Bergvesenet

Postboks 3021, N-7441 Trondheim

Rapportarkivet

Bergvesenet rapport nr	Intern Journal nr	Internt arkiv nr	Rapport lokalisering	Gradering
4694	1564/98			**Fortrolig**
Kommer fra ..arkiv	**Ekstern rapport nr**	**Oversendt fra**	**Fortrolig pga**	**Fortrolig fra dato:**
	Aspro 2381	Prospektering a.s.	Prospekteringsfondet 1998	

Tittel

Drilling at Naranas

Forfatter	Dato År	Bedrift (Oppdragsgiver og/eller oppdragstaker)
Rui, Ingolf	17 aug 1998	Prospektering A/S Fuxite AS

Kommune	Fylke	Bergdistrikt	1: 50 000 kartblad	1: 250 000 kartblad
Kautokeino	Finnmark		18332 19333	Nordreisa

Fagområde	Dokument type	Forekomster (forekomst, gruvefelt, undersøkelsesfelt)
Boring		Naranas

Råstoffgruppe	Råstofftype
Bygningstein	grønn kvartsitt

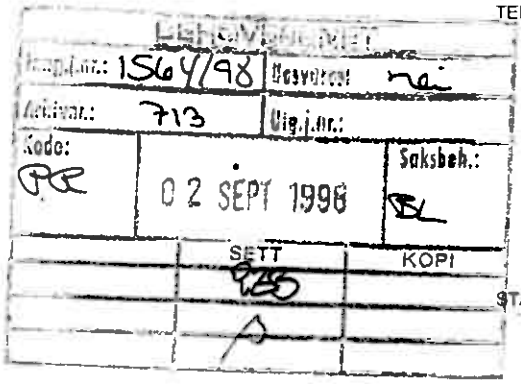
Sammendrag, innholdsfortegnelse eller innholdsbeskrivelse

A total of 12 holes were finished along 5 separate E-W sections, totalling 383,4m in the emerald-green gneisic rock at the Naranas naural stonequarry.

ASPRO PROSPEKTERING A/S
NORDRAAKS VEI 2 - POSTBOKS 83 - 1321 STABEKK

TELEFON 67 53 08 34
TELEFAX 67 53 98 57

Bergvesenet
Postboks 3021 – Lade
7002 Trondheim



ARKIV/REF. **TLS/ås**

STABEKK **01.09.1998**

Ad.: Støtte til prosjekt Naranas.

Vi er blitt informert om at vår revisor sender det bekreftede regnskapet direkte til Dem.
Vedlagt følger vår rapport nr. 2381 etter de utførte diamantboringene.

BV 4694

Med vennlig hilsen
p.p.Prospektering A/S

Thor L. Sverdrup
adm.direktør

VEDLEGG

ASPRO PROSPEKTERING A/S
Nordnaks vei 2, post-box 83 - 1321 Stabekk. Tlf.: 67 53 08 34 - Fax: 67 53 98 57

Rapport no.: 2381	*Date:* 17 August 1998	*Pages:* 9 *Enclosure:* 2	*Confidential:* ☒

Title:

CORE DRILLING AT NARANAS

Project:	*Ordered by:* FUXITE A/S
Author: Ingolf J. Rui	*Project leader: Ingolf J. Rui*
Land/county: NORWAY/FINNMARK	*District:* KAUTOKEINO
Map sheet 1:250 000: NORDREISA	*Map sheet 1:50 000:* 1833 II, 1933 II

Summary: THIS REPORT SUMS UP THE RESULTS FROM CORE DRILLING AT THE NARANAS NATURAL STONE QUARRY IN FINNMARK, NORTH NORWAY.

Key Words	Natural stone	
	Fuchite gneiss	
Distribution	Prospektering A/S	Fuxite A/S
	Duat S.A.	
	Bergvesenet	

CORE DRILLING AT NARANAS

Introduction

Early in the 1980'ies Prospektering A/S got interested in a beautiful, emerald-green gneiss rock, which occurs several places on the gently rolling plains of Finnmarksvidda in the north of Norway. The rock is coloured green by a chromium-bearing mica variety named *fuchsite*. In due course the interest was focused on the Naranas area situated some 20 km to the NE of the village of Kautokeino and a couple of km to the east of the Kautokeino river (Fig. 1).

Test blocks, which later were quarried and brought out of the area on two occasions, awaked good response in the market. A production company was established in 1998 and given the name Fuxite A/S. It is owned 50 – 50 % by Prospektering A/S and Luxembourg based Duat S.A. At the same time it was decided that rather comprehensive test production should be initiated the very same year, during late summer and fall.

Before start-up of test production, a core-drilling program was recommended and subsequently approved. Some 500 core-meters were considered appropriate, which were budgeted to about NOK 450 00. The expenses will be shared about equally between the company and by government funds (Fond for Prospektering).

Drilling 1998

The drilling in the Naranas field commenced 24th of June and was concluded 12th of July 1998. The drill contractor was Terje Holmen A/S, Kautokeino. A total of 12 holes were finished along 5 separate E – W sections, totalling 383,4 core meters. All holes plunge due east at 50, 60, or 70°. Ingolf J. Rui from Prospektering A/S conducted the drilling operations. The main goals of the program were:

1. Secure volumes of good, colourful stone sufficiently large for later permanent production.
2. Direct the subsequent test production into the better portions of the deposit.
3. Delineate the southern border of the fuchsite gneiss.
4. Generally disclose areas containing serious defects such as frequent fractures, rust staining, and open pores.
5. Get a better understanding of the main structures of the deposit.

We feel that the drilling proved very successful, fulfilling most of the goals set above.

The Deposit

The fuchsite gneiss is comparatively well exposed around the culmination of the eastern Naranas ridge and the steep eastern slope down to the 430-440 contours. The more gentle slopes down to the stretch of boggy ground to the west and north are almost completely covered by till below the 450-455 contours. No exposures are found in the southern slope of the hill. The southern border of the fuchsite gneiss is, thus, just roughly indicated on the basis of scattered exposures, drill holes and erratic boulders (Fig. 2).

Approaching this border from north, it becomes evident that the fuchsite gneiss turns lighter in colour. This colour change may be gradual, but probably progress more stepwise. What is certain is that the cores from drill hole 4 and 5 are powerful green in colour, whereas the core from drill hole 7 represent a grey or faint green quartzite with only traces of fuchsite.

A narrow zone of fuchsite gneiss of good colour does also occurs to the south of the main zone. It is not known if it represents a separate layer, or in some way is attached to the latter by folding.

The ordinary fuchsite gneiss is composed of alternating, closely spaced bright green and greyish white bands. The latter is essentially composed of quartz and feldspar. The rock is intensely folded; fold axes plunge uniformly some 12° in direction N203° E. Irregular out-sweats of quartz are common and may attain sizes up to a few decimetres in diameter. These have evidently been introduced during folding and metamorphoses. Small bodies of pink to red pegmatite may also occur.

Drilling revealed an another quality of fuchsite gneiss, which is composed of green and pinkish bands. Dark coloured biotite-rich bands may also be more pronounced than in the ordinary fuchsite quality. The green/pink fuchsite gneiss appears predominantly in the strongly folded core of the Naranas ridge and has never been recorded in natural exposures. This fuchsite variety crops out below till cover in the north-west corner of the drill area (Fig. 3 and 4).

The general tight to isoclinal fold style in the area indicate that the grey footwall metasediments in the east, wrap around and is ultimately positioned above the main fuchsite body in the southern sector of the ridge. This means that the fuchsite gneiss protrude beneath grey country rocks in a SSW direction, along axes of folding.

Defects in the stone

Fractures rust staining, and open pores are defects which sometimes may destroy the stone quality.

Fractures most frequently disclosed by the drilling are discrete structures, sometimes somewhat irregular and rarely more than from 1-10 millimetre wide. Observations on surface indicate that the fractures essentially belong to two steep sets, the one set orientated ca. NV, and the other one ca. VNV. More extensive zones of heavy jointing or brecciation were not recorded.

Rust staining is caused by weathering of iron sulphides, which may occur locally. We are dealing with this problem in Dh 4 in particular and to some extent in Dh 5 (Fig. 3).

Open pores occur in the light coloured quartz-feldspar bands where they may be locally present in abundance. They are rarely more than a few millimetres in diameter and appear to represent some kind of holes in the rock, which are not completely sealed by glassy quartz. Open pores were particularly common in Dh 4, and to some extent in Dh 5. This agrees with the experience from the quarry site next to Dh 4 (Fig. 2 and 3), where no blocks were recovered largely do to this particular problem.

Conclusions

Drilling has shown that:

1. Large volumes of fuchsite gneiss occur in the eastern Naranas ridge. The thickness of the zone is at least 40 – 50 meters and proven dimensions in the horizontal plane are in the order of magnitude 400 x 400 meters (Fig. 2).
2. Two qualities of the stone have been distinguished: a) the normal green and greyish white banded fuchsite gneiss, and b) a green and pink banded fuchsite gneiss variety. The latter occurs in the core of the ridge and is nowhere exposed (fig. 3).
3. Defects like rust staining and open pores in the stone, occur preferably along the southern margin of the deposit – i. e. near the border to the grey country rocks.
4. More extensive, heavy fracturing has not been observed in the cores.

Lysaker 17 August 1998.

Ingolf J. Rui.

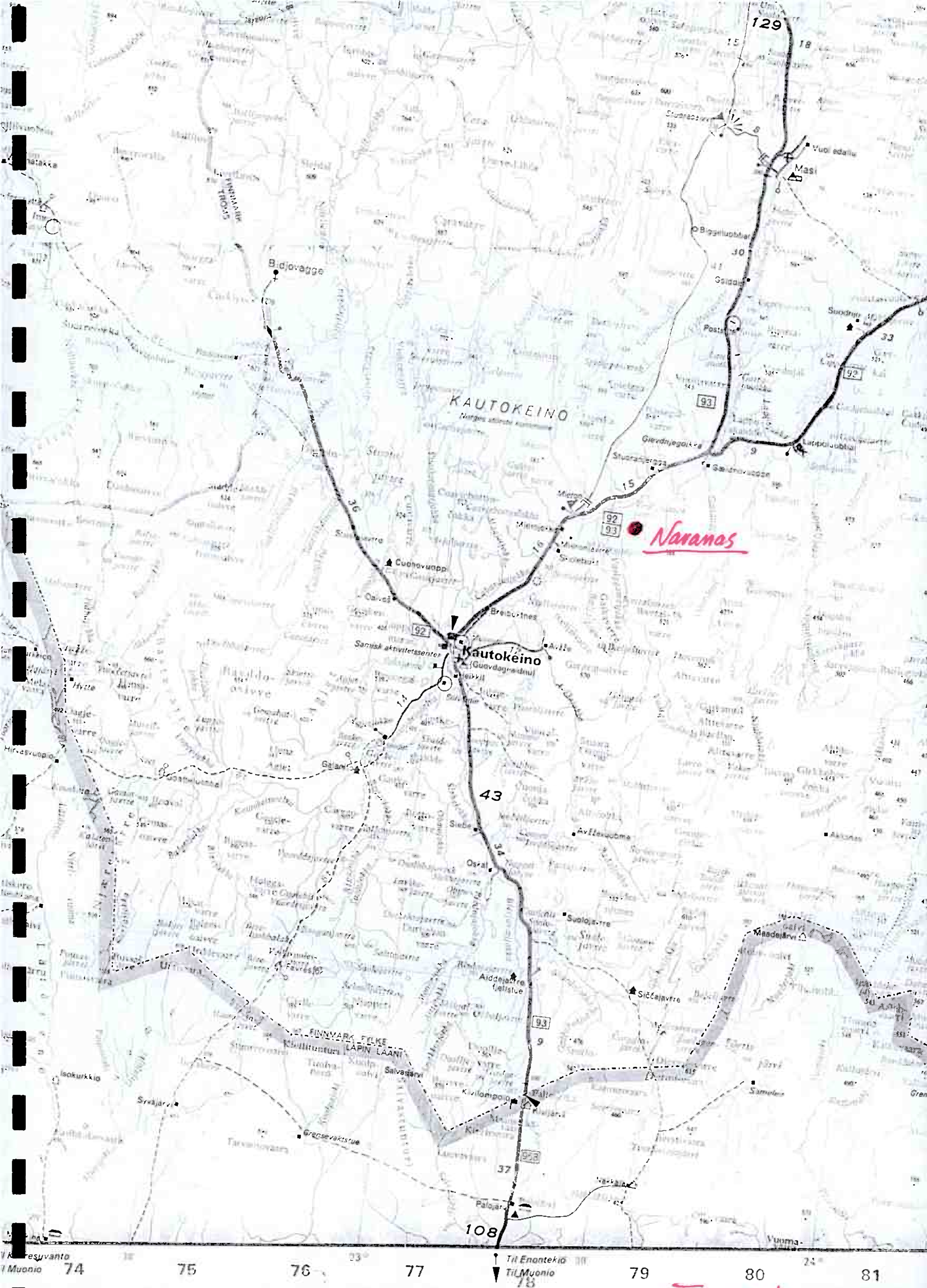

KAUTOKEINO
Norges største kommune
Kautokeino
(Guovdageaidnu)
Samisk aktivitetssenter
Naranas
Bidjovagge
Masi
Vuoi adalle
Biggeluobbal
Goiddi
Postsi
Suodnjo
Lappoluobbal
Gievdnjegoikka
Stuoranjarga
Mieron
Mieronjokka
Saeidnoluoppal
Skolebakt
Cuohcvuopp
Oaivos
Breibotnes
Aitte
Galanito
Siebe
Osral
Aiddejavre fjellstue
Siccajavre
Suolojavre
Avzzeluobma
Aksanas
Maadejärvi
Kivilompolo
Pälle
Alajärvi
Salvasjärvi
FINNMARK FYLKE
LAPIN LÄÄNI
Grensevaktstue
Isokurkkio
Syväjärvi
Palojärvi
Markkina
Samelan
Vuoma-
Hirvasvuopio
Hytte
Karesuvanto
Muonio
Til Enontekiö
Til Muonio
129
108
43
36
34
37
92
93
74
75
76
77
78
79
80
81

Figure 1

Fuxite A. S.

Kautokeino
Geologisk Kart
Målestokk 1:6000

Fuchsite gneiss

Amphibolite (metadiabase)

12° Fold axis

6 5 Drill section

Sites of former block excavation

Concession area

Lake/bog

470 Contour interval: 2 meters. Index contours: 10 meters Vertical datum: Sea level

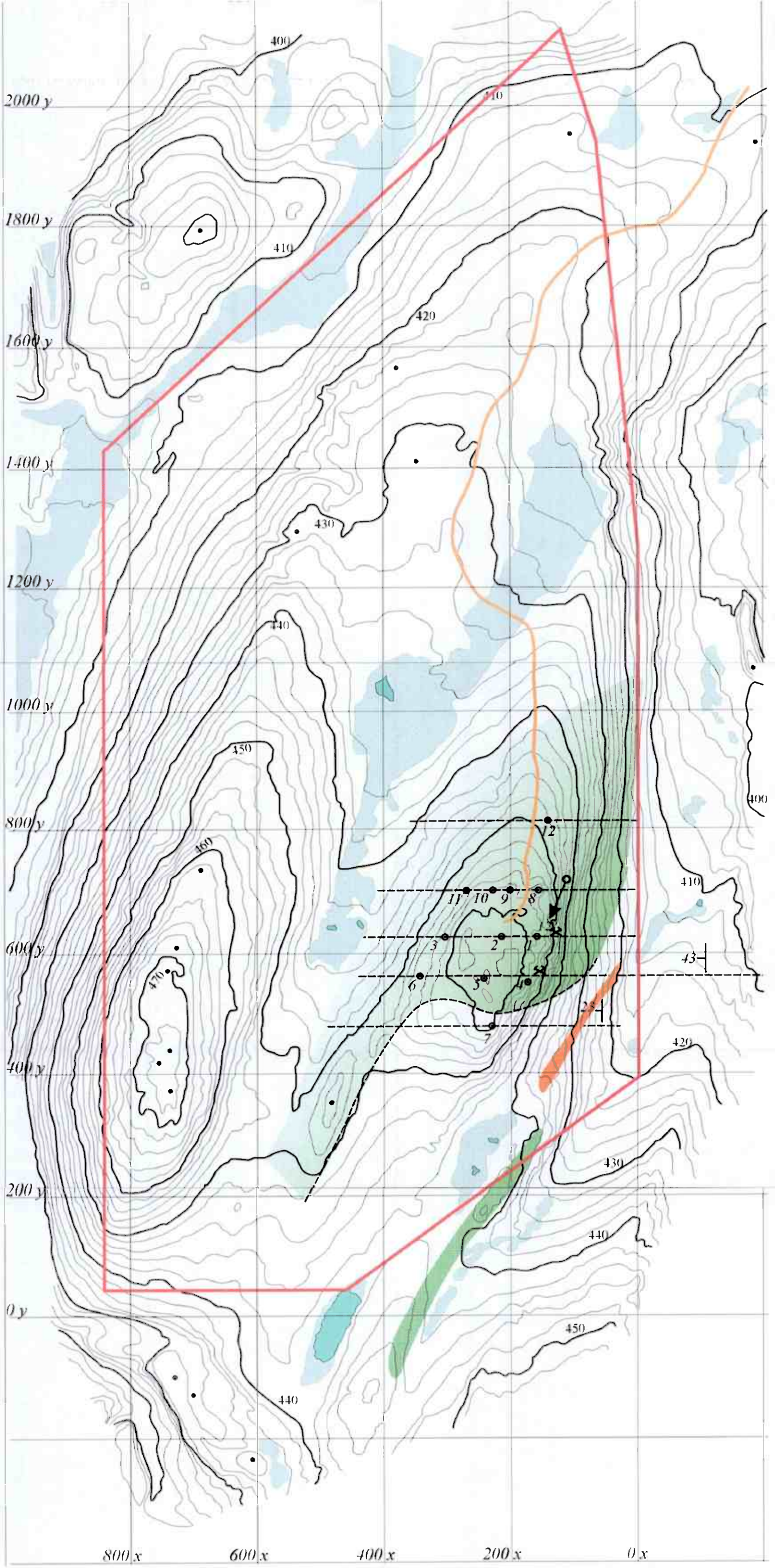
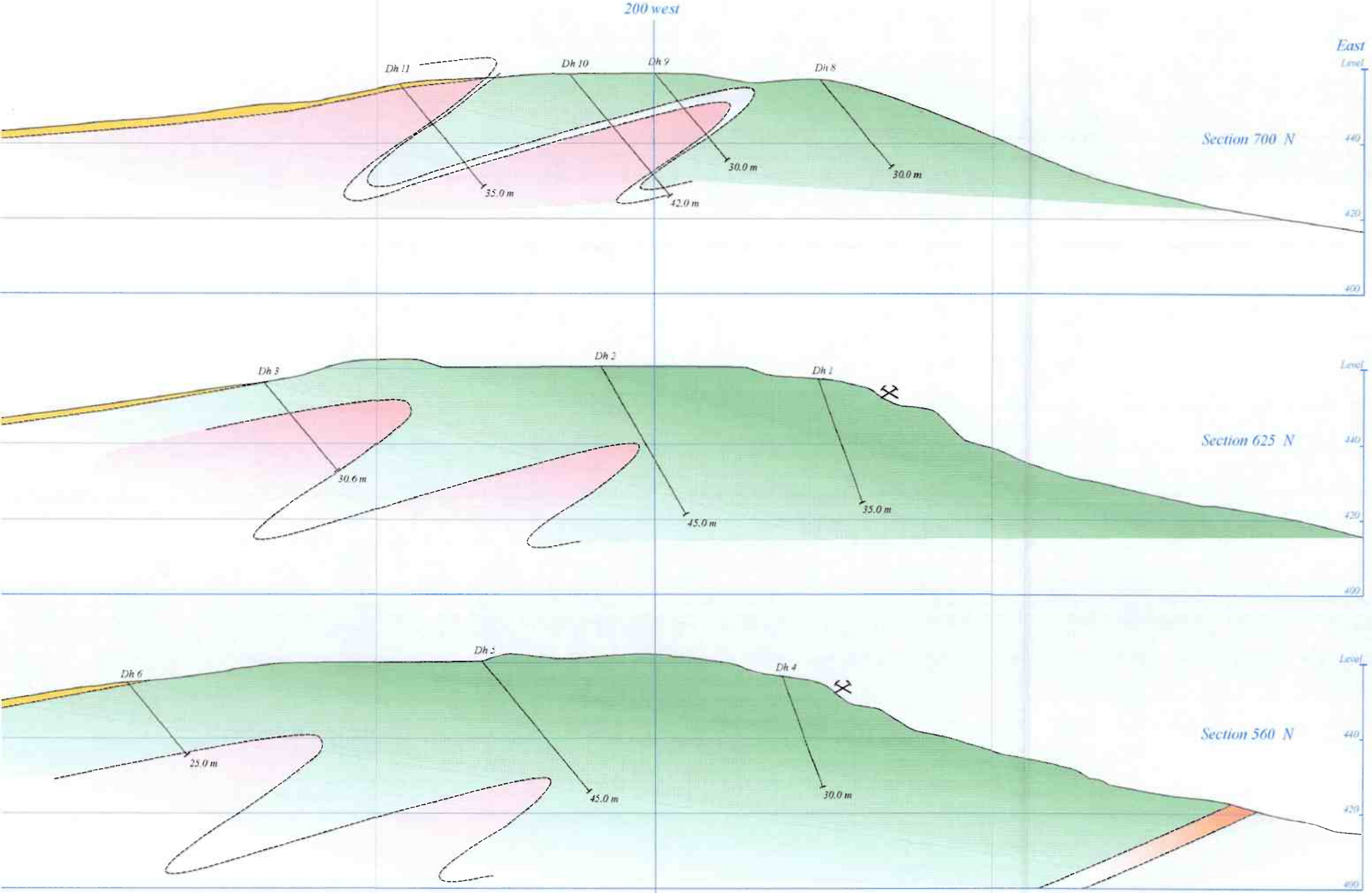


Fig. 2: Geological map of the Naranas area with locations of drill holes and constructed E-W sections shown in figures 3 and 4.

Prospektering A/S Ingolf J. Rui 1998

Fuxite A.S. Kutokeino

Finnmark, North Norway
Scale 1:1000



Legend

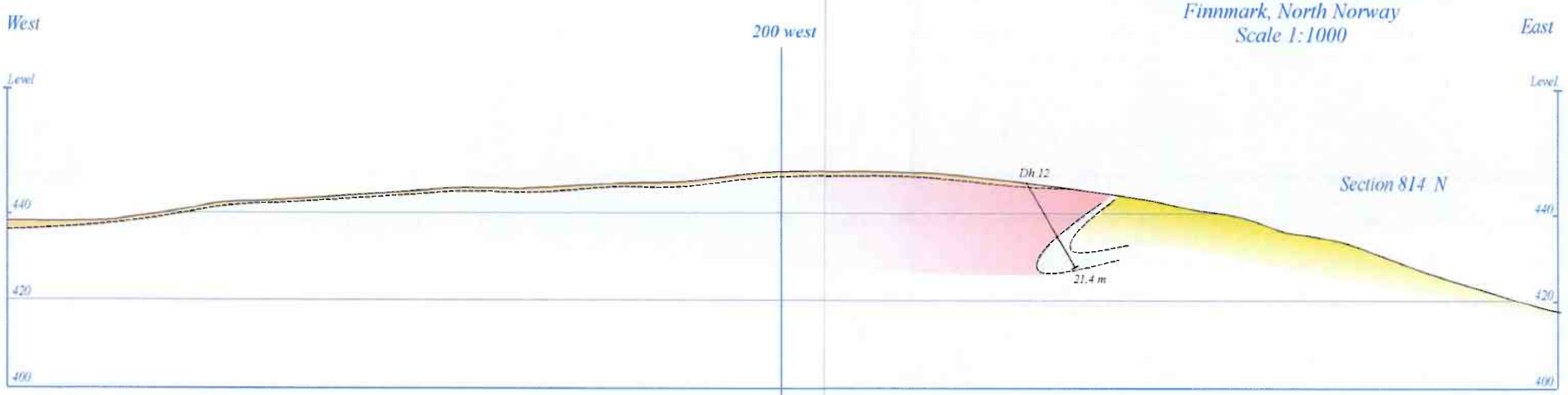
- Fuchsite gneiss; banded green/white.
- Fuchsite gneiss; banded green/pink.
- Amphibolite (metadiabase).
- Greyish gneiss/quartzite; some fuchsite.
- Till
- Dh 8 — Drill hole 1998 — 30.0 m
- Sites of former block excavation.

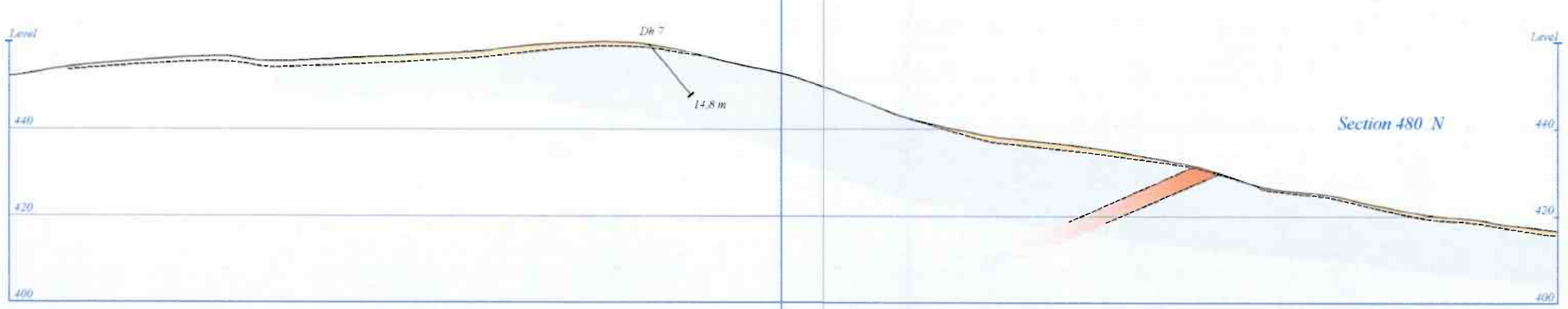
Fig. 3: Drill sections from the central, eastern Naranas ridge (see figure 2).

Prospektering A/S; Ingolf J. Rui, July 1998

Fuxite A.S. Kutokeino

Finnmark, North Norway
Scale 1:1000





Legend

- Fuchsite gneiss; banded green/white.
- Fuchsite gneiss; banded green/pink.
- Till
- Amphibolite (metadiabase).
- Greyish gneiss/quartzite; some fuchsite.
- Dh 7 — 14.8 m: Drill hole 1998

Fig. 4: Drill sections situated peripherally to the north and south of the most potent quarry area (see figure 2). One single hole in each section, few exposures, and complex folding make interpretations speculative.

Prospektering A/S; Ingolf J. Rui, August 1998.

ASPRO PROSPEKTERING AS

KJERNELOGG: **Sted: Kautokeino** **År: 1998**

Borhull nr.:	1-98	Lokalitet:	Naranas
Koordinater:	160 x, 625 y	Høyde:	457 m.o.h.
Retning:	N 90° Ø	Helning:	-70° Ø
Lengde:	35,0 m	Logget av:	Ingolf J. Rui Dato: 5/8-98

Bormeter	Bergartsbeskrivelse	Skifrighet	Prøve
0			
1.4	Jord		
35,0	Fuchsitt gneis, normal type. Noe lys fra ca. 1.4 – 7,2 m, mørkere grønn fra 7,2 – 17,7 m, middels grønn fra 17,7 – 28,6 m, lysere grønn med enkelte grå partier fra 28,6 – 35,0 m.		

ASPRO PROSPEKTERING AS

KJERNELOGG: **Sted: Kautokeino** **År: 1998**

Borhull nr.:	2-98	Lokalitet:	Naranas
Koordinater:	214 x, 625 y	Høyde:	458 m.o.h.
Retning:	N 90° Ø	Helning:	-60° Ø
Lengde:	45,0 m	Logget av:	Ingolf J. Rui Dato: 5/8-98

Bormeter	Bergartsbeskrivelse	Skifrighet	Prøve
0			
0,8	Jord		
45,0	Fuchsitt gneis, normal type. Svakt rustfargede partier i intervallet 21,7 – 29,8 m.		

ASPRO PROSPEKTERING AS

KJERNELOGG:	Sted: Kautokeino	År: 1998

Borhull nr.:	3-98	Lokalitet:	Naranas
Koordinater:	305 x, 625 y	Høyde:	457 m.o.h.
Retning:	N 90° Ø	Helning:	-50° Ø
Lengde:	30,6 m	Logget av:	Ingolf J. Rui Dato: 5/8-98

Bormeter	Bergartsbeskrivelse	Skifrighet	Prøve
0			
2,0	Jord		
3,2	Fuchsitt gneis, anomal type med mest rødlige i stedet for hvite bånd.		
3,6	Pegmatitt, rødlig.		
9,5	Fuchsitt gneis, normal.		
18,5	Fuchsitt gneis, anomal type med rødlige bånd.		
20,1	Fuchsitt gneis. Anomal type; svakere grønn med mer rødlige og sorte, biotitt-rike bånd.		
20,4	Kvarts.		
21,1	Mørk, biotitt-rik sone.		
23,5	Gneis; rødlig og mørk stripet. Mørke striper med mye biotitt og noe fuchsitt. Rødlige slirer av granittisk materiale. Stygg med åpne sprekker siste 30 cm.		
25,5	Fuchsitt gneis; relativt mørk, biotitt-rik med rødlige striper. Stygg.		
27,5	Fuchsitt-biotitt gneis; mørk, homogen.		
29,5	Fuchsitt gneis; mer normalt båndet, men med rødlige bånd.		
30,4	Fuchsitt-biotitt gneis; mørk type. Homogen.		
30,6	Fuchsitt gneis; anomal med rødlige bånd.		

ASPRO PROSPEKTERING AS

KJERNELOGG:	Sted: Kautokeino	År: 1998

Borhull nr.:	4-98	Lokalitet:	Naranas	
Koordinater:	175 x, 555 y	Høyde:	457 m.o.h.	
Retning:	N 90° Ø	Helning:	-70° Ø	
Lengde:	30,0 m	Logget av:	Ingolf J. Rui	Dato: 5/8-98

Bormeter	Bergartsbeskrivelse	Skifrighet	Prøve
0			
1,6	Jord		
30,0	Fuchsitt gneis; normal farge og struktur, men med nokså mye rustskjolder og åpne hulrom. Dette partiet er neppe drivverdig.		

ASPRO PROSPEKTERING AS

KJERNELOGG:	Sted: Kautokeino		År: 1998
Borhull nr.:	5-98	Lokalitet:	Naranas
Koordinater:	244 x, 560 y	Høyde:	462 m.o.h.
Retning:	N 90° Ø	Helning:	-50° Ø
Lengde:	45,0 m	Logget av:	Ingolf J. Rui Dato: 5/8-98

Bormeter	Bergartsbeskrivelse	Skifrighet	Prøve
0			
0,5	Jord		
1,4	Pegmatitt.		
45,0	Fuchsitt gneis; normal struktur og farge, men en del rustfargede partier og åpne hulrom. Rust særlig i de lyse, kvarts-rike båndene skyldes jern-sulfider.		

ASPRO PROSPEKTERING AS

KJERNELOGG:	Sted: Kautokeino	År: 1998

Borhull nr.:	6-98	Lokalitet:	Naranas	
Koordinater:	344 x, 560y	Høyde:	455 m.o.h.	
Retning:	N 90° Ø	Helning:	-50° Ø	
Lengde:	25,0 m	Logget av:	Ingolf J. Rui	Dato: 5/8-98

Bormeter	Bergartsbeskrivelse	Skifrighet	Prøve
0			
1,5	Jord.		
25,0	Fuchsitt gneis; pen ordinær type med grønne og hvite bånd.		

ASPRO PROSPEKTERING AS

KJERNELOGG:	Sted: Kautokeino	År: 1998

Borhull nr.:	7-98	Lokalitet:	Naranas	
Koordinater:	230 x, 480 y	Høyde:	460 m.o.h.	
Retning:	N 90° Ø	Helning:	-50° Ø	
Lengde:	14,8 m	Logget av:	Ingolf J. Rui	Dato: 5/8-98

Bormeter	Bergartsbeskrivelse	Skifrighet	Prøve
0			
1,6	Jord.		
14,8	Kvartsitt; grå med spor av fuchsitt. Pegmatitt fra 7,35 – 7,60 m.		

ASPRO PROSPEKTERING AS

KJERNELOGG: **Sted: Kautokeino** **År: 1998**

Borhull nr.:	8-98	Lokalitet:	Naranas
Koordinater:	155 x, 700 y	Høyde:	457 m.o.h.
Retning:	N 90° Ø	Helning:	-50° Ø
Lengde:	30,0 m	Logget av:	Ingolf J. Rui Dato: 5/8-98

Bormeter	Bergartsbeskrivelse	Skifrighet	Prøve
0			
1,2	Jord.		
30,0	Fuchsitt gneis; pen og normal grønn/hvit stripet type.		

ASPRO PROSPEKTERING AS

KJERNELOGG:	Sted: Kautokeino	År: 1998

Borhull nr.:	9-98	Lokalitet:	Naranas	
Koordinater:	700 x, 200 y	Høyde:	458 m.o.h.	
Retning:	N 90° Ø	Helning:	-50° Ø	
Lengde:	30,0 m	Logget av:	Ingolf J. Rui	Dato: 5/8-98

Bormeter	Bergartsbeskrivelse	Skifrighet	Prøve
0			
0,6	Jord		
9,7	Fuchsitt gneis; normal grønn/hvit stripet type.		
11,9	Gneis, grå med spor av fuchsitt og enkelte rødlige striper.		
23,7	Fuchsitt gneis; svakere grønn og med rødlige striper.		
30,0	Fuchsitt gneis; normal grønn/hvit stripet type. 10,24 – 10,41 m råtasone med mye biotitt.		

ASPRO PROSPEKTERING AS

KJERNELOGG: **Sted: Kautokeino** **År: 1998**

Borhull nr.:	10-98	Lokalitet:	Naranas
Koordinater:	215 x, 700 y	Høyde:	458 m.o.h.
Retning:	N 90° Ø	Helning:	-50° Ø
Lengde:	42,0 m	Logget av:	Ingolf J. Rui Dato: 5/8-98

Bormeter	Bergartsbeskrivelse	Skifrighet	Prøve
0			
1,3	Jord		
15,6	Fuchsitt gneis; normal, pen grønn/hvit stripet type.		
19,6	Gneis; grå med spor av fuchsitt.		
20,3	Pegmatitt; rødlig med en bit fuchsitt gneis fra 19,14 – 19,45 m.		
34,0	Fuchsitt gneis; normal lysere variant med mer av de hvite stripene.		
41,5	Fuchsitt gneis; normal grønn/hvit stripet type.		
42,0	Kvarts.		

ASPRO PROSPEKTERING AS

KJERNELOGG:	Sted: Kautokeino	År: 1998

Borhull nr.:	11-98	Lokalitet:	Naranas	
Koordinater:	270 x, 700 y	Høyde:	455 m.o.h.	
Retning:	N 90° Ø	Helning:	-50° Ø	
Lengde:	35,0 m	Logget av:	Ingolf J. Rui	Dato: 5/8-98

Bormeter	Bergartsbeskrivelse	Skifrighet	Prøve
0			
2,8	Jord.		
7,0	Fuchsitt gneis; grønn/rødlig stripet type. Nokså stygt oppsprukken og med åpne hull siste meter.		
14,4	Do., men mye helere.		
14,9	Pegmatitt; rødlig.		
27,4	Fuchsitt gneis; Sterkt grønn, meget hel og pen. Enkelte rødlige pegmatitt striper.		
29,5	Gneis; mest grå. med biotitt-rikt parti fra 28,46 – 28,75 m.		
32,2	Fuchsitt gneis; sterkt stripet med rosa og mørke biotitt bånd. Relativt lite fuchsitt.		
35,0	Fuchsitt gneis; mer normal båndet type.		

ASPRO PROSPEKTERING AS

KJERNELOGG: **Sted: Kautokeino** **År: 1998**

Borhull nr.:	12-98	Lokalitet:	Naranas
Koordinater:	142 x, 814 y	Høyde:	448 m.o.h.
Retning:	N 90° Ø	Helning:	-60° Ø
Lengde:	21,4 m	Logget av:	Ingolf J. Rui Dato: 5/8-98

Bormeter	Bergartsbeskrivelse	Skifrighet	Prøve
0			
3,0	Jord		
16,2	Fuchsitt gneis; pen grønn med noe rødlige striper.		
16,5	Kvarts med biotitt-slirer.		
18,3	Biotitt-rik, mørk sone.		
21,4	Kvartsitt; grå med biotitt-slirer.		