Exploration in Finnmark and Troms 2012

Scandinavian Resources AB

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Contents

1 Introduction

During the field season 2012 Scandinavian Resources has carried out follow-up work within most of the license areas in Finnmark and Troms. The exploration work has mainly consisted of geological detail- and reconnaissance mapping, and also soil- and rock sampling, and magnetometer ground surveys in selected areas. Soil sampling programmes and ground geophysical surveys were planned for this summer field season in Finnmark but have been postponed until 2013 due to governmental delay in permitting.
Our license areas in Kvæfjord and within the Alta-Kvænangen window have been covered by airborne geophysics (mag, rad, EM) in NGUs MINN-programme during 2012 with subsequent public release of the data.
Rock and soil samples are analysed at ALS Laboratories and assay procedures are described in the 2011 reports.

2 Ringvassøy gold

This year Holmvasshøgda is mapped in scale 1 : 2000 (enclosure 1) and the detailed mapped area at Sørdalshøgda is extended to cover Sørdalshøgda South (enclosure 2). Reconnaissance mapping is also extended further south, to Soltindaksla. Holmvasshøgda and Sørdalshøgda are covered by ground magnetic surveys this year (Bergshjorth, in prep).

2.1 Holmvasshøgda

This year`s detail mapping brought no explanation concerning the source for the alluvial gold. On the contrary, both the Dåfjord Fault and previously suggested shear zones (Bliss 2000) are now viewed as less probable gold-bearing structures.
The main lineament through the area, the Dåfjord Fault (fig. 1), has previously been postulated by several workers (see Wilberg 2011b) as a possible host for the alluvial gold. However, the scarce exposures along this lineament show only late, brittle deformation lacking any sign of ore bearing processes. In places schistosity, slickensides with hematite coating, and weak brecciation are developed along the structure.
The two shear zones suggested by Bliss (2000) are absent. The one at UTM 435205 7765038 is a 4 m thick banded iron formation, composed of sugary quartz, magnetite, cummingtonite, garnet, pyrrhotite and traces of chalcopyrite and arsenopyrite (resembling the mineralisation at Sørdalshøgda South). Parts of it are decomposed to quartz sand, in which a small pit is excavated. Rock samples RI12001-4 are all collected from this iron formation, and they are low in gold (tab. 1).

Bedrock within the Holmvasshøgda area is dominated by massive greenstone with diabase dykes and minor sills/lenses, belonging to the Hessfjord Formation. Occasional quartz veins without sulphides occur in the greenstone. The Sætervik Formation metasediments (fine-grained, sericitic quartzo-feldspatic schist and minor argillite) are overlying the greenstones in the northern and eastern parts of the mapped area.
Within Sætervik Formation mixed felsic sericite schist and argillite, at the bottom of low escarpment (UTM 435670 7765218) occur an at least 15 cm thick semimassive pyrrhotite-

chalcopyrite mineralisation with quartz matrix (weathering sand below), from which sample RI12007 is collected. The sulphide layer and schistosity dips gently westwards and are probably thrust related.
Flat-lying (c. 20° west) shear zones, related to thrusting are also observed elsewhere within the northern part of the mapped area. Schistosity is well developed in these shear zones, and they preserve fine-grained mylonitic textures (e.g. at UTM 435517 7765260) as well as being carbonate-rich. As they occupy the lower parts of few-meters high escarpments, their base is not exposed and observations is not possible without excavation.

The earlier proposed deep till sampling program is still recommended for Holmvasshøgda, due to the previously reported strong geochemical gold anomaly, and also encouraged by this year`s quarternary studies at Ringvassøy by NGU which conclude short transport distance and local weathering material as the main component in the cover (Fredin, pers. com.).

SAMPLE	UTMeast	UTMnorth	UTMzone	Au	As	Cu	Zn	Fe	S
				ppm	ppm	ppm	ppm	%	%
RI12001	435205	7765038	34	0,05	239	190	66	24,5	0,98
RI12002	435205	7765038	34	0,07	75	197	10	16,7	1,57
RI12003	435149	7765040	34	0,02	83	30	109	29	0,04
RI12004	435111	7764988	34	0,09	446	102	128	18,3	0,2
RI12005	435842	7764924	34	0,05	39	143	188	9,01	1,06
RI12007	435670	7765218	34	0,04	44	1285	15	19,65	>10.0

Tab. 1. Assay results, rock samples Holmvasshøgda.

Fig. 1. Aerial photo of Holmvasshøgda with the Dåfjord Fault.

2.2 Sørdalshøgda

Sørdalshøgda was detail mapped in 2011 and described in Wilberg (2011b). A few additional observations will be mentioned here. Detailed mapping was extended southwards to cover the Sørdalshøgda South mineralisation in 2012 (enclosure 2). The Sørdalshøgda South map is based on Cuttle (1984) and own observations. The auriferous mineralisation centrally in the map is described by Cuttle (1984) and Wilberg (2011b).

Whereas the Sørdalshøgda ridge has a significant content of felsic (`tonalite`) intrusives, bedrock within the Sørdalshøgda South map is totally dominated by mafic volcanics. It is mainly massive greenstone (metabasalt) with minor schistose intercalations.
At Sørdalshøgda and Sørdalshøgda South most or all(?) of the schistose sections represent high-strain zones in conjunction with thrust sheets. These schistose shear zones are retrograded and carbonate-chlorite altered, with carbonate in more or less concordant bands, and often ankerite-filled crenulation cleavage (e.g. at the Main Vein North and -South). The massive greenstone can be seen to grade into the schistose variety towards the shear zone (fig. 2, 3 and 4), and often lenses of tonalite or greenstone have irregular schistose zones wrapped around the non-schistose rock (fig. 5).
These schist zones are believed to be tectonic and not lithologic in origin. They have often been wrongly identified in the past as banded tuffitic sediments and called greenschist. So is the host rock for the Sørdalshøgda South mineralisation (a schist composed of chlorite, mica, amphibole, carbonate and quartz), by Cuttle (1984) interpreted as a sediment. A rather significant area here is underlain by gently dipping shists and might represent the sheared and altered variety of the surrounding massive greenstone. According to Cuttle (1984) the whole area underlain by schist is anomalous in gold (soil samples) suggesting that the altered and sheared schist is enhanced in gold, and further enriched in gold and sulphides within a more restricted zone (i.e. the Sørdalshøgda South mineralisation).
Also 200 m south of the Sørdalshøgda South mineralisation is a similar zone with schistose shear zone fabric within the greenstone. It carries pyrite-chalcopyrite dissemination but is low in gold (sample RI12009).

Further work will be based on interpretation of the mag survey (Bergshjorth, in prep.).

SAMPLE	UTMeast	UTMnorth	UTMzone	Au	As	Cu	Zn	Fe	S
				ppm	ppm	ppm	ppm	%	%
RI12006	437489	7760354	34	0,03	15	1695	38	2,54	0,29
RI12008	437993	7761337	34	0,07	23	413	44	9,52	0,22
RI12009	437485	7759811	34	0,02	13	719	231	16,4	0,65
RI12011	437670	7760562	34	0,02	104	111	62	8,01	1,34
RI12012	437638	7760570	34	1,74	1110	4970	28	5,49	5,94

Tab. 2. Assay results, rock samples Sørdalshøgda.

Fig. 2. Schistose carbonate-chlorite altered shear zone in metabasalt, viewed WSW. Scistosity 220°/18°. UTM 437449 7760324.

Fig. 3. Sheared contact between tonalite sill (below hammer) and underlying porphyritic greenstone. The greenstone is magnetic and carries layers and lenses of epidote and carbonate respectively, and also cm-sized lenses of a fine-grained felsic rock. UTM 437710 7760557.

Fig. 4. High-strain zone in mafic schist with tonalite lens, viewed north. UTM 437489 7760354. Sample RI12006 of tonalite with chalcopyrite.

Fig.5. Tonalite lens (at hammer head) in schistose, carbonate-chlorite altered shear zone. Looking north. UTM 437336 7760320.

2.3 Soltindaksla

Folldal Verk (Cuttle 1984) reports up to 3.7 g/t Au from arsenopyrite mineralised quartz veins at Soltindaksla, c. 1 km south of Sørdalshøgda South. According to follow-up Tollefsrud (1985) states that the quartz-feldspar vein is < 1 m thick and 50 m long, and rooted in a quartz diorite; the vein is arsenopyrite mineralised and one sampled assayed 1.2 g/t Au. Folldal Verk carried out an IP survey and rock sampling (16 samples) in a grid located SW of the above mentioned quartz vein, with negative result (Tollefsrud 1985).

This year`s investigation showed the Au-As mineralisation to be more extensive than previously assumed. Subcrops and outcrops of arsenopyrite mineralised sugar quartz were found over a north-south length of c. 300 m (fig. 6). Bedrock is ENE-WSW striking greenstone with diabase sills and small tonalite sills. A cross-cutting, c. north-south running felsic (`tonalite`) dyke occur immediately east of the mineralised subcrops. The mineralised subcrops and floats are bound to vegetated N-S lineaments, and also to a NNW-SSE lineament. One mineralised subcrop assayed 1.12 g/t Au (sample RI12010), while two assays (RI12013+14) are still pending. The area should be mapped in detail next field season.

Some observations:

436969 7758918: Subcrop and floats of rusty sugar quartz with bands (up to 1 cm thick) of massive and disseminated arsenopyrite (RI12010). The mineralised sugar quartz is probably associated to a few outcropping tonalite lenses.

Also subcropping mineralised sugar quartz at 436965 7758925 (poisoning extends further NW) and 436964 7758905.

Subcrops and floats of mineralised sugar quartz are found along a NNW-SSE directed vegetated lineament from sample point RI12010 to 437041 7758884.

436939 7758679: Subcrop and floats of arsenopyrite mineralised sugar quartz (RI12013) and also floats of greenstone with arsenopyrite dissemination (RI12014).

Additional subcrops/floats of mineralised sugar quartz: 436931 7758659, 436930 7758640, 436947 7758708, 436959 7758730 and 436957 7758739.

436906 7758603: Exposed shear zone consisting of retrograded, asymmetrically folded chlorite-aktinolite schist.

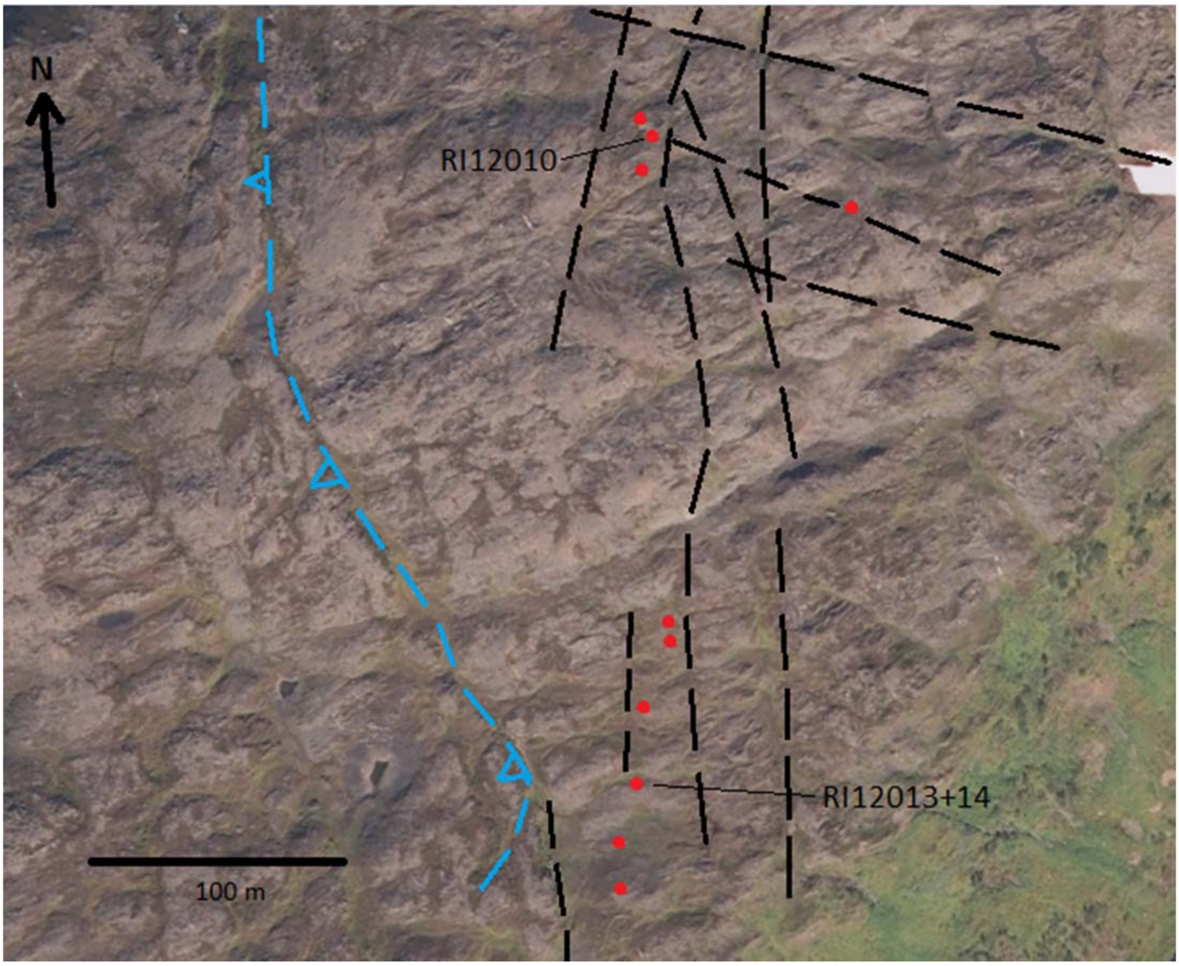

Fig. 6. Soltindaksla As-Au-Zn mineralisation. Red dots are subcrops and outcrops of mineralised sugar quartz. Black hatched lines are lineaments. Blue hatched line is thrust zone.

3 Kvæfjord polymetallic mineralisations

The West Troms Basement Complex is limited to the southwest by the 1.87-1.77 Ga gabbro-anorthosite-mangerite-charnockite-granite suite and Archaean gneisses of Lofoten and Vesterålen. Kvæfjord, in the Vesterålen region, is located on the island Hinnøya in Troms county. Archaean tonalitic gneiss and small greenstone belts, the latter being the target for this work, comprise most of the bedrock on Hinnøya. They are transected by Early Proterozoic plutonic rocks (Nordgulen & Andresen 2008). The basal thrust of the Caledonian nappes occurs due east of the license areas. In fact, the Straumsfjellet and Salen permits are underlain by Precambrian rocks interpreted by Gustavson (1974) to belong to the allochtonous Uppermost tectonic unit, the Straumsbotn Nappe, which is transported a short distance (fig. 7); whereas the Kvæfjord permit to the north is underlain by undisputable autochtonous to parautochtonous pre-Caledonian crystalline basement.

Studies by Bartley (1981a, 1984) represent significant revisions of the map relations of east Hinnøy and demonstrated the lithostratigraphic complexity of basement rocks at east Hinnøy to be markedly greater than previously recognised. All metasedimentary rocks and most amphibolite units had previously been assumed to be for the most part allochtonous along Caledonian thrusts. According to Bartley (1981a) many of these rocks are however intruded by Precambrian granitoid bodies and hence are themselves part of the pre-Caledonian basement.
Detailed mapping in the Middagstind area (Straumsfjellet permit) revealed that amphibolitic rocks and associated lenses of marble and quartzite there are part of the contact aureole of the 1726 Ma Middagstind Syenite pluton (Bartley 1981a).

Bartley`s work is challenged by Björklund (1987) who postulates the basal Caledonian thrust to occur considerably below the thrust Bartley identified as such, and his studies support large-scale involvement in thin-skinned tectonics of the uppermost basement crust and its sedimentary cover.

Copper mineralisations were discovered at Straumsfjellet and Berg (Kvæfjord) during the 1880th and small scale trial mining took place periodically in 1895-1917. Between 1964 and 1980 both A/S Sydvaranger and NGU carried out exploration. This work did not reveal significant tonnages but assays in the NGU Ore Database show high levels of Au, Ag, U, PGE, V and REE (La) in the copper ores from Straumsfjellet and Berg. The polymetallic character of the known mineralisations and a previously unexplained conductor at Berg was the motivation for this survey which included geological mapping in the Straumsfjellet and Kvæfjord permits, and also soil sampling in the latter.
In 2012 NGU has covered the entire Kvæfjord area by helicopter geophysics (mag, rad, EM) and the data is released to the public by October 2012.

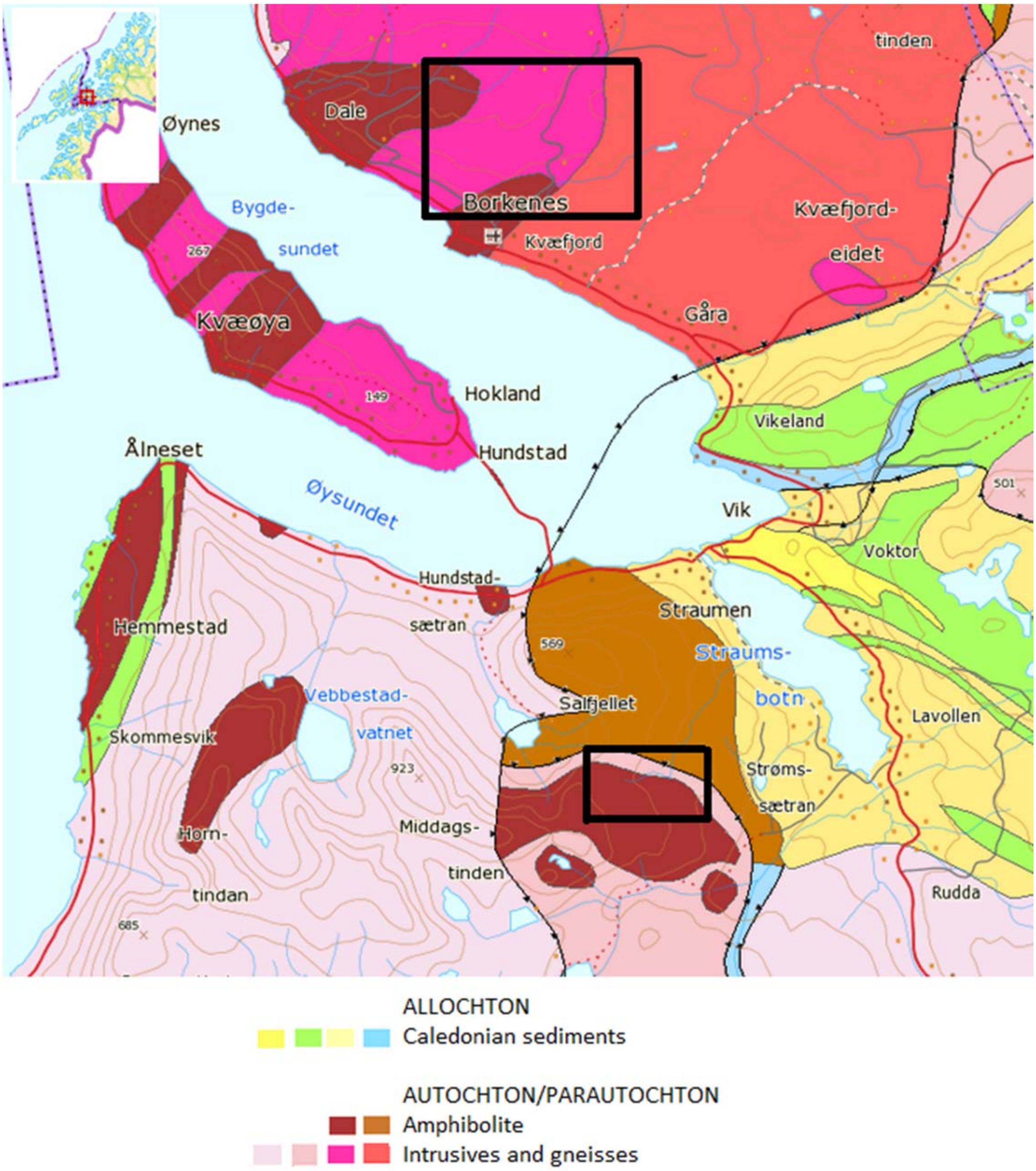

Fig. 7. Geological map of Kvæfjord (Gustavson 1974). Southern square: area of geological map Straumsfjellet, fig. 9. Northern square: area of soil survey Kvæfjord, fig. 11 and 12.

3.1 Straumsfjellet

The area of interest is located above the tree line at altitude 450-600 m and is accessible by a 3 km long gravel road and walking path from Straumsbotn.
Trial mining was carried out at Straumsfjellet by A/S Skandia Kobberverk in 1906-09. The area was geologically mapped by Flood (1961). A/S Sydvaranger/NGU conducted ground

geophysics (mag, EM, SP) in 1964 (Singsaas 1965). NGU carried out a VLF survey and geological mapping in 1977 (Often 1979) and airborne geophysics in 2012.

The mineralisations are tested with approximately 30 diggings and trenches which are GPS located and shown in fig. 9 together with geology from Often (1979). 8 rock samples from mineralisation were collected and assayed (tab. 3).

Several sulphide-oxide mineralised skarn horizons are hosted in a c. 600 m thick sequence of amphibolite and calcareous sediments over a strike length of 1 km (fig. 9).
Between the two levels of medium-grained, foliated amphibolite occurs a c. 250 m thick unit of calcareous metasediments, generally composed of a lower level of partly conglomeratic limestone and an upper level of fine-grained, more or less conglomeratic quartz-feldspar rock. The skarn altered horizons/lenses are in the order of a few meters thick, and up to 10-15 m. Skarn mineralogy are epidote, diopside, garnet and wollastonite. A 60-70 m wide zone of granitic gneiss occurs between the metasediments and the upper amphibolite. Few-meters wide granite dykes cuts through all the other lithologies.

Lens-shaped skarn bodies are found along certain stratigraphic levels in both limestone and amphibolite. The ore mineralogy is dependent of host rock. The amphibolite hosted skarn lenses carry chalcopyrite, pyrrhotite and magnetite as major ore minerals, and locally subordinate bornite. Within widths up to 1-2 m the ore minerals occur as dissemination, clusters and veining.
Skarn mineralisation in the calcareous metasediments are characterised by chalcocite, bornite, chalcopyrite, magnetite and accessoric covelin, digenite and native gold and silver. This type occurs more or less continuous over significant lengths along two levels. Low-grade mineralisation can reach 2-3 m in thickness, and significant grades (4-6 % Cu, 0.5-1.8 g/t Au and 60-190 g/t Ag) are observed in thickness up to 0.7 m. The limestone hosted mineralisation through sample locations ST12007 and 08 is accompanied by only very weak skarnification. The sulphide minerals typically occur as dissemination, and in places (also in the amphibolite hosted type) bound to veins of hydrothermal quartz.

The geophysical ground surveys, Turam in 1964 (Singsaas 1965) and VLF in 1977 (Often 1979), confirms the mapping, that the mineralisations are limited and of low conductivity, due both to the disseminated character and incontinuous extent.

Fig. 8. Straumsfjellet and Salen permits.

Even if the Middagstind Syenite pluton (if Bartley`s interpretation is wright) and associated granite dykes might be crucial as heat source for the skarn mineralisations, Bartley (1984) states that the outcrop of the contact aureole rocks reflects a nearly horizontal contact between the syenite and its wall rocks, which implies that the volume of potentially mineralised contact rocks are limited. In addition, when field observations and ground geophysics indicate that the mineralisations are thin and lens-shaped, the potential for significant volumes cannot be seen at Straumsfjellet. Hence, no follow-up work is proposed at Straumsfjellet.

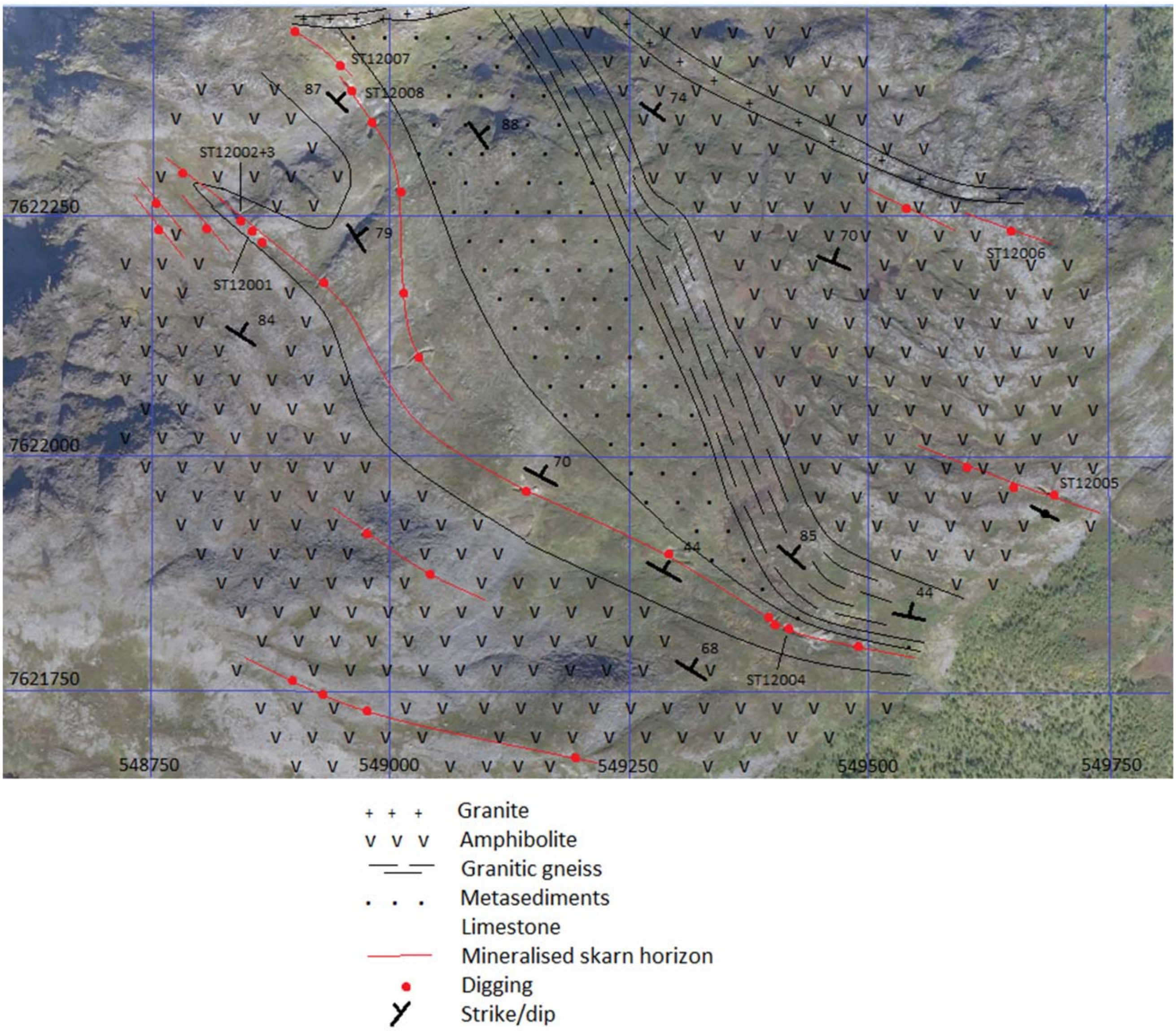

Fig. 9. Geological map Straumsfjellet. Based on own mapping and Often (1979). For location see fig. 7.

SAMPLE	UTMeast	UTMnorth	UTMzone	Au	Ag	Cu	Zn	Pb	Fe	S
				ppm	ppm	%	%	%	%	%
ST12001	548849	7622231	33	0,35	16,2	1,02	141	31	10,05	0,4
ST12002	548840	7622243	33	0,66	60,2	5,02	121	54	9,89	2,13
ST12003	548840	7622243	33	0,55	190	14,2	162	78	9,06	5,55
ST12004	549408	7621820	33	0,53	185	6,42	158	53	6,14	1,75
ST12005	549689	7621959	33	0,39	19,2	2,78	436	23	18,5	4,58
ST12006	549647	7622235	33	1,85	46,6	2,71	115	44	12	0,94
ST12007	548944	7622414	33	1,78	97	4,83	78	2120	1,61	0,9
ST12008	548962	7622378	33	1,03	103	5,72	140	193	1,65	1,56

Tab. 3. Assay results rock samples Straumsfjellet.

3.2 Salen

3 km north of Straumsfjellet, at Salen and Hoklandsætran, similar skarn mineralisations occur. They are not included in this investigation but they are described in the Ore database, NGU. It is copper mineralised skarn, apparently at two separate levels, with anomalous Au and PGE, where pyrite and chalcopyrite are bound to a network of calcite veins within few-meter thick skarn horizons.

3.3 Kvæfjord (Berg mine)

Fig. 10. Kvæfjord permit.

The aim for this work was to investigate the surroundings of the abandoned Berg copper mine (fig. 11). Historic exploration has revealed 1) significant contents of additional elements, such as Ag, U, V and Ba (Often 1982), 2) a more than 600m long unexplained, weak VLF anomaly extending ENE from the mine and out of the survey area (Singsaas 1977 and 1980), and 3) further ENE, 2km from the mine and presumably along strike extension of the VLF conductor, is a small digging (Storsurnåsen) in chalcopyrite-disseminated amphibolite which assays up to 2.2 g/t Au (the Ore Database, NGU).

The area is hilly and partly densely forested. The degree of exposure is poor. The quarternary cover is generally thin but continuous.

The Berg deposit was discovered in the 1880^{th}. Trial mining took place during four periods between 1895 and 1917. According to Bryn & Lenschow (1917) it is extracted in excess of 500 tons of ore grading 5 % Cu and c. 2000 tons grading c. 2 % Cu.
During 1973-75 A/S Sydvaranger carried out geological mapping and stream sediment sampling (Færden 1973 and 1975). Their conclusion was negative concerning the ore potential within the area.
In the period 1976-80 NGU conducted geological mapping, soil- and rock sampling, SP- and VLF ground survey, and drilled 2 diamond drill holes totalling 47m to test a strong conductor 1km NE of the mine (they revealed banded, disseminated to semimassive pyrrhotite in a felsic gneiss).

The area is underlain by amphibolite grade (local retrograded epidote-chlorite assemblages is related to shear deformation) metasupracrustals which are intruded by two generations of granite. Amphibole gneiss (the dominant rock type), amphibolite, and felsic to intermediate gneisses have an interfingering relationship. A conspicuous feature, especially east and north of the NGU-mapped area, is repeated, rusty (disseminated pyrrhotite) chert-like rock outcropping along ridges. They are believed to represent silicified and sulphidised gneiss zones.

The mine workings are marked on fig. 11. The main southern part is at least 150m length of adits northwards from the main pit (triangle in fig. 11). This is now refilled and inaccessible. The mine was accessible during the NGU survey and a detail map is included in Often (1982). A few diggings occur N and NNW of the main pit (the larger one among them is refilled).

The southern part of the mineralisation at the Berg mine occurs between two smaller granite bodies, and is hosted within a 20-30m wide zone of epidotised amphibolites/amphibole gneiss, quartz-muscovite schist and biotite schist. Silicification is strong, expressed both as pervasive modification of the whole-rock and as hydrothermal quartz veining.
The extent of the northern part is less obvious as there are no outcrops between the diggings, but the total width influenced by the mineralised shear structures seems to be wider than in the south. The dominating lithology in the northern part is epidote-amphibolite gneiss with ENE shearing. Structures in the southern part trend NW-SE dipping 50-55° SW, while in the northern part the trend is ENE-WSW dipping 45-60° NNW.

Dominating sulphides in the irregularly distributed dissemination are chalcopyrite and pyrrhotite. The sulphide content reaches 25% in restricted lenses. Subordinate ore minerals are pyrite, bornite, magnetite, sphalerite, uraninite (restricted to weakly brecciated zones), digenite, covelin, mackinawite, molybdenite, pentlandite and native copper.

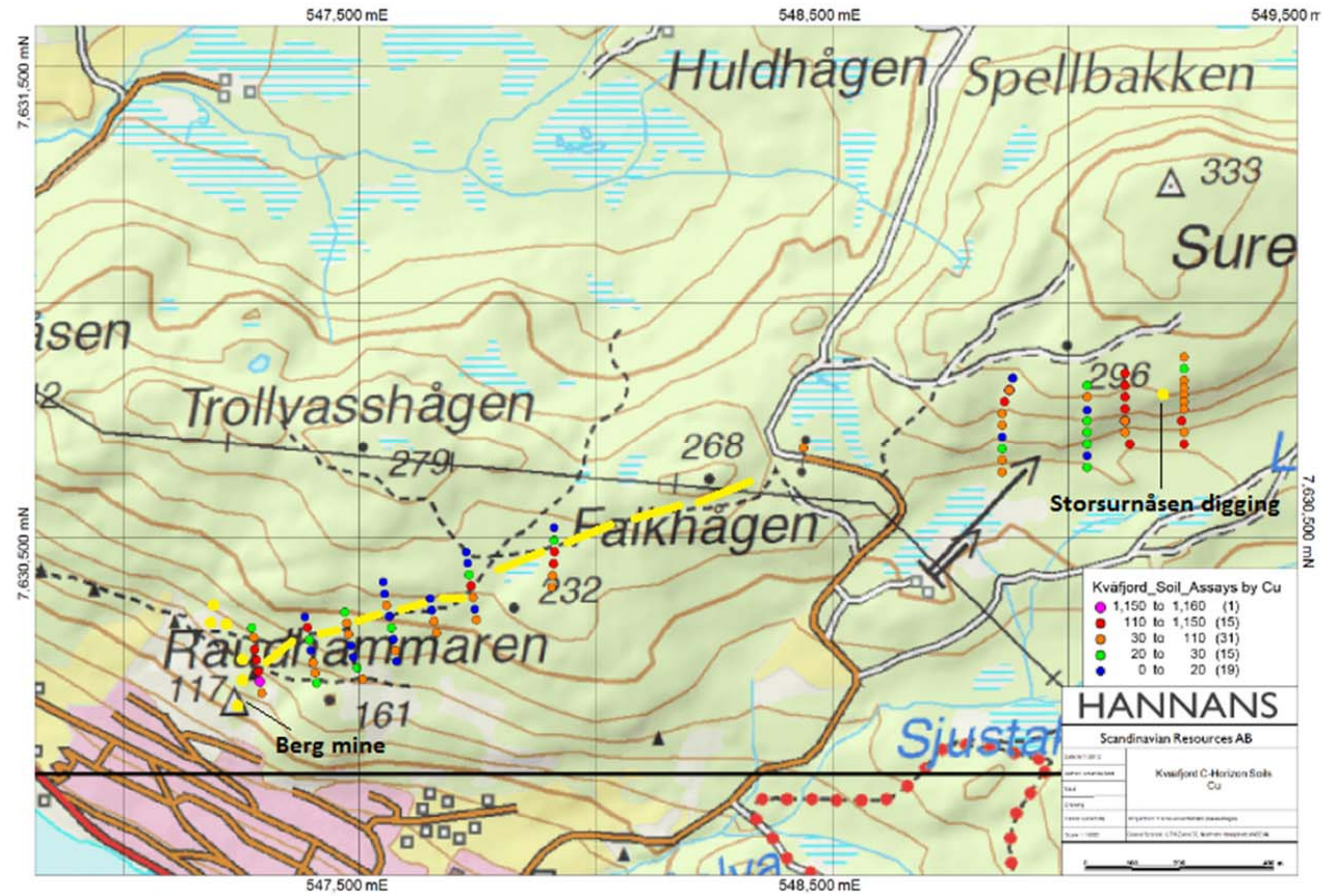

Fig. 11. Copper soil map, Berg. Yellow line is weak VLF conductor. Yellow dots are diggings.

Grab samples collected by NGU (Often 1982) have returned up to 6.3 % Cu, 124 g/t Ag, 0.9 % U, 0.21 % V, 0.16 % Ba and 0.1 g/t Au. NGU also collected 20 average channel samples along the adit walls. Average grades of 18 (excluding 2 from unmineralised granite) of them are 0.37 % Cu, <10 g/t Ag, 12 ppm U, 261 ppm V, 146 ppm Zn and <0.05 g/t Au, indicating low economic potential in the mine zone.

Of greater interest is to identify the cause for the VLF anomaly extending from the mine and ENE-wards. It is totally covered, including its ENE continuation towards the Storsurnåsen digging (fig. 11). This small digging in a steep hillside exposes an at least 5m wide Cu-Au mineralised brittle-ductile shear structure (250°/50°) in amphibole gneiss.

81 C-horizon soil samples (sampled with auger at 0.3-0.5 m depth) are collected during this survey along 11 profile lines intersecting this VLF anomaly and its continuation towards the

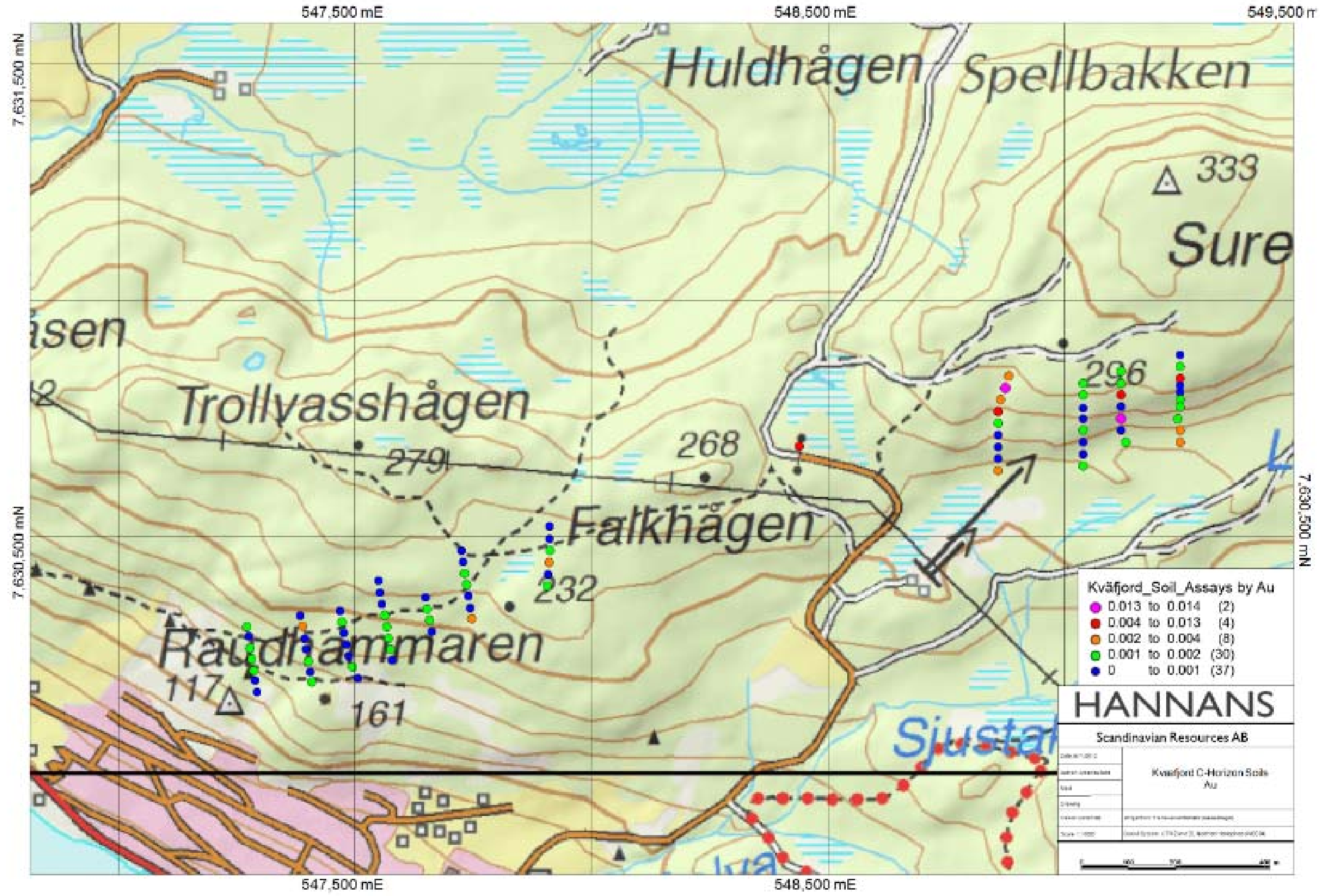

Fig. 12. Gold soil map Berg.

Storsurnåsen digging. The VLF anomaly is outlined on fig. 11. It might as well extend further eastwards from Falkhågen but this is outside of the VLF survey area.

The soil geochemistry shows slightly different signature in the eastern (Storsurnåsen) and the western (Berg-Falkhågen) part, e.g. in Au and V content. The VLF anomaly is accompanied by a weak copper anomaly, as is the Storsurnåsen mineralisation, but with no associated distinct gold enhancement.
Finding of a 10 kg boulder downslope from the VLF anomaly (UTM 547795 7630393) might possibly give an explanation to the conductor; it is graphitic mica gneiss with weak pyrrhotite-chalcopyrite dissemination (sample KV12007).

Short description of the workings at the Berg mine, from NNW to SSE:
547188 7630351: Small digging in at least 2 m wide shear zone (254°/60°) in amphibole gneiss. Granite veins intruded in the shear zone and subsequently brecciated (epidote filled veins). Silicification (hydrothermal quartz) in the most intensely sheared parts, which also

contain shear bands of epidote. Sulphide mineralisation is irregular with pyrrhotite and chalcopyrite enriched in small lenses. KV12008 is composite sample over 1.5 m width and assays 0.56 % Cu. Exposed over 5 m length.
547150 7630375: Similar type of mineralisation but weaker. 226°/45°.
547141 7630377: At least 2 m thick hydrothermal quartz vein (270°/45°) in brecciated amphibole gneiss. Traces of chalcopyrite.
547178 7630309: Refilled working (`Fuchsen Mine`). Dump samples show dissemination, locally rich clusters, of pyrrhotite and chalcopyrite in both fine-grained amphibolite (KV12020: 1.67 % Cu and 48 g/t Ag) and hydrothermal quartz (KV12019: 1.10 % Cu and 25 g/t Ag). Exposed tectonised amphibole gneiss with red K-feldspar and magnetite dissemination between the Fuchsen Mine and the digging at:
547199 7630310: Small digging in sheared (64°/80°), pervasively epidotised amphibole gneiss with pyrrhotite-chalcopyrite dissemination. Sample KV12018 assays 0.62 % Cu and 48 g/t Ag. A few quartz veins (64°/80°) of few-cm thickness.
547259 7630252: Excavation. At least 4 m width of fine-grained, banded amphibole gneiss is rusty and pyrrhotite-chalcopyrite disseminated (KV120017: 0.84 % Cu, 19 g/t Ag and 70 ppm U). Banding: 120°/55°. A fault with parallel quartz- (KV12016: 188 ppm Cu) and garnet-biotite-hornblende granite veins has direction 241°/70°. Silicic and chloritic alteration of host rock.
547258 7630204: Excavation in banded amphibole gneiss (locally with garnet) and fine-grained, often silicified amphibolite, both with pyrrhotite-chalcopyrite dissemination. Foliation 142°/52°. Hydrothermal quartz veins with minor sulphide dissemination. Dump samples also show massive pyrrhotite. Samples KV12021 and 22 of mineralised amphibolite assay up to 1.02 % Cu, 15 g/t Ag and 0.26 % Cr.
547241 7630149: North end of refilled pit, where adit runs northwards. Sample KV12023 of fine-grained amphibolite with radiation and pyrrhotite-pyrite-chalcopyrite dissemination assays 1.43 % Cu, 33 g/t Ag and 0.25 % U. KV12024 of epidotised amphibolite with chalcopyrite-pyrrhotite dissemination assays 3.94 % Cu and 111 g/t Ag. Dump samples also show hydrothermal quartz with sulphides, silicified gneiss and massive chalcopyrite.

The small digging at Storsurnåsen (UTM 549197 7630792) is located in the upper part of a steep slope, in otherwise completely covered terrain. It exposes an at least 5 m wide brittle-ductile strain zone, trending 250°/50°, in fine- to medium-grained amphibolite gneiss which is weakly chlorite-epidote-sericite altered. It is intruded by irregular felsic (feldspar and hornblende) veining. The distribution of pyrite and chalcopyrite dissemination is very irregular within the zone. Samples KV12004-6 are collected from the mineralisation and assay up to 0.78 % Cu, 0.67 g/t Au and 12 g/t Ag. A composite sample (KV12006) collected across the 5 m wide zone assays 0.11 % Cu and 0.28 g/t Au.

The above mentioned rusty (disseminated pyrrhotite, pyrite and traces of chalcopyrite) chert-like rock outcropping along ridges, believed to represent silicified and sulphidised gneiss zones, are sampled (sample no KV12001, 2, 3, 9 and 10) east and north of Berg-Storsurnåsen. Both copper and gold contents are however low.

Scintillometer measurements in the area demonstrated very low radiation in all lithologies except a few active samples at the dump of the Berg main pit.

From the Berg Mine the supracrustal succession trends SW-wards (shown on the NGU airmag) and shows up on the island of Kvæøya. Here an abandoned iron mine in skarn host rock was in operation during 1902-04 and 1908-14, producing 4-8000 tons of sulphide contained magnetite ore per year. Samples KV12011-15 are collected at the mine dump at UTM 543986 7628336 and show up to 0.34 % Cu and 0.13 % Zn.

The current mapping and rock- and soil assays do not encourage further work at the Kvæfjord permit since the copper grades over widths of significance in the mine zone seem to be rather low and the gold contents are low. In addition, gold grades in the Storsurnåsen mineralisation are lower than expected, and the soil anomalies are not convincing.

SAMPLE	UTMeast	UTMnorth	UTMzone	Au	Ag	Cu	Zn	Pb	Fe	S	Cr	U
				ppm	ppm	ppm	ppm	ppm	%	%	ppm	ppm
KV12001	550904	7631491	33	0,02	0,9	91	37	22	10,75	2,53	53	10
KV12002	551063	7631028	33	<0.01	1	215	58	28	6,1	2,38	80	<10
KV12003	548675	7630829	33	0,07	0,9	224	64	24	5,59	2,45	71	<10
KV12004	549197	7630792	33	0,67	12,1	7840	175	18	13,1	0,99	94	<10
KV12005	549197	7630792	33	0,38	12,7	7860	195	19	14,05	1,14	122	<10
KV12006	549197	7630792	33	0,28	2,7	1185	179	21	10,65	0,21	105	<10
KV12007	547795	7630393	33	<0.01	<0.5	46	85	21	3,83	0,38	89	10
KV12008	547188	7630351	33	<0.01	7,5	5630	95	10	7,1	0,54	53	<10
KV12009	548697	7632945	33	<0.01	1,1	190	32	17	3,65	1,16	92	10
KV12010	548716	7632987	33	<0.01	0,8	174	31	26	2,97	1,24	81	10
KV12011	543986	7628336	33	<0.01	<0.5	312	1355	3	34	1,43	97	10
KV12012	543986	7628336	33	0,02	1,8	3470	912	4	22,4	5,36	111	10
KV12013	543986	7628336	33	<0.01	<0.5	32	50	<2	4,43	0,81	106	<10
KV12014	543986	7628336	33	<0.01	<0.5	894	876	3	22,8	3,7	388	10
KV12015	543986	7628336	33	<0.01	<0.5	292	872	4	41,1	0,68	86	10
KV12016	547259	7630252	33	<0.01	0,8	188	58	4	3,86	0,06	54	<10
KV12017	547259	7630252	33	0,02	19,5	8430	197	20	14,25	1,5	47	70
KV12018	547199	7630310	33	0,07	48,8	6210	136	6	9,77	0,41	483	10
KV12019	547178	7630309	33	0,03	24,9	11000	85	2	5,41	1,25	34	<10
KV12020	547178	7630309	33	0,09	48,1	16750	197	5	14,3	2,04	9	10
KV12021	547258	7630204	33	<0.01	9,2	6450	366	6	16,9	3,82	53	30
KV12022	547258	7630204	33	0,01	14,9	10250	295	7	18,95	5,9	2600	<10
KV12023	547241	7630149	33	0,02	33,4	14300	331	227	15	1,74	139	2510
KV12024	547241	7630149	33	0,08	111	39400	275	10	12,85	3,81	14	20

Tab. 4. Assay results rock samples Kvæfjord/Berg.

4 Brennfjellmyra copper-gold

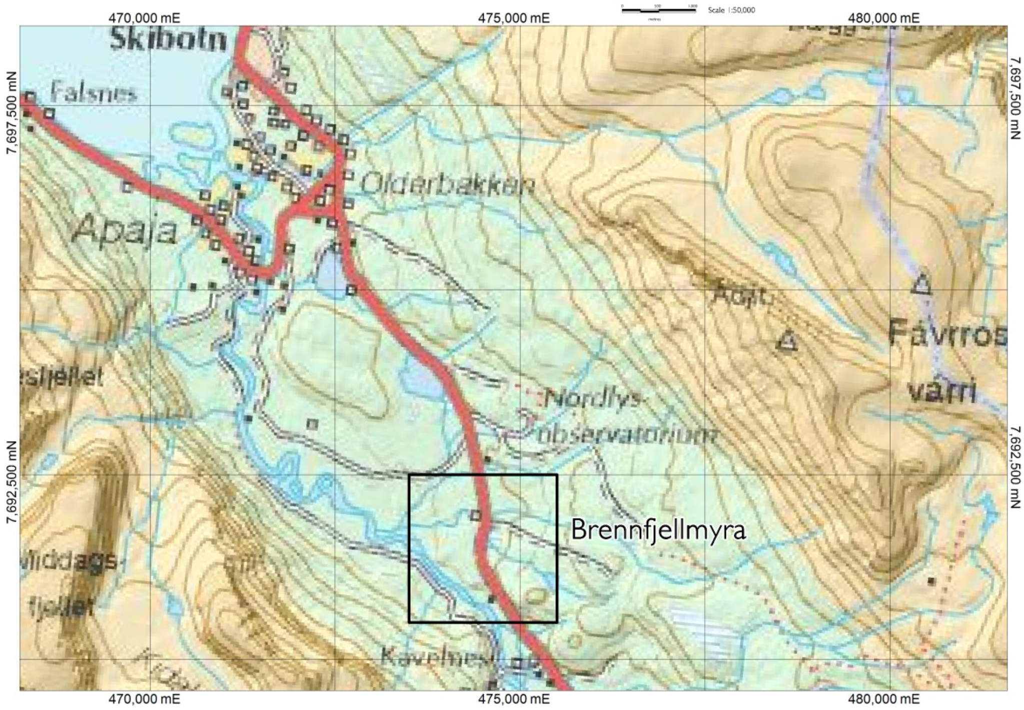

Fig. 13. Brennfjellmyra permit.

The Brennfjellmyra prospect is underlain by the Caledonian Reisa Nappe Complex and has been objected to a short field visit. Minor excavations close by the main road were conducted in 1916. The reason for claiming this object was enhanced gold content, 1.68-3.32 g/t, in 3 assays of copper mineralisation from the Ore database, NGU.
The Nappe rocks in the area are dominated by greywacke, intruded by two gabbro bodies at Brennfjellmyra. Disseminated pyrrhotite and chalcopyrite are hosted in garnet-amphibolite along the gabbro rim. Bedrock is not well exposed – a few outcrops occur along the road cut and scattered within the till cover west of the road. East of the road is protected area.

The NGU database plot at UTM 474447 7691339 is a 4x4 m² water-filled pit, exposing 2 m thickness of foliated, calcareous garnet-amphibolite with variable content of mica, chlorite, quartz and feldspar, striking 260°/30°. Chalcopyrite and pyrrhotite occur in bands and dissemination within c. 0.5 m thickness. Two grab samples assayed 0.58 g/t Au, 1.44 % Cu and 1.5 g/t Au, 2.71 % Cu. 3 NGU database assays from this pit show 1.68-3.32 g/t Au, 194 ppm-2.82 % Cu. Worth noting is that gold is not well correlated with copper – a sample with low-grade copper (194 ppm) contains 1.68 g/t Au.
The mineralised zone is exposed in the road cut 50 m to the east. It is 1 m thick and folded, plunging 300°/10°. Along the upper contact repeated, few-cm thick quartz bands are also weakly copper mineralised.

Another working, not contained in the NGU database, was found 90 m to the south at UTM 474463 7691256, i.e. in an apparently lower structural level. It is a refilled shaft, c. 25 m³

dump. A small outcrop shows at least 2 m thick mineralisation. Dump material shows varieties of gneissic garnet-amphibolite with carbonate- and quartz bands and lenses, and garnet-mica rock, both with chalcopyrite ± pyrrhotite dissemination. Isoclinal folds can be observed. Assays (BR12003-6) show 0.53-5.5 % Cu, 0.13-1.38 g/t Au and 4.4-48.2 g/t Ag.
At UTM 474440 7691266 is a 2-3 m wide strike-parallel trench in an apparently higher structural level. Almost no mineralisation is exposed. Strike/dip: 265°/60°.

The assays showed lower gold content than previous Ore database assays. However, further work is recommended. A detailed mag survey between the road and the river should be carried out and an IP survey should be considered.

				Au-AA25	ME-ICP61	Cu-OG62	ME-ICP61	ME-ICP61	ME-ICP61	ME-ICP61
SAMPLE	UTMeast	UTMnorth	UTMzone	Au	Ag	Cu	Zn	Pb	Fe	S
				ppm	ppm	%	ppm	ppm	%	%
BR12001	474447	7691339	34	1,5	19,4	2,71	724	9	15,6	3,35
BR12002	474447	7691339	34	0,58	8,4	1,445	578	4	14,3	2,06
BR12003	474463	7691256	34	0,13	4,4	0,533	146	5	13,15	0,77
BR12004	474463	7691256	34	1,38	20,2	1,9	320	4	16,25	2,14
BR12005	474463	7691256	34	0,81	26,1	3,91	693	3	21,5	6,76
BR12006	474440	7691266	34	0,81	48,2	5,5	533	5	17,85	4,97

Tab. 5. Assay results rock samples Brennfjellmyra.

5 Alta-Kvænangen sediment-hosted copper

Limited work, minor mapping and rock sampling, has been carried out during 2012 in the Fiskarfjellet and Flintfjellet permits (fig. 14) which has resulted in additional discoveries of copper mineralised dolomites in the Storviknes Formation. Copper occurrences known prior to 2011 is shown in fig. 15 and discoveries made in 2011, as well as regional geology etc., are treated in Wilberg (2011a). Geological map of the eastern part of the Alta-Kvænangen tectonic window is shown in fig. 16. Public release of NGU`s airborne survey is expected 1st of February.

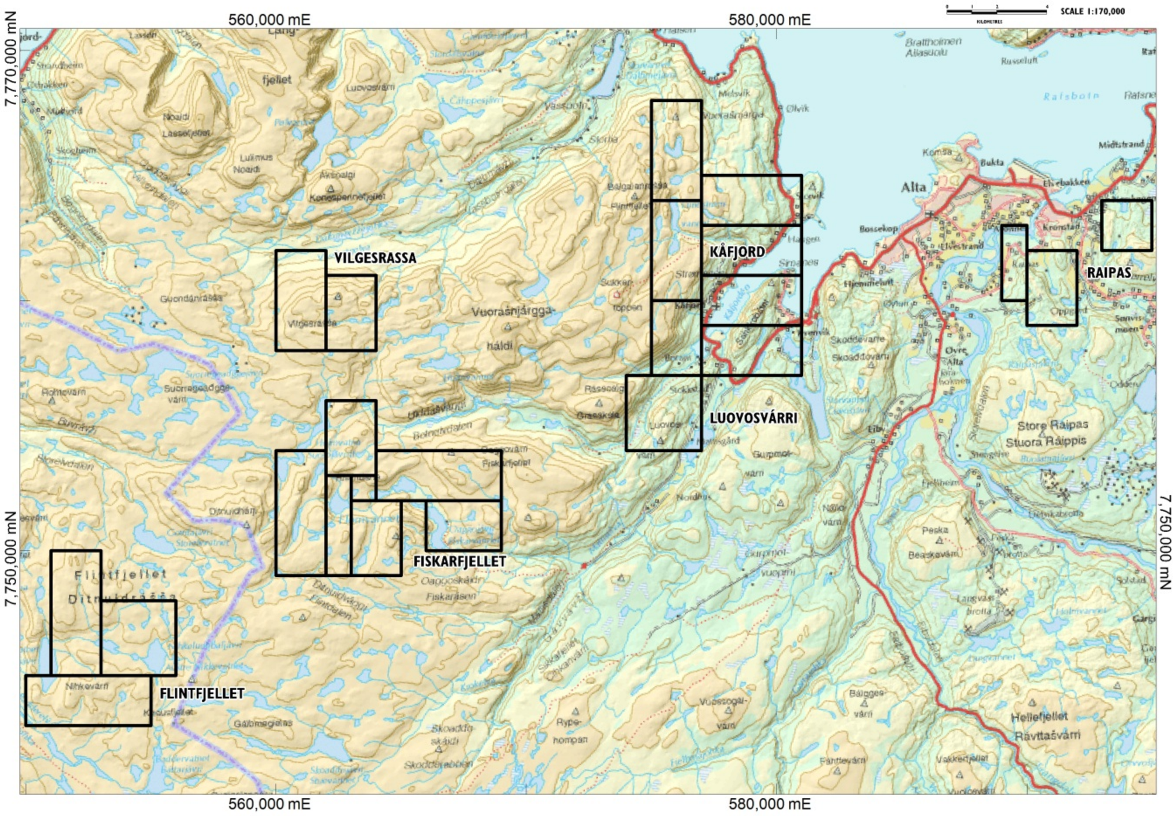

Fig. 14. Scandinavian Resources` permits in the Alta-Kvænangen tectonic window.

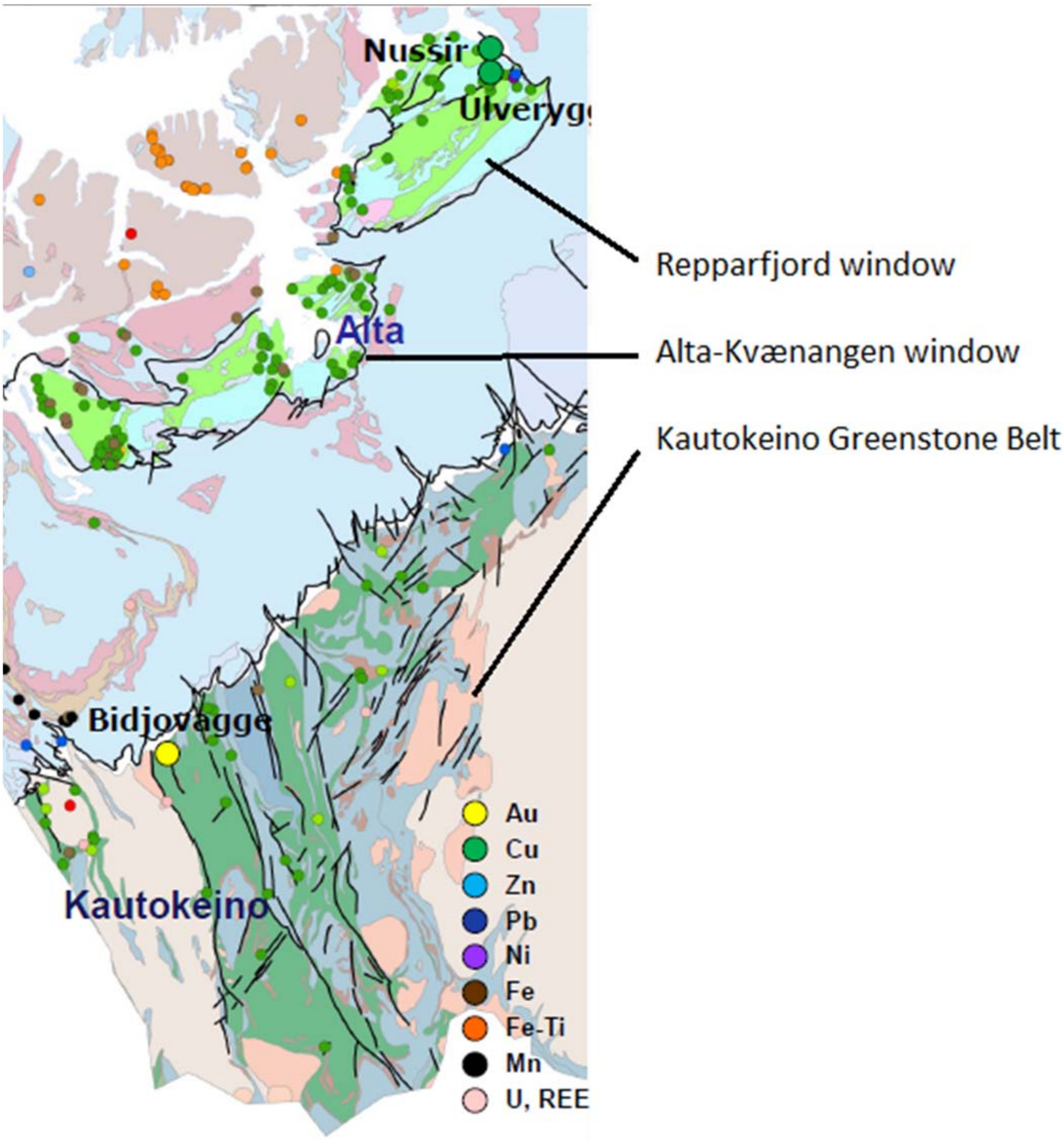

Fig. 15. The Alta-Kvænangen tectonic window with copper occurrences known prior to 2011. From the Ore Database, NGU.

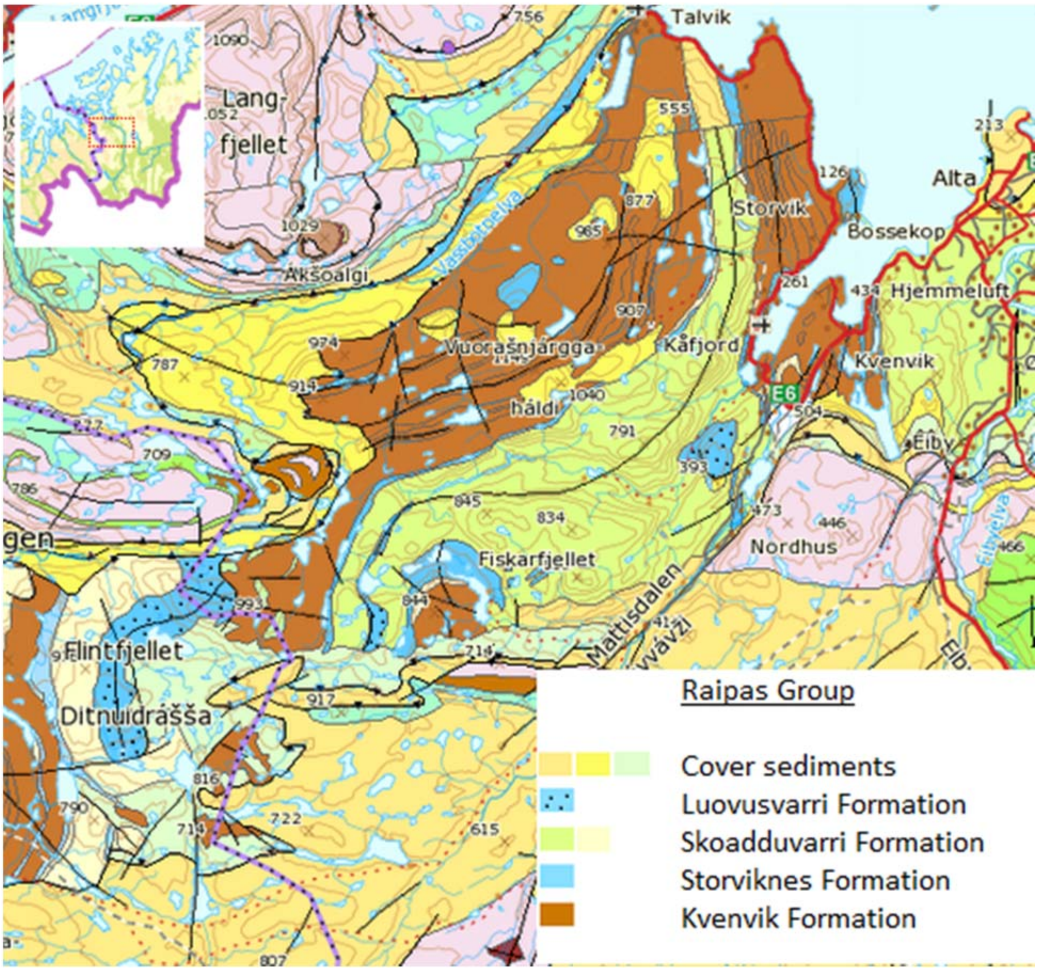

Fig. 16. Geological map of the eastern part of the Alta-Kvænangen tectonic window (the Raipas Group). From Zwaan & Gautier 1980, Gautier et al. 1986, Zwaan 1988).

5.1 Fiskarfjellet

The identified copper mineralised dolomites in the Fiskarfjellet and Kåfjord permits are shown in fig. 17 and 18. Blue line represents chalcocite-bornite mineralisation of significant grade in Storviknes Formation dolomite, and red line is lower-grade chalcopyrite mineralisation in dolomites belonging to the Storviknes-, Luovusvarri- and Kvenvik formations. Each line often represents more than one mineralised dolomite bed.

Only additional observations made during a couple of days reconnaissance in 2012 will be described here. For background information, see Wilberg (2011a).

Kvartpååttevannet (western blue line on fig. 17): The small outcrop at UTM 562047 7753759 shows that the rich copper mineralisation here is bound to the stratigraphical upper part of the Storviknes dolomite, i.e. the structurally lower part as the sequence is inverted. Mineralisation is hosted in the laminated dolomite type. The dolomite bed seems to be approximately 5 m thick, with siltstone above and below. Local floats of schistose siltstone with cm-sized pyrite-chalcopyrite lenses assaying 0.25 % Cu, 0.66 g/t Au and 0.21 % Ba were found, indicating potential also in the siltstone.

Fiskarvatnet - a few additional observations: North of Rundvatnet it is well illustrated that the wide, lower dolomite layer carries mineralisation along the footwall contact to the green, chloritic siltstone. Typically, copper mineralisation in the Storviknes Formation dolomites in the Fiskarfjellet and Flintfjellet areas is hosted in the basal layer, consisting of a lower massive dolomite and overlying white/yellow laminated dolomite (fig. 29), which is overlain by generally massive, barren dolomite. This is also the case north of Rundvatnet. This basal, mineralised part is intensely, tightly folded (fig. 19). In the digging at UTM 565684 7753158 the fold axes is plunging 294°/50° (fig. 20). In another small digging, found at UTM 565578 7753193, the axial plane is measured at 147°/50°.
Where bedding can be observed, it is seen that the footwall green siltstone is folded in more open, upright folds with strong axial planar strain-slip cleavage. In addition to the tight folding within the dolomite, the siltstone-dolomite sequence is folded with greater fold amplitude, and the large Fiskarfjellet antiform represents the last fold face.
The footwall chloritic siltstone is underlain by argillite. A few floats of red-violet siltstone are found, indicating that oxidic, red-bed type sediments occur within the sequence. This red siltstone is exposed between Sæterfjellet and Tverrelvvatnet.

The mineralisation consists of dissemination and veinlets (both parallel to and crosscutting lamination) of chalcocite, bornite and chalcopyrite. Mineralised thickness is enhanced due to the tight folding. Where exposed in the Rundvatnet area it is typically 0.5-1 m thick. A few places dissemination of chalcopyrite is also observed in the adjacent footwall siltstone (sample AL12011, assay pending), as is also the case at Kvartpååttevannet.

Additional outcrops of good mineralisation found at UTM 565737 7753208, 566294 7753001 and 566470 7752924.

Detailed geological mapping is proposed for Fiskarfjellet (including Kvartpååttevannet) and also IP/mag ground survey at Sæterfjellet.

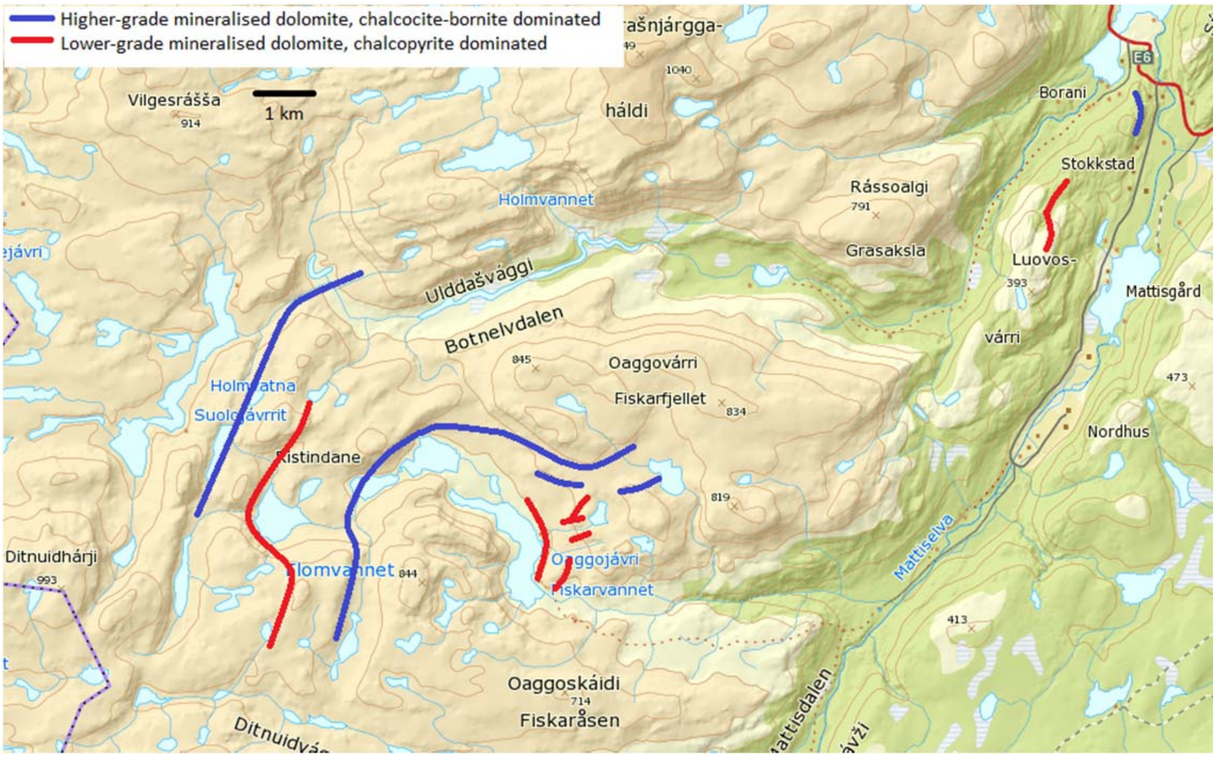

Fig. 17. Copper mineralised dolomite layers within the Fiskarfjellet permits.

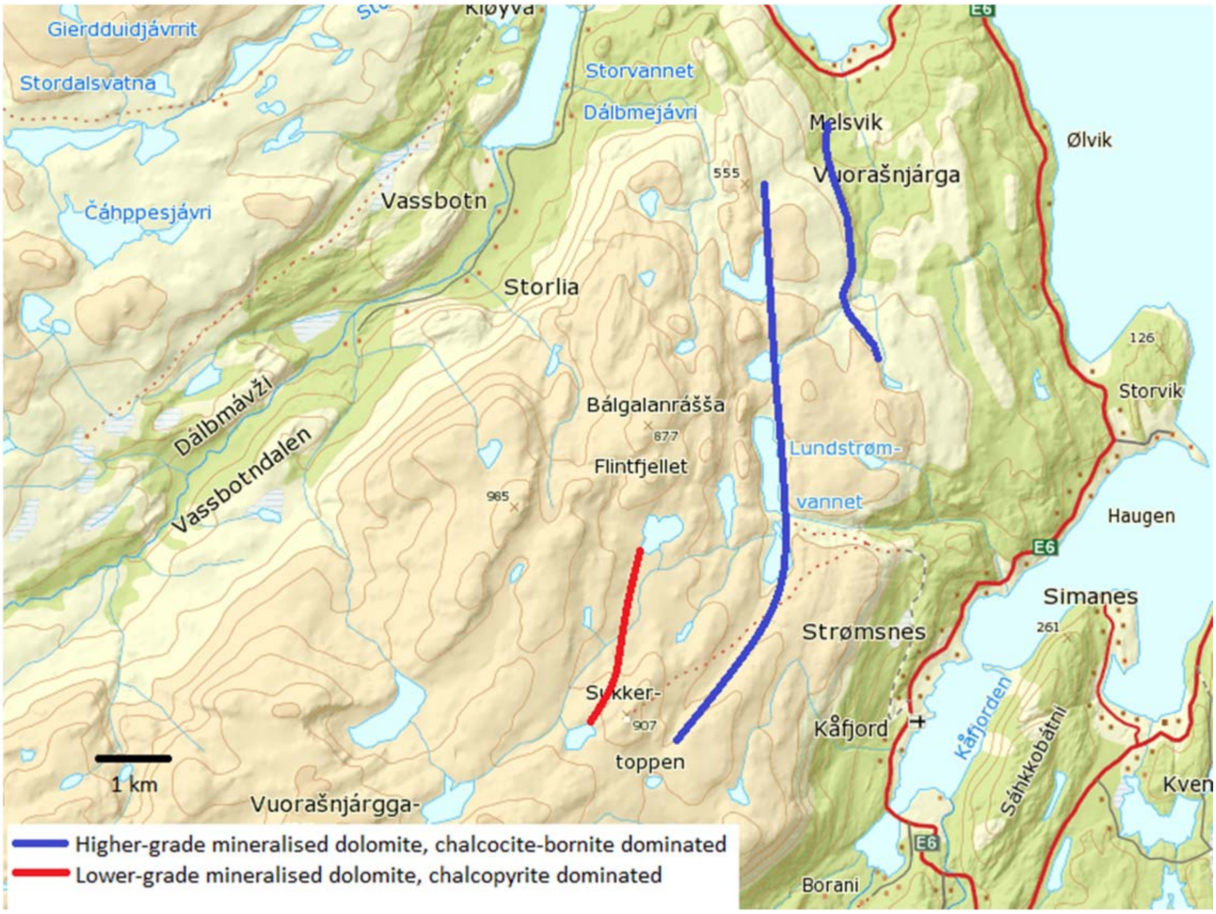

Fig. 18. Copper mineralised dolomite layers within the Kåfjord permits.

Fig. 19. Tightly folded laminated dolomite with infolded underlying massive dolomite, both mineralised. UTM 564864 7753168. Viewed north.

Fig. 20. Isoclinally folded mineralised, laminated dolomite. Digging at UTM 565684 7753193. Looking northwest.

5.2 Flintfjellet

In addition to the boulder discovery of high-grade copper-silver mineralisation at Rassaladdot in 2011 (Wilberg 2011a) additional discoveries were made this summer within the Flintfjellet permits (fig. 14 and 21).

The boulder field containing dolomite boulders at Rassaladdot is mapped out (fig. 22 and 23). It is at least 1 km long and c. 200 m wide, containing dolomite boulders up to more than 1 m^3 in size. The boulder field is dominated by boulders of Skuoddavarri sandstone, with scattered dolomite boulders. The dolomite is typically grey and massive, and minor red with frequent quartz veining. A few boulders show brecciated chert in contact with dolomite. Veining of massive bornite and chalcocite (plus secondary malachite) occurs in both, often with associated hematite. Edged, fist sized floats of massive copper mineralisation occur scattered around sample location AL12004-6 – some of them have breccia fragments of dolomite, resembling Raipas type, karst collapse breccia mineralisation. Assays of 5 samples of the mineralisation (tab. 6) show high grades in copper and silver, and one assay of 1.26 g/t gold.
It is a few exposures at the outskirts of the boulder field: quartzite (118°/45°) at 554738 7746898 and arcosic sandstone (150°/40°) at 554977 7746539.

The discovery boulder (fig. 24) at 554597 7747027 is approximately 1.5 m^3 in size and constitutes of dolomite and chert breccia, both red, with bornite-chalcocite(-malachite) veins. Sample no AL12004 (tab. 6). Hematite occurs as fracture filling and in veins.

Several small floats of massive bornite-chalcocite as matrix in brecciated dolomite are found at 554594 7747031 (fig. 25). Sample AL12005.

Mineralised boulders up to 0.5 m^3 in size are found at 554584 7747036. Dolomite and chert (both red) are bornite-chalcocite veined. Floats up to 1 kg of massive mineralisation (fig. 26). Sample AL12006.

554718 7746914: 3 kg boulder of semimassive bornite and chalcocite (fig. 27). The fine-grained sulphides occur as infill between < 1 mm sized carbonate grains and occasional, up to 1 cm^3, dolomite fragments. Sample AL12002.

554793 7747014: 0.5 m^3 sized boulder of dolomite with vein network of massive bornite (fig. 28). Sample AL12003.

Reconnaissance mapping revealed ice striation with direction 324°, and also north-south approximately 3 km NW of Rassaladdot. The frequent mineralised boulders around sample points AL12004-6 indicate a nearby source – they are assumed to be almost in-situ. To target the hidden mineralisation an IP survey is proposed. However, it might be inappropriate due to lack of sediment cover and bad grounding conditions in the boulder field.

A sequence of Storviknes Formation, including 3-4 dolomite beds, is running through Djupvatnet (Nihkejavri). North of the lake (outside of our permit area) it is four dolomite beds. Copper mineralisation observed along footwall of the eastern dolomite.
South of the lake three parallel dolomites are sporadically exposed. The easternmost bed is exposed at 550845 7743634. It is approximately 7 m thick. Only traces of chalcopyrite observed. The middle dolomite, about 25 m thick, is exposed at 550813 7743707. Up to 0.5 m of the footwall is irregularly enriched in chalcopyrite, bornite and chalcocite (sample AL12008). The westernmost dolomite (550677 7743934) is at least 40 m thick. Contacts are not exposed and mineralisation not observed.

Further to the north, at 551061 7744230, the middle dolomite carries mineralisation typical for the area (fig. 29); above the subvertical contact to green, schistose siltstone a thickness of 0.5-0.7 m of both massive and laminated dolomite contain dissemination of bornite and chalcocite (AL12009).
The same scenario occurs within the eastern dolomite at 551291 7744279 where the bornite-chalcocite(-malachite) dissemination in massive dolomite is c. 0.5 m thick (AL12010).

Approximately 1.5 km to the east, at 552337 7743350: C. 20 m thick reddish to grey dolomite with brown surface weathering. The upper meters (west) are argillite laminated and contain sporadic dissemination of chalcopyrite and pyrite, and also baryte (AL12007). Minor dolomite breccia. A couple of dolomite beds to the west separated by quartzite. This dolomite sequence can be followed in sporadic outcrops northwards to 552390 7743904 and further. To the west three, up to 7 m thick dolomite (well laminated) layers occur at 552230 7744015. Mineralisation not observed.
Although these dolomites, especially the potentially mineralised contacts, are not well exposed, the thickness of observed mineralisation seems to be too small to hold economic potential.
Other observations of dolomite layers where no mineralisation were found: 553655 7743517, 553559 7743490, 552697 7743006, 552331 7743288 and 551143 7746573. No mineralisation where observed in Luovosvarri Formation dolomites along the west flank of the Mittavarri synform.

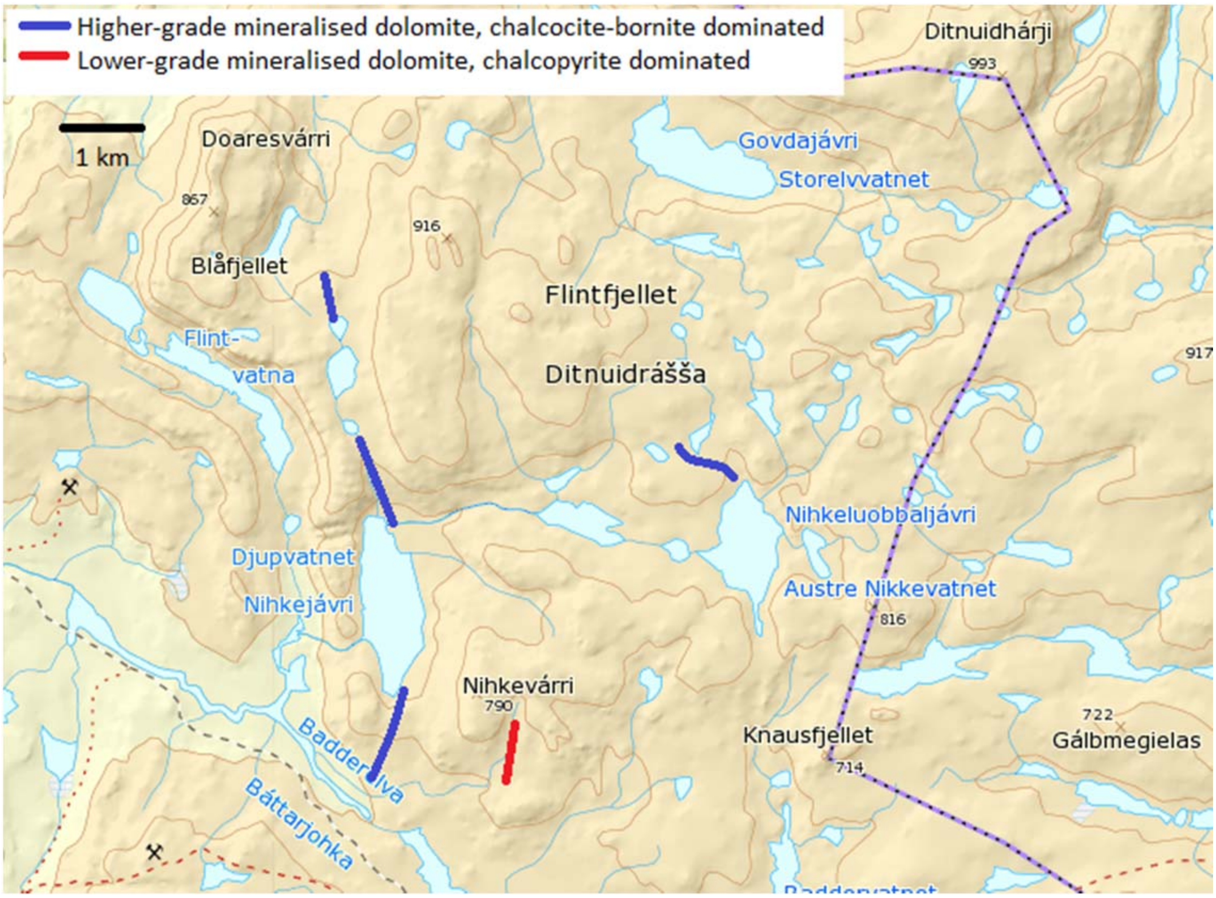

Fig. 21. Copper mineralised dolomite layers within the Flintfjellet permits.

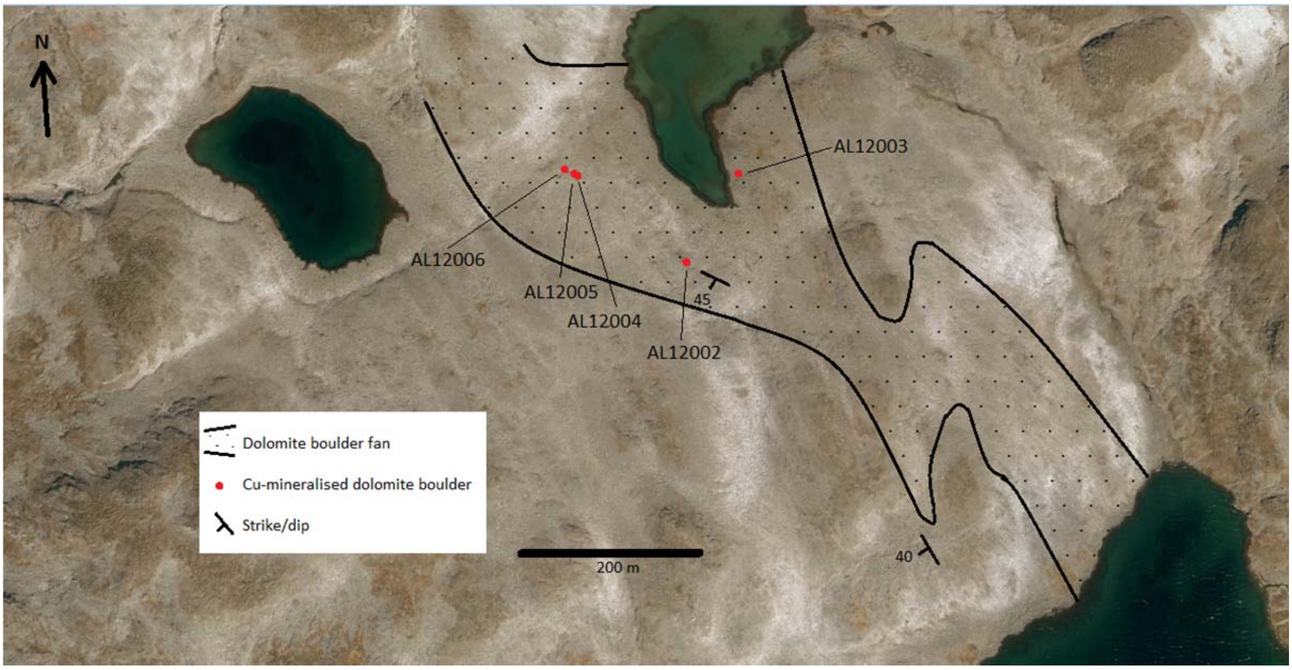

Fig. 22. Dolomite boulder field with sampled copper mineralised dolomite boulders at Rassaladdot, Flintfjellet.

SAMPLE	UTMeast	UTMnorth	UTMzone	Cu	Ag	Au	Fe	S
				%	ppm	ppm	%	%
AL12002	554718	7746914	34	23,7	181	<0.01	4,88	5,01
AL12003	554793	7747014	34	3,99	35	<0.01	1,83	0,88
AL12004	554597	7747027	34	26	218	<0.01	9,03	4,98
AL12005	554594	7747031	34	>40	314	0,01	3,62	7,76
AL12006	554584	7747036	34	26,2	226	1,26	3,82	5,22
AL12007	552337	7743350	34	0,511	1,4	0,02	4,4	0,71
AL12008	550813	7743707	34	27,4	151	0,06	6	7,29
AL12009	551061	7744230	34	0,761	4,2	<0.01	0,92	0,19
AL12010	551291	7744279	34	1,23	6,7	0,03	1,18	0,28

Tab. 6. Assay results rock samples Flintfjellet.


Fig. 23. The boulder field at Rassaladdot viewed WNW. Sample locations AL12004-6 are to the left of the lake.


Fig. 24. The discovery boulder at UTM 554597 7747027.

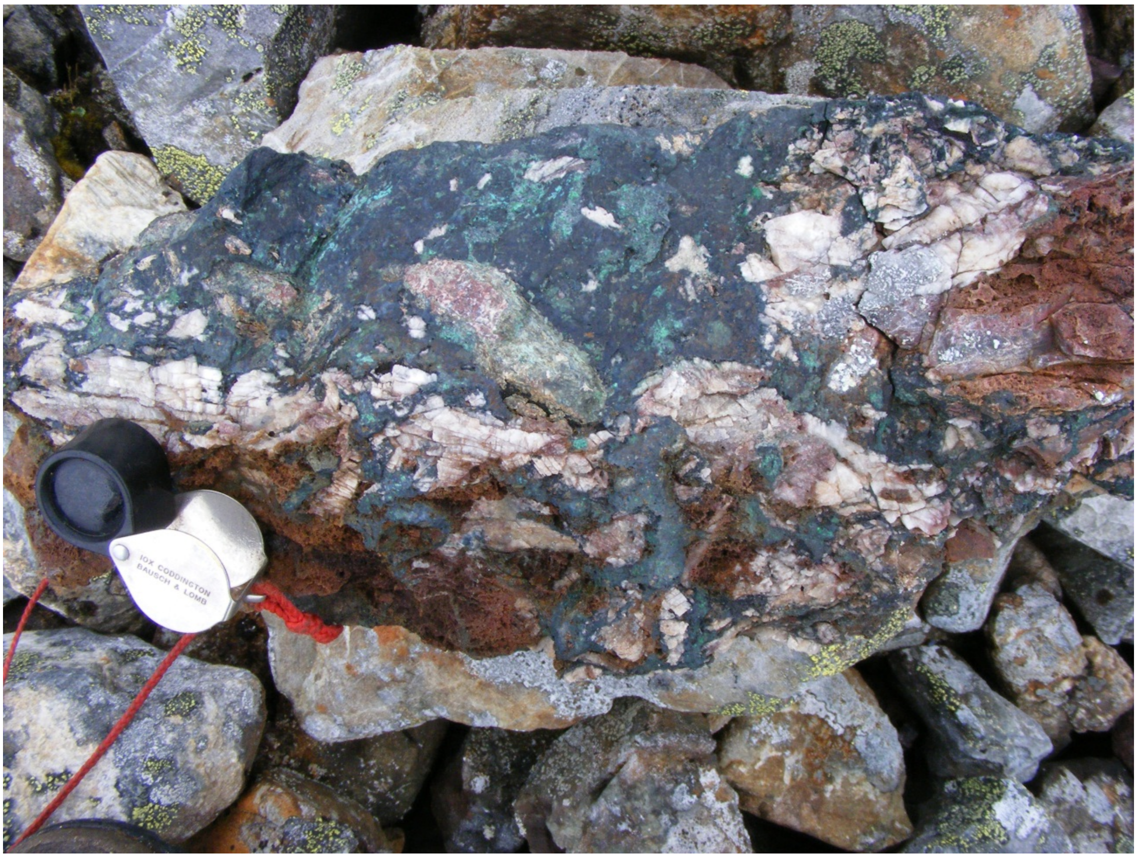

Fig. 25. Massive bornite-chalcocite matrix with dolomite breccia fragments. UTM 554594 7747031.

Fig. 26. Floats of massive bornite and chalcocite. UTM 554584 7747036.


Fig. 27. 3 kg boulder of semimassive bornite and chalcosite at 554718 7746914.

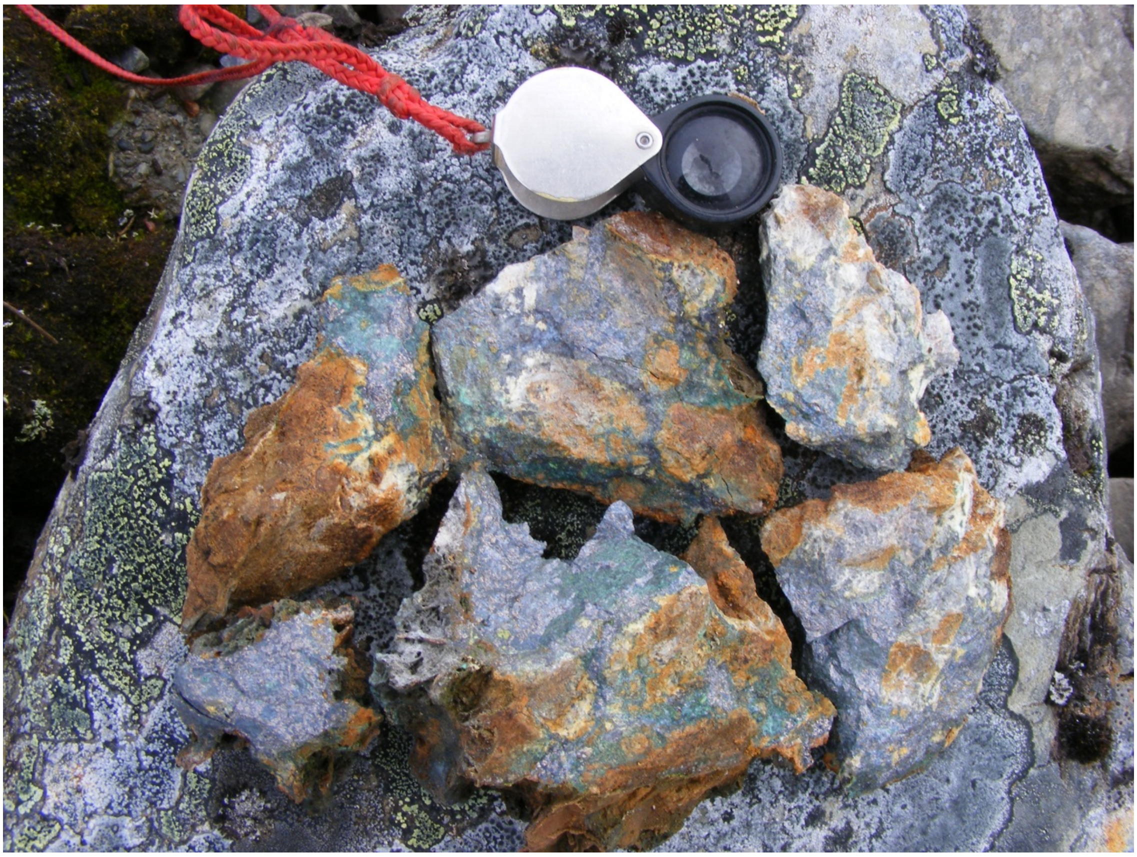
Fig. 28. Vein material of bornite mineralisation. UTM 554793 7747014.

Fig. 28. Typical mineralisation of disseminated bornite and chalcocite in massive and laminated dolomite. Footwall is green, schistose siltstone. UTM 551061 7744230.

6 Kautokeino copper-gold

As a consequence of governmental delay in permitting major parts of the planned work in Kautokeino has been postponed. Mapping and prospecting have been carried out in Njivlojavri, Uccavuovdas (+ soil sampling) and Ragatmaras.

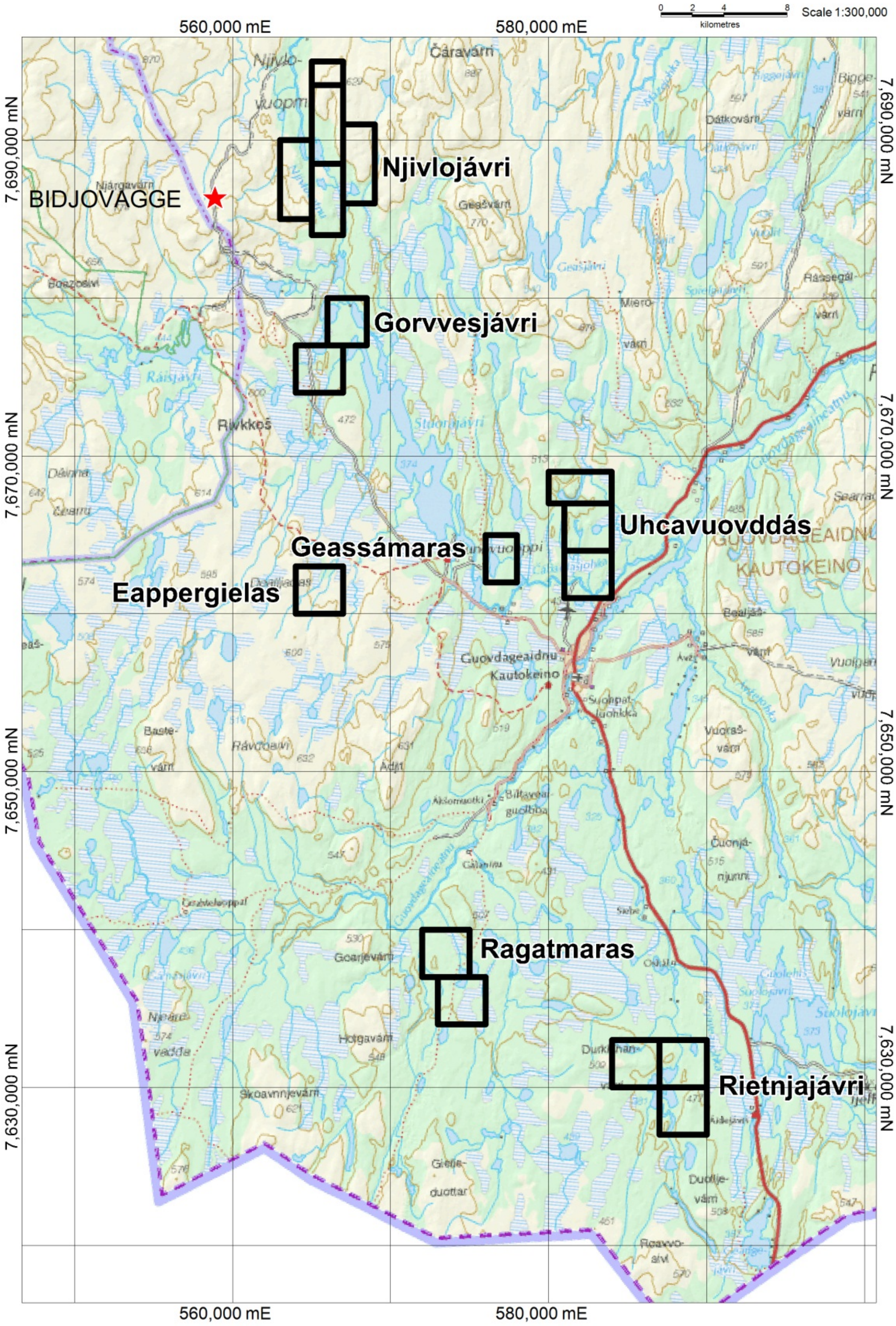

Fig. 30. Permits in Kautokeino.

6.1 Uccavuovdas

Totally 121 C-horizon soil samples are collected in two areas. The SE`ern area covers a low-mag (fig. 31) and conductivity anomaly (fig. 32) north of Uccavuovdas North (Wilberg 2011c). Previously NGU/GM has defined a 1000 m by 200 m sized till-geochemical dispersion anomaly based on micro-boulder tracing within this area (Tan 1970). This anomaly straddles a second order shear structure and extends northwards from drill hole UV-16/92.
Except a small exposure of quartzite with few-mm thick layers of fine-grained hematite at UTM 583025 7665100, no outcrops are found within the sampled area. To the south, at UTM 582890 7664477, a small mineralised outcrop was found in 2011 of brecciated, light grey albite felsite with chalcopyrite as dissemination and in veins, assaying 1.56 % Cu and 0.75 g/t Au (sample KA11049).
Soils in this area north of Uccavuovdas North are higher in Cu, Co, Ni and V, and lower in Au than the other sampled subarea to the NW, SE of Hoallomaras (fig. 33 and 34).
The airmagnetic data (fig. 31) shows a mag-low NW-SE lineament, crossed by a NE-SW trend which is coincident with the Cu anomaly and also coincident and parallel to a conductive trend (fig. 32) which the mineralisation at 582890 7664477 could be related to.

In addition to the 2011 observations (Wilberg 2011c), another trench was found at Uccavuovdas North. It is 40 m long, with direction 65°, running from UTM 582929 7664230 to 582892 7664213. A diamond drill hole (255°/40°) is collared in the NE end. No outcrops found.

Scattered outcrops in the area between the two soil sample areas show that a larger area is underlain by conglomeratic sediments than previously mapped by NGU. Some localities of exposed conglomerate: 582270 7664700, 581633 7667005, and between 581898 7666706 and 582170 7666653. The two soil sample lines extending westwards from the SE`ern area, and the sample line extending eastwards from the NW`ern area are probably also underlain by the conglomeratic sediments – this is judged from the colour and mineralogy in the till cover (which is rather thin above the conglomeratic sediments).

Further work at Uccavuovdas should include ground geophysics (mag, IP/EM) covering the combined anomaly north of Uccavuovdas North, preferentially carried out during winter when the lakes are frozen, in addition to previously recommended follow-up of targets within the Uccavuovdas and Gæssamaras permits (Wilberg 2011c). The Suhkkesmaras conductivity anomaly and the 3 Outokumpu drill holes from 1992 are shown in fig. 35, as drill hole UV-19/92 seems to be wrongly plotted in their report (Nessvoll 1994). None of the three holes seem to be optimally collared to intersect the conductor.

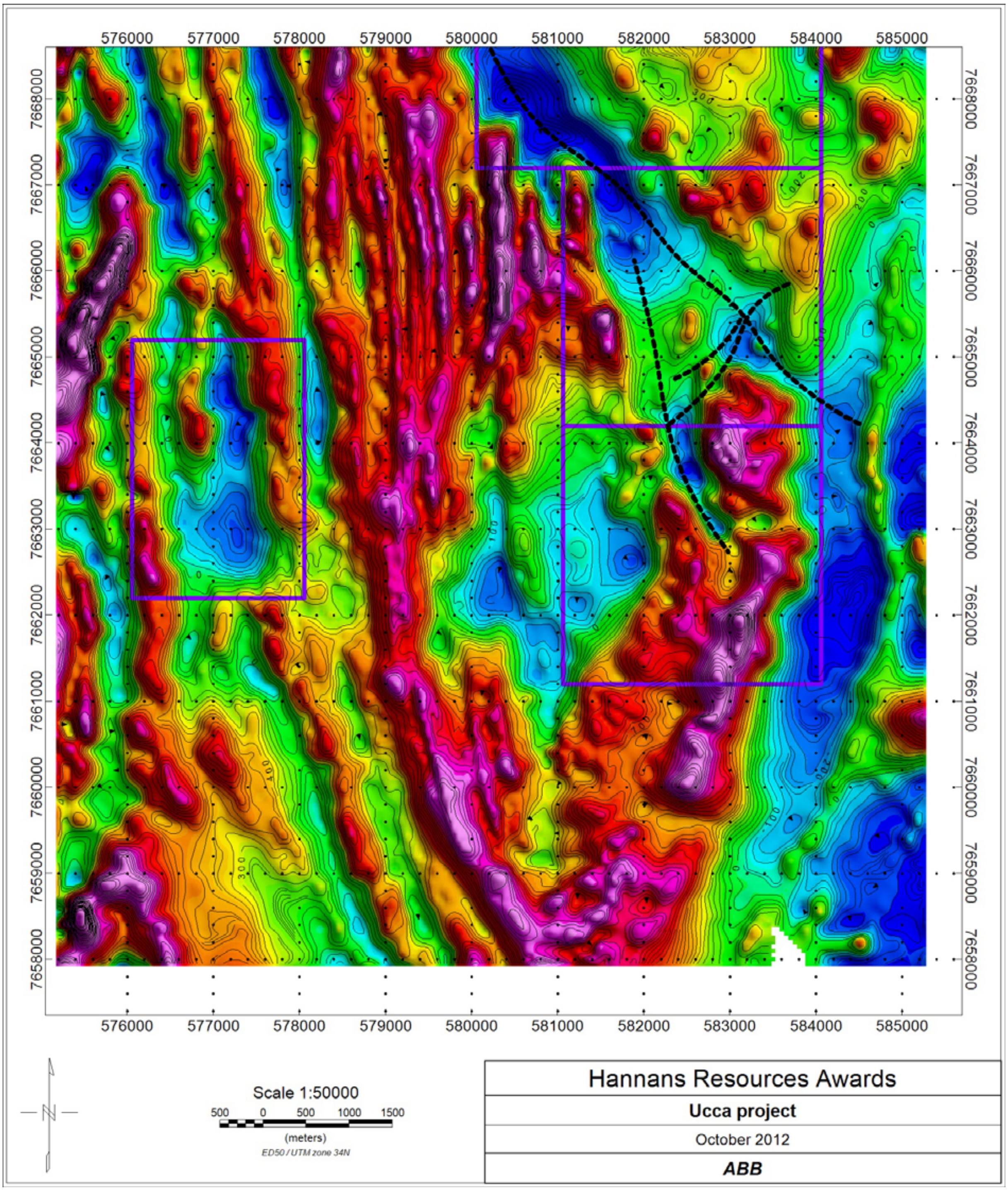

Fig. 31. Total magnetic field Uccavuovdas and Gæssamaras, and interpreted structures in the vicinity of the soil sampled area.

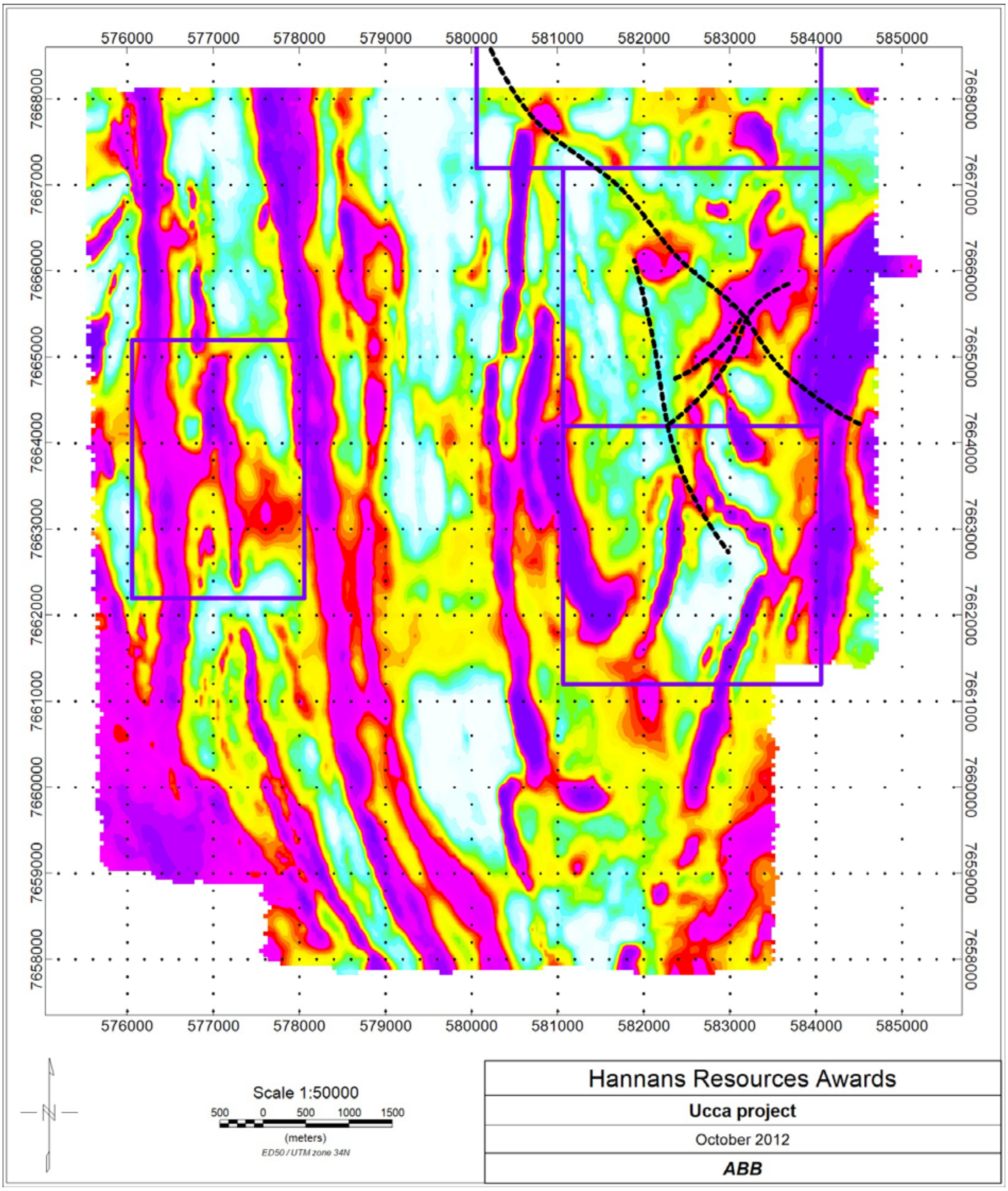

Fig. 32. Contoured resistivity map Uccavuovdas and Gæssamaras. Magenta represents low resistivity or high conductivity.

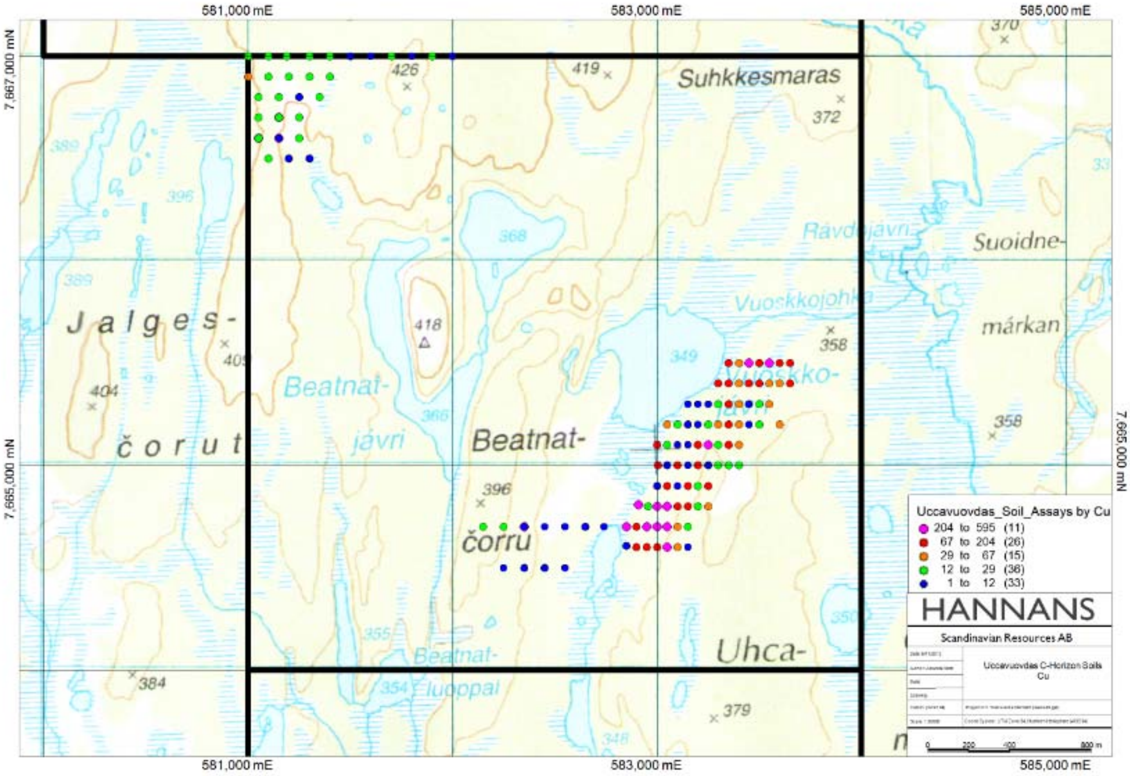

Fig. 33. Cu in soil samples Uccavuovdas.

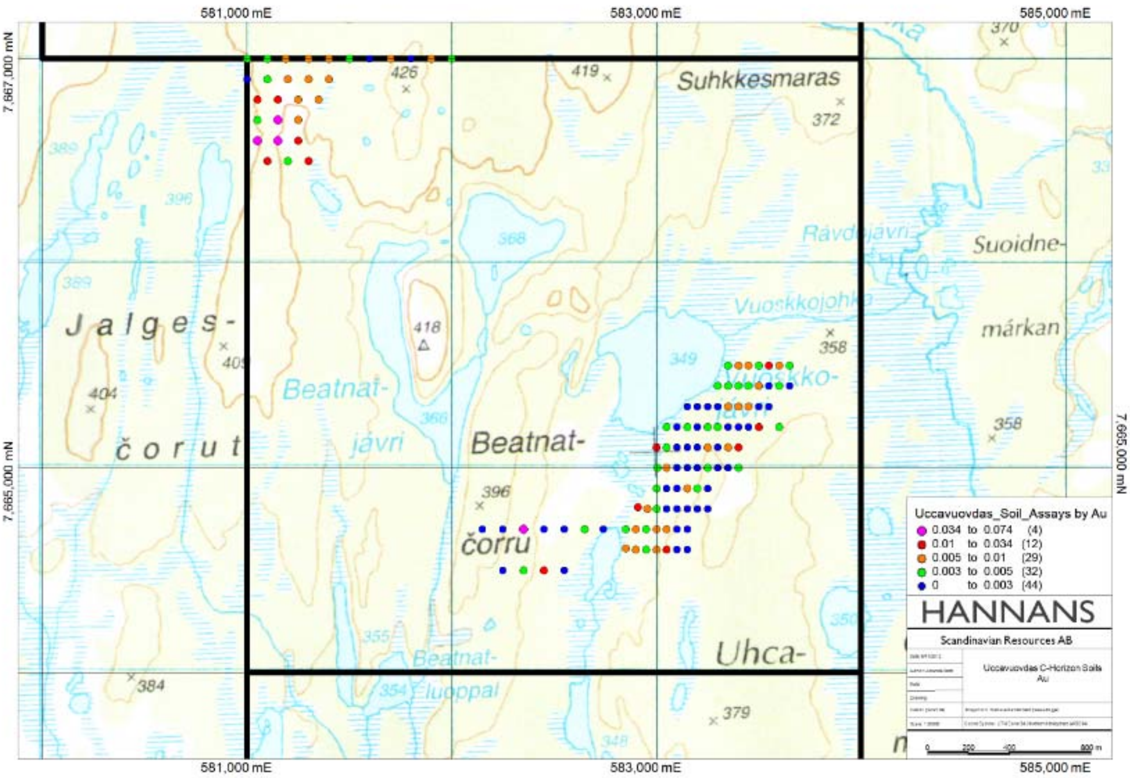

Fig. 34. Au in soil samples Uccavuovdas.

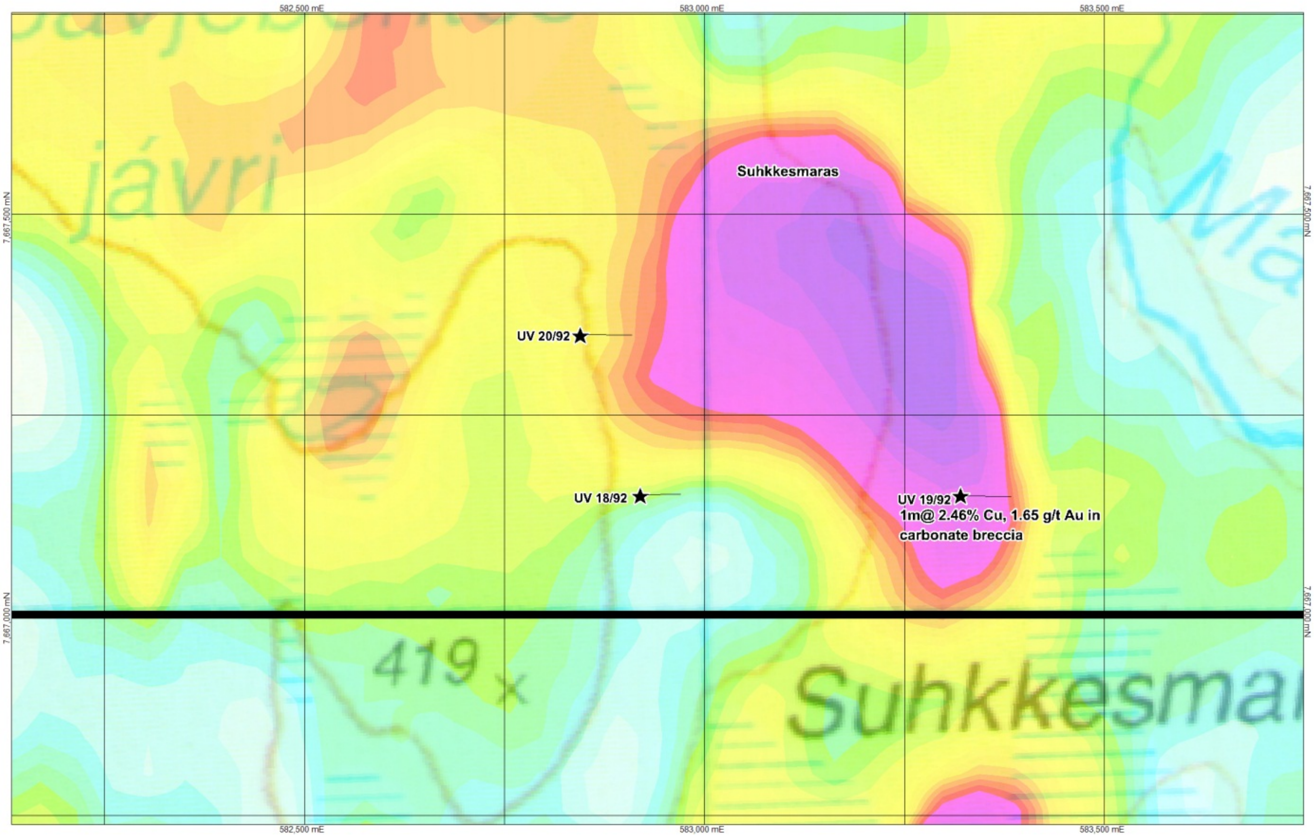

Fig. 35. Conductivity anomaly and diamond drill holes Suhkkesmaras.

6.2 Njivlojavri

The Cu-Au mineralisations within the Njivlojavri permits are previously described in Wilberg (2011c), and here only results from last year`s reconnaissance mapping and rock sampling will be treated.

Rock samples collected at the Suovrrajavri mineralisation:
KA12001 is albite felsite with quartz-ankerite-pyrite veining, low in Cu and Au (tab. 7).
KA12002 is an auriferous (1.37 g/t Au and enhanced As, Co and Ni) quartz-carbonate-chalcopyrite vein which is 4 cm thick. It is subparallel to bedding in mafic tuffite which also hosts `breccia`-veining of similar veins (Wilberg 2011c).

Additional mineralisation were discovered in the western diabase, north of the NW-SE quartz veins in fig. 13 in Wilberg (2011c): This generally unaltered diabase is chlorite altered and contains rich dissemination of fine-grained magnetite, and minor pyrite and chalcopyrite (KA12004) along the contact to overlying tuffite. Here the diabase also carries veins, up to 10 cm wide, of quartz-carbonate-chalcopyrite (KA12005), dominantly of N-S and NE-SW directions. Both samples show low gold grades.

Observations northwards towards Suovrravarri:
565262 7692688: Small outcrop of quartz-chalcopyrite vein in diabase.
565230 7692981: Frequent argillite floats.

565178 7693074: Exposed diabase with E-W running quartz-carbonate-chalcopyrite veins (KA12006). Low in gold.
565222 7693254: Outcropping greenschist/tuffite. 342°/50°.
565197 7693457: Altered diabase with weak chalcopyrite dissemination.
565249 7693389: Outcrop of albite-carbonate ± chlorite altered diabase. Floats of massive chalcopyrite. Viscaria Alpina.
Chalcopyrite mineralised floats found along the ridge all the way to 565269 7693890, where it is a 3 cm thick quartz-carbonate-chalcopyrite vein (KA12007, 0.25 g/t Au) in subcrop of pervasively carbonate-albite altered diabase.

Outcrop of the mineralised diabase east of the detailed mapped area (Wilberg 2011c), at 565419 7692552, shows a new zone of pervasive alteration. Further east an extensive N-S running depression follows the eastern extensive soil gold anomaly (Wilberg 2011c).

South of the deatail mapped area at Suovrrajavri, and along the same gold-geochem anomaly, the diabase hosts a few up to 10 cm wide quartz veins with traces of sulphides between 565340 7691938 and 565330 7692012.

Observations SE and NE of the Suovrrajavri mineralisation:
565762 7692002: Argillite horizon within the tuffite.
565691 7692289: Small diabase lens with N-S quartz vein.
566251 7693591: Irregular quartz-carbonate-chalcopyrite vein (KA12008, 0.29 g/t Au) in pervasively carbonate-albite altered diabase. Also pervasively altered diabase at the west side of the valley. Towards the NNE thin horizons of fine-grained magnetite occur at various stratigraphic levels within the tuffite.
566295 7693656: Area of pervasively carbonate-albite altered rocks, mainly tuffite, which is brecciated with ankerite veining (fig. 37).
566368 7693570: Local and few-cm thick rich chalcopyrite dissemination within 1 m wide albite rich rock. Carbonate dominated alteration outside of this layer.

Outside of our permit area, at UTM 567041 7693723, ASPRO target \`Area 22\`, dolomite breccia with fragments of graphite schist and locally chalcopyrite-chalcocite(+malachite) mineralisation (fig. 36) was detected.
North of our permit area, at UTM 566647 7695954, the Suovrarrahppat Øst mineralisation was visited. It consists of dissemination and veins of chalcopyrite in albite felsite and graphite schist (35°/40°).

Daccavarri (ASPRO\`s \`Area 56 and 57\`):
566214 7685382: 0.5 m wide rust zone, bleached, with pyrite dissemination in mafic tuffite (KA12003) 5 m west of contact to diabase.
566204 7685288: Unaltered and magnetic diabase.
566288 7685572: Chalcopyrite-pyrite dissemination, and malachite, in mafic tuffite.
No outcrops found along the conductor.

Previous recommendations (Wilberg 2011c) should be conducted, including geological mapping of the entire permit area, and extended soil sampling and ground geophysics.

SAMPLE	UTMeast	UTMnorth	UTMzone	Au	Cu	As	Co	Ni	Fe	S
				ppm	%	ppm	ppm	ppm	%	%
KA12001	565372	7692409	34	<0.01	0,009	5	29	39	2,89	0,18
KA12002	565351	7692418	34	1,37	17,05	2160	1300	604	21,8	8,66
KA12003	566214	7685382	34	0,02	0,248	13	31	23	7,04	0,63
KA12004	565240	7692618	34	0,1	0,633	98	239	109	19,55	1,28
KA12005	565242	7692617	34	0,07	12,45	10	44	36	13,4	7,9
KA12006	565178	7693074	34	0,03	1,1	7	6	10	3,47	0,75
KA12007	565269	7693890	34	0,25	2,84	10	19	13	7,09	2,11
KA12008	566251	7693591	34	0,29	15,05	14	585	67	14,25	9,42

Tab. 7. Assay results rock samples Njivlojavri.

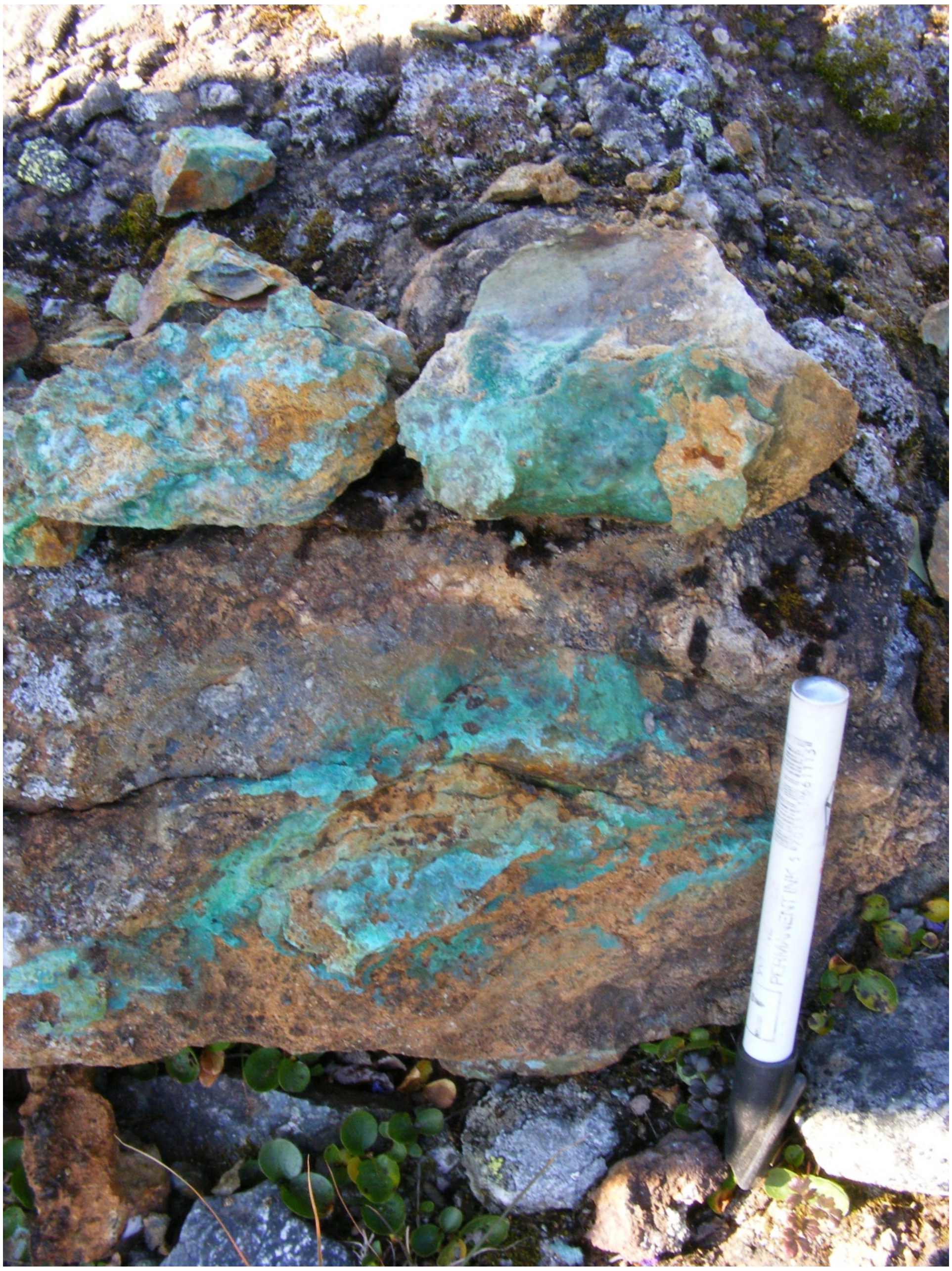

Fig. 36. Dolomite breccia with fragments of graphite schist and chalcopyrite-chalcocite(+malachite) mineralisation. UTM 567041 7693723.

Fig. 37. Brecciated albite altered tuffite with ankerite veining from Njivlojavri , UTM 566295 7693656 (upper), and similar rock in boulder displayed at the Bidjovagge mine site (below).

6.3 Ragatmaras

The Ragatmaras target, which is accessed by a c. 13 km long (1 hour) ATV ride from Aksomuotki, is previously described by Anttonen & Nessvoll (1993) and Wilberg (2011c). Last year`s work included one day reconnaissance mapping. A major part of the permit area is till covered and no sign of mineralisation were detected.
The following outcrops were localised:

572534 7634776: Quartzitic muscovite-biotite shist (siltstone). 54°/58°.
572355 7634366: Banded amphibolite (Bidjovagge type), calcareous and magnetic. 50°/65°.
572334 7635457: Conglomerate.
572379 7636043: Large outcrop, previously mapped as granite. Probably recrystallized quartzite. Approximately 200 m to the north: amphibolite (30°/85°).
572573 7636508: Conglomerate and minor chlorite-biotite schist. 40°/80°.
572680 7636745: Dark grey, fine-grained sediment with thin (1-2 mm) amphibolite bands. 30°/65°.
572770 7636869: Biotite-rich sediment. Magnetic. 25°/62°.
573007 7637572: White calcite marble. 330°/90°.

The location of diamond drill hole no 4 (270°/55°) from 1990 was relocated at UTM 573195 7638005.

As priority should be laid on Njivlojavri and Uccavuovdas, no follow-up is proposed for Ragatmaras coming field season.

7 Nordkapp and Snefjord rare-metal till anomalies, and Honningsvåg Cu-Ni

7 permits cover an area of 70 km² at Nordkapp, Magerøya and 6 permits totalling 60 km² at Snefjord (fig. 38). The reason for the claiming is anomalously high concentrations of REE and a suite of elements (exemplified by Sn in fig. 39) in regional till samples (one sample per 30-40 km²) within a large area covering the Nordkinn and Sværholt peninsulas (claimed by other companies), and Nordkapp and Snefjord (Reimann et al. 2011). Follow-up till sampling (one sample per 2 km²) was carried out by NGU at Nordkinn in 2011 (Reimann et al. 2012).
The Nordkapp and Snefjord areas are generally higher in As, Sc, Sn (fig. 39), W, Nb, Be, Th and U and lower in Zr compared with Nordkinn and Sværholt.

The Nordkapp and Snefjord licenses are underlain by dominantly metasedimentary (psammites and pelites) successions belonging to two nappe units, the Magerøy Nappe and the Kalak Nappe Complex respectively.
The Kalak Nappe Complex overlies the Laksefjord Nappe Complex along a major thrust and covers large areas of northern and western Finnmark (fig. 40). It has been subdivided into 13-14 thrust sheets, or nappes, the highest of which includes the voluminous rift-related Seiland Igneous Province (Roberts 2007).

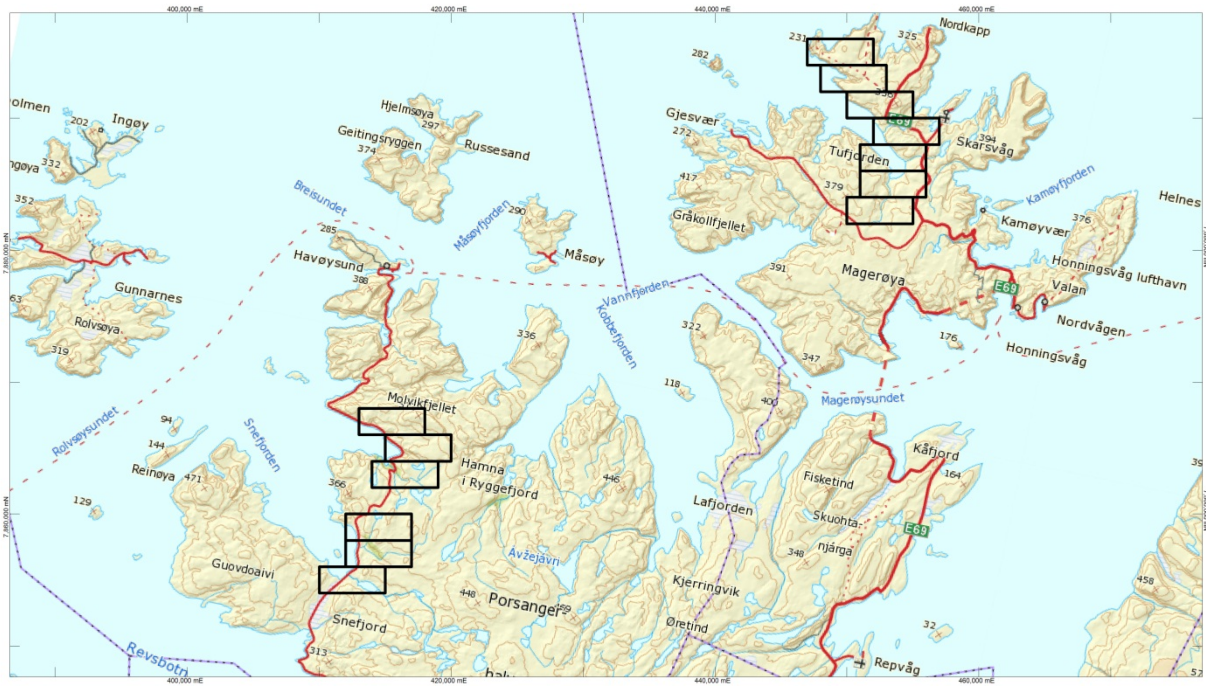

Fig. 38. Nordkapp and Snefjord permits.

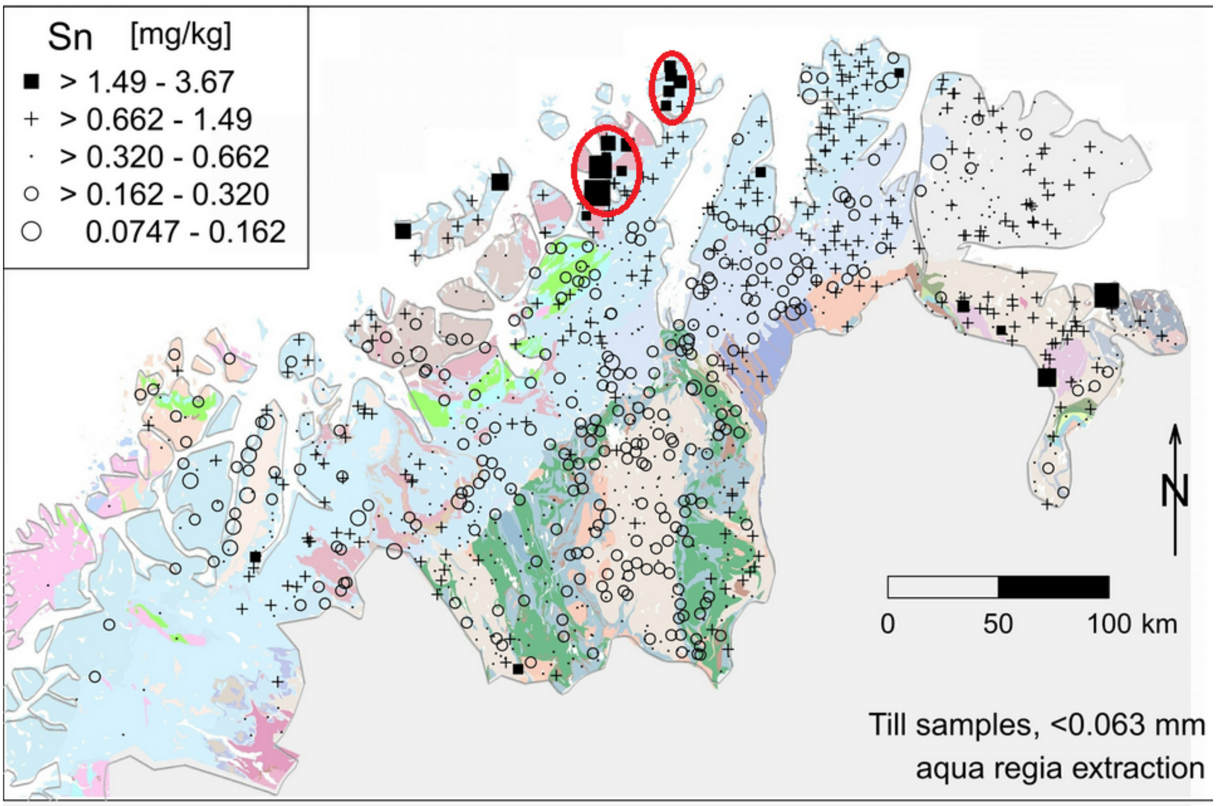

Fig. 39. Sn in till samples, NGU, Finnmark and Troms. From Reimann et al. (2011).

The Silurian Magerøy Nappe overlies the Kalak Nappe Complex and was thrust onto the Sørøy-Seiland Nappe during the early Silurian Scandian event (Andersen 1981). The Honningsvåg Intrusive Suite is intrusive into the rocks of the Magerøy Nappe, the youngest supracrustal rocks exposed in Finnmark. These include an approximately 5.5 km thick sequence of flysch-type metasediments and syn-orogenic granites in addition to the mafic/ultramafic Honningsvåg Intrusive Suite. The Magerøy Nappe lithologies underwent polyphase deformation and greenschist to amphibolite facies metamorphism during nappe emplacement in the Silurian – Early Devonian Scandian phase. The tectonothermal Scandian event also affected the Kalak lithologies that are separated from the Magerøy Nappe by a thick package of amphibolite facies mylonites.

A feature of a large number of the Neoproterozoic sandstone beds, mostly on the Nordkinn- but also recorded on the Sværholt peninsula, is the enrichment of laminae and foreset strata in a variety of heavy minerals, including Ti-magnetite, titanite, rutile and zircon (Roberts & Andersen 1985). Roberts & Andersen (1985) states that titanomagnetite is in certain layers in fact a major mineral, which could mean that it is a potential for also rare-metal heavy mineral concentrates in these rocks.

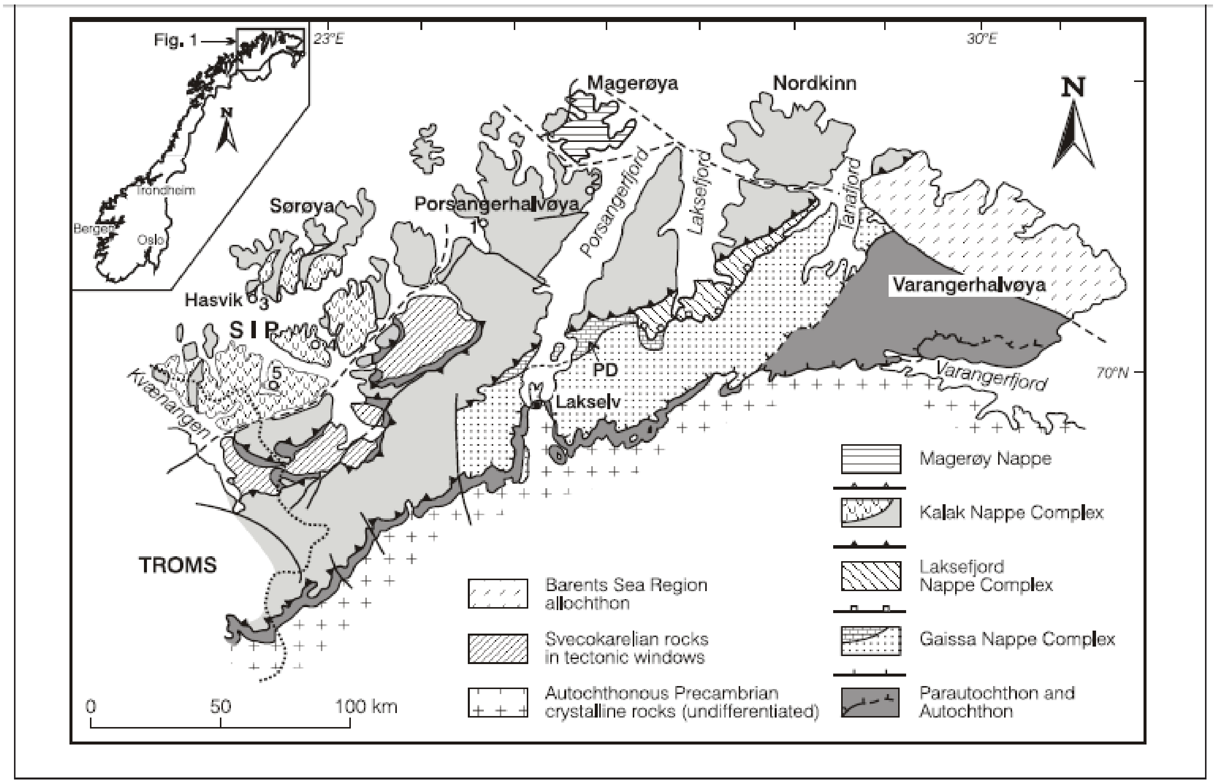

Fig. 1. Simplified tectonostratigraphy of the Caledonides of Finnmark (modified from Roberts 1985). The five small circles numbered 1-5 mark the locations of the samples dated by Daly et al. (1991), the first three of which formed the basis for their introduction of the term 'Porsanger orogeny'. 1. Litlefjord metagranite, U-Pb zircon 804 ± 19 Ma (now revised to 850 ± 15 Ma, Kirkland & Daly 2003). 2. Repvåg metagranite, Rb-Sr whole rock 851 ± 130 Ma. 3. Hasvik gabbro, Sm-Nd whole rock/minerals 700 ± 33 Ma (now revised, with a U-Pb zircon, Vendian age, R.J. Roberts, pers. comm. 2002). 4. Kvalfjord gabbro, Sm-Nd whole rock/minerals 612 ± 33 Ma. 5. Storvik gabbro, Sm-Nd whole rock/minerals 604 ± 44 Ma. PD – principal areas of outcrop of the Porsanger Dolomite (Formation). SIP – Seiland Igneous Province (V ornament).

Fig. 40. Simplified tectonostratigraphy of the Caledonides of Finnmark. From Roberts (2003).

Reconnaissance mapping was carried out at Nordkapp and Snefjord early field season 2012 with still some snow cover. This revealed immature Caledonian Nappe sediments (greywacke and schists) and minor quartzite beds. No heavy mineral concentrate layers were observed. Scintillometer surveying was also conducted due to anomalous U and Th in till. Radiation was very low.
Due to the negative mapping no rock- or sediment sampling were conducted.

Olesen et al. (2012) postulate that deep weathering processes may explain some of the anomalous high concentrations of heavy metals and REE in Fennoscandian till, and provide a possible explanation for the till anomalies at Nordkinn, caused by tropical weathering where the overburden may represent a glacially reworked saprolite. The observed anomalous high concentrations of REEs and heavy metals such as Cr, Ni, Mo, Zn and Pb (Reimann et al. 2011, 2012) can be partly caused by a weathering process where main elements such as K, Na and Ca have been partly removed by leaching. Similar geochemical patterns with reduced concentrations of main elements and increased concentrations of heavy metals and REEs in till relative to the adjacent bedrock have also been reported in southeastern Norway (Roaldset 1975, Reimann et al. 2007).

Rust staining within olivine gabbro of the Honningsvåg Intrusive Suite, along the road cut west of Storbukta attracted attention and one rock sample was collected (NO12001) from a 1 m wide massive-sulphide dyke or cumulate layer. Pyrrhotite is the major sulphide, with subordinate chalcopyrite and pentlandite. The sample assayed 0.73 % Cu, 0.32 % Ni and 844 ppm Co.

The Honningsvåg Intrusive Suite consists of several layered mafic/ultramafic intrusions and a transgressive body of igneous breccia that appears to represent a magma conduit (Robins 1998). Cross-cutting relationships show that the magma chambers – evolved by fractional crystallisation, assimilation of country rocks and periodic replenishment – were not active simultaneously but were emplaced sequentially, generally at successively higher structural levels. The sulphide showing at Storbukta occurs within Intrusion 5 of the Honningsvåg Intrusive Suite (Lundgaard et al. 2002).

It is recommended no follow-up on the till anomalies at Nordkapp and Snefjord. The Cu-Ni mineralisation in the Honningsvåg Intrusive Suite is worth a closer look next field season.

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