Aittoranta

Alternative Names: Iso-Aittojärvi
Occurence type: prospect

Commodity	Rank	Total measure	Total production	Total resource	Importance
gold	1	NA	NA	NA	NA

Easting EUREF: 599694,311
Northing EUREF: 7142810,238
Easting YKJ: 3599907
Northing YKJ: 7145801

Discovery year: 1992
Discovered by: private prospector
Province: Kuhmo (Ni, Ag, Au)
District: Kuhmo (Au)
Comments: A mineralised sample from outcrop indicated to GTK by an amateur prospector
References: 7, 8, 9, 10

Mineral deposit type

Group: Metallogenic deposit
Main type: Orogenic (metamorphic hydrothermal)
Comments: Clearly epigenetic, "mesothermal" mineralisation with a distinct structural control, formed during late-Archaean cratonisation. Fluid inclusions suggest a single-event mineralisation at about 2.5-3.5 kbar, 450-500°C.
References: 5, 6, 7

Dimension

Expression: exposed
Form: NA
Shape: NA
Length (m): 500
Width (m): 10
Thickness (m): NA
Depth (m): NA
Area (ha): NA
Dip azim: NA
Dip: NA
Plunge azim: NA
Plunge dip: NA
Orientation method: NA
Dimension comments: The mineralised zone may, in fact, comprise a set of narrow, parallel subzones

Holder history

Current holder: Mineral Exploration Network (Suomi) Oy
Years: 2019-2023
Holding type: Exploration permit

Previous holders:

Company	Years	Holding type	Comments

Mineral Exploration Network (Finland) Limited	2010-2011	Claim reservation (old law)	NA
Geological Survey of Finland	1992-2000	NA	NA

EXPLORATION ACTIVITY

Geological Survey of Finland

Years	Activity type	Geologist	Exploration result	Ref
1992-1999	detailed geology	Erkki Luukkonen.	key geological features	4, 7

1992-2000	detailed geochemistry	Erkki Luukkonen.	geochemical anomaly	4
	Au-As anomaly in till			

1992-1999	excavation	Erkki Luukkonen.	key geological features	4, 7

1992-1999	detailed geophysics	Erkki Luukkonen.	geophysical anomaly	4, 7

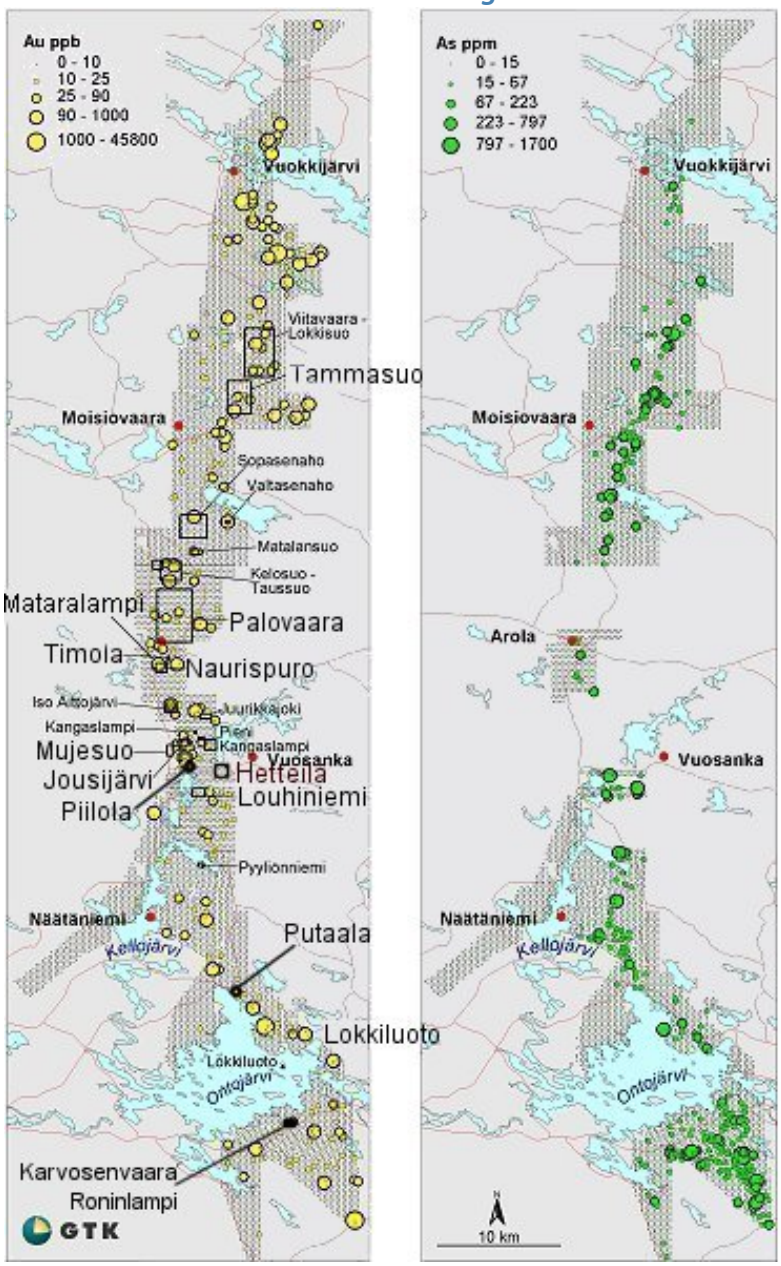
1992-1999	core drilling	Erkki Luukkonen.	mineral occurrences	7
	Core drilling (reconnaissance drilling): 5 diamond-drill holes.			

1990-2001	regional geochemistry	Markku Tenhola	geochemical anomaly	4
	Greenstone belt-wide till-geochemical survey with 16 samples per sq.km			

1986-1986	regional geochemistry	Markku Tenhola	geochemical anomaly	4
	Country-wide till-geochemical survey			

Figures

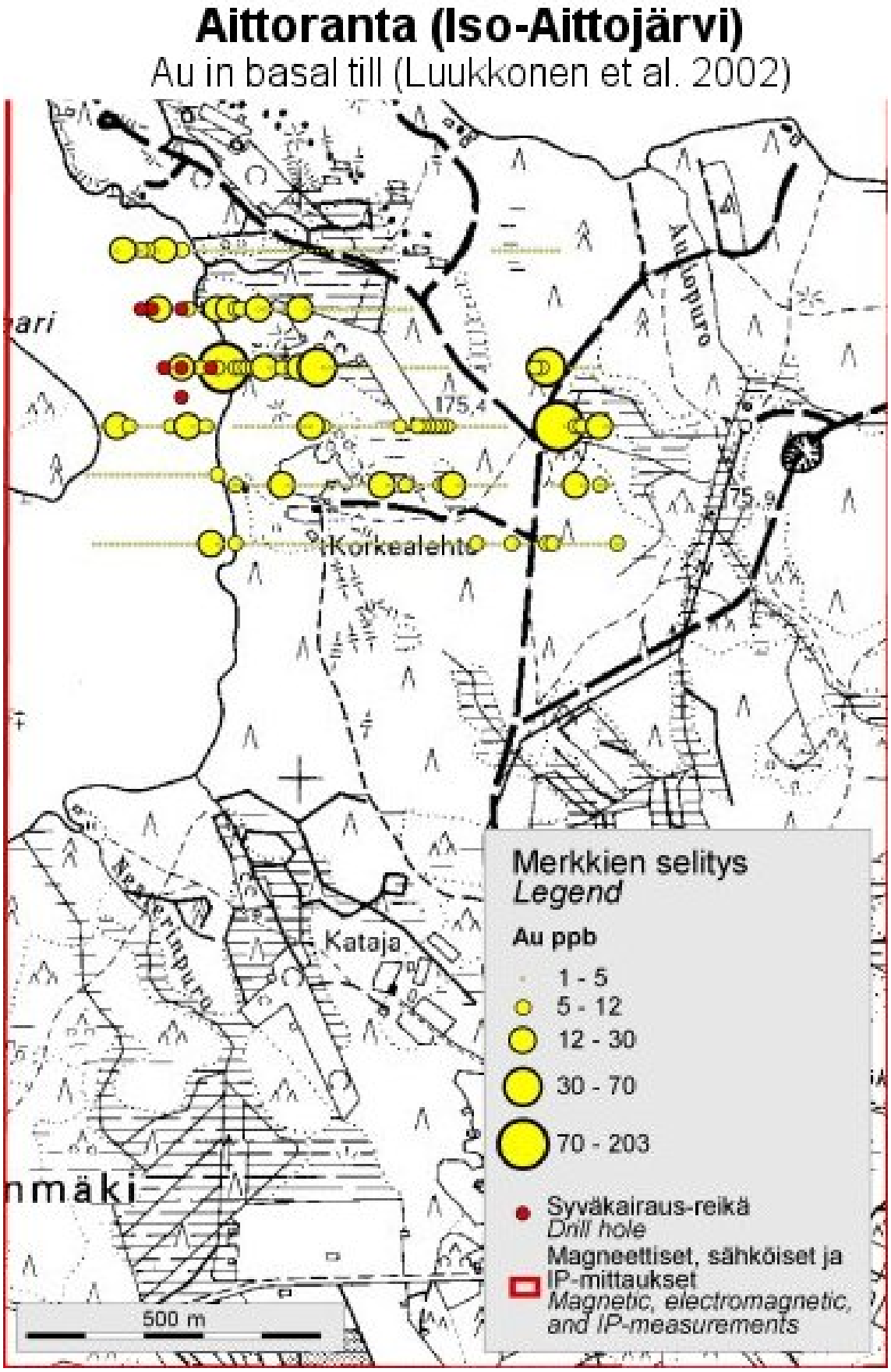
As and Au in basal till in the Kuhmo greenstone belt:



Kuhmo greenstone belt

As (ppm) and Au (ppb) in till
(Luukkonen et al. 2002)

Gold in basal till in the Aittoranta area:



GEOLOGY

Host rock: Mafic volcanic rock, Quartz vein, Schist, Komatiite

Mafic volcanic rock (Host rock)

Rock type: Host rock
Proportion: major
Grain size: NA
Color: NA
References: 1, 4, 7
Comments: The occurrence is defined by tourmaline-quartz veins and altered host rock, and located in the eastern margin of the main, N-trending shear zone of the greenstone belt

Ore minerals:

Mineral	Proportion	Mineral texture
Arsenopyrite	major	

Other minerals:

Mineral	Proportion	Mineral texture
Quartz	present	
Tourmaline	present	

Alteration:	Distribution:	Degree:	Relation to mineralization:
biotite alteration	NA	NA	Syn
tourmalinisation	NA	NA	Syn

Metamorphic description:

Type:	Facies:	Degree:	Relation to mineralization:	Min P- Max P (kbar)	MIn T- Max T (°C)
Regional	epidote amphibolite metamorphic facies	medium metamorphic grade	NA		
Comments: Transitional between greenschist and amphibolite facies. A very weak, unevenly distributed Palaeoproterozoic overprint.					

Geological age:

Geological era:	Max age - Minage (Ma):	Inferred age (Ma):	Age of mineralization:
Archean (4000-2500 Ma)	2500-4000		N
Comments: Mineralisation during ca. 2700-2650 Ma.			

Quartz vein (Host rock)

Rock type: Host rock
Proportion: minor
Grain size: NA
Color: NA

References: 7
Comments: Arsenopyrite-rich quartz-tourmaline veins up to 50 cm wide, quartz-tourmaline breccia

Other minerals:

Mineral	Proportion	Mineral texture
Arsenopyrite	minor	
Quartz	major	
Tourmaline	major	

Textures
Banded
Comments: Banded quartz-tourmaline veining

Schist (Host rock)

Rock type: Host rock
Proportion: minor
Grain size: NA
Color: NA
References: 1, 2, 4, 7

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		
Comments: Transitional between greenschist and amphibolite facies. A very weak, unevenly distributed Palaeoproterozoic overprint.					

Geological age:

Geological era:	Max age - Minage (Ma):	Inferred age (Ma):	Age of mineralization:
Archean (4000-2500 Ma)	2500-4000		N

Komatiite (Host rock)

Rock type: Host rock
Proportion: minor
Grain size: NA
Color: NA
References: 1, 2, 4, 7

Metamorphic description:

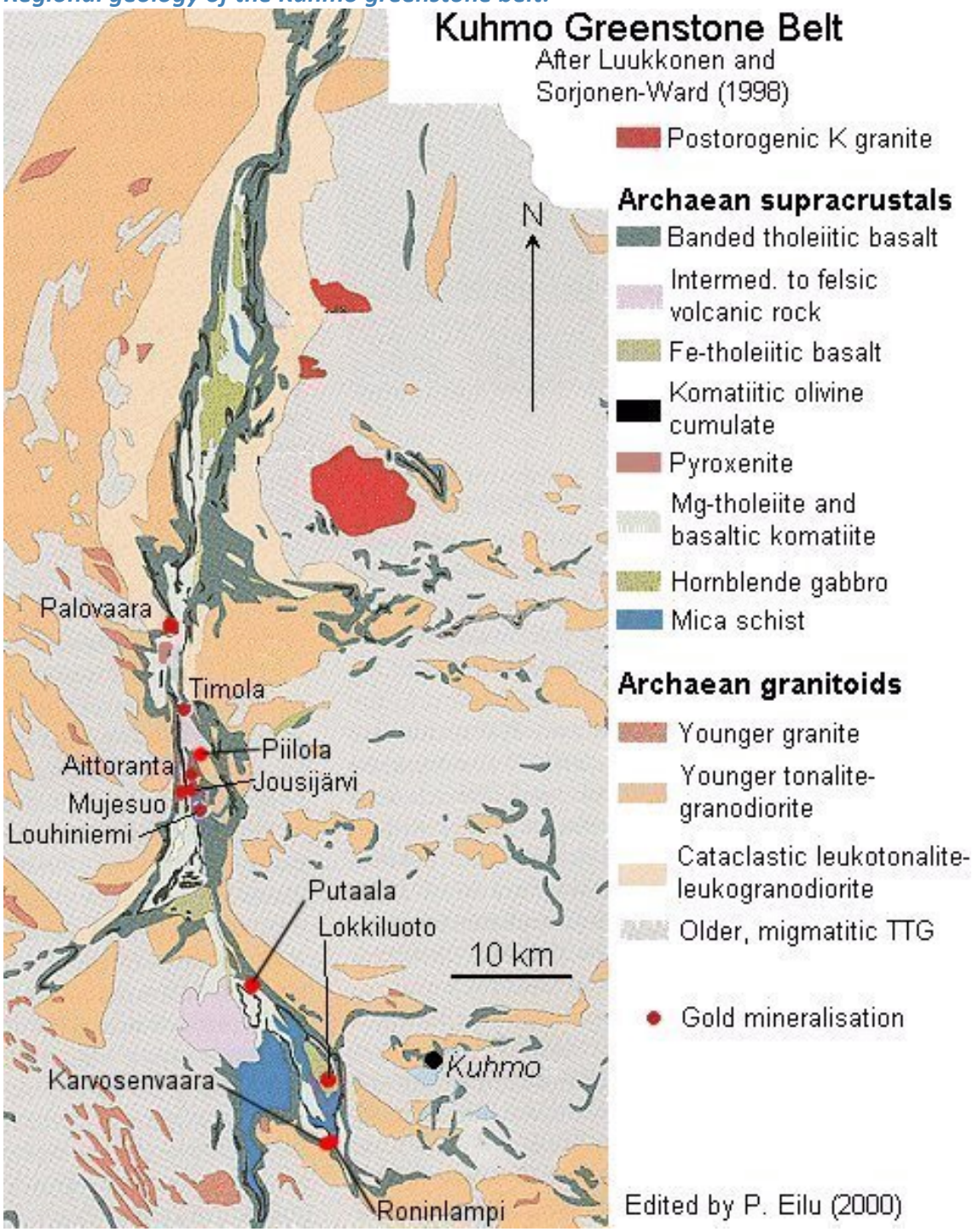
Type:	Facies:	Degree:	Relation to mineralization:	Min P- Max P (kbar)	MIn T- Max T (°C)
Regional	amphibolite metamorphic facies	medium metamorphic grade	NA		
Comments: Transitional between greenschist and amphibolite facies. A very weak, unevenly distributed Palaeoproterozoic overprint.					

Geological age:

Geological era:	Max age - Minage (Ma):	Inferred age (Ma):	Age of mineralization:
Archean (4000-2500 Ma)	2500-4000		N

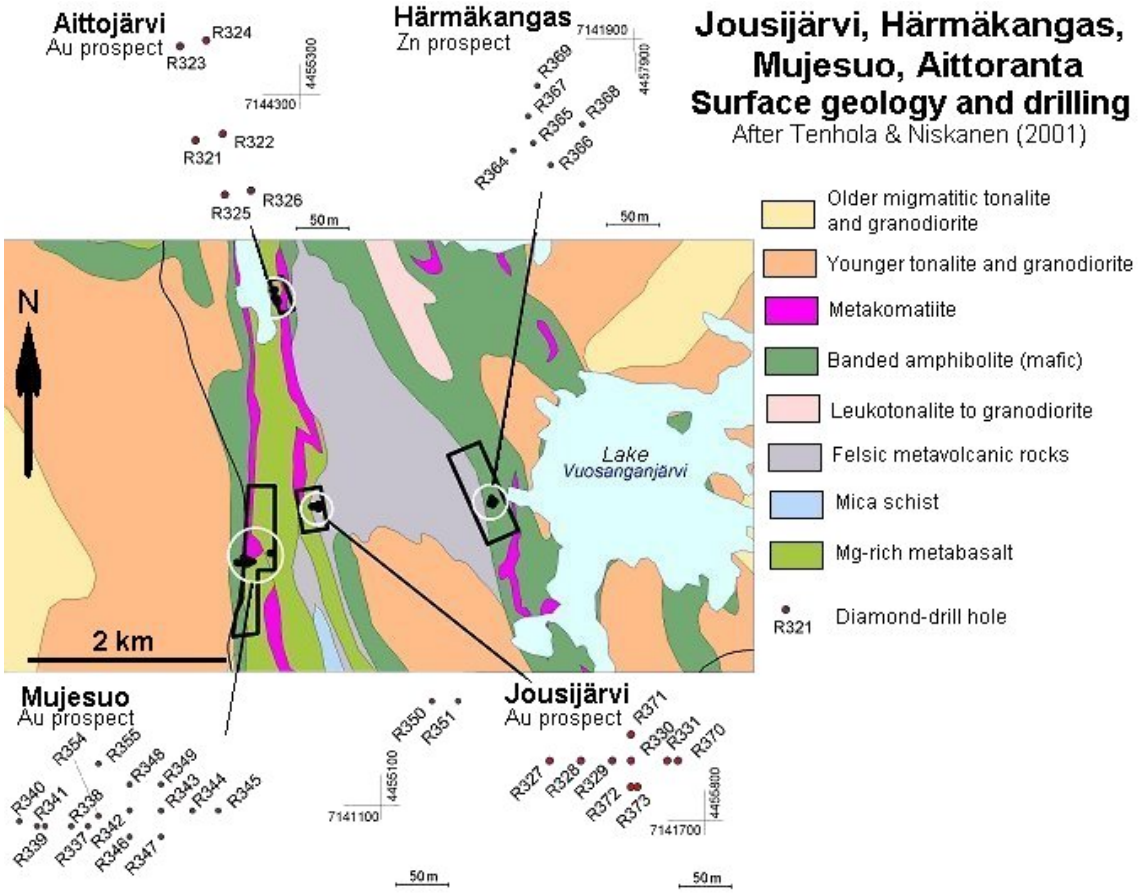
Figures

Regional geology of the Kuhmo greenstone belt:



Local geology of the Jousijärvi-Härmänkngas-Aittorenta-Mujesuo region, Kuhmo

greenstone belt:



Laminated, banded tourmaline-quartz vein from Aittoranta:

Folded, laminated, quartz-tourmaline vein from the Aittoranta gold mineralisation. The dominant ore mineral is arsenopyrite. Also alteration-related, green, calcic amphibole is present. Field of view 11 cm. Sampling by Pasi Eilu, in 1998. Photo Jari Väätäinen.

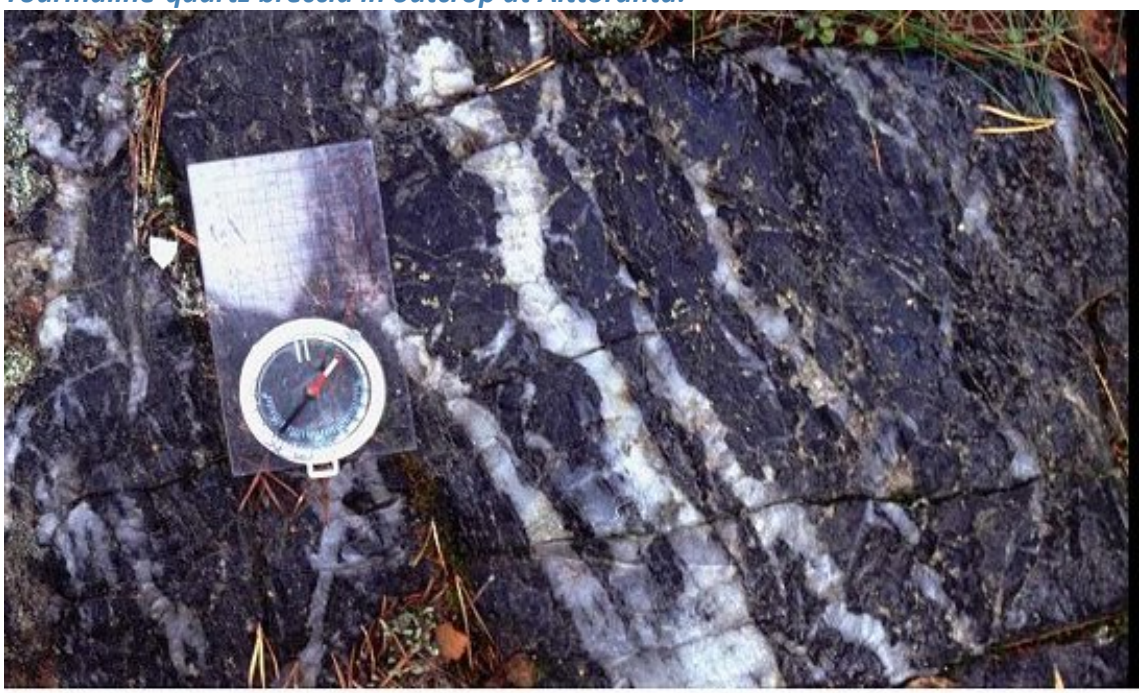
Tourmaline-quartz breccia at Aittoranta:

Intensely tourmalinised host rock with brecciating quartz veins from the Aittoranta gold mineralisation. Locally, Ca amphibole formed during alteration. Arsenopyrite both in veins and host rock. Field of view 8 cm. Sampling by Pasi Eilu, in 1998. Photo Jari Väätäinen.

Tourmaline-quartz breccia in outcrop at Aittoranta:

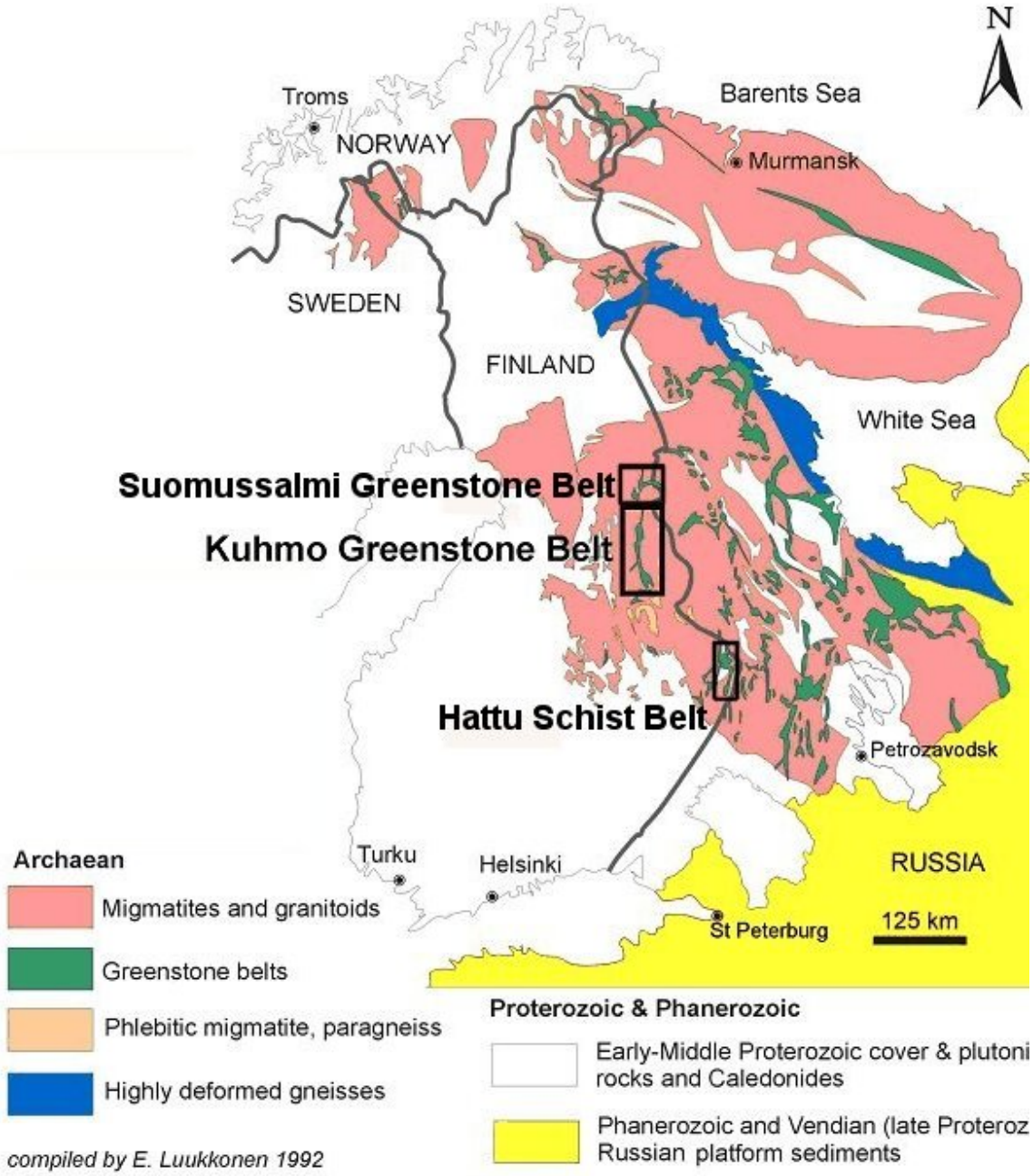
Auriferous quartz-tourmaline breccia, Aittoranta. Compass plate is 11 cm long. Photo Pasi Eilu 14/9/1998.

Tourmaline-quartz breccia in outcrop at Aittoranta:

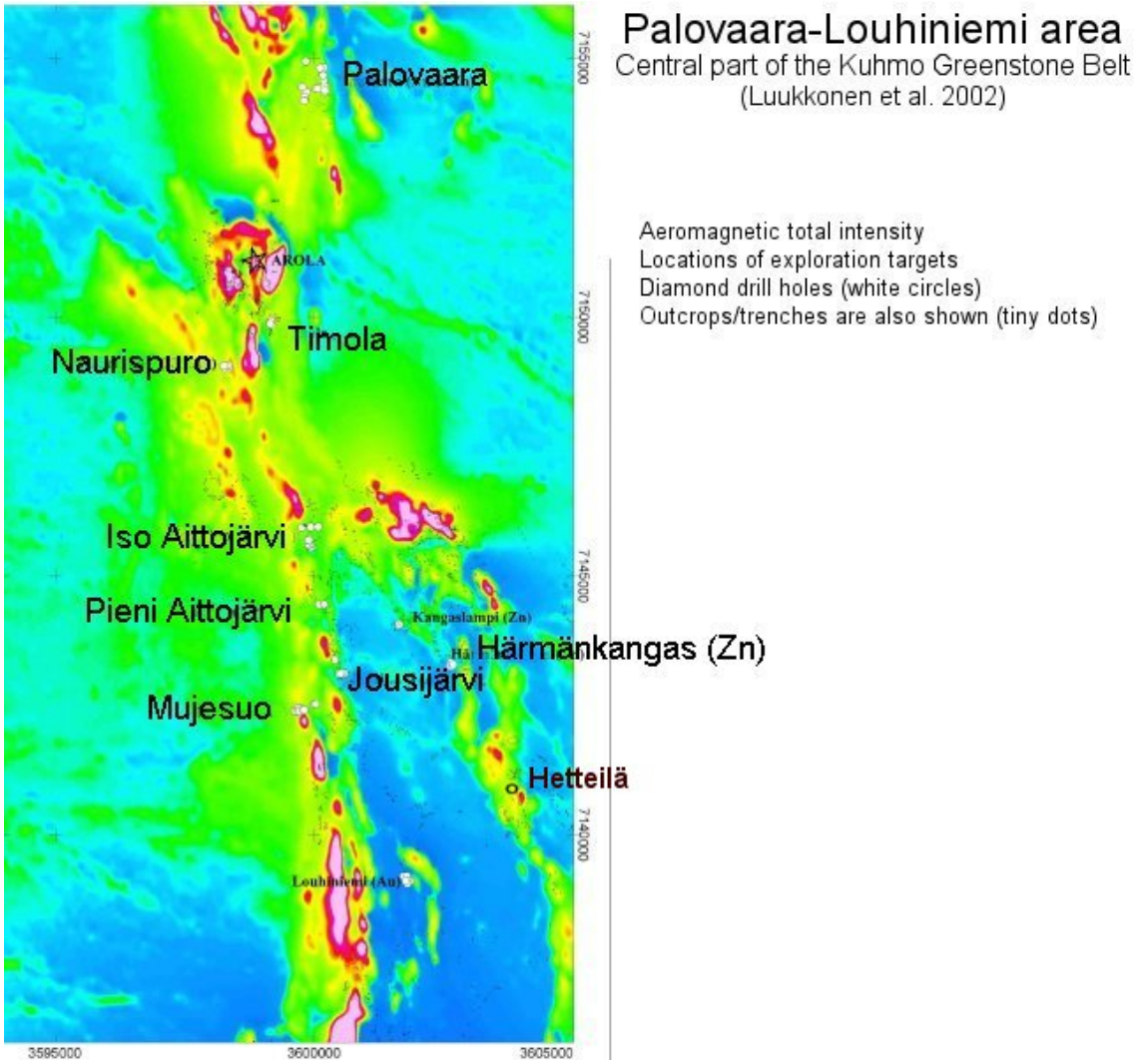


Auriferous quartz-tourmaline breccia, Aittoranta. Compass plate is 11 cm long. Photo Pasi Eilu 14/9/1998.

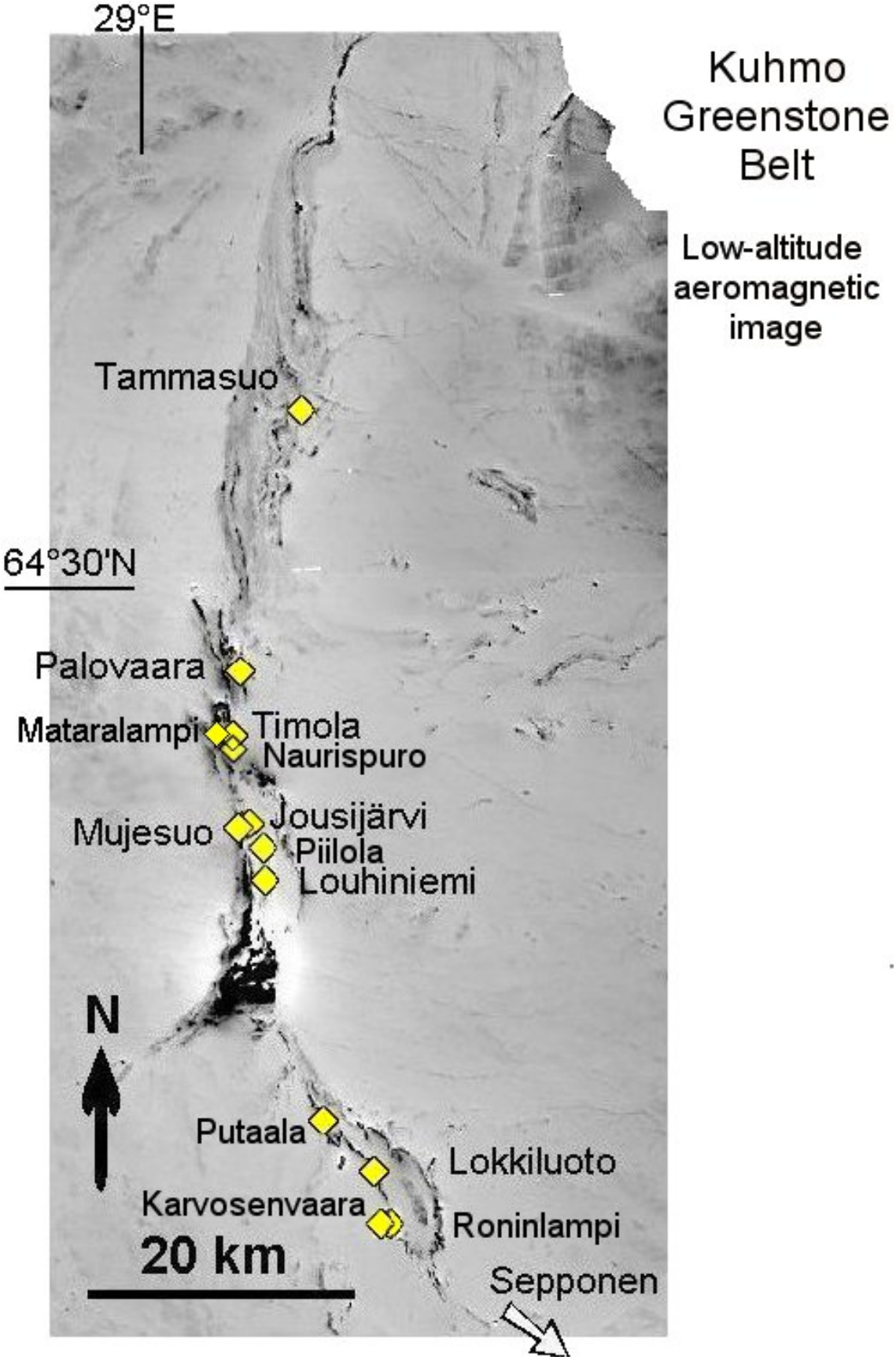
Ilomantsi, Kuhmo and Suomussalmi greenstone belts in the Carelian craton:



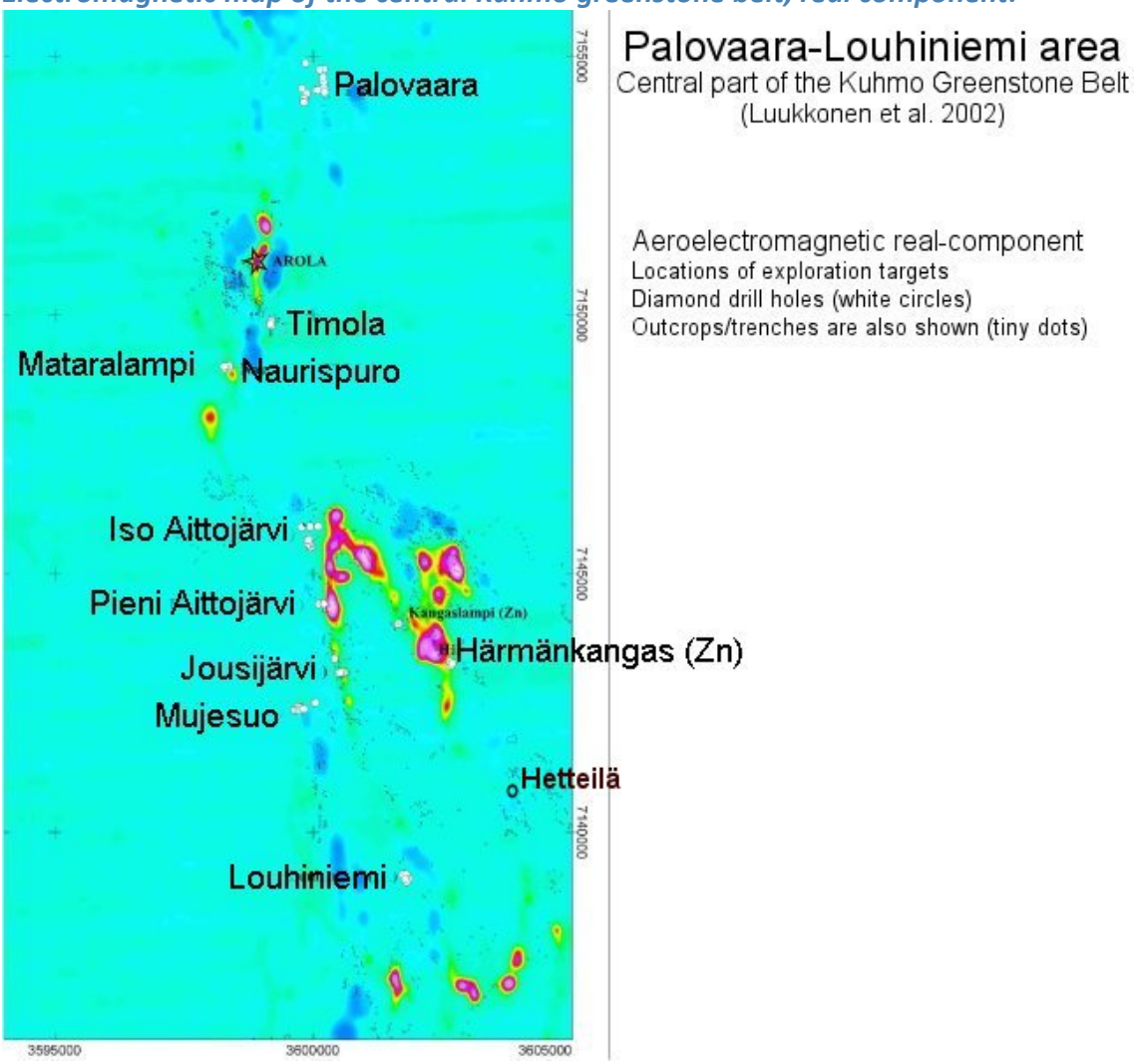
Aeromagnetic map of the central Kuhmo greenstone belt:



Aeromagnetic map of the entire Kuhmo greenstone belt:



Electromagnetic map of the central Kuhmo greenstone belt, real component:



REFERENCES

1. 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.

2. Luukkonen, E. 1998. Personal communication 27/10/98.

3. Luukkonen, E. 2001. Lentiiran kartta-alueen kallioperä. Summary: Pre-Quaternary rock of the Lentiira map-sheet area. Suomen geologinen kartta 1:100 000. Kallioperäkarttojen selitykset, 4414 + 4432 Lentiira. 68 p.*http://tupa.gtk.fi/kartta/kallioperakartta100/kps_4414_4432.pdf*

4. Luukkonen, E., Halkoaho, T., Hartikainen, A., Heino, T., Niskanen, M., Pietikäinen, K. & Tenhola, M. 2002. Itä-Suomen arkeeiset alueet -hankkeen (12201 ja 210 5000) toiminta vuosina 1992-2001 Suomussalmen, Hyrynsalmen, Kuhmon, Nurmeksen, Rautavaaran, Valtimon, Lieksan, Ilomantsin, Kiihtelysvaaran, Enon, Kontiolahden, Tohmajärven ja Tuupovaaran alueella. Geological Survey of Finland, Report M19/4513/2002/1. 265 p. (in Finnish)
http://tupa.gtk.fi/raportti/arkisto/m19_4513_2002_1.pdf

5. Luukkonen, E., Pajunen, M. & Poutiainen, M. 1992. Kuhmo-Suomussalmen alueen arkeeisen kallioperän rakenne-evoluutio ja Au-aiheet. In: E. Ekdahl (ed.) Suomen kallioperän kehitys ja raaka-ainevarat. Vuorimiesyhdistys, Sarja B, 51, 11-12. (in Finnish)

6. Papunen, H., Halkoaho, T., Liimatainen, J. & Luukkonen, E. 2001. Metallogeny of the Archaean Tipasjärvi-Kuhmo-Suomussalmi greenstone belt, Finland. AGSO - Geoscience Australia, Record 2001/37, 456-458.

7. Pietikäinen, K. 1998. Personal communication 14/9/98.

8. Poutiainen, M. and Partamies, S. 2003. Fluid inclusion characteristics of auriferous quartz veins in Archean and Paleoproterozoic greenstone belts of eastern and southern Finland. Econ. Geol. 98, 1355-1369.

9. Sorjonen-Ward, P. & Luukkonen, E.J. 2005. Archean rocks. In: Precambrian Geology of Finland - Key to the Evolution of The Fennoscandian Shield. Elsevier Science B.V., Amsterdam, 19-99.

10. Sorjonen-Ward, P., Nironen, M. & Luukkonen, E. 1997. Greenstone associations in Finland. In: M. J. de Wit and L. D. Ashwal (eds) Greenstone Belts. Clarendon Press, Oxford. 677-698.