Kedonojankulma, a recently discovered Palaeoproterozoic porphyry-type Cu-Au deposit in Southern Finland

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Intoduction

- Located in the Palaeoproterozoic Svecofennian Arc Complex (1.89-1.88 Ga) in Southern Finland
- Hosted by a subvolcanic, moderately to intensely altered quartz-plagioclase porphyrite, a rhyodacitic phase of the Kedonojankulma tonalite intrusion

Exploration

Geochemistry:

- The prospect (Cu-Au-Ag-Mo-Zn-Sb anomaly) was found after systematic till geochemical exploration. The sampling density was increased during the exploration process from 4 samples/1 km^2 to 50 m grid

Geophysics:

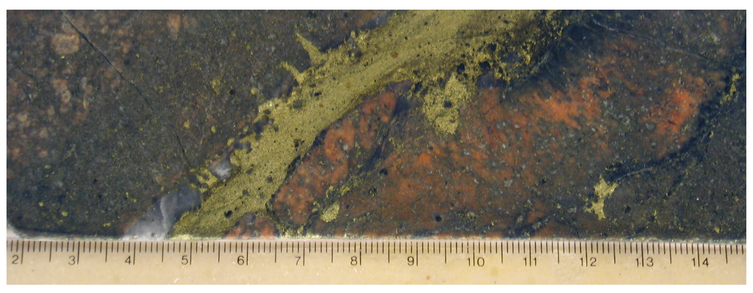
- Magnetic surveys, to outline the lithological units.
- IP surveys, to delineate the sulphide mineralization

Geological mapping:

- Bedrock mapping and tracing of mineralized erratics

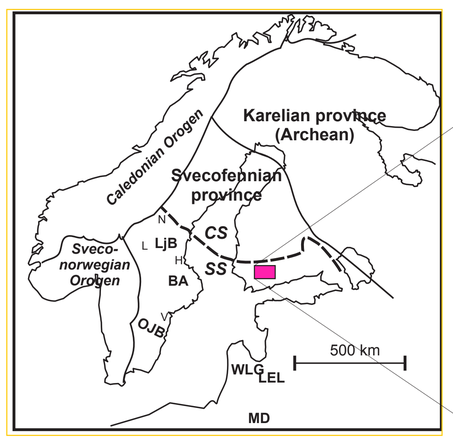
Diamond drilling:

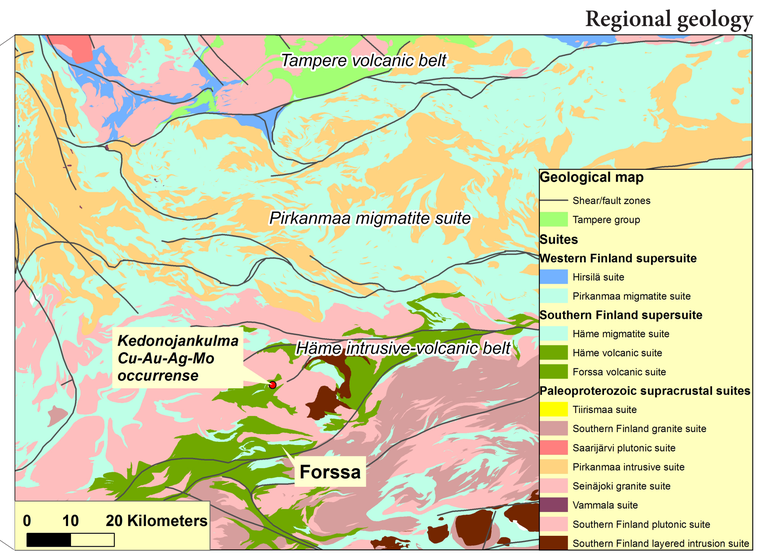
- 58 drill holes, altogether 5 km were drilled to outline the altered and mineralized part of the intrusion

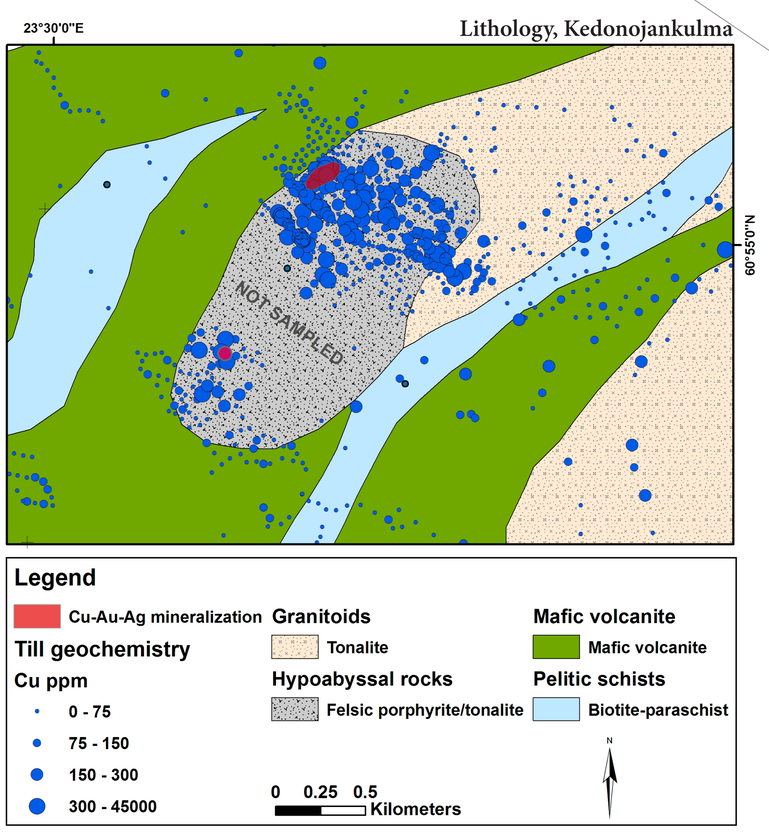


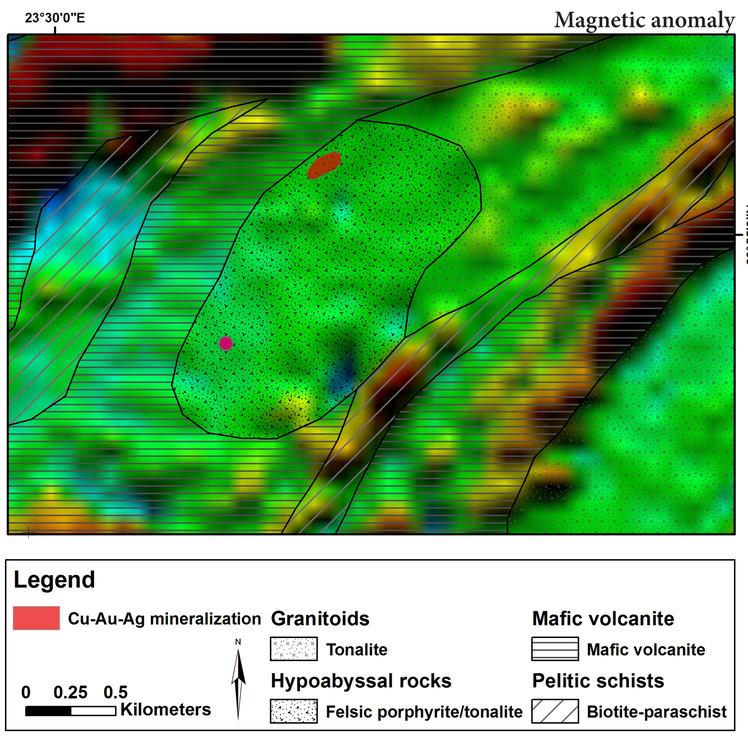
Cu ore

Regional geology









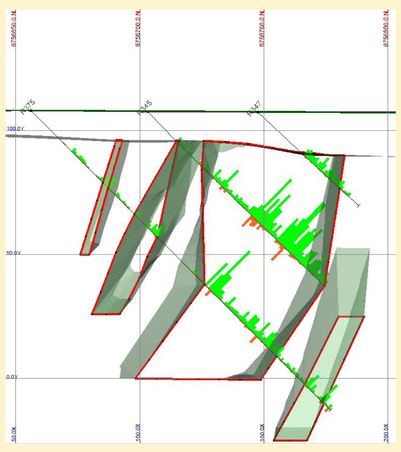
Mineral deposit

The mineral deposit has been modelled using the cut-off value 0.2 % of Cu (see table)

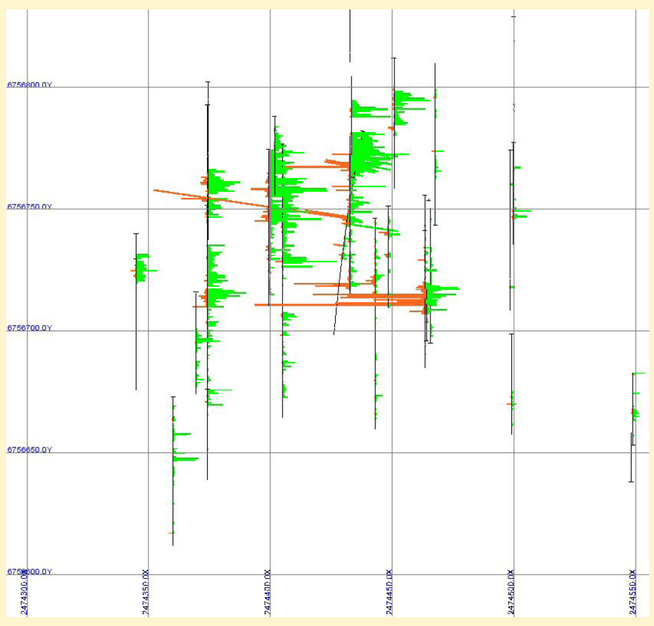
- The width of the drilled mineralization is up to 70 meters and length at least 200 meters
- The size of deposit is open to the depth and towards south-west
- Another Cu mineralization was discovered in the same intrusion, at a distance of 1.5 km

Table. Metal contents in 1 meter drill core samples

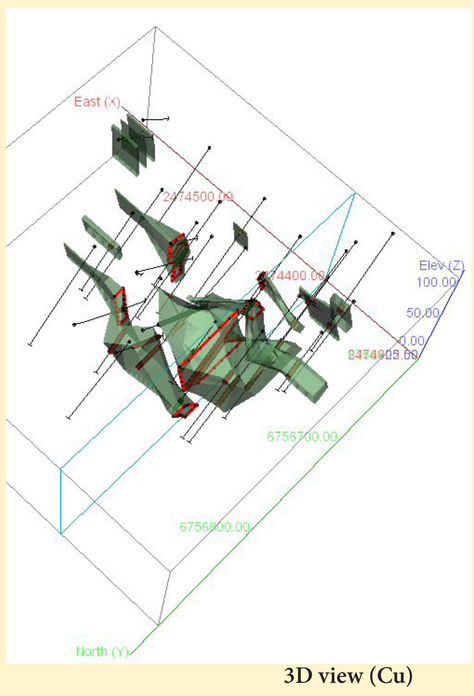
Metal	Mean of samples with Cu >0.2 %	Highest values
Cu %	0.4	2.4
Au ppm	0.15	8.0
Ag ppm	15	120
Mo ppm	20	800
Sb ppm		1500
Bi ppm		3300
Zn %		1.3



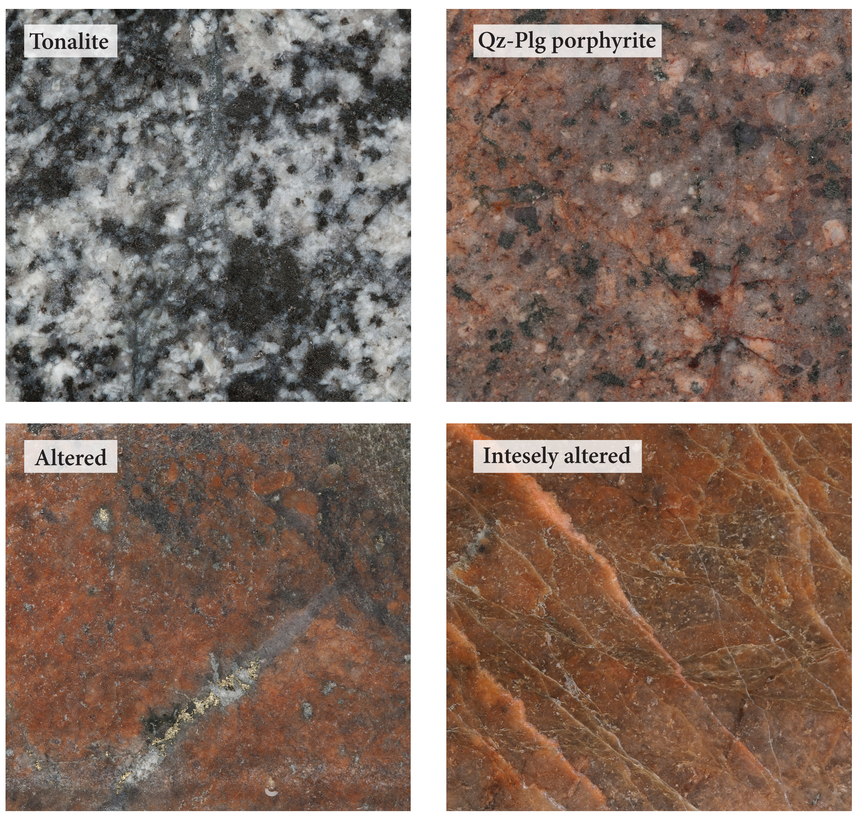
Vertical section (Cu, Au)

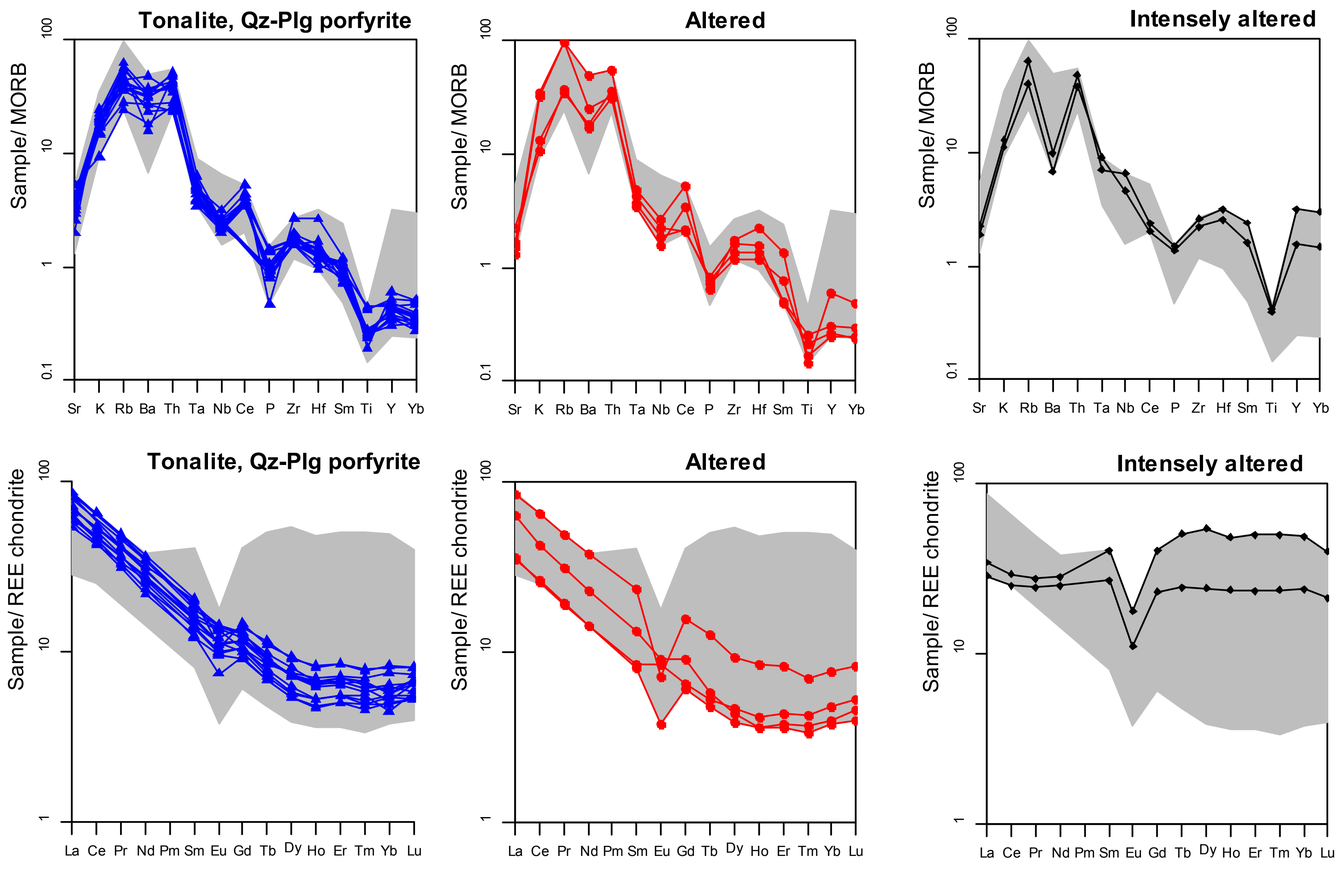


Planview (Cu, Au)



3D view (Cu)





Mineralization and alteration

- Polymetallic Cu-Au-Ag-Mo-Zn-Sb ore
- Very fine grained sulphide dissemination, in places as chalcopyrite veins
- Controlled by shear/breccia structures
- Narrow quartz veins, including chalcopyrite, pyrite and sometimes molybdenite, both in core mineralization and in places outside the mineralization
- Main ore minerals: chalcopyrite, arsenopyrite, pyrite, pyrrhotite, sphalerite and in places chalcocite and bornite. Chalcosite as secondary mineral
- Minor ore minerals: galena, mackinawite, marcasite, scheelite, ilmenite, rutile, native bismuth, Bi-sulphides, Bi-selenides, Co-arsenides, gold, silver and several types of Ag-Sb sulfides
- Typical alteration features: propylitic alteration, serisitification, silicification, albitization
- Intensely altered rock: LREE depletion, Th/La 0.9, Na/K 4.5

Conclusion

- Metallic zoning from core outwards: Cu-Au-Ag-Mo-Zn-Sb-Bi-As, Mo, Zn
- Host rock is moderately to intensely altered quartz-plagioclase porphyrite
- Mineralization is controlled by sheared, brecciated zone
- Potential to increase the size of the deposit

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