Antinoja

Occurence type: occurrence

Commodity	Rank	Total measure	Total production	Total resource	Importance
gold	1	NA	NA	NA	NA
copper	2	NA	NA	NA	NA
silver	3	NA	NA	NA	NA

Easting EUREF: 362884,414
Northing EUREF: 7087738,094

Easting YKJ: 3363001
Northing YKJ: 7090708

Discovery year: 1981
Discovered by: Outokumpu Oy
Province: Laivakangas (Au, Cu)
Comments: Discovery by Outokumpu: arsenopyrite- and chalcopyrite-rich glacial erratic boulder with 0.36% Cu and 129 ppm Au, found by an amateur prospector led Outokumpu to the mineralisation

References: 1, 4, 5

Mineral deposit type

Group: Metallogenic deposit
Main type: Orogenic (metamorphic hydrothermal)
Comments: Orogenic "mesothermal" deposit. Factor analysis of lithogeochemical data suggests that Au mineralisation is unrelated to As-Cu-Co mineralisation in the area.
References: 4

Dimension

Expression: exposed
Form: discordant
Shape: NA
Length (m): NA
Width (m): NA
Thickness (m): NA
Depth (m): NA

Area (ha): NA
Dip azim: NA
Dip: NA
Plunge azim: NA
Plunge dip: NA
Orientation method: NA

Holder history

Current holder: Magnus Minerals Oy
Years: 2022
Holding type: Application for exploration permit

Previous holders:

Company	Years	Holding type	Comments
Magnus Minerals Oy	2019	Reservation	NA
Belvedere Resources Ltd	2012-2015	Claim (old law)	NA

Belvedere Resources Ltd	2003-2009	Claim (old law)	NA
Outokumpu Oy	1981-1984	NA	NA

EXPLORATION ACTIVITY

Belvedere Resources Ltd

Years	Activity type	Geologist	Exploration result	Ref
2004-2004	core drilling	NA	key geological features	2, 11
	Five diamond-drill holes, in total 383 m			
	Intersections			
	HoleID	ANT002		
	From-To	102,3-102,9		
	Length	0,7m		
	silver	4,8ppm		
	gold	1,25ppm		
	copper	1,1%		

2003-2004	detailed geophysics	NA	geophysical anomaly	11
	Induced polarization (IP)/resistivity and magnetic surveys; IP anomalies are related to the mineralisation.			

2003-2003	excavation	NA	NA	2, 3, 11
	In total 119 pits; sampling and mapping of the bedrock and till samples from the bedrock interface			

Geological Survey of Finland

Years	Activity type	Geologist	Exploration result	Ref
1985-1985	regional geophysics	NA	NA	
	Low-altitude airborne magnetic, electromagnetic and radiometric survey			

1985-1988	detailed geology	NA	NA	12

1984-1988	regional geochemistry	E. Iisalo, M. Tenhola	geochemical anomaly	12
	Geochemical till survey around the Rautio granodiorite			

1984-1984	regional geochemistry	NA	NA	
	Countrywide regional geochemical till survey			

Outokumpu Oy

Years	Activity type	Geologist	Exploration result	Ref
1983-1983	excavation	Esa Sandberg, Markku Isohanni.	NA	4, 9, 10

1983-1984	core drilling	Esa Sandberg, Markku Isohanni.	NA	4, 9
	29 diamond-drill holes, total 2051 m, drilling profiles are 50-100 m apart.			
	Intersections			
	HoleID	KNS/AN-11		

	From-To	NA
	Length	8m
	gold	1,3ppm
	HoleID	KNS/AN-14
	From-To	NA
	Length	1,3m
	gold	10,5ppm
	HoleID	KNS/AN-15
	From-To	NA
	Length	8,2m
	gold	2,2ppm
	HoleID	KNS/AN-3
	From-To	NA
	Length	3,2m
	copper	0,62%
	HoleID	KNS/AN-5
	From-To	NA
	Length	2,1m
	copper	0,79%

1982-1982	detailed geophysics	Esa Sandberg, Markku Isohanni.	NA	4, 9
	IP anomalies are related to the mineralisation.			

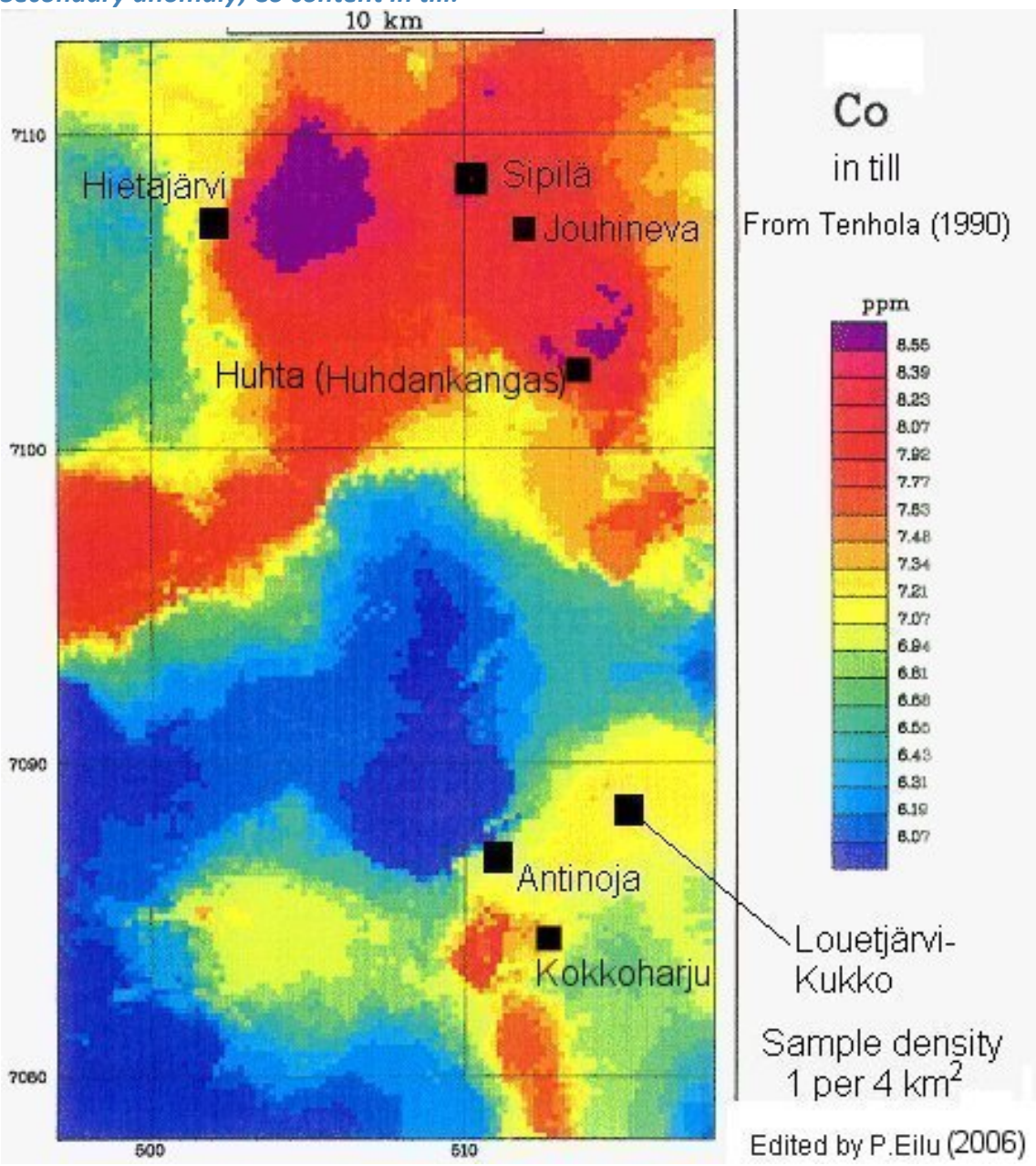
1981-1984	detailed geology	Esa Sandberg, Markku Isohanni.	NA	4, 9, 10
	arsenopyrite- and chalcopyrite-rich glacial erratic boulder with 0.36% Cu and 129 ppm Au, found by an amateur prospector led Outokumpu to the mineralisation			

1981-1983	percussion drilling	Esa Sandberg, Markku Isohanni.	NA	4, 9, 10

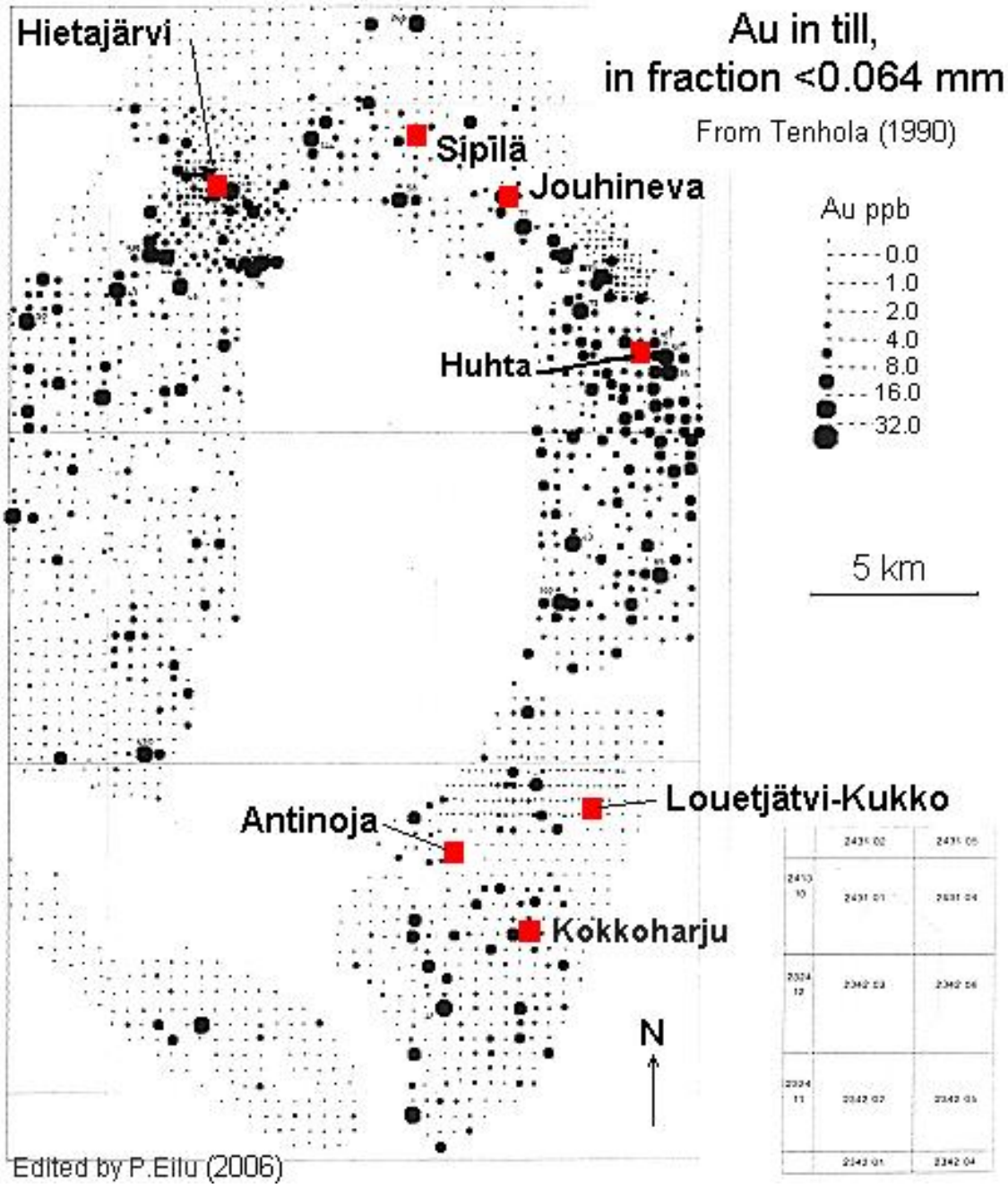
1981-1983	detailed geochemistry	Esa Sandberg, Markku Isohanni.	NA	4, 9, 10
	Gold, As, Cu and Sb anomalies in till.			

Figures

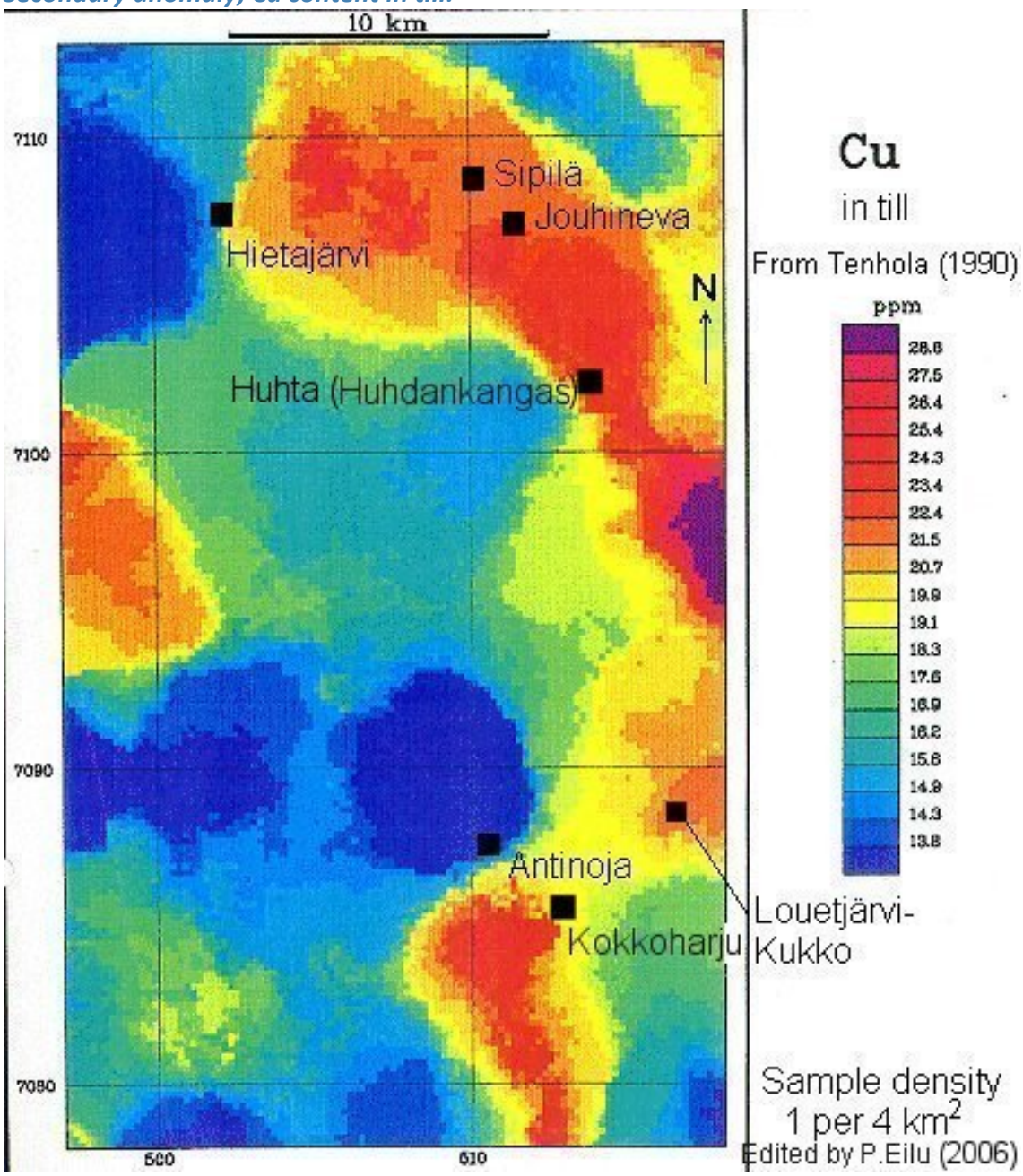
Secondary anomaly; Co content in till:



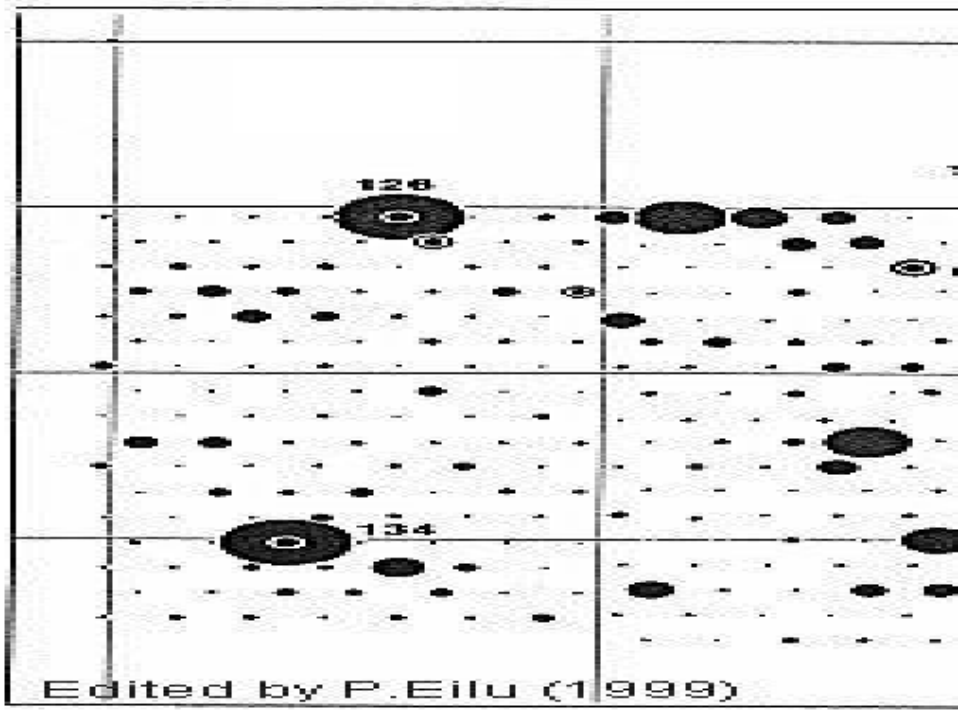
Secondary anomaly; Au content in till:



Secondary anomaly; Cu content in till:



Secondary anomaly; Au content in till:



Gold in till in the Antin
between the hos

GEOLOGY

Host rock: Intermediate volcanic rock, Mafic volcanic rock

Intermediate volcanic rock (Host rock)

Rock type: Host rock
Proportion: major
Grain size: NA
Color: NA
References: 4

Metamorphic description:

Type:	Facies:	Degree:	Relation to mineralization:	Min P- Max P (kbar)	MIn T- Max T (°C)
Regional	amphibolite metamorphic facies	medium metamorphic grade	NA		

Mafic volcanic rock (Host rock)

Rock type: Host rock
Proportion: major
Grain size: NA
Color: NA
References: 2, 4, 6, 7, 8, 9, 10
Comments: A set of gold-rich zones within a broad zone of low-degree Cu mineralisation in mafic metalava in a N-S or NW-trending shear zone. The occurrence is near the SE contact between the synorogenic Rautio batholith and its wallrocks

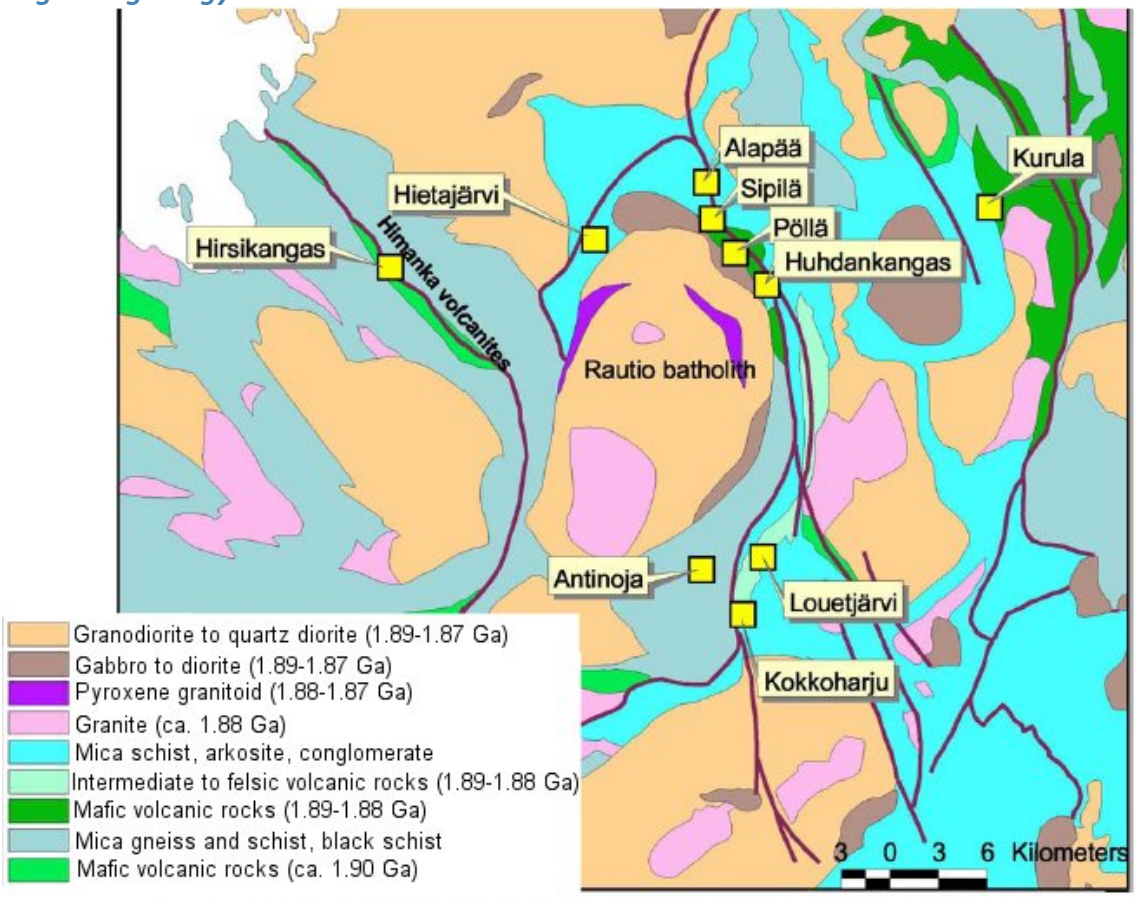
Metamorphic description:
Ore minerals:

Mineral	Proportion	Mineral texture
Arsenopyrite	major	
Chalcopyrite	minor	
Gold	present	
Pyrrhotite	minor	

Type:	Facies:	Degree:	Relation to mineralization:	Min P- Max P (kbar)	MIn T- Max T (°C)
Regional	amphibolite metamorphic facies	medium metamorphic grade	NA		

Figures

Regional geology:



Gold showings and occurrences in the vicinity of the Rautio batholith. Deformation zones (mostly shear zones) are shown by purple lines. Geology after Korsman et al. (1997).
Figure from Kontoniemi & Mursu (2006)

REFERENCES

1. Belvedere Resources Ltd. 2003. Press release 21/02/2003.

2. Belvedere Resources Ltd. 2004. Press release 06/10/2004.
http://tupa.gtk.fi/karttasovellus/mdae/references/355_Ollinsuo/355_Belvedere06_060102004.pdf

3. Belvedere Resources Ltd. 2004. Press release 20/04/2004.
http://tupa.gtk.fi/karttasovellus/mdae/references/312_Kopsa/312_Belvedere03_200404.pdf

4. Isohanni, M. 1984. Malminetsintätyöt Kannuksen Antiojalla. Outokumpu Oy, Report 001/2342/MAI/84. 10 p., 200 app. (in Finnish)
http://tupa.gtk.fi/raportti/arkisto/001_2342_mai_84.pdf

5. Korsman, K. (ed.) & Glebovitsky, V. (ed.) 1999. Raahe-Ladoga Zone structure-lithology, metamorphism and metallogeny: a Finnish-Russian cooperation project 1996-1999. Map 2: Metamorphism of the Raahe-Ladoga Zone 1:1000000. Geological Survey of Finland.

6. Mäkelä, M., Sandberg, E. & Rantala, O. 1988. Geochemical exploration of gold-bearing veins associated with granitoids in western Finland. In: D. R. MacDonald & K. A. Mills (eds) Prospecting in Areas of Glaciated Terrain - 1988: Papers presented at the Eighth International Symposium on Prospecting in Areas of Glaciated Terrain, Halifax, Nova Scotia, August 28 - September 3, 1988: Canadian Institute of Mining and Metallurgy. 255-270.

7. Mäkelä, M., Sandberg, E. & Rantala, O. 1988. Proterozoic, gold-bearing vein occurrences associated with the granitoids in western Finland. In: A. D. T. Goode et al. (comp.) Bicentennial Gold 88, Melbourne, Victoria, May 16-20, 1988: Extended abstracts. Poster programme. 1. Geological Society of Australia. Abstracts Series 23, 153-155.

8. Nurmi, P. A., Lestinen, P. & Niskavaara, H. 1991. Geochemical characteristics of mesothermal gold deposits in the Fennoscandian Shield, and a comparison with selected Canadian and Australian deposits. Geological Survey of Finland, Bulletin 351. 101 p.
http://tupa.gtk.fi/julkaisu/bulletin/bt_351.pdf

9. Sandberg, E. 1985. Kaivoslain 19 pyk. mukainen tutkimustyöselostus. Kannus, Antinoja, Antinoja 2. Outokumpu Oy, Report 080/2342/EAS/85. 4 p. (in Finnish)
http://tupa.gtk.fi/raportti/valtaus/3470.pdf

10. Sandberg, E. 1987. Kannuksen Antiojan ympäristön kullan raskasmineraalitutkimukset 1986. Outokumpu Oy, Report 063/2342 02, 05/EAS/87. 1 p. (in Finnish)
http://tupa.gtk.fi/raportti/arkisto/063_2342_02_05_eas_87.pdf

11. Strauss, T., 2009. Claim Relinquishment Report for the Antinoja Claims 7455/1, 7685/1, 7797/1, 7797/2, 7797/3. Belvedere Resources Finland Oy.

http://tupa.gtk.fi/raportti/valtaus/7455_1_7685_1_7797_1_3.pdf

12. Tenhola, M. 1990. Raution batoliitin geokemialliset tutkimukset vuosina 1984-1988, karttalehdet 2431 Ylivieska, 2342 Sievi, 2324 Kannus, 2413 Kalajoki. Geological Survey of Finland, Report S/41/2431/90. 27 p. (in Finnish)*http://tupa.gtk.fi/raportti/arkisto/s41_2431_90.pdf*