL BRECCIA ZONE

75.9–78m CPY ASSOCIATED WITH MILDLY SILICIFIED ZONES

96.3–96.6m QUARTZ ACTINOLITE ZONE

Alteration:

CPY AS CROSS CUTTING VEINLETS ASSOCIATED WITH Po OR WITHIN THE CLEAVAGE (90° TO CA) OR OCCASIONALLY DISSEMINATED WITHOUT Po OR Py

ZONE OF LESS CPY

CPY IN X-CUT VEINLETS AND IN CLEAVAGE

101m TO E.O.H. INCREASE IN Py

BOREHOLE LOG

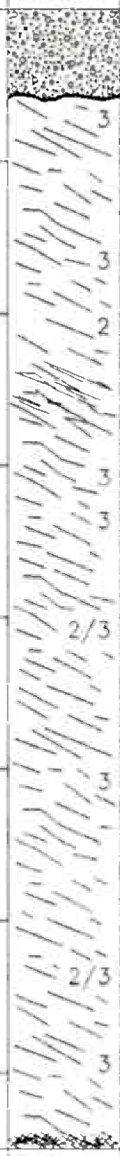
SUMMARY LOG : MJ

RAITEVARRI

BOREHOLE No. RHR07/94

COREBOX No.	DRILLED LENGTH	RECOVERY %	METRES	GRAPHIC LOG		ALTERATION	SULPHIDE MINERALISATION TYPE	%	N%

RECOVERY: OVERALL >98%



- 0–5.9m O/B
- 5.9–7.9m FINE Gr. CHL. MICA SCHIST ± SILICA ± GNT
- MINOR GRAPHITE FLAKES
- 3 — 7.9–18.15m Qz–CHL–MICA SCHIST ± Hbl ± GNT
- 8.1–8.7m Fe Mn Ox & FRAC. CORE
- 7.9–8.7m INTENSE SICICIFICATION
- 11.65m MORE CHLORITIC
- 12.2m Po SEEN–NO MORE Py
- 3 — 18.75–20m Qz–GNT–CHL–MICA SCHIST
- 2 — 20.5–24.5m SILICIC ZONE WITH HEAVY VEINING IN SCHIST
- 22.2m Po IN BRECCIA=70% Po & CPY SPECK
- 22.25m HONEYCOMBE TEXTURE IN SULPHIDES
- UPTO 5% TOTAL SULPHIDE +0.5% CPY
- (70%Po 30%Py)
- 22.7m VEIN >90% Po
- HONEYCOMBE TEXTURE COMMON
- 3 — 24.5–29m COARSE GNT–MICA–Hbl–CHL SCHIST
- 29–41m Qz–MICA–AMPH–CHL SCHIST ± GNT
- 3 — 29–29.5m FRAC. ZONE–SOME VUGGY STRUC. VIS.
- 2/3 — 41–50m FINE Gr. Qz–CHL–MICA–SER SCHIST
- 46m SEE OXIDE SPOTS ± 1%
- 3 — 50–65.7m Qz–CHL–MICA SCHIST ± SER ± GNT
- 2/3 — 65.7–69m FINE Gr. Qz–CHL ± Hbl ± MICA SCHIST
- 3 — 69m–E.O.H AS 50–65.7m
- 69–45m MINOR CPY SPECK
- 72.8m CPY SPECKS

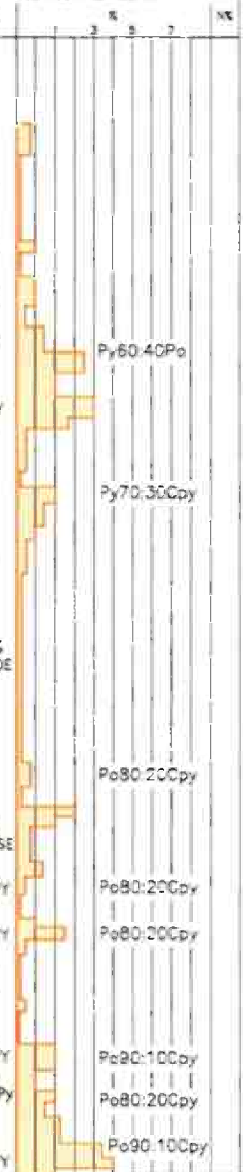
E.O.H. 75m

ALTERATION:

- 20–24.5 Po CPY
- CPY SPECK @25.05
- +28.3 CPY
- +30.7 CPY
- 35.8 SPECK CPY+Po

SULPHIDE MINERALISATION – TYPE:

Py; Py; Po; Po Py; Po Py; Po Py CPY; Po; <0.2% SULPHIDE; CPY DECREASE; Po; Po CPY; Po CPY; Po; Po CPY; Po MINOR Py; Po CPY

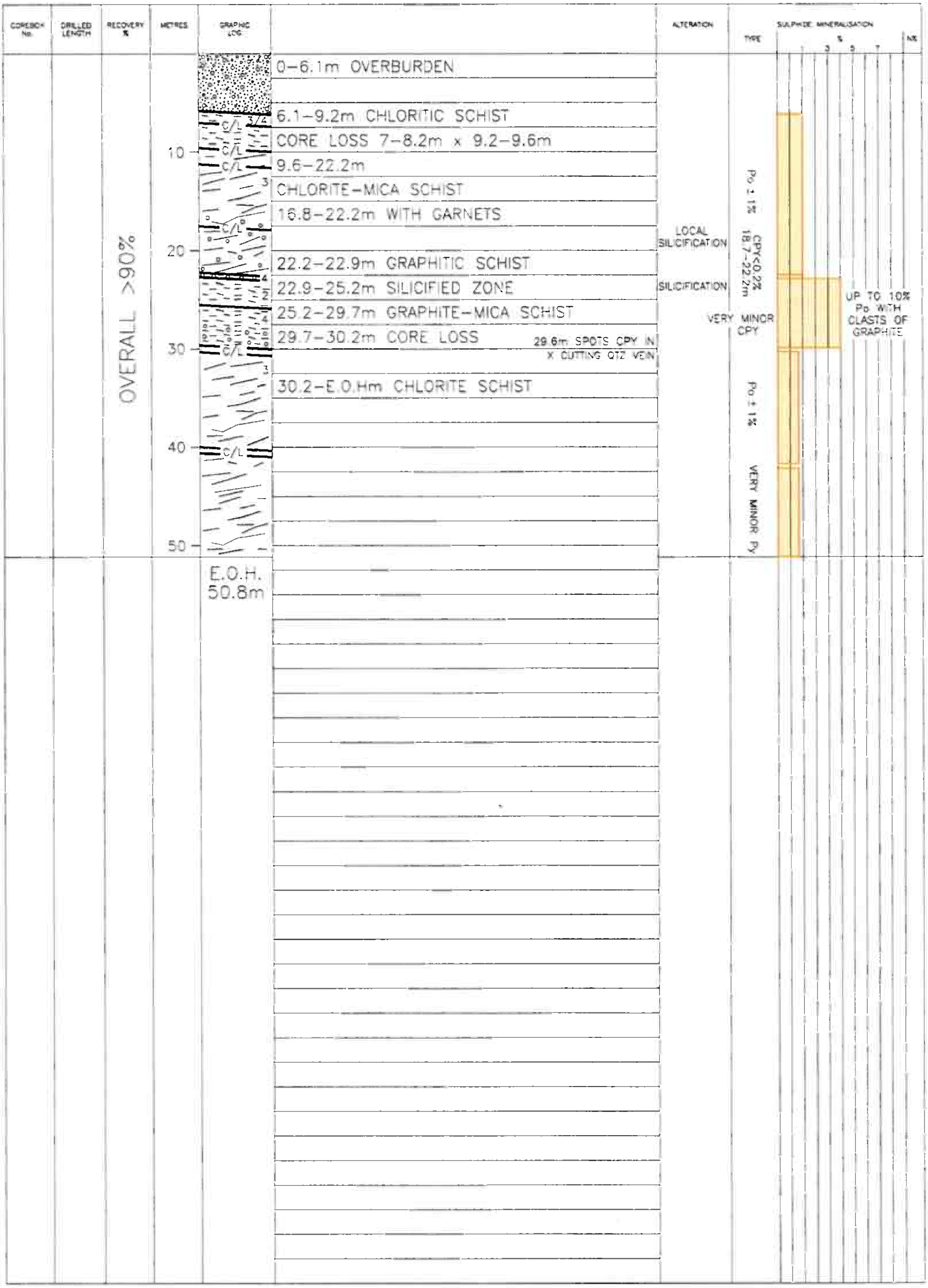


BOREHOLE LOG

SUMMARY LOG : MJ

RAITEVARRI

BOREHOLE No. RHR08/94

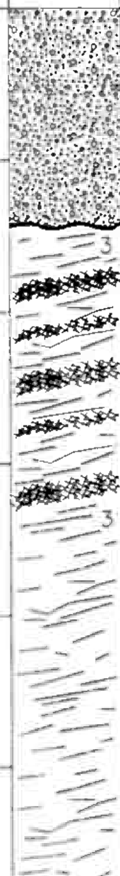
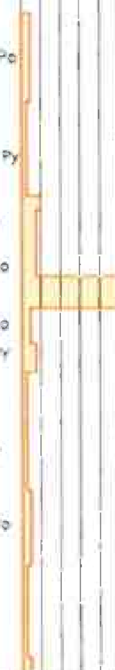


BOREHOLE LOG

SUMMARY LOG : MJ

RAITEVARRI

BOREHOLE No. RHR09/94

COREBOX No.	DRILLED LENGTH	RECOVERY %	METRES	GRAPHIC LOG	DESCRIPTION	ALTERATION	SULPHIDE MINERALISATION TYPE	%
		OVERALL >98%			O/B-13.50m			
			10		13.5m-E.O.H			
				3	Qz-MICA-AMPH ± GNT ± CHL		DISS Po	
					FRAC ZONE + FeOx			
			20		SMALL FRAC ZONE			
					FRESH ACTINOLITE COMMON-SOME UNORIENTATED		Po MINOR Py	
					FRAC ZONE			
					LITHOLOGY BECOMES MORE SILICIC + INC IN GNT			
					25.15m PyPo MINOR CPY IN CLEAR \\ ZONE WITH CHLORITE			
					MINOR CPY SPECKS		CPY	
			30		29.3m BANDED Po			
					GNT P'BLASTS + SILICA INJECTION WITH Po BANDS + Po		Py Po	
					HEALING BRECCIA TEXTURES IN Qz-ACTIN-CHL SCHIST		Po	
				3	Qz-AMPH-CHL SCHIST		Py Po	
					35.7m SILICIC BAND + PoPy ? MINOR CPY		? CPY	
			40				Py ± Po	
					Qz-AMPH-CHL SCHIST ± GNT			
					LOCAL INC IN CHL + Bi WITH CORRESPONDING			
					DECREASE IN SILICA		Py Po	
			50		INCREASE IN GNT AND SILICA-SILICA AROUND GNT			
							Po	
				E.O.H. 56.30m	OVERALL VERY MINOR CPY			

APPENDIX 3

GEOPHYSICS

RAI'TEVARRI IP SURVEY

Introduction:

In order to ascertain the validity of the NGU Gradient Array IP data and to further define drilling targets, 10 km line length of 50 metre spacing Dipole-Dipole array IP were proposed over the Rai'tevarri prospect.

Survey Methods:

The RTZ Dipole-Dipole IP survey was carried out during the period 10 April-30 April 1994. Ground conditions during this time proved, at times, difficult. Snow depths varied between 25 cm to in excess of 1.5 metres. Snow depths, in combination with daily temperatures ranging between -8°C and +15°C, periodically created soft snow conditions, resulting in slow progress. Permafrost was ubiquitous throughout the area, and varied in thickness between 5 cm and 25 cm. Daily access was gained to the survey area by snow scooter.

Equipment used during the IP survey consisted of a Scintrex IPC 7 transmitter and IPR10a receiver and a Honda 2.5 BHP petrol generator. Steel reinforced rods cut to 1.1 metre lengths used in pairs, were found suitable as electrodes. Electrodes needed to penetrate through the permafrost layer to obtain workable contact resistances. Porous pots filled with saturated copper sulphate solution were used as potential electrodes.

RGU equipment was used for the survey, transported and returned (after the survey) to Purton. No problems with equipment were encountered during the whole period of the survey.

Personnel:

J Beswick and J Coppard are RTZ M&E geologists. G Findlay a contract geophysicist and M Jones a contract geologist.

Results:

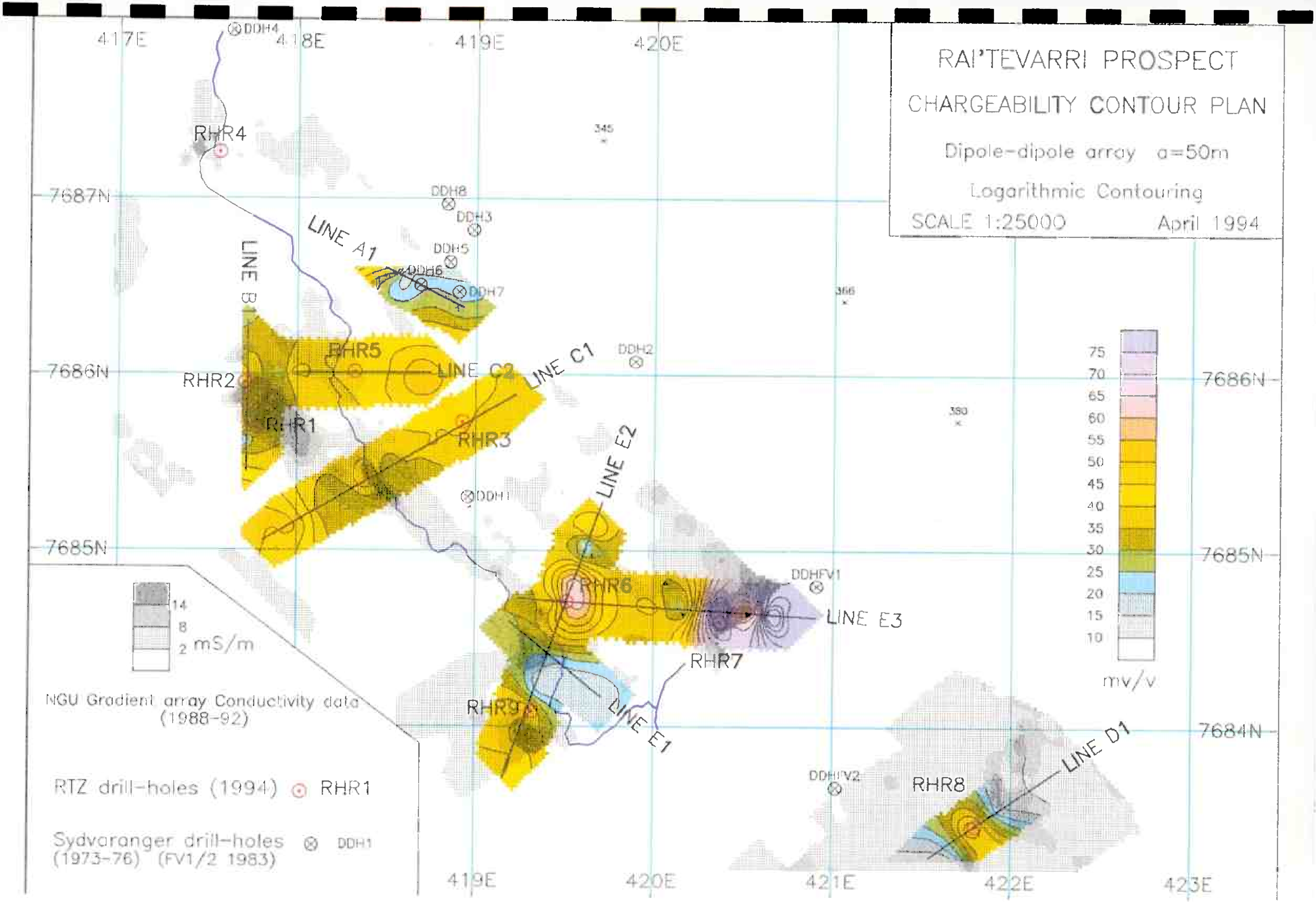
8 lines totalling 9.15 km of 50 metre spacing Dipole-Dipole array IP were completed during the allocated time period. Initial processing of results were carried out in the field camp by C Harris, S McIntosh, J Coppard and J Beswick. The majority of RTZ's Rai'tevarri DDH's were sited on the most prospective anomalies. Detailed processing of results and production of quality pseudo sections was carried out by Tony Cumpstey at Purton (see attached sections).

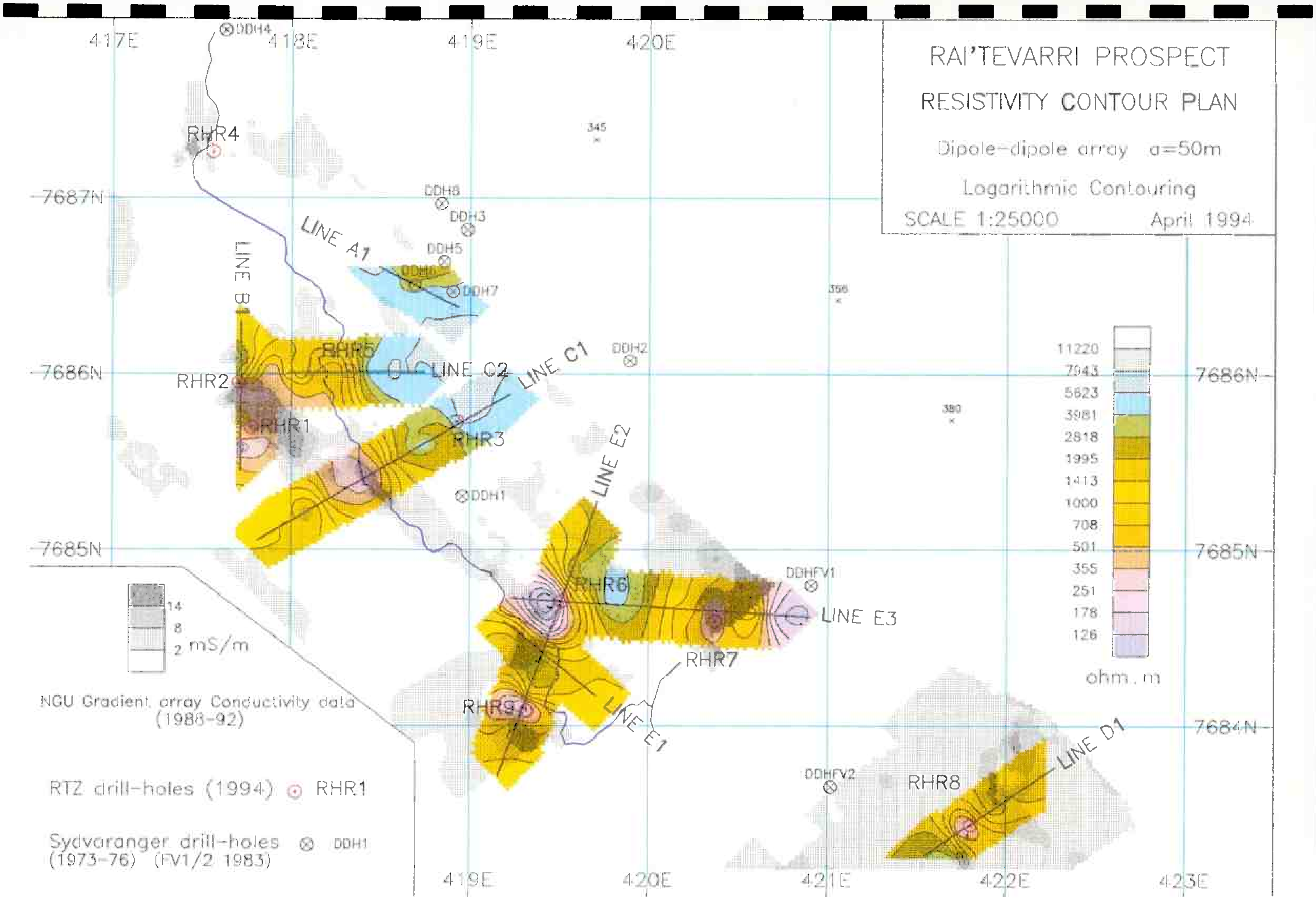
Conclusions:

RTZ's Rai'tevarri Dipole-Dipole array IP survey appeared successful in detecting disseminated sulphides. All DDH's drilled on RTZ IP anomalies revealed sufficient disseminated sulphide to provide an IP response. The validity of the NGU's gradient array IP survey was only partially proved. Two important observations regarding the IP response of the Rai'tevarri area can be made:

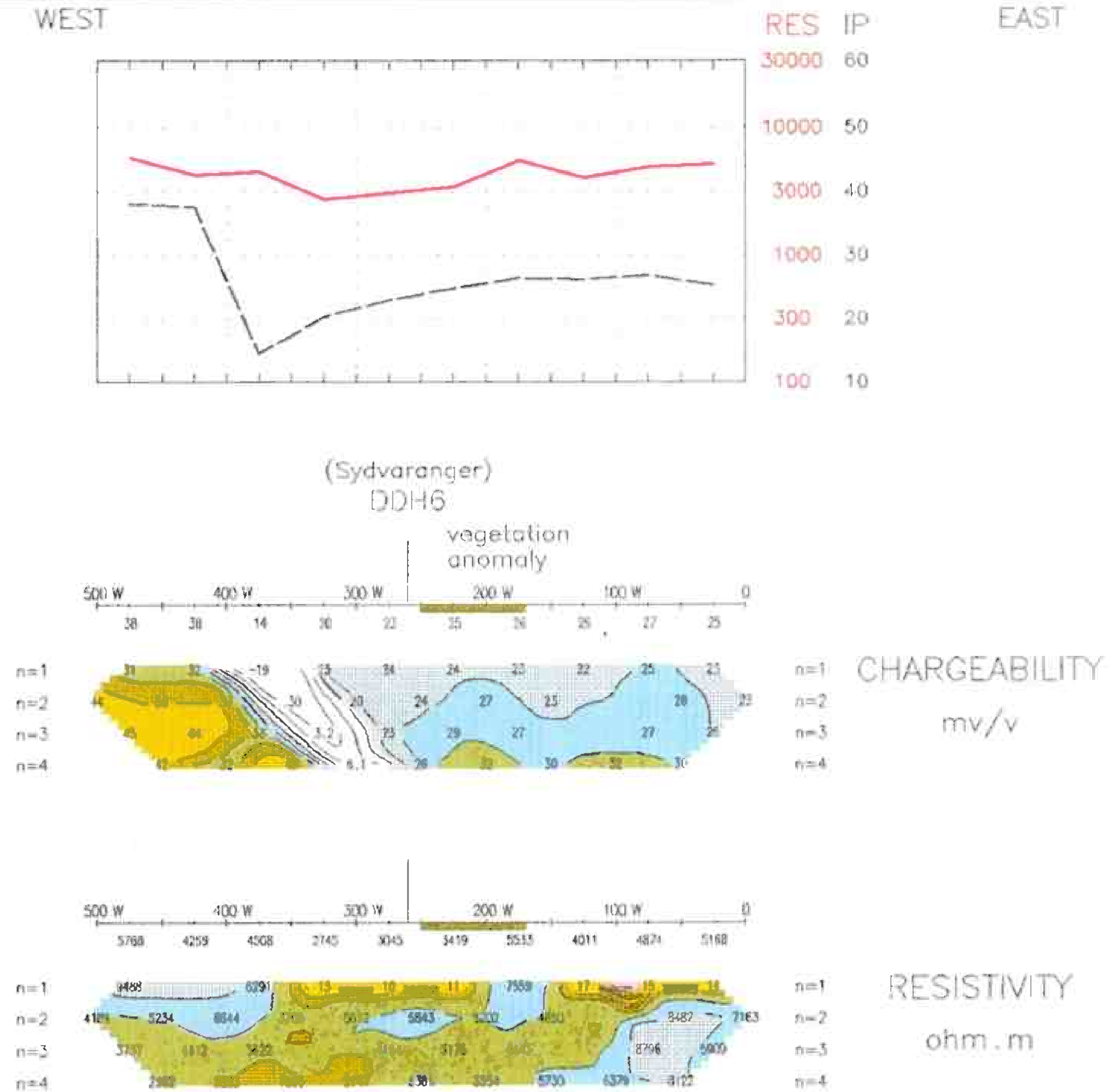
(i) RHR 06/94 - RTZ's most encouraging DDH was sighted on a IP anomaly at the junction of RTZ's lines E_2 and E_3, within an area previously surveyed by the NGU, but apparently not detected by them.

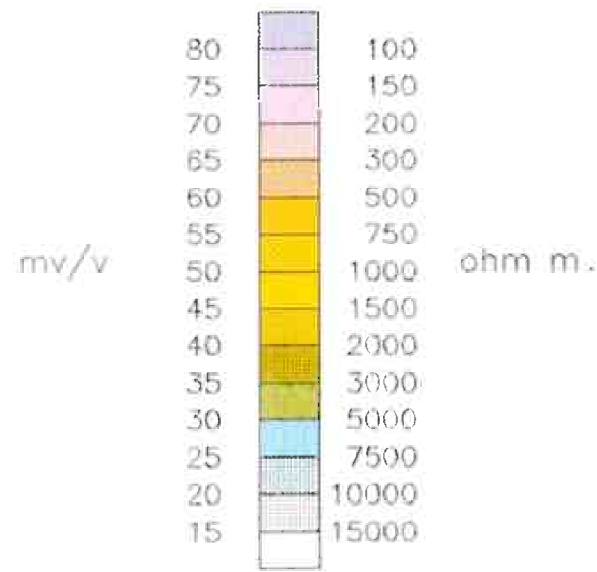
(ii) A test line (A_1) crossing the area of mutated vegetation and known Cu mineralisation (BH6 0.24% Cu over 34 metres) revealed no IP response in either the chargeability or resistivity phases.


RAI'TEVARRI PROSPECT
CHARGEABILITY CONTOUR PLAN
Dipole-dipole array a=50m
Logarithmic Contouring
SCALE 1:25000
April 1994
417E
418E
419E
420E
421E
422E
423E
7687N
7686N
7685N
7684N
LINE A1
LINE B1
LINE C1
LINE C2
LINE D1
LINE E1
LINE E2
LINE E3
RHR1
RHR2
RHR3
RHR4
RHR5
RHR6
RHR7
RHR8
RHR9
DDH1
DDH2
DDH3
DDH4
DDH5
DDH6
DDH7
DDH8
DDHFV1
DDHFV2
345
366
380
75
70
65
60
55
50
45
40
35
30
25
20
15
10
mv/v
14
8
2 mS/m
NGU Gradient array Conductivity data (1988-92)
RTZ drill-holes (1994) RHR1
Sydvaranger drill-holes DDH1
(1973-76) (FV1/2 1983)



RAI'TEVARRI PROSPECT
RESISTIVITY CONTOUR PLAN
Dipole-dipole array a=50m
Logarithmic Contouring
SCALE 1:25000
April 1994
417E
418E
419E
420E
421E
422E
423E
7687N
7686N
7685N
7684N
DDH1
DDH2
DDH3
DDH4
DDH5
DDH6
DDH7
DDH8
DDHFV1
DDHFV2
RHR1
RHR2
RHR3
RHR4
RHR5
RHR6
RHR7
RHR8
RHR9
LINE A1
LINE B1
LINE C1
LINE C2
LINE D1
LINE E1
LINE E2
LINE E3
345
356
380
11220
7943
5623
3981
2818
1995
1413
1000
708
501
355
251
178
126
ohm.m
14
8
2 mS/m
NGU Gradient array Conductivity data
(1988-92)
RTZ drill-holes (1994) RHR1
Sydvaranger drill-holes DDH1
(1973-76) (FV1/2 1983)





RIOFINEX GEOPHYSICAL UNIT

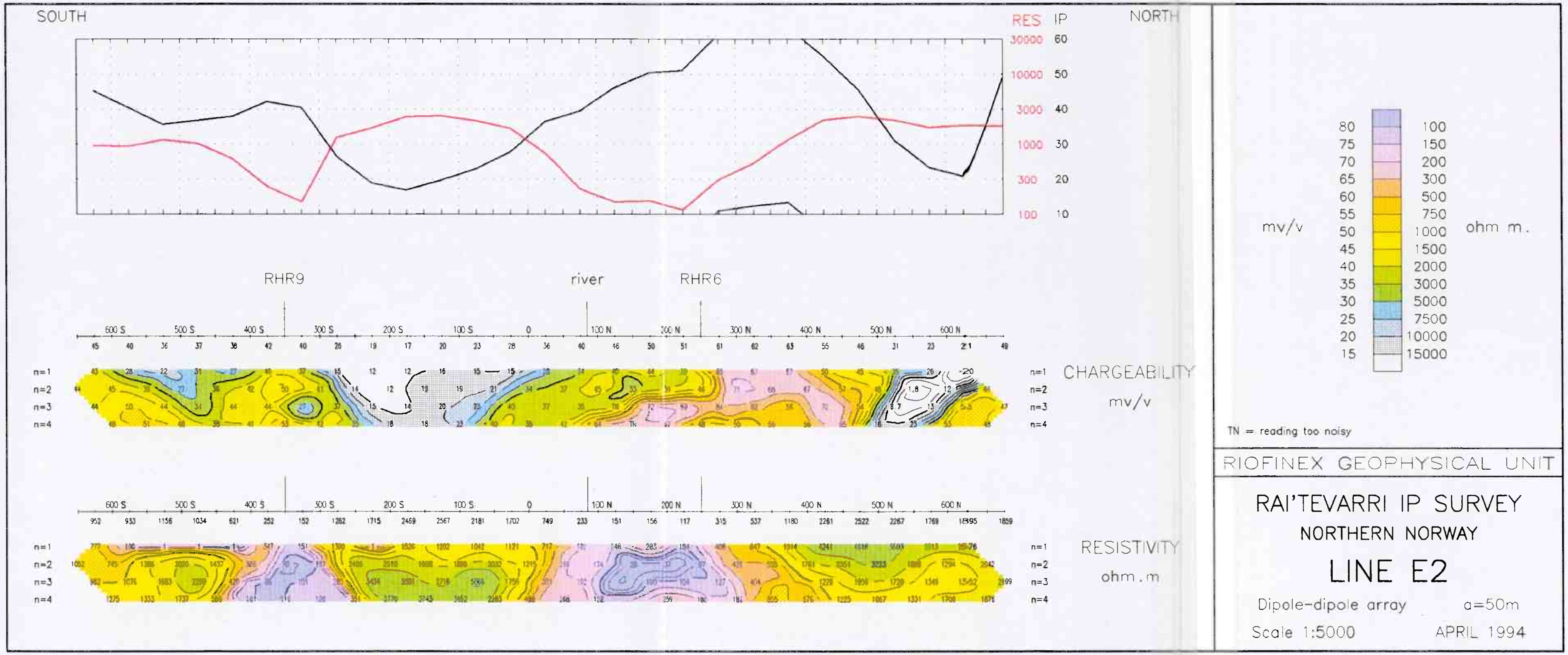
RAITEVARRI IP SURVEY

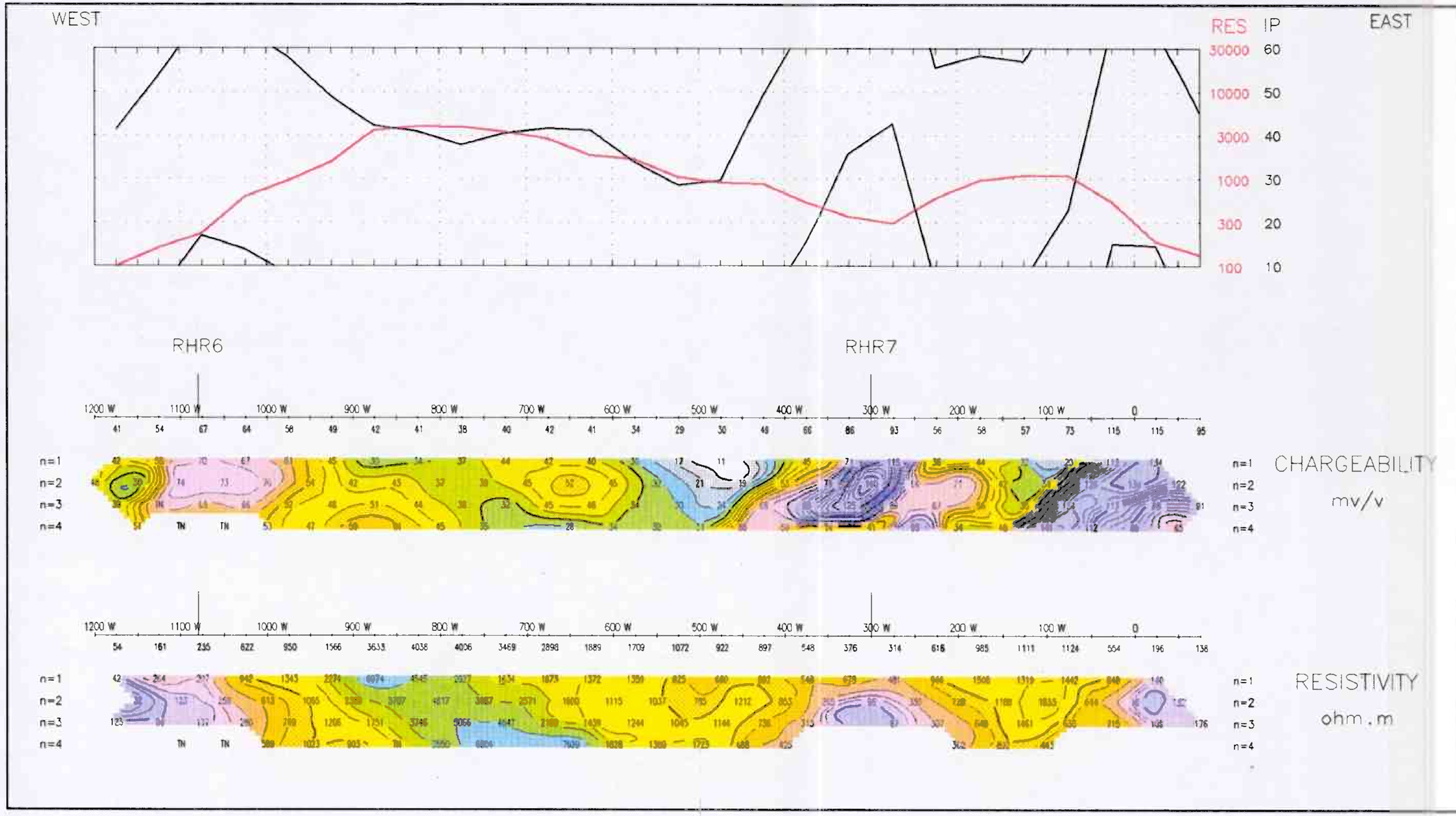
NORTHERN NORWAY

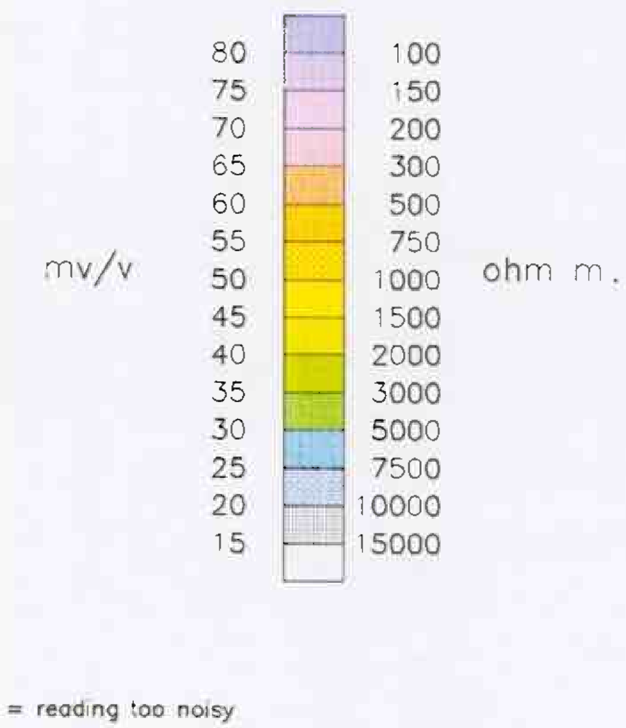
LINE A1 VEGETATION ANOMALY

Dipole-dipole array a=50m

Scale 1:5000 APRIL 1994


SOUTH
NORTH
RES
IP
30000 60
10000 50
3000 40
1000 30
300 20
100 10
RHR9
river
RHR6
600 S
500 S
400 S
300 S
200 S
100 S
0
100 N
200 N
300 N
400 N
500 N
600 N
n=1
n=2
n=3
n=4
CHARGEABILITY
mv/v
RESISTIVITY
ohm.m
mv/v
ohm m.
80 100
75 150
70 200
65 300
60 500
55 750
50 1000
45 1500
40 2000
35 3000
30 5000
25 7500
20 10000
15 15000
TN = reading too noisy
RIOFINEX GEOPHYSICAL UNIT
RAI'TEVARRI IP SURVEY
NORTHERN NORWAY
LINE E2
Dipole-dipole array
a=50m
Scale 1:5000
APRIL 1994





RIOFINEX GEOPHYSICAL UNIT

RAI'TEVARRI IP SURVEY

NORTHERN NORWAY

LINE E3

Dipole-dipole array a=50m

Scale 1:5000 APRIL 1994

RIOFINEX NORTH LIMITED

RAI'TEVARRI GEOPHYSICAL REVIEW

by

S M^c^Intosh
September 1993

Distribution:

C J Harris
Purton Office
Bristol File Copy

Ref: 0035-EN

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1. INTRODUCTION

The Rai'tevarri copper prospect occurs within the Karasjok Greenstone belt in the far north of Norway. The first recorded exploration in the area occurred between 1953 and 1955 when prospecting for iron ore was conducted in the region. The copper prospect was located by the NGU and A/S Sydvaranger in 1967 by stream sediment sampling. The NGU, A/S Sydvaranger (now Aspro) and ARCO have conducted work in this region on and off between 1967 and 1992. The NGU conducted extensive geophysical surveys over an area of 24 km^2 between 1988 and 1992. A total of 10 drill holes have been drilled, concentrating mainly on an area of mutated vegetation.

The primary aim of this study is to review the data collected to date in an attempt to locate possible drill targets. The second aim was to critically appraise the quality of the data and the suitability of the techniques applied in previous studies, and to suggest other techniques felt to be more appropriate for the location of potential mineralised zones.

2. LOCATION

Rai'tevarri is situated about 30 kms southwest of Karasjok within the Karasjok Greenstone belt (Figure 1). A large copper anomaly covers an area of 10 km^2, part of which consists of a zone of mutated vegetation. The area of interest is located near the Karasjohka and Noaidatjakka rivers within the southern portion of 1:50,000 sheet Iesjakka 2033 IV.

3. ACCESS

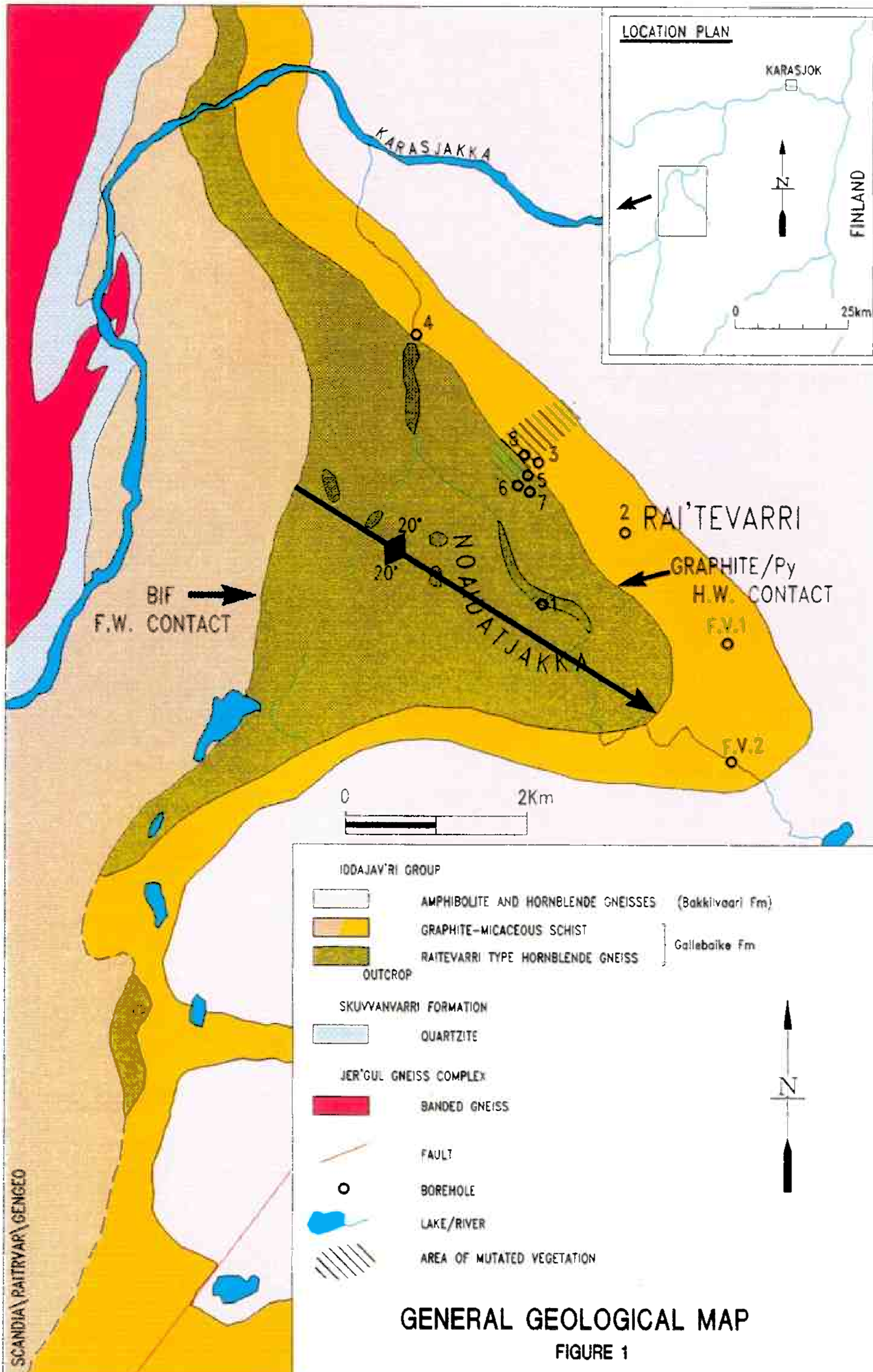
Rai'tevarri can be reached from Karasjok either by river boat along the Karasjohka river, by car to Appemakki then overland by all terrain vehicle for the last 17 kms, or it is possible to take a 10 minute helicopter flight from Karasjok.

4. PHYSIOGRAPHY

The area is typical of the Finnmarksvidda plateau with relief between 180 and 360 metres. The vegetation consists of birch, pine, aspen, several types of heather and moss. The lower parts of the area are often covered with marsh. Exposure in the area is less than 1% and generally occurs along the banks of the Noaidatjakka and Karasjohka rivers.

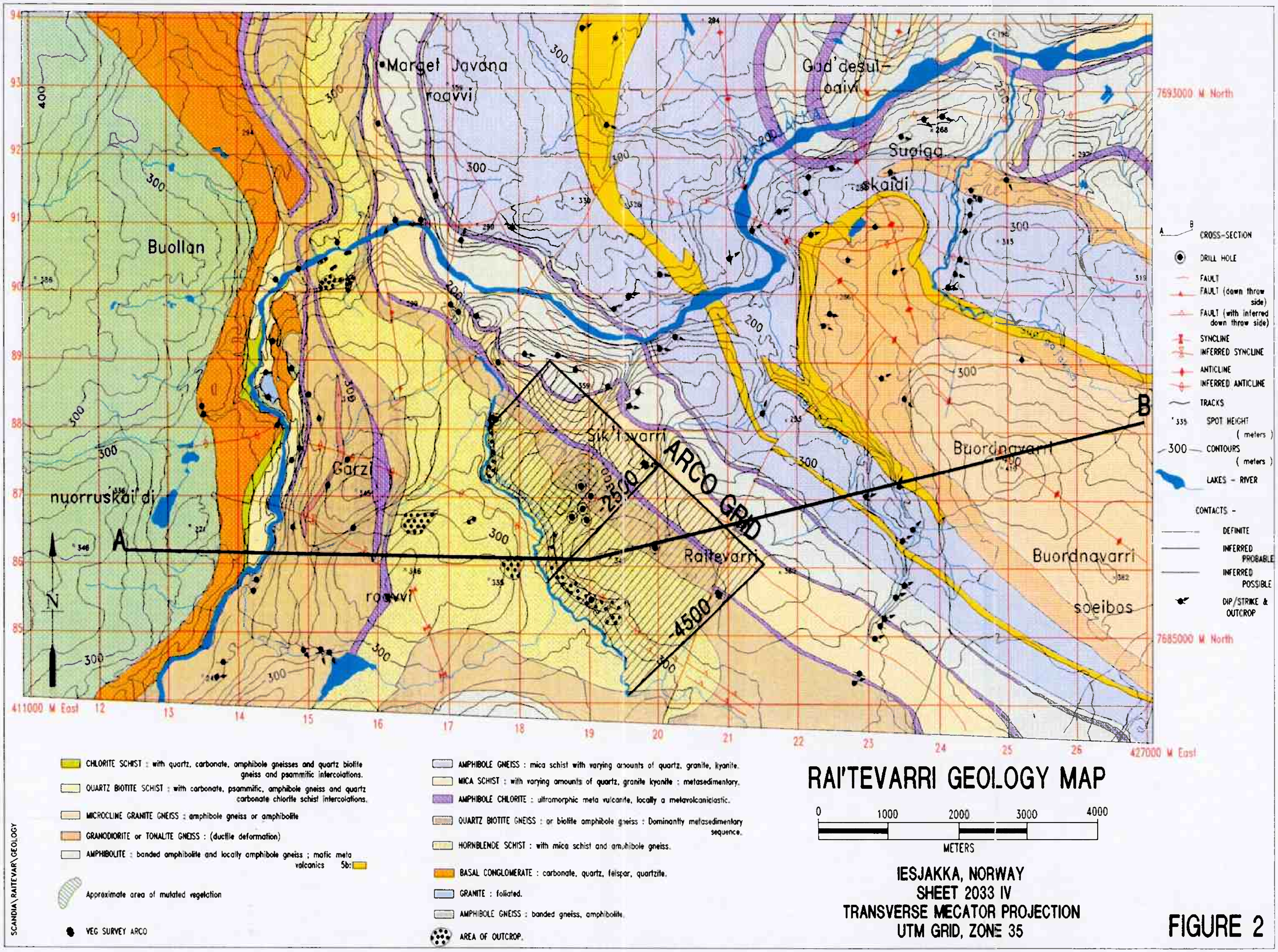
5. GEOLOGICAL SETTING (age ~2 Ba Sveko-Karelian)

The Rai'tevarri prospect occurs near the top of the lower pelite unit of the Karasjok Greenstone belt. The host rocks consist of a package of highly metamorphosed intermediate volcaniclastic rocks. The grade of metamorphism ranges from green schist to amphibolites. The prospect is centred over an antiform which strikes NW-SE and plunges to the SE (Figure 2). The host of most of the recorded mineralisation is a quartz-plagioclase-biotite-amphibole schist, often called a dioritic gneiss which is bounded by a graphitic black schist unit. The black schist appears to have a marked magnetic, IP, SP and resistivity response. Most of the geology of this region has been interpreted from airborne and ground geophysical surveys which have been conducted in this region. The following rock types have been observed in outcrop:-



GENERAL GEOLOGICAL MAP

FIGURE 1



RAI'TEVARRI GEOLOGY MAP

IESJAKKA, NORWAY
SHEET 2033 IV
TRANSVERSE MECATOR PROJECTION
UTM GRID, ZONE 35

FIGURE 2

- Amphibolite ±with garnet
- Mica schists and quartzites
- Quartz-muscovite-biotite schist ±chlorite
- Quartz-plagioclase-biotite-amphibole schist (the Rai'tevarri schist)
- Ultramafic hornblendite
- Quartz veins

The schistose and well bedded quartz-muscovite-biotite schist has characteristics of pyroclastics of felsic to intermediate composition (from field and thin section descriptions). The quartz-plagioclase-biotite-amphibole schist is very similar to the above and most likely has the same origin. Some of the outcrop show a more dioritic texture which has been interpreted to be part of the package having an intrusive origin, possibly as feeder dykes. For simplicity the lithologies known as quartz-biotite schist or diorite gneiss etc will henceforth be referred to as the 'Rai'tevarri Schist'.

6. MINERALISATION

Pyrite and chalcopyrite occur from accessory amounts to rich disseminations in most of the outcrops of the mica schist and the quartz-plagioclase-biotite-amphibole schist. The NGU report mineralised outcrops scattered throughout the anomalous area although exposure is reported to be <1% of the surface area. The copper grade for the mineralised zone is stated as being 0.4% with gold values averaging 0.5 g/t. ARCO analysed several samples during their survey in 1983:-

Sample No.	Location	Au ppm	Ag ppm	Cu ppm	Pb ppm	Zn ppm
BF-83-3	Sub-outcrop 50m NW of DDH8	0.019	<0.5	197	11	11
BF-83-4	Trench 200m W of DDH6	0.252	<0.5	5,900	<10	10

TABLE 1 : ARCO 1983 GEOCHEMICAL ANALYSES FOR RAI'TEVARRI SCHIST

The black schist overlying the Cu-Au mineralisation has been reported to carry considerable pyrrhotite and some pyrite when the graphite content is high. Small amounts of sphalerite have also been reported. Blocks of graphitic schist and fine grained graphitic quartzites rich in pyrrhotite were found in the area and the assays are listed below:-

Sample No.	Au ppm	Ag ppm	Cu ppm	Pb ppm	Zn ppm	As ppm	Ni ppm	Co ppm
BF-83-54	0.022	0.6	453	<10	172	85	138	31
BF-83-55	<0.005	1.2	320	<10	81	<10	277	38

TABLE 2 : ARCO 1983 GEOCHEMICAL ANALYSES FROM GRAPHITIC MATERIAL

7. EXPLORATION HISTORY

The first recorded exploration occurred between 1953 and 1955 when prospecting for iron ore was conducted in the region. Some, what must have been vertical field magnetics were conducted in the area and in 1957 three holes for a total of 208 metres were drilled into a BIF located to the southwest of the Rai'tevarri area. The BIF is associated with a very small strong magnetic feature which is spatially associated with a deep seated broad magnetic anomaly (Figure 3).

The NGU and A/S Sydvaranger carried out extensive geological, geochemical and geophysical work during the period 1968-1976. The area was located in 1967 by stream sediment sampling. Follow-up work outlined large soil anomalies and vegetation anomalies due to copper poisoning. A heli-borne EM and magnetic survey was flown in 1968 covering an area of approximately 45 km^2. The conclusions drawn from this survey were:-

a) The vertical field magnetic map offered no useful information.

b) The EM maps display a set of dominant anomalies generally striking NW-SE. A second set of anomalies striking SW-NE also occur but in the NNE of the Rai'tevarri area.

Apparently the total field magnetics data was not looked at at the time the interpretation was made.

Between 1973 and 1976 Aspro (formerly A/S Sydvaranger) conducted minor trenching and a drilling programme consisting of 8 boreholes totalling 1,421 metres (Figure 4). Five of these boreholes (3, 5, 6, 7 and 8) were centred over the mutated vegetation anomaly while hole 4 was located 2 kms to the NW, hole 2, 1.5 kms to the SE and hole 1, 1 km to the south. The assay results from these holes were varied and not all of the core was assayed. These holes are currently being re-logged and samples are being sent off for analysis. The best results to date are listed below:-

1981 NGU Total Field Magnetics Image

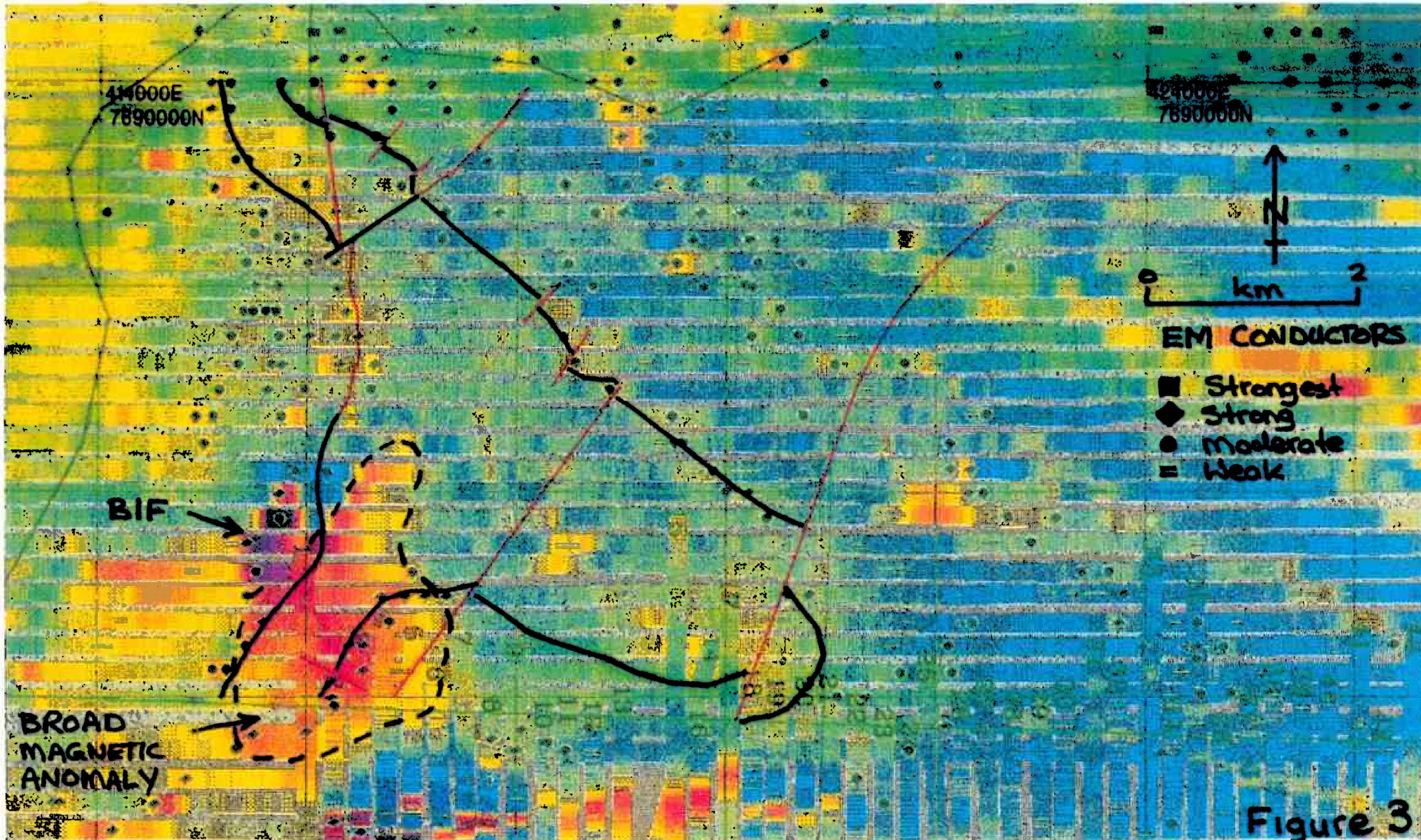
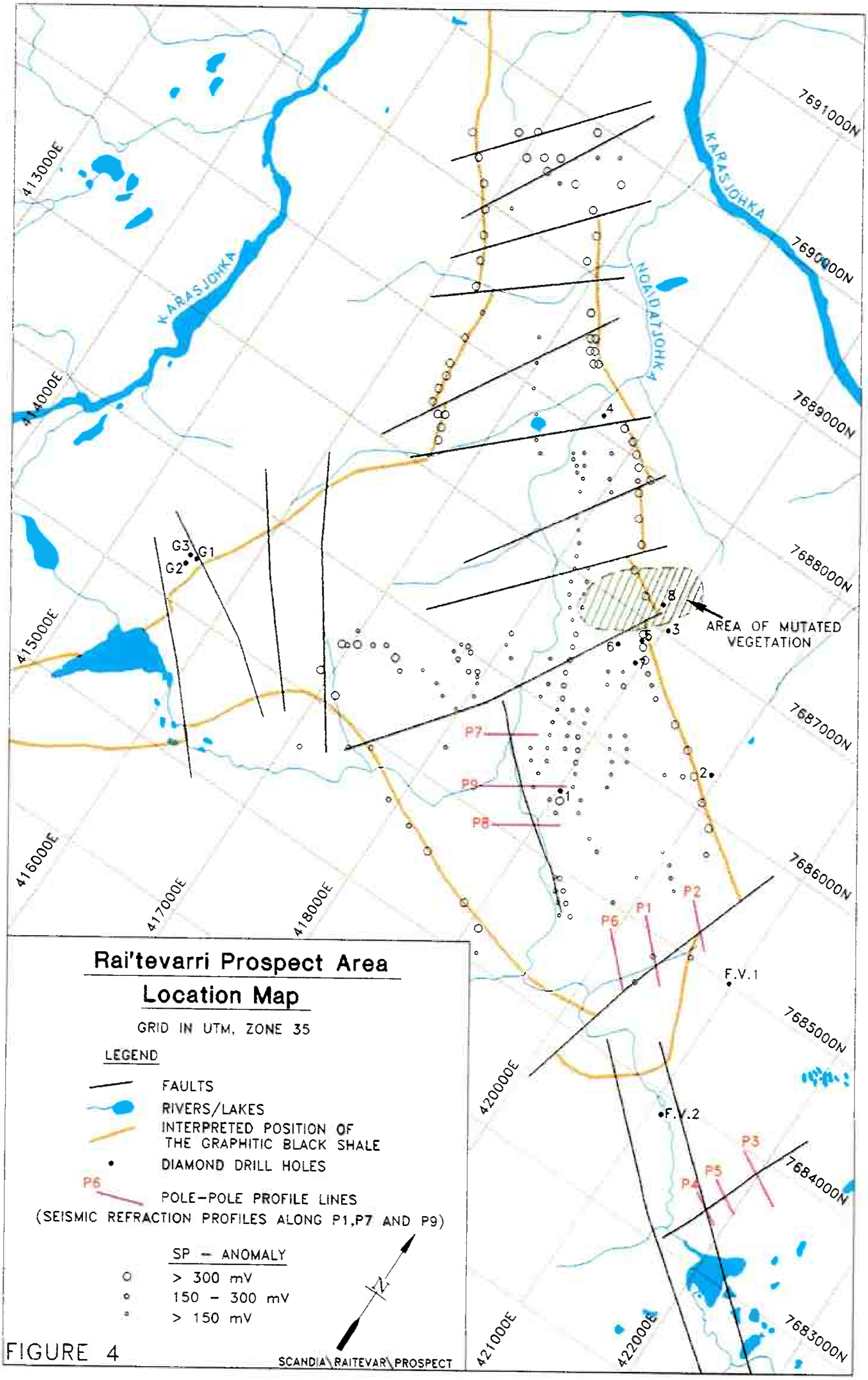


Figure 3



Rai'tevarri Prospect Area
Location Map

GRID IN UTM, ZONE 35

LEGEND

FAULTS

RIVERS/LAKES

INTERPRETED POSITION OF THE GRAPHITIC BLACK SHALE

DIAMOND DRILL HOLES

P6 POLE-POLE PROFILE LINES

(SEISMIC REFRACTION PROFILES ALONG P1,P7 AND P9)

SP - ANOMALY

> 300 mV

150 - 300 mV

> 150 mV

FIGURE 4

SCANDIA\RAITEVAR\PROSPECT

Hole No.	Intersection		Total Width	% Cu (cutoff 0.2% Cu)
	From	To		
DDH 1	39	48	9	0.20
DDH 2	No values >0.20% Cu			
DDH 3	168 180 200	180 190 210	12 10 10	0.295 0.402 0.306
DDH 4	No values >0.20% Cu			
DDH 5	17 103.5	40 124	23 20.5	0.269 0.438
DDH 6	5.9 46	40 50	34.1 4	0.234 0.250
DDH 7	11 35 96	21.3 48 117	10.3 13 21	0.408 0.243 0.264
DDH 8	116	140	24	0.303

TABLE 3 : COPPER ASSAYS (+0.2% CU) FROM 1973 TO 1976 ASPRO (FORMERLY A/S SYDVARANGER) DRILL PROGRAMME

In 1981 the NGU flew a combined helicopter magnetic, EM, VLF and radiometric survey over the Karasjok area for a total of 1,900 line kms. N-S flight lines spaced 250 metres apart were surveyed using a magnetic sensor clearance of 60 metres and an EM sensor clearance of 40 metres. A Geometrics G803 proton procession magnetometer was utilised sampling at 0.5 second intervals. This translates to a station spacing on the ground of somewhere between 12 and 15 metres. The EM survey utilised a Sander EM3 device slung 30 metres below the helicopter giving a ground clearance of approximately 30 metres. This is a single frequency system operating at 1,000 Hz. The VLF measurements were taken using a Geonics EM-18. Western European and USA stations were used in the operating frequency range of 15 to 25 kHz. The radiometrics were measured using a 7 litre NaI crystal attached to a Geometrics DIGRS 3001 spectrometer. Three channels were recorded relating to:-

Potassium	40
Bismuth	214 (Uranium 238)
Thallium	208 (Thorium 232)

This equipment was sampling at a rate of one reading every 1.4 seconds which equates to an average station spacing along the flight line of 21.5 metres. This data is in digital format as it was attached to a Geometrics G-714 data logger writing to 9½ tapes at 800 bpi.

The results of this survey are described in NGU report 1800/38c compiled in 1981. All the data is presented as stacked profiles. We do not have good quality hardcopy of this data nor do we have it in digital form. Figure 3 is a copy of a portion of the NGU hardcopy we have showing the magnetics data as colour strips representing the flight lines. The graphitic zone is shown as a black band surrounding the central prospect area. The main EM anomalies have also been plotted on this image. This is certainly not the best presentation format for this type of data. The cost of acquiring this dataset is 25 NOK/profile km. The total cost therefore, of purchasing this dataset, would be 1900 x 25 = 47,500 NOK (~£4,750). Surveying in the Karasjok area continued up to 1984 at which time sheets 2033 I, II, III and IV had been flown.

In July 1983 Folldal Verk A/S drilled two drill holes FV1 and FV2 at the eastern edge of the prospect area (Figure 4):-

Hole No.	Azimuth	Dip	Final Depth (m)
FV1	224°	-45°	155.15
FV2	340°	-45°	102.6

TABLE 4 : FOLLDAL VERK A/S DRILL HOLE DETAILS

The core is held by the NGU and drill hole logs are available, however no assays are available nor is there a report on the work that they conducted in the area.

ARCO was also in the Rai'tevarri area in 1983 during August. However, again they concentrated their work on the area of poisoned vegetation where they had drilled previously from 1973 to 1976. ARCO conducted a programme of soil sampling and conducted their own biogeochemical survey which supplemented that carried out by the NGU in 1976 and 1977. They also conducted a ground magnetics survey over an area NE of the Noaidatjakka river centred over the area of poisoned vegetation.

Between 1988 and 1992 the NGU conducted a programme of ground geophysics covering an area totalling 24 km^2 in the Rai'tevarri area (Figure 5). The programme consisted of:-

a) 121.5 line kms of gradient array IP/resistivity;

b) 42 line kms of VLF;

c) 100 line kms of magnetics;

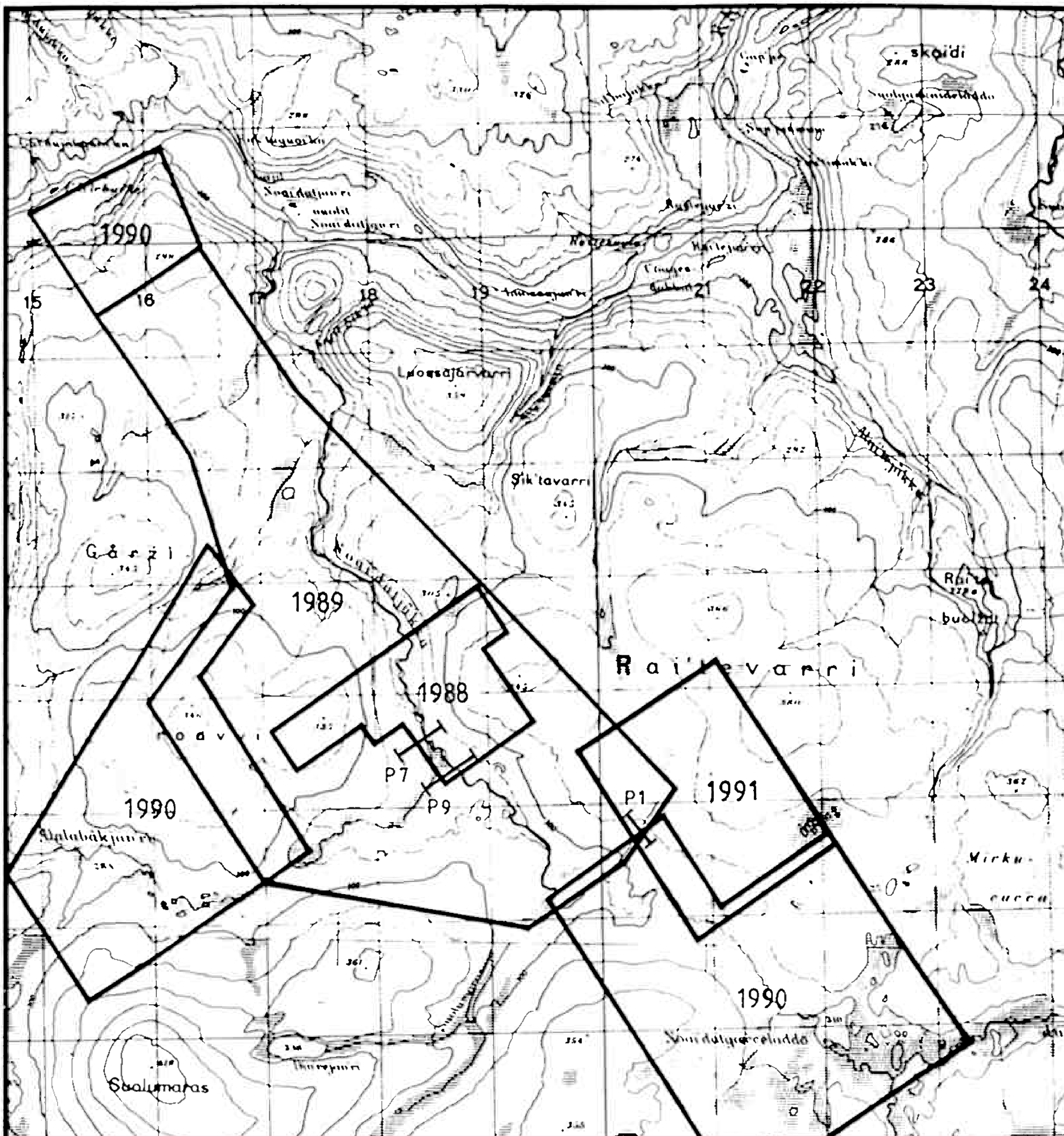
d) 4.7 line kms of pole-pole;

e) 1.35 line kms of seismic refraction profiling.

The majority of readings were collected along NE orientated lines, however some of the VLF and ground magnetics data was collected on lines orientated NW-SE.

8. SUMMARY OF NGU GROUND GEOPHYSICS

The majority of the ground geophysics has been acquired by the NGU between the years 1988 and 1992 (Figure 5). Most of the effort was put into the acquisition of 121.5 line kms of gradient array IP/resistivity data. Almost all of the gradient array data was collected using a potential



UNDERSØKT OMRÅDE 1988 - 1991

P1 REFRAKSJONSSEISMISK PROFIL

Figure 5

NGU OVERSIKTSKART RAITEVARRE KARASJOK, FINNMARK	MÅLESTOKK 1:50000	MÅLT E.D. T.L.	1988 - 1992
		TEGN E.D	1990
		TRAC T.H	1990
		KFR	1990
NORGES GEOLOGISKE UNDERSØKELSE TRONDHEIM	TEGNING NR 93.081-01	KARTBLAD NR 2033 III, IV	

dipole spacing of 25 metres. However, some infill readings were taken over anomalous areas using 12.5 metre dipole spacings. The current electrodes varied in separation from less than 1,000 metres to over 3,000 metres. In all cases an NGU built IP receiver was used. The receiver (IP4) uses an output current of up to 2.5 amps, with a maximum output of 300VA. A current cycle of 2 seconds was used for all of the survey. According to information obtained from the NGU a delay time of 0.18 seconds was used before readings were taken and an integration time of 0.06 seconds was used to calculate the IP effect. This value seems extraordinarily low and needs to be checked with the NGU. The values shown are called %IP and relate to:

%IP = IP(mv) = IP displayed * scale factor * IP factor

NB : IP Factor = 0.1 in all cases

A technical description of the equipment is given below in Table 5

IP TRANSMITTER

Type	**IP-4**
Output Voltage	0 - 250 V
Output Current	0 - 2.5 A
Maximum Output Power	300 VA
Current Cycle ON+/OFF/ON-/OFF	2/2/2/2
Time Base	RC Oscillator
Frequency Offset	
Synchronisation with Receiver	Radio signal CB, 27 MHz, 5W AM modulation

IP RECEIVER

Type		**IP-4**
IP delay time		0.18
IP integration time		0.06 sek
IP factor (IP[mV]=IP displayed*scale factor*.1)		0.1
IP ranges		+/-(40uV to 1 V)
RP Ranges		+/-(4 mV to 10 V)
SP ranges (SF = scale factor)	display SF 1 2 10	SP range +/- 0.2 V +/- 0.4 V +/- 2 V
Input voltage		Maximum +/- 10 V
Input impedance		$>10^8$ ohm
Noise Filter		Low pass, 4 poles, 17 Hz, Butterworth transfer function
Offset correction		Multiturn potentiometers
Synchronisation		Radio signal, CB 27 MHz, 2-tone AM modulation
Display resolution		+/- 199 counts

TABLE 5 : NGU IP TIME DOMAIN INSTRUMENT SPECIFICATIONS

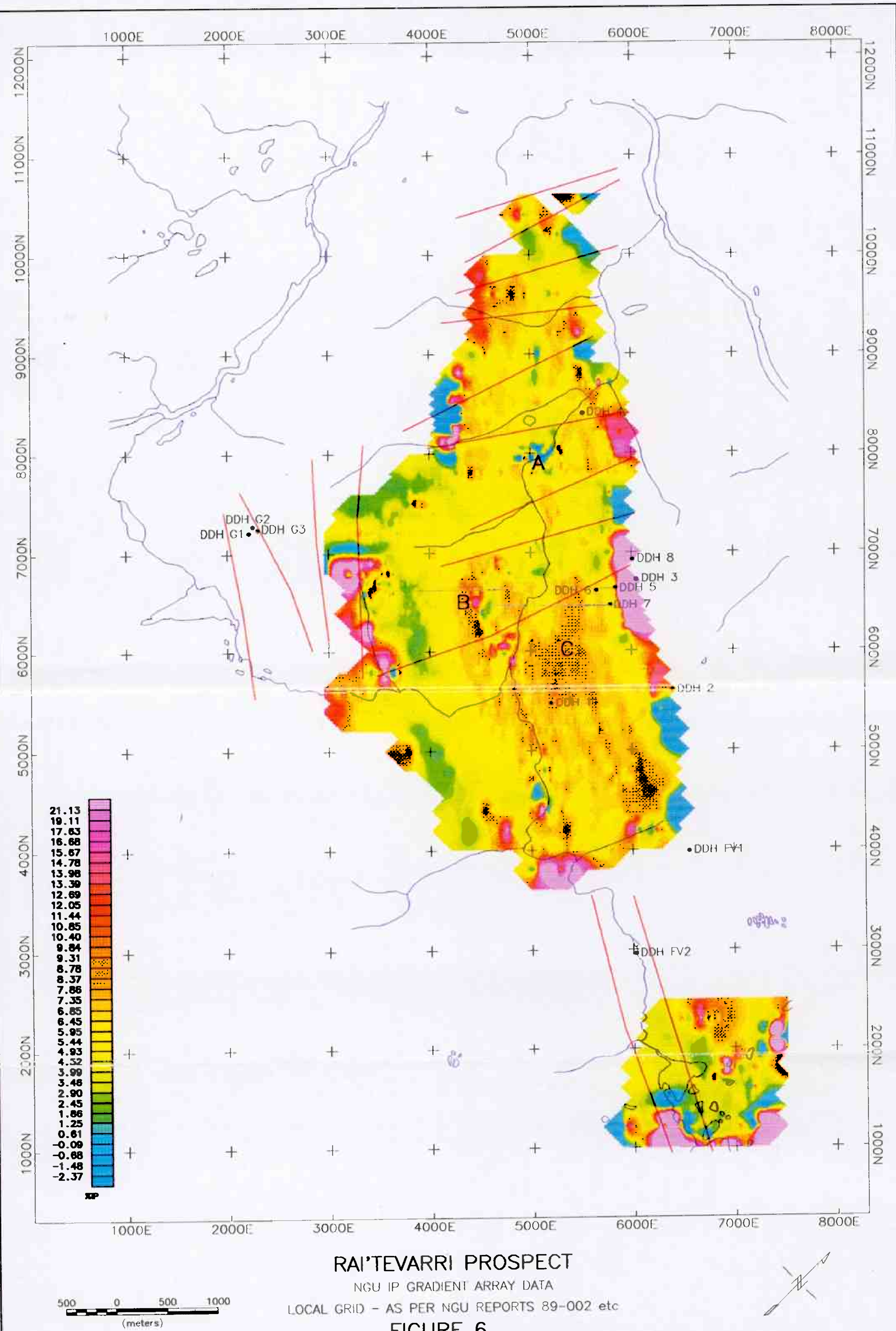
The readings of IP, resistivity and SP were taken in the following order:

a) SP, voltage bucked (volts)

b) Resistivity (milli siemens)

c) Chargeability (%IP)

All resistivities in this case are presented as conductivities (mS/m). In this study the NGU's final reports have been the main source of data. However, the field sheets were obtained for the IP gradient array portion of the survey and this data has been transcribed into a digital form. Figure 6 represents the gridded IP data while Figure 7 represents the conductivity data. The most striking features on each map are the areas of high conductivity and generally high chargeability on the margins of the prospect area. These have been interpreted as responses over the graphitic zone. The negative chargeabilities may relate to possible inductive coupling although the NGU's equipment has unusual specifications, with an especially narrow integration time for the decay

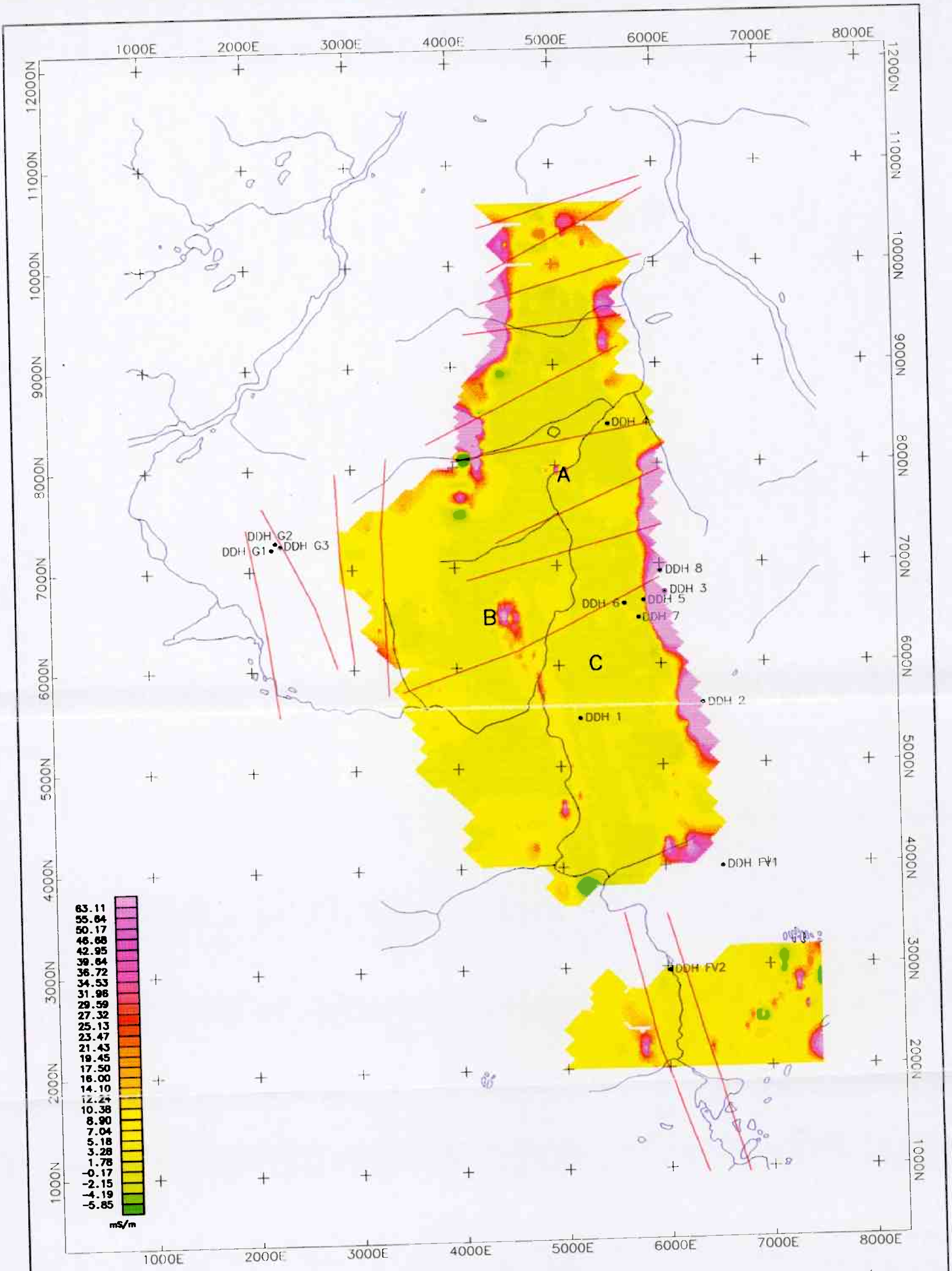


RAI'TEVARRI PROSPECT

NGU IP GRADIENT ARRAY DATA

LOCAL GRID - AS PER NGU REPORTS 89-002 etc

FIGURE 6



RAI'TEVARRI PROSPECT

NGU GRADIENT ARRAY CONDUCTIVITY DATA

LOCAL GRID - AS PER NGU REPORTS 89-002 etc

FIGURE 7

curve (0.06 seconds). Within the main zone of coverage are three areas of direct interest (areas A, B and C, Figures 6 and 7). Area A occurs along a jog in the Noaidatjakka river which corresponds roughly to an outcrop of weakly mineralised Rai'tevarri Schist.

Area B is located at a large coincident conductivity high and IP high. This anomaly extends SE for quite some way paralleling the upper reaches of the Noaidatjakka river. Previous soil sample coverage does not appear to have extended west of the Noaidatjakka River into Area B (refer S Swatton Report 1993). Area C has no conductivity response but is centred in a broad area of moderately elevated chargeabilities. This may reflect an area with higher sulphide content at relatively shallow depths which the gradient array technique is managing to delineate. One problem with using the gradient array technique in this situation is that much of the geology is interpreted to be relatively flat lying. In general this will prevent the gradient array technique from picking up lateral contrasts, especially conductivities but to a lesser extend in IP.

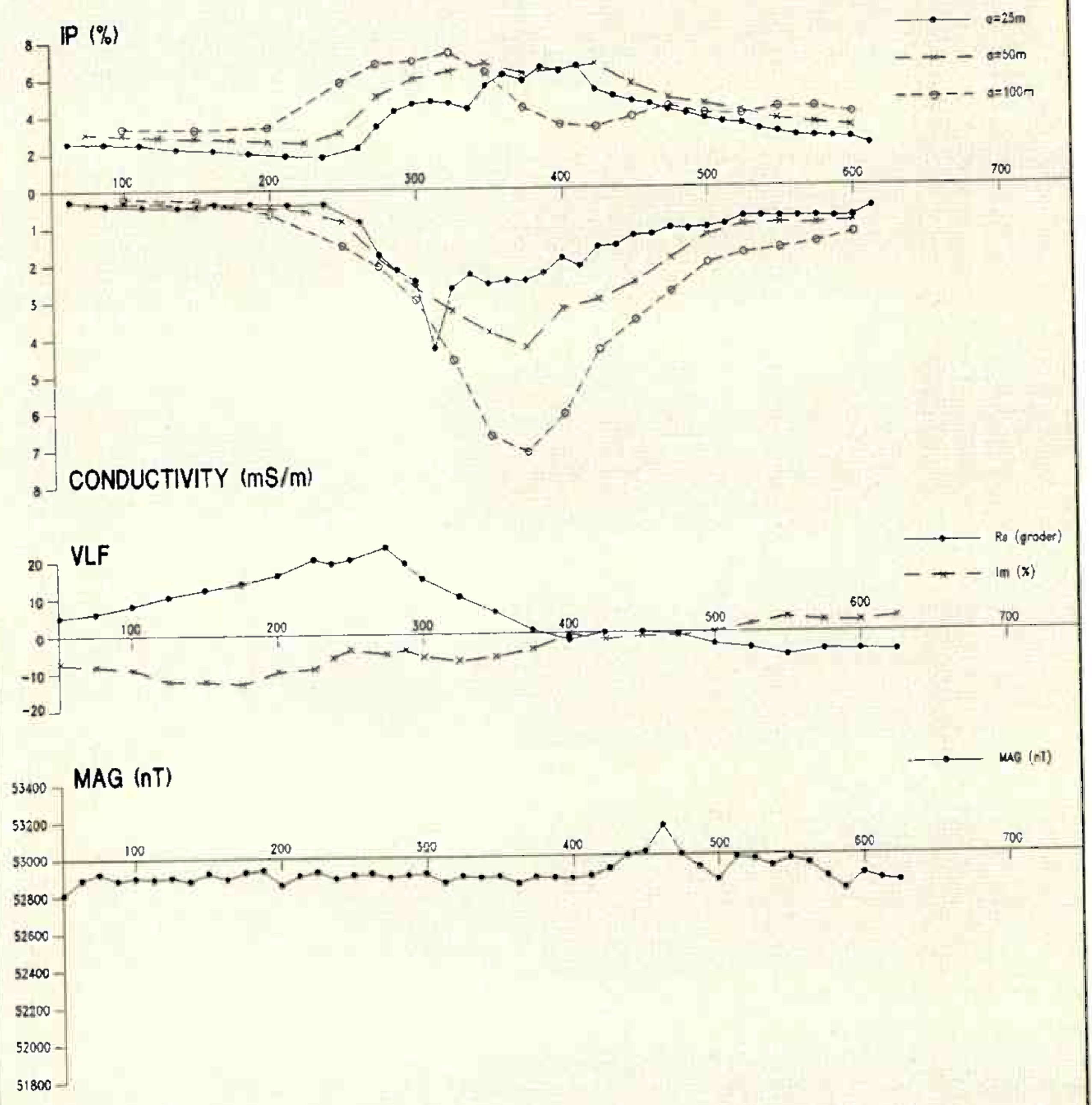
The VLF and SP measurements define the graphitic schist zone well but yield little additional information within the prospect area. The ground magnetics data was collected mainly on the periphery of the Rai'tevarri Schist and is presented only as stacked profiles. The most obvious magnetic feature in the data is the very high response over the banded iron formation in the SW of the area. There is not enough detail in the central zone to establish if there might be a subtle magnetic expression in the region, which may relate to mineralisation.

A very limited pole-pole survey was conducted in 1991 totalling 4.7 line kms along 9 separate lines (Figure 4 and 8, 9, 10, 11, 12, 13, 14, 15, 16). Three dipole spacings of 25, 50 and 100 metres were used during this survey. Where these profiles cross anomalously high conductivities and chargeabilities there is an obvious increase in resolution of the anomalies using the wider dipole spacings. The limited use of a suitable profiling technique gives little insight into the distribution of sulphides in the region. However, it can be seen that an increase in the IP response is usually associated with an increase in conductivity (decrease in resistivity). Profiles 1, 2 and 6 (Figures 8, 9 and 13) were carried out across the SE nose of the inferred anticline. An obvious structure is observed in profiles 1 and 2 but appears to pass to the south of profile 6 (Figure 4). The second group of pole-pole profiles were carried out south of the graphitic horizon. These lines were orientated NW-SE. An obvious NE-SW structure is mapped out by the three profiles with high IP and high conductivity. This is also shown well in the corresponding VLF data. The final group of three pole-pole profiles were orientated E-W and crossed the lower portion of the Noaidatjakka River. Profiles 7 and 9 (Figure 4) show the highest IP response, with profile 8 being quite low. Profiles 7 and 9 also have high conductivity responses to the east of the profiles which may be related to the gravels in the river bed. The coincident IP/conductivity occurs slightly to the west of the highest conductivities. The VLF appears to have only delineated the river response. The NNW orientation of the IP/conductivity anomaly follows the gradient array Zone B response.

Along several of the pole-pole profiles (1, 7 and 9) seismic refraction data was acquired (Figures 4, 8, 14 and 16). This work was conducted in 1991 and a 12 channel seismograph was used. In general the geophones were laid out 10 metres apart except near the explosive source where the spacing was reduced to 5 metres. The explosive source was offset from the profile by 110 metres. Profile 1 totalled 330 metres and a total of 3 layouts were used (Figure 17). Profile 7 totalled 440 metres and 4 layouts were used in this case, while Profile 9 totalled 550 metres and 5 layouts were used. In general this data has been used to establish the thickness of till in the area and to try and establish if an oxidised zone is present. If there is any oxidation present it would appear to have limited thickness. The tills in general range from 5 to 10 metres in thickness, but in Profile 9 reaches approximately 30 metres in thickness. The velocities of the underlying units have been calculated and lower velocity zones in all three profiles have been

\NORWAY\RAITEVAR\RAI-PROJ RTZMME SEPTEMBER/1993

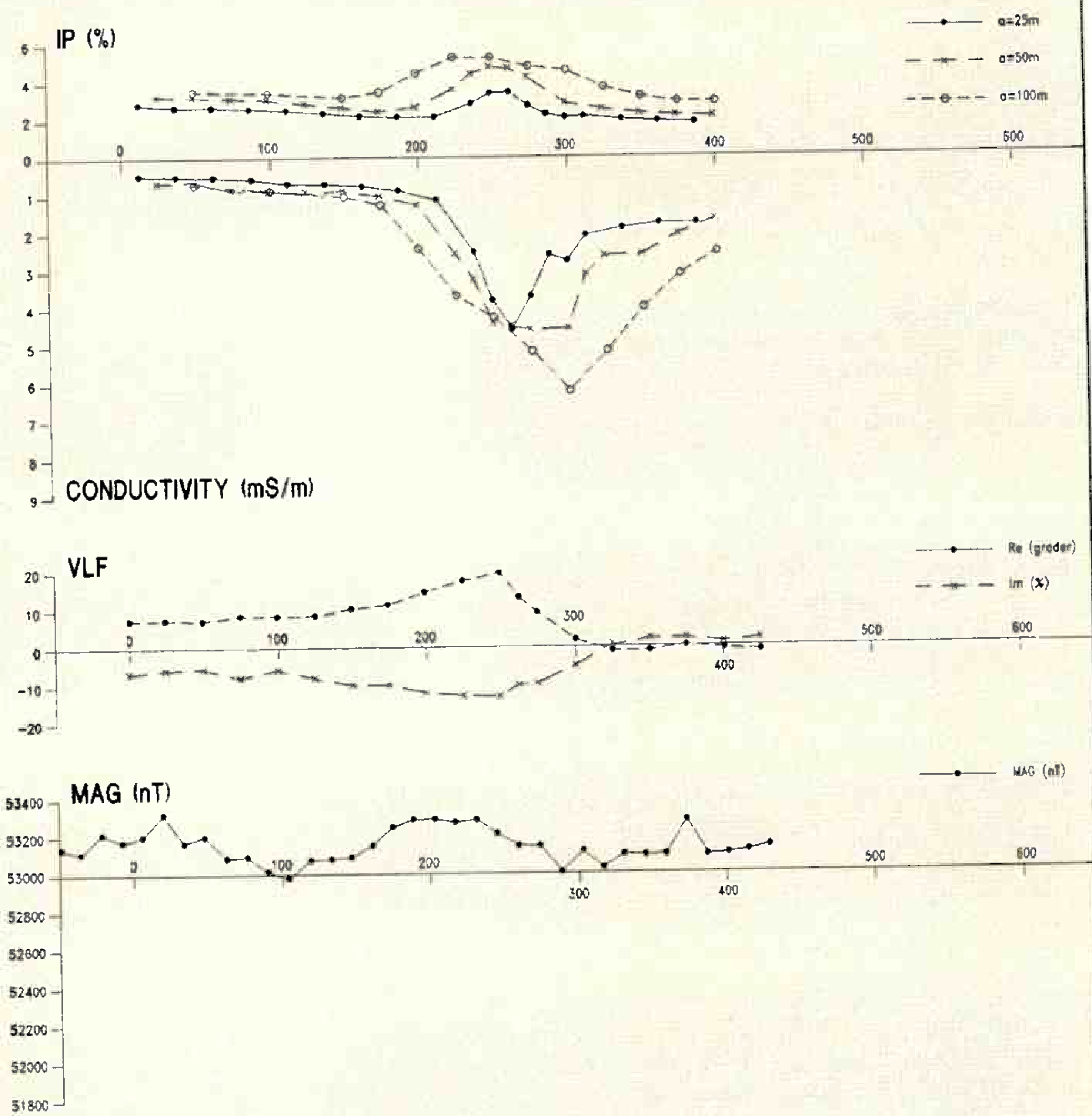
RAI'TEVARRI COPPER PROSPECT
GEOPHYSICAL PROFILES
PROFILE 1



DATA COLLECTED BY NGU - 1991 FIELD SEASON

FIGURE 8

RAI'TEVARRI COPPER PROSPECT
GEOPHYSICAL PROFILES
PROFILE 2

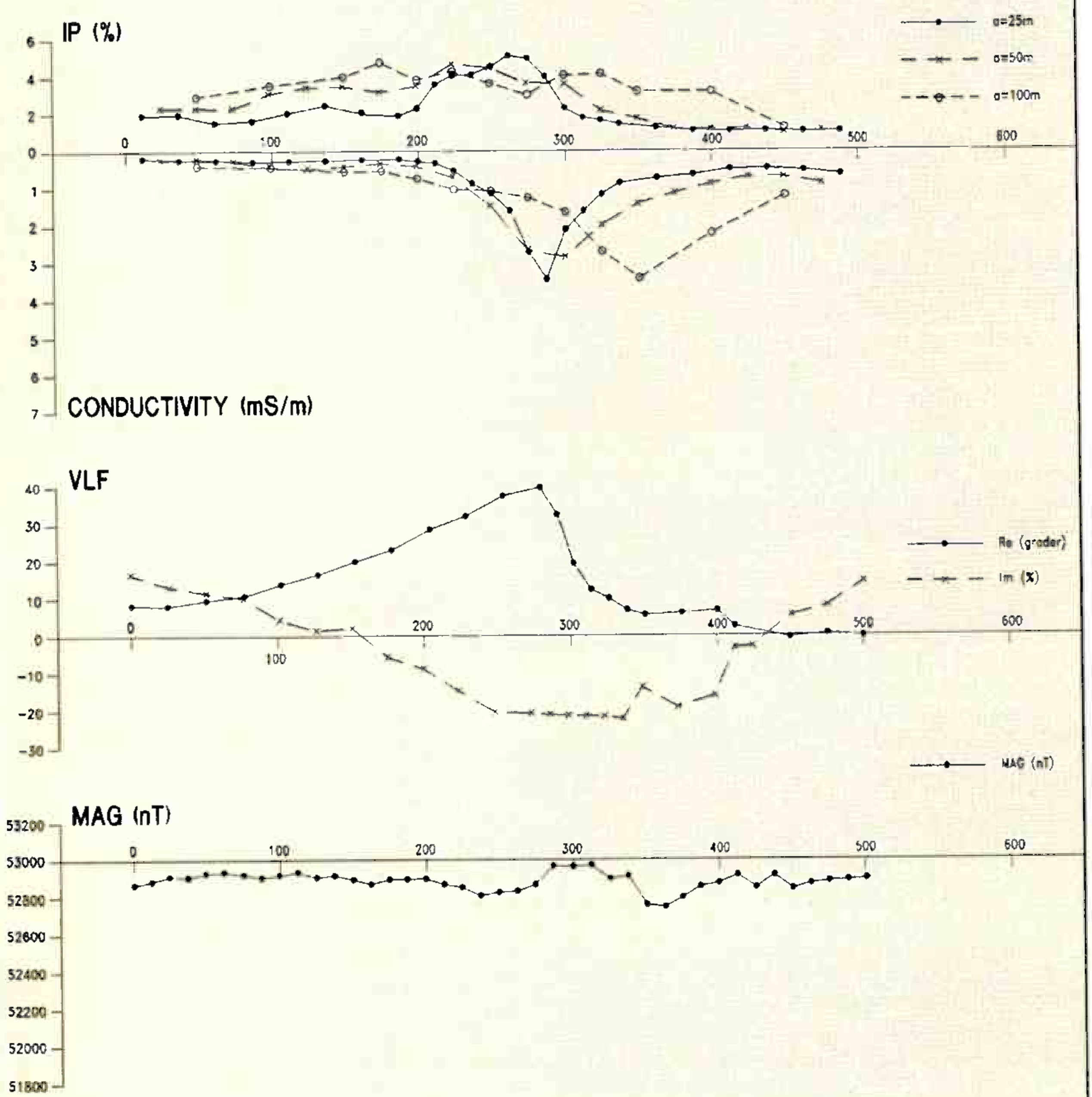


DATA COLLECTED BY NGU - 1991 FIELD SEASON

FIGURE 9

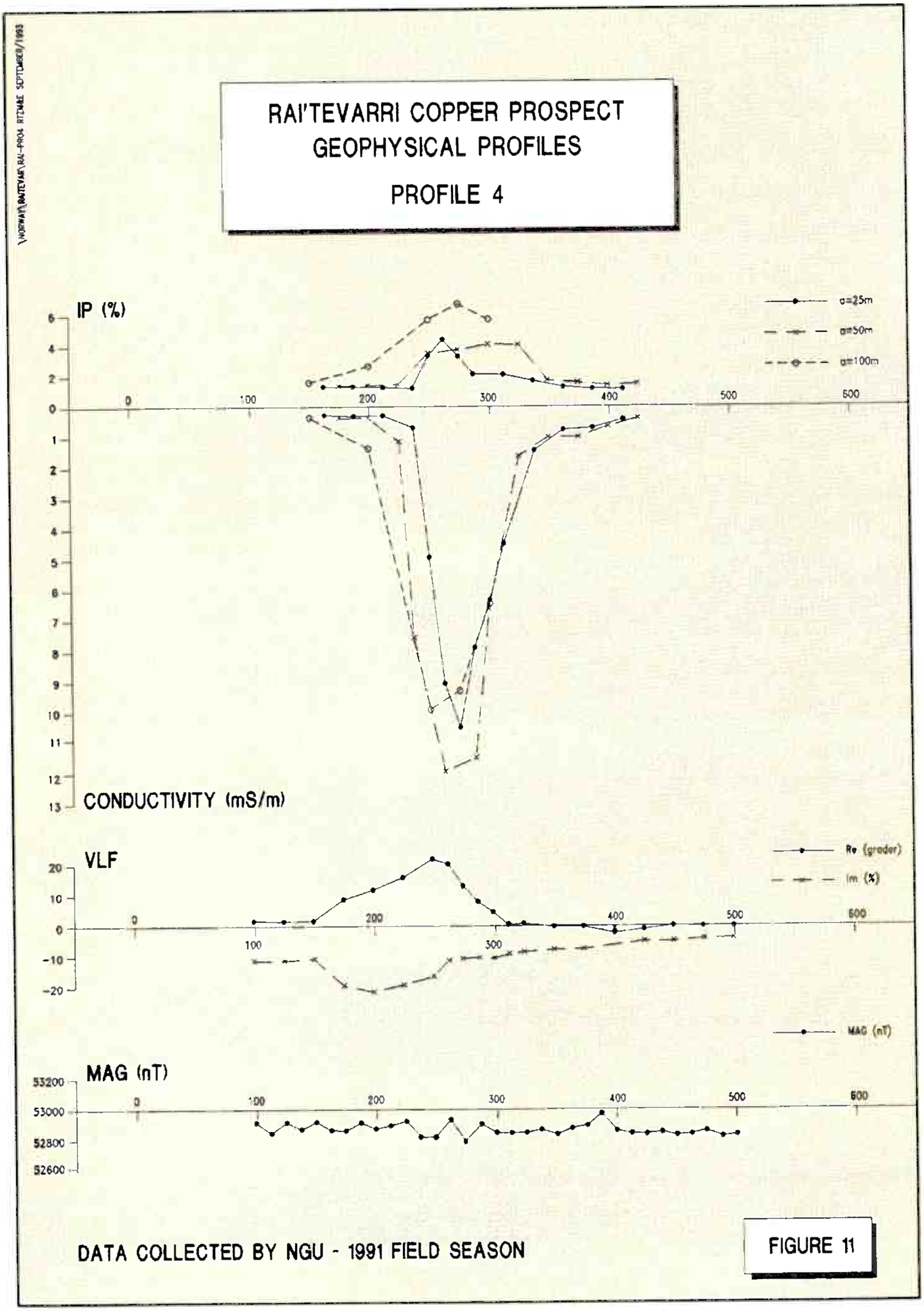
\NORWAY\RAITEVAR\RAI-PRO3 RTZM&E SEPTEMBER/1993

RAI'TEVARRI COPPER PROSPECT
GEOPHYSICAL PROFILES
PROFILE 3



DATA COLLECTED BY NGU - 1991 FIELD SEASON

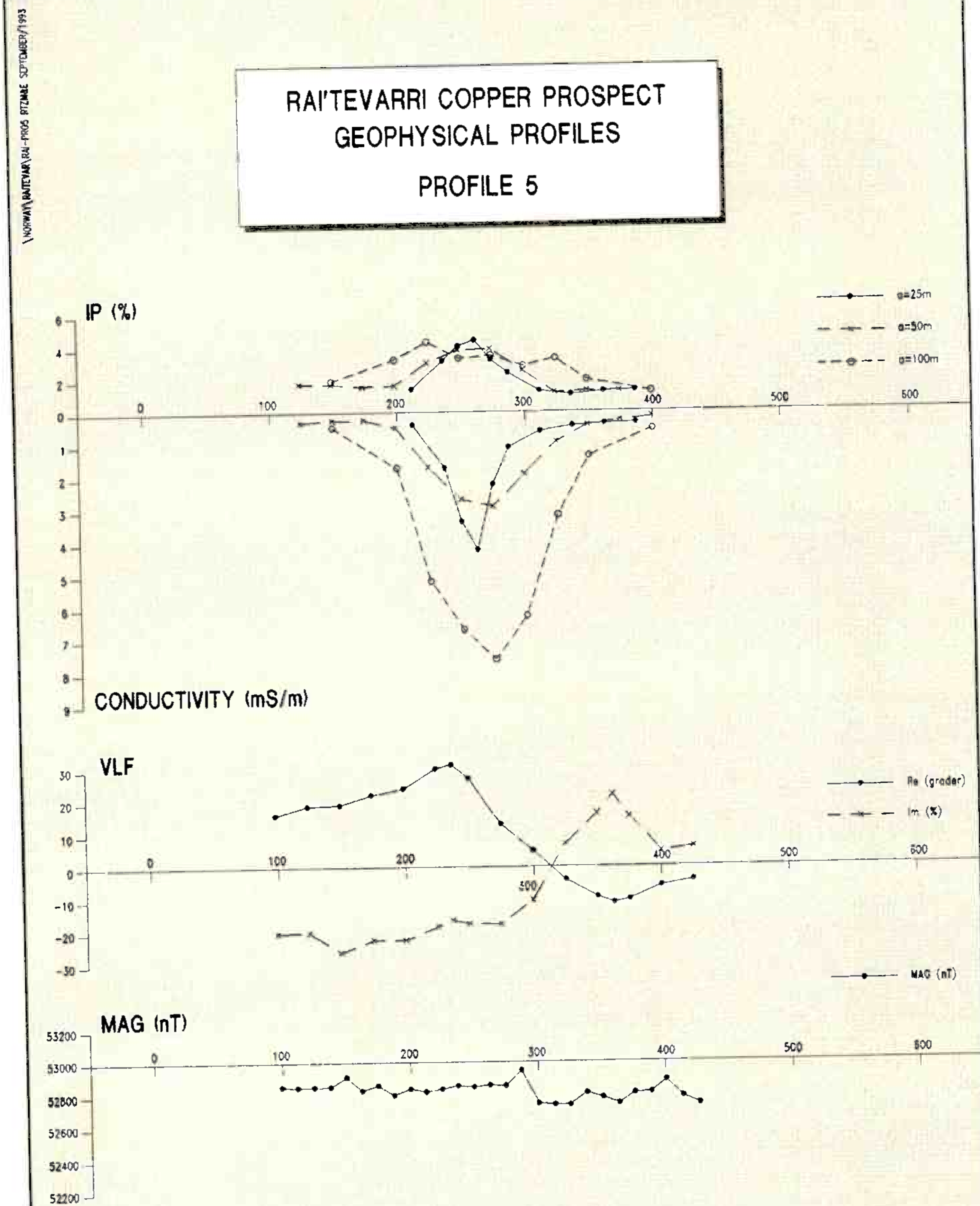
FIGURE 10



\NORWAY\RAITEVARR\RAI-PRO4 RTZMAE SEPTEMBER/1993
RAI'TEVARRI COPPER PROSPECT
GEOPHYSICAL PROFILES
PROFILE 4
IP (%)
a=25m
a=50m
a=100m
CONDUCTIVITY (mS/m)
VLF
Re (grader)
Im (%)
MAG (nT)
MAG (nT)
DATA COLLECTED BY NGU - 1991 FIELD SEASON

FIGURE 11

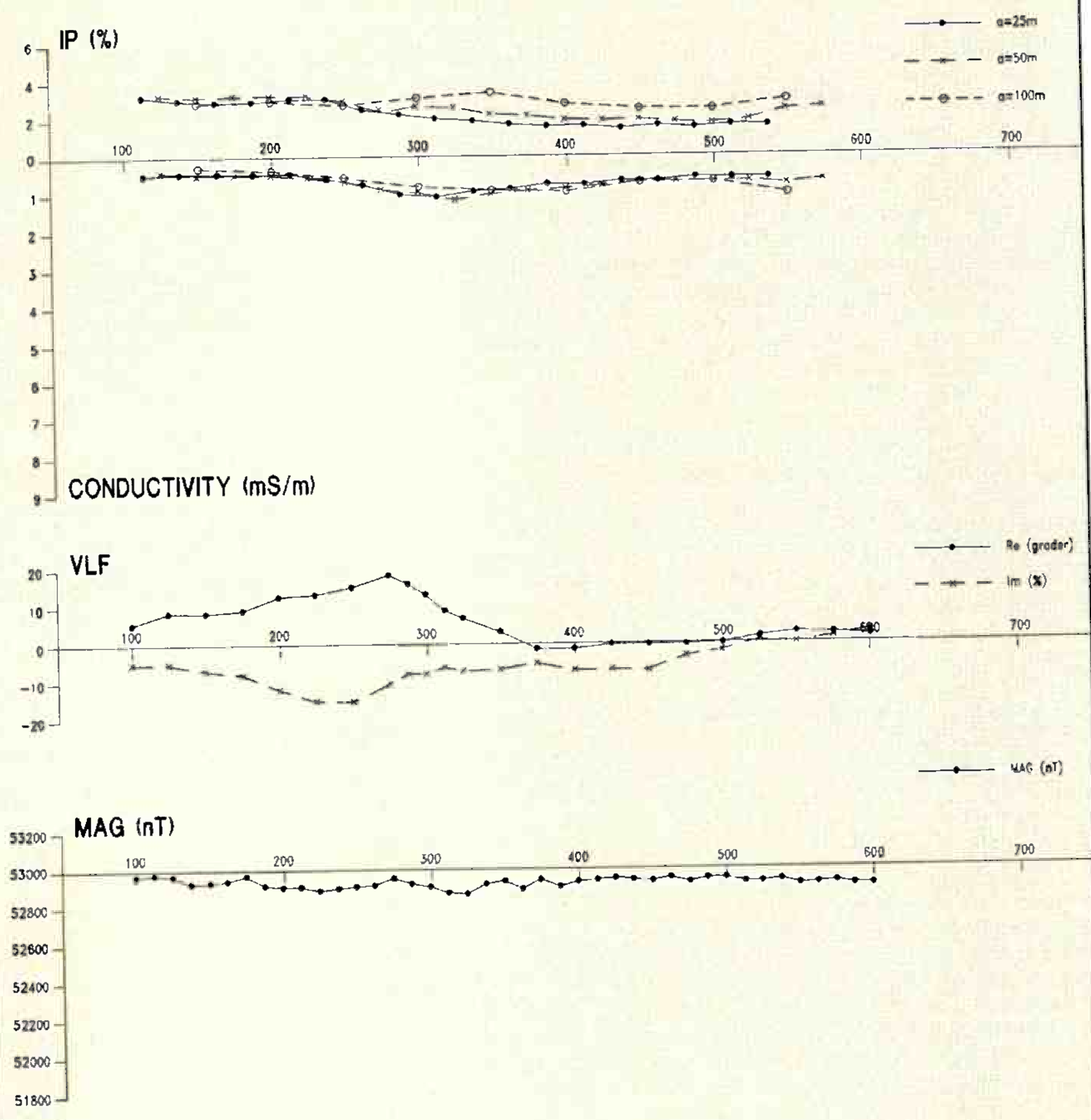
RAI'TEVARRI COPPER PROSPECT
GEOPHYSICAL PROFILES
PROFILE 5



DATA COLLECTED BY NGU - 1991 FIELD SEASON

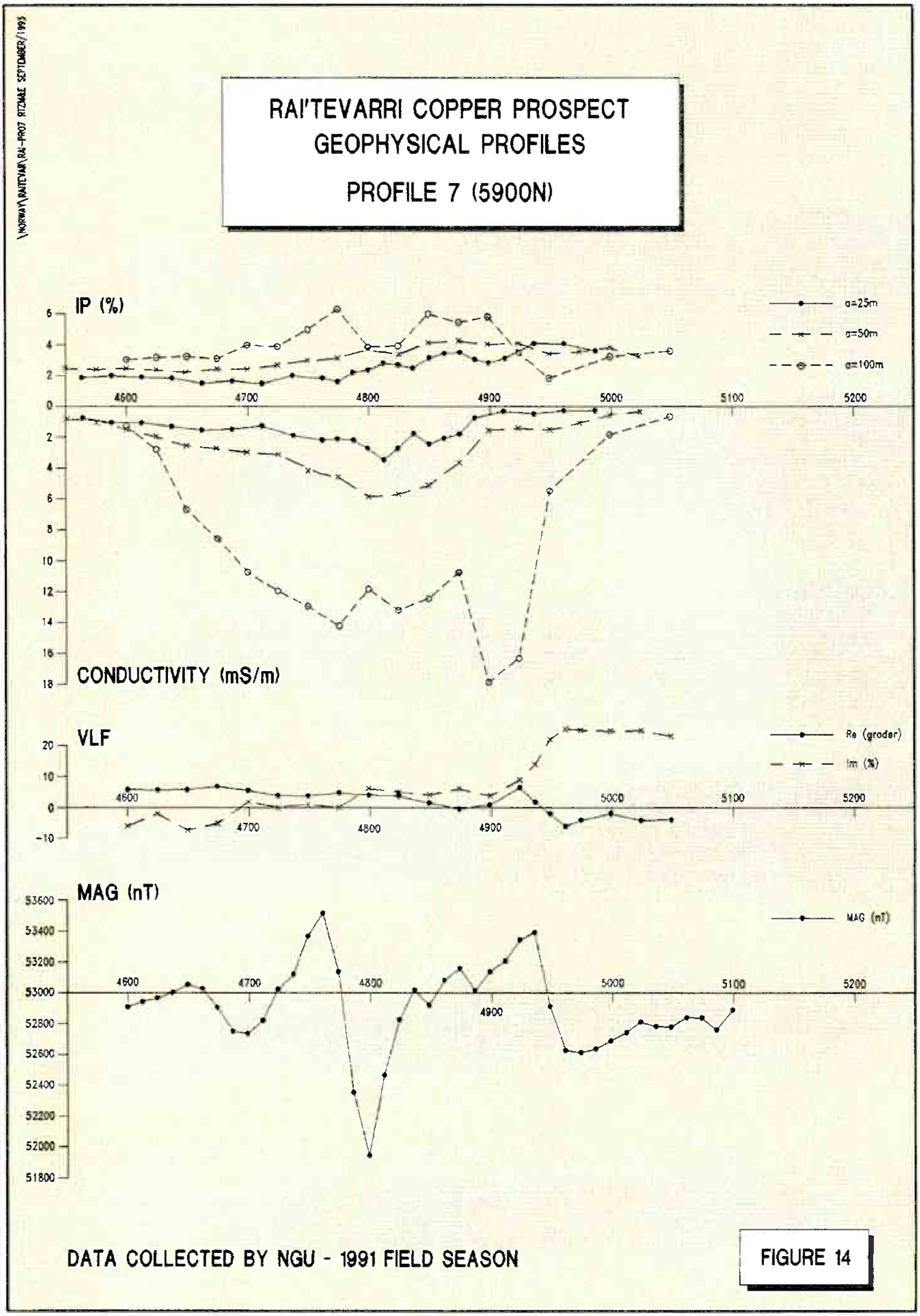
FIGURE 12

RAI'TEVARRI COPPER PROSPECT
GEOPHYSICAL PROFILES
PROFILE 6



DATA COLLECTED BY NGU - 1991 FIELD SEASON

FIGURE 13

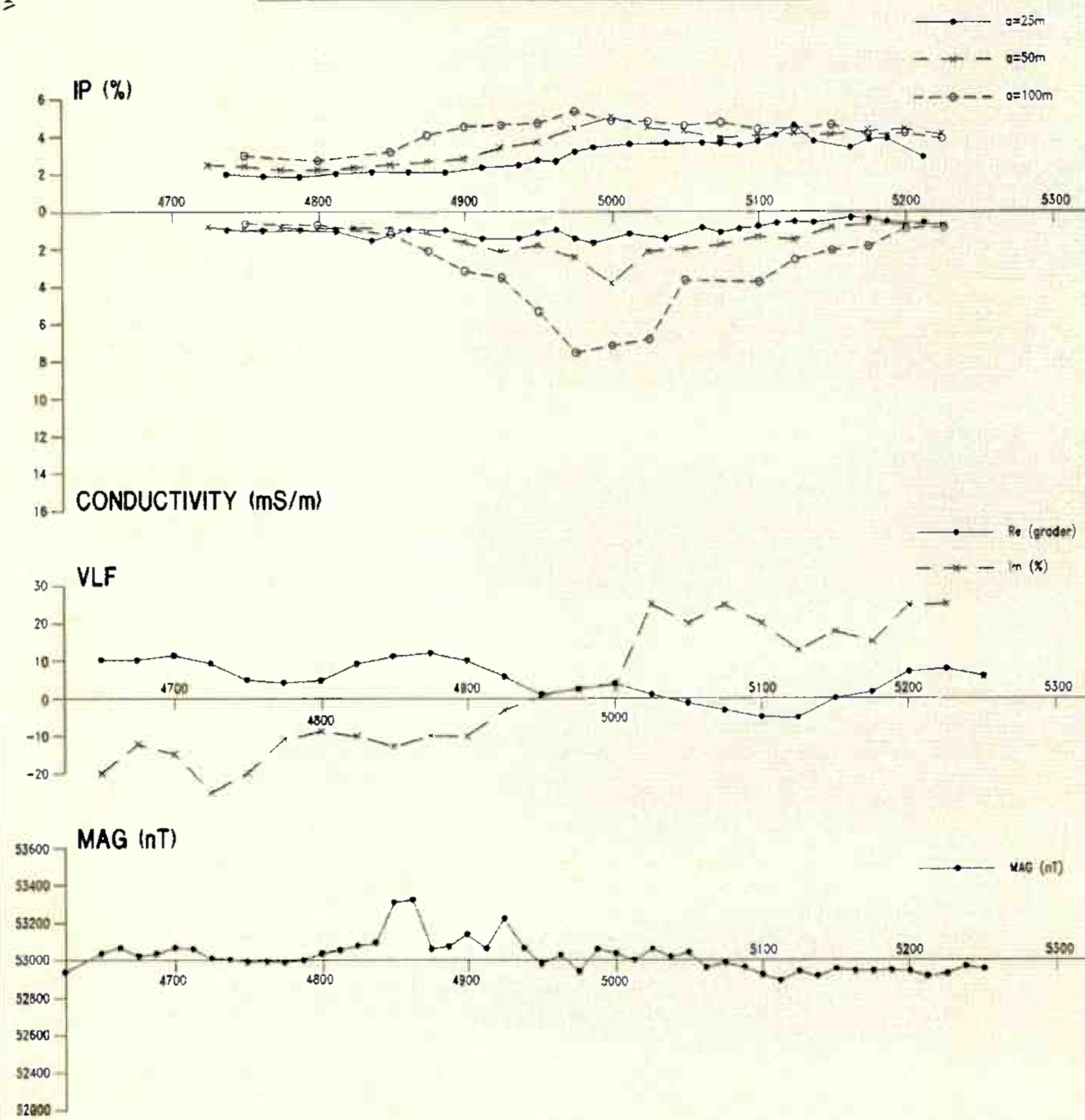


\NORWAY\RAITEVAR\RAI-PRO7 RITZMAE SEPTEMBER/1993
RAI'TEVARRI COPPER PROSPECT
GEOPHYSICAL PROFILES
PROFILE 7 (5900N)
IP (%)
a=25m
a=50m
a=100m
CONDUCTIVITY (mS/m)
VLF
Re (grader)
Im (%)
MAG (nT)
MAG (nT)
4600
4700
4800
4900
5000
5100
5200
DATA COLLECTED BY NGU - 1991 FIELD SEASON

FIGURE 14

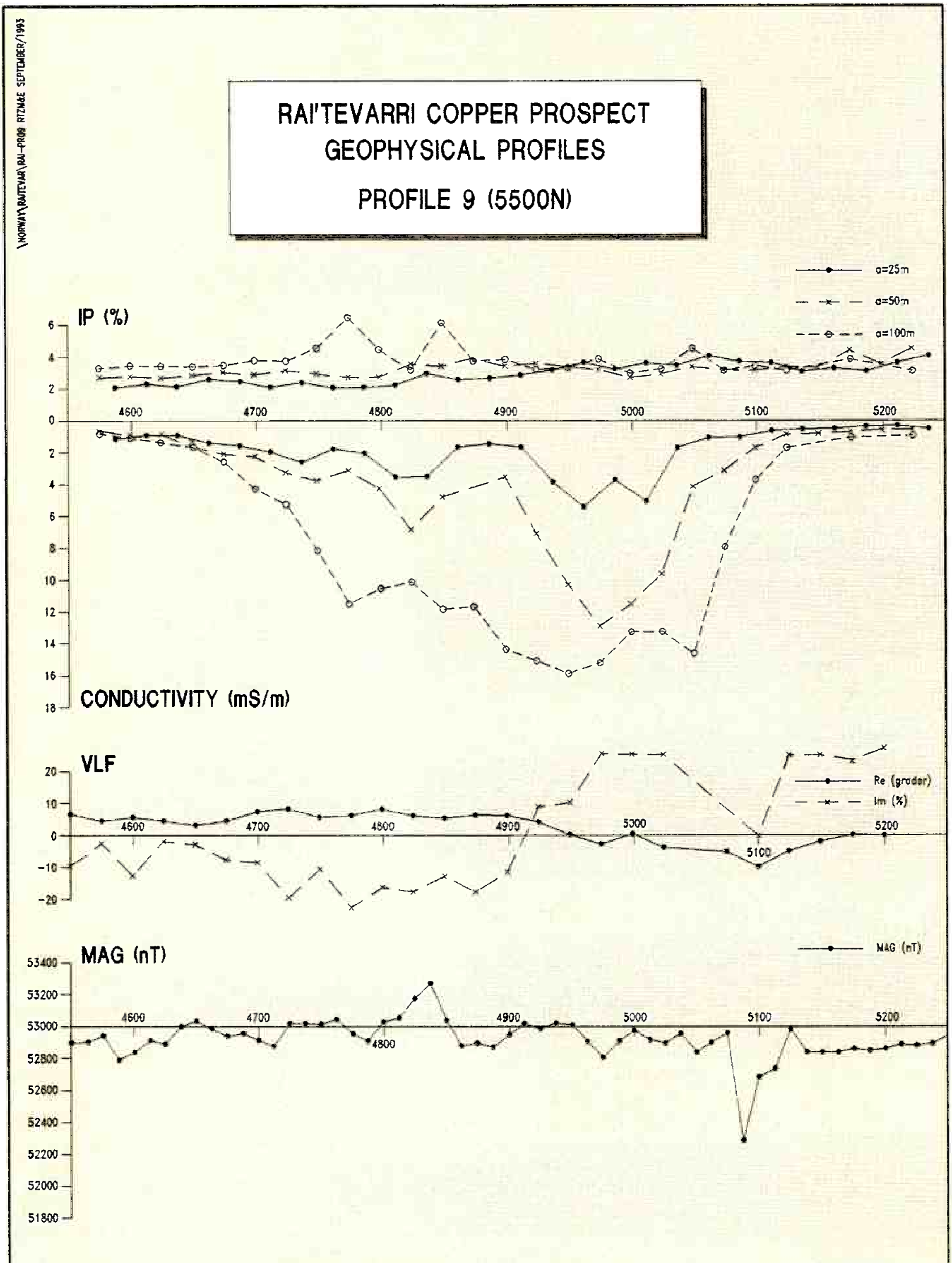
RAI'TEVARRI COPPER PROSPECT
GEOPHYSICAL PROFILES

PROFILE 8 (5200N)



DATA COLLECTED BY NGU - 1991 FIELD SEASON

FIGURE 15



DATA COLLECTED BY NGU - 1991 FIELD SEASON

FIGURE 16

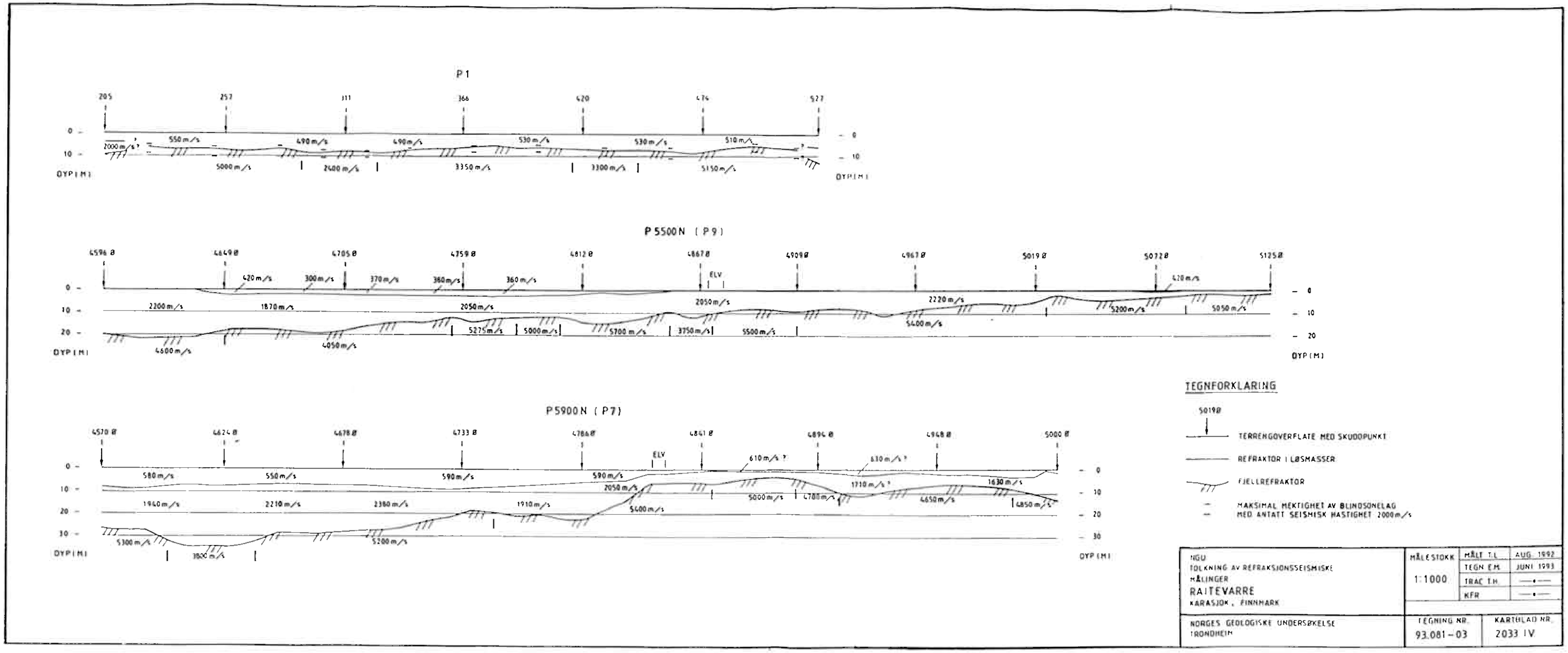

P 1
P 5500N (P9)
P5900N (P7)
DYP (M)
ELV
TEGNFORKLARING
5019Ø
TERRENGOVERFLATE MED SKUDDPUNKT
REFRAKTOR I LØSMASSER
FJELLREFRAKTOR
MAKSIMAL MEKTIGHET AV BLINDSONELAG
MED ANTATT SEISMISK HASTIGHET 2000m/s
NGU
TOLKNING AV REFRAKSJONSSEISMISKE
MÅLINGER
RAITEVARRE
KARASJOK, FINNMARK
NORGES GEOLOGISKE UNDERSØKELSE
TRONDHEIM
MÅLESTOKK
1:1000
MÅLT T.L.
AUG. 1992
TEGN E.M.
JUNI 1993
TRAC T.H.
KFR
TEGNING NR.
93.081-03
KARTBLAD NR.
2033 IV

Figure 17.

interpreted to be due to a shear zone, although the direction of this does not correlate well with the IP and conductivity anomalies as the low velocity zone strikes ESE compared to a SE direction for the IP responses.

The airborne magnetics and EM (Figure 3) pick out the more regional anomalies and appear to map the graphitic zone, but give few details as to the internal structure of the region. However, more detailed analysis of these results ie image processing, may elucidate fine detail not seen in the hardcopy plots that the NGU have produced.

9. FIELD VISIT

On 15 August 1993 a party of four people made a field visit to the Rai'tevarri area. This party consisted of:

Peter Ihlen	- NGU
Steve Swatton	- Riofinex North Ltd
Steve M[c]Intosh	- Riofinex North Ltd
Mike Jones	- Contractor

The area was visited by helicopter using a Hughes 500E. In general there is limited outcrop within the prospect area. The copper poisoned vegetation anomaly was visited first. This zone is devoid of trees and is covered by stunted mosses and grasses, including viscaria. There are several smaller poisoned zones and all are characterised by weeping springs.

What outcrop is seen within and on the margins of the prospect area is generally highly deformed. Along the western margins there are several imbricated thrust sheets consisting of rocks from lower in the stratigraphic sequence. These occur above a tectonic melange which include clasts of a very sodic rich granite.

No significant mineralisation was noted in outcrop. Only patchily developed chalcopyrite was observed and most of the accessory sulphides consist of pyrite and pyrrhotite to a total of ~1%.

An outcrop of graphitic black schist was visited on the western margin of the prospect area. In general the outcrop was quite highly oxidised. However, in some of the less oxidised portions there was clearly a high percentage of graphitic material and in place 1-2% of finely disseminated sulphides were noted, mainly pyrite and pyrrhotite. This horizon is weakly magnetic indicating the presence of pyrrhotite, but reports of disseminated magnetite in some portions of the black schist have been made by members of the NGU.

Along the lower portions of the Noaidatjakka there are several outcrops containing weak mineralisation. Some of the Rai'tevarri Schist contains visible chalcopyrite and total sulphide content approaches 2%. Localised bands of apparently barren massive pyrite (to 5cms thick) occur at the base of this outcrop.

10. SUMMARY AND RECOMMENDATIONS

The lack of mineralised outcrop and the failure of the IP resistivity gradient array survey to adequately test the area makes this a difficult property to assess. There is a moderate amount of encouragement from the previous drilling that there may be higher grade zones in the area. However, the choice of a suitable investigative technique is difficult to say. In all likelihood a series of relatively shallow (~100 metres) drill holes on a wide spaced pattern would provide the most information. A series of widely spaced dipole-dipole lines may also be useful in targeting potential mineralised zones. This would also help us to interpret the NGU results ie give some real world perspective to their results.

Additional ground geophysics would be relatively costly and may not provide enough information to confidently target drill holes. The use of detailed ground magnetics may be inappropriate as regional metamorphism to green schist grade and higher to amphibolite grades tends to demagnetise basic igneous rocks. Even if these rocks are metasediments and not metavolcanics as they have been interpreted to be, pyrrhotite will still be the main magnetic mineral found in such sequences.

APPENDIX 1

RESULTS FROM DENSITY AND SUSCEPTIBILITY MEASUREMENTS ON SAMPLES FROM RAI'TEVARRI

Sample	Density (kg/m^3)	Susceptibility (SI units)
1 - 41.5	2,841	2.58 E^{-4}
2 - 108.5	2,814	2.80 E^{-4}
3 - 7.0	2,761	7.90 E^{-4}
3 - 7.8	2,655	1.06 E^{-4}
3 - 60	2,736	5.04 E^{-3}
3 - 90	2,825	3.92 E^{-4}
3 - 120.8	2,609	4.30 E^{-3}
5 - 190.8	2,782	7.31 E^{-4}
5 - 215.6	2,819	3.43 E^{-4}
6 - 214.8	3,133	3.70 E^{-5}
7 - 130.4	2,714	3.21 E^{-5}
8 - 52.3	2,873	3.23 E^{-4}

NB The sample numbers refer to samples collected by Steve Swatton from some of the drill holes previously drilled at Rai'tevarri by ASPRO. These samples correspond to the hole number and depth.

APPENDIX 4

RAI'TEVARRI ENVIRONMENTAL PHOTOGRAPHS AND ENVIRONMENTAL CONTROL REPORT

RHR1 drilling

RHR1 site post drilling

RHR1 drill collar

RHR2/94 site pre drilling

RHR2 drilling

RHR2 site post-drilling

RHR3 pre-drilling

RHR3 site post-drilling

RHR4 site pre-drilling

Drilling at RHR4

RHR5 site pre-drilling

RHR5 drilling

RHR5 site post-drilling (please refer to environmental section of report)

RHR6 site pre-drilling

RHR6 drilling

RHR6 drill site

RHR6 site post-drilling

RHR7 pre-drilling

RHR7 site post-drilling

RHR8 pre-drilling

RHR8 site post-drilling

RHR9 site-pre-drilling

RHR9 post-drilling

Winter road to drill sites RHR1 and RHR2

Drill road between RHR3-RHR5

Drill road to RHR1 and RHR2

Drill road to RHR3

Main access drill road

Drill site visit by Karasjok's Mayor, Environmental Officer and Chief of Police to RHR4

Sami President, Mr Magga at RHR6

Post-drill site visit snack with Karasjok's Mayor, Environmental officer and Chief of Police

I.P. crew taking a break

FILE COPY
Bristol Office

ASPRO PROSPEKTERING A/S

GAMLE RINGERIKS VEI 14, POSTB. 83 - 1321 STABEKK TLF.: (02) 53 08 34 TELEX 72 987 aspro n

Dato 10.07.1994	Rapport nr. 2303	Antall sider: 3 Antall bilag: 33	Konfidensielt X

Rapport vedr.:

REPORT PREPARATION AND MONITORING OF ENVIRONMENTAL CONTROL RAITEVARRE, KARASJOK.

Prosjekt: Raitevarre	Oppdragsgiver: RIO HOLDING NORWAY A/S
Forfatter: Bernt Røsholt	Prosjektleder: Colin Harris
Land/fylke: Finnmark	Kommune: Karasjok
Kartbladnavn 1:250 000	Kartblad 1:50 000

Sammendrag:

Preparation and monitoring of environmental control at Raitevarre, Karasjok, for officials.
Day of inspection July 4th, 1994.
Participants from drilling company, Karasjok kommune, County of Finnmark, Mining office, Sametinget, Pasture 17/18 and the writer.
The clean up was concluded very good and negligible harm on the vegetation was registered.

Emneord		
	Miljø	

Fordeling		
Rio Holding Norway A/S	1	
Rio Tinto Zinc	1	

Report from preparation of environmental inspection of possible damages made during diamond drilling at Raitevarre April 7th to May 4th - 1994.

Formal application for permission for the use of motorized vehicles in the field from July 1st for the crew of the drilling company Terje Holmen Diamantboring A/S and Mr. Røsholt was sent early in June to Karasjok kommune. Permission was naturally given and an invitation was sent to the following organizations :

1. Fylkesmannens Miljøvernkontor (Environmental office of Finnmark).
2. Karasjok kommune, Miljøvernkontor (Environmental office of Karasjok).
3. Reinbeitedistrikt 17/18 (Reindeerpasture area 17/18, Karasjok).
4. Sametinget, Karasjok.
5. Terje Holmen Diamantboring A/S, Kautokeino.
6. Bergvesenet, Trondheim (Mining office, Trondheim).

An additional letter to the invited participants underlines that each had to cover his/her own field expences.

The inspection should take place Monday July 4th and Røsholt went into the field by riverboat Saturday July 2nd as also the two men Mr. Kai Storvik and Mr. Hugo Hætta from Terje Holmen Diamantboring A/S did. They went in by "fourcycles".

Before going into the field Mr. Røsholt had a meeting with Mr. Ingolf Balto, environmental office of Karasjok. Mr. Balto accepted the proposition to have the following programme :

A. Have an overall orientation of the mutated vegetation anomaly.
B. Visit a limited number of old drillsites.
C. Visit a limited number of the drillsites from 1994 including roads where trees were cut. It was proposed that drillsites 5, 2, 1 and 3 were inspected.

The following persons attended the inspection :

Karasjok kommune	:	Mr. Kjell Sæther, Mayor.
		Mr. Ingolf Balto, Environmental office.
County of Finnmark	:	Mr. Steinar Schanke.
		By a misunderstanding of where Myrskog is located and that enclosed map from Røsholt was forgotten, Mr. Schanke

did not show up at appointed place and time. When the inspection was completed he, however, showed up by the river at Karasjokka at 21^{00} HRS and Mr. Balto made a second tour into the Raitevarre area for him to see the mutated vegetation anomaly.

Sametinget : Ms. Ragnhild Nystad.
Mining Office : Mr. Bjarne Lieungh.
Pasture District 17/18: Mr. Samuel Anti.
Terje Holmen Diamantboring A/S :
Mr. Kai Storvik.
Mr. Hugo Hætta.

At Friday July 1st Røsholt also made contact with Mr. Oddleif Nordsletta, head of Fjelltjenesten, "Mountain service", which represents Statsskog. He explained that he had been informed about the inspection tour, however, he regretted he was unable to attend.

The inspection tour started at the mutated vegetation anomaly at 14 HRS July the 4th. An aerophotocopy over the area demonstrating the mutated vegetation anomalies was given to the participants. All participants showed great interest in this area and particularly the possible heavy metal, copper, poisoning of the reindeers. It was, however, believed that the heavy metal poisoning would be negligible since the reindeer moss (winter pasture) is limited in this area and that the reindeer herds are by the coastal areas at summer time.

The inspection was followed to A/S Sydvaranger's old drillsites no 8, 5 and 6 from 1976. All participants agreed that vegetation had been restored and that negligible damages had been made. Some old tracks from the moving of equipment were seen. These tracks had also been used later by moose hunters.

At last the inspection went to Rio Holding Norway A/S' drillsite no 5, where it had been an oil spill. The oil spill was concluded to be minor and that the spill was limited to a restricted area of about 10 m^2. The drill hole which gave arthesic water was plugged in order to dry out the area and prevent further spreading of the oil.

Further the drillsites no 2, 1 and 3 were visited as well as the "roads" made for access to the drillsites. The participants were very pleased with the clean up (cutting of damaged trees) and how limited the damage of the ground vegetation actually was.

The final conclusion was that the withheld sum of NOK 50.000 from the drilling company could be released. This has been informed to Mr. Terje Holmen.

The following drillsites and other "motives" are photographed and enclosed :

A/S Sydvaranger 1976 and 1973

DDH no 6	2	pictures
5	2	"
3	2	"
8	2	"
7	1	"
4	1	"

Tractor tracks N of DDH 3	1	picture
" " and trail	1	"

Rio Holding Norway A/S 1994

DDH no 4	3	pictures (some oil)
3	3	" " "
5	7	"
2	2	"
1	3	"

"Road" to DDH 3	4	pictures

BLEIKA, 8/7-1994

Bernt Røsholt

Bernt Røsholt

BR/bs D.14-Dok.31

S

Sydvaranger DDH 8 1976

N

Sydvaranger DDH 8 1976
Mutated veg. Anom. top right.

W

Sydvaranger DDH 5 1976

N

Sydvaranger DDH 5 1976

N

Sydvaranger DDH 7 1976

N

Sydvaranger DDH 6 1976

S

Sydvaranger
DDH 6
1976

3

SW

Sydvaranger
Drillholes
1973

3

NE

4

N

Trail and tractor track from SW part of Mutated Veg. Anom. Tracks from 1976 and later.

SW

Tractor tracks NE of Sydvaranger DDH 3 1973 and 76. Tracks are later "renewed" by moose hunters.

W

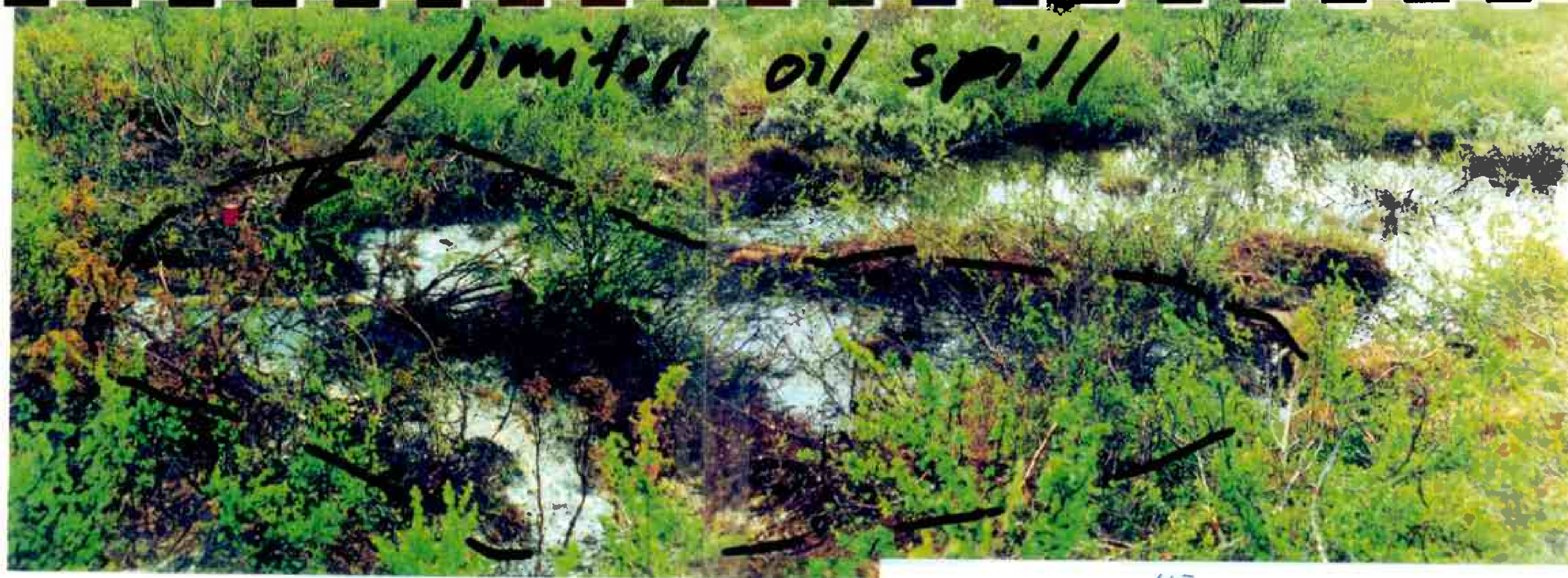
N

S

RHR-94/4
A small oil spill

W SW S

RHR 94/5
From Oil spill. White is crushed rock.



E NE

RHR94/5

From Oil spill

S SE

RHR-94/2

N

Balko Anti

W

S

W

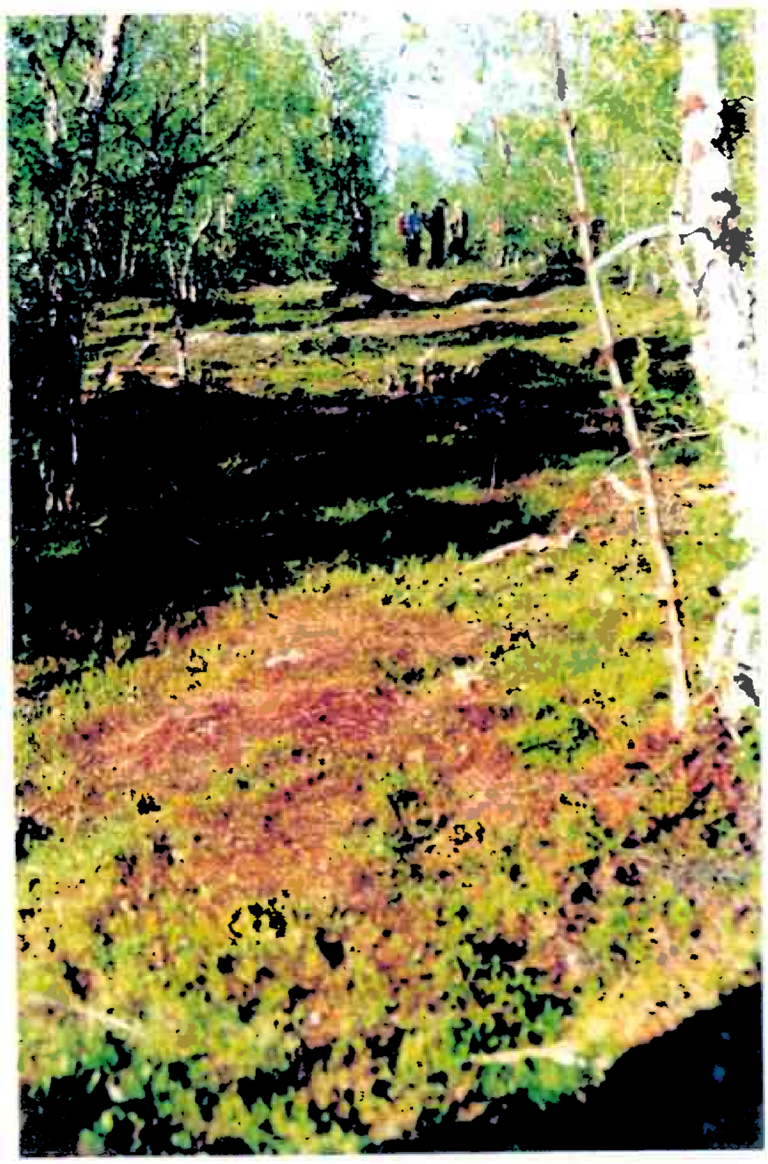
RHR 94/1

N

NW

"Road" towards RHR-94/3

NW



W

N

RHR-94/3

E

W

NW

RHR 94/3

Lievngh, Balto, Anti, Scether, Nystad

APPENDIX 5

RIO HOLDINGS NORWAY A/S RAI'TEVARRI PROJECT AUDITED ACCOUNTS FOR 1994

RIO HOLDING NORWAY A/S

Exploration costs 1994

	NOK	Basis for grant NOK
Diamond drilling 1000m	374881	500.000
Establishment, removal, clearing up	98897	150.000
Norwegian project consultants	36926	50.000
Geophysics 10 per km	109927	120.000
Personnel transport,vehicles,field equipment	46536	85.000
Analysis of 150 samples	54006	30.000
Travelling, drawing, reports	409596	40.000
Total	**1130769**	**975.000**

Rate of Exchange:

GBP 1.00 = NOK 10.582

We have controlled the above expenses. In our opinion these expenses have incurred in 1994 and relates to the Raittevarri project in the municipality of Karasjok.

Oslo, 3. February 1995

Coopers & Lybrand AS

Carl Bonnevie
State Authorized Public Accountant