

FAA- Site # 3: Kevitsa Mine-Finland

The Kevitsa mafic layered intrusion is located in Central Lapland (Fig. 1), some 35 km north of Sodankylä. The Kevitsa intrusion was explored by the Geological Survey of Finland between the years 1984 and 1995. The presence of magmatic sulphides within the intrusion was indicated by early drilling in 1984 which intersected several meters of pyrrhotite-rich sulphides with low base and precious metal values, near the basal contact. The discovery hole (R326) was drilled in 1987 to the western part of the currently known mineralized domain, where it intersected about 30 meters of disseminated sulphides. Subsequent drilling programs delineated a large, low-grade Ni-Cu-PGE-Au occurrence, the Kevitsa deposit (formerly known by the names Keivitsa and Keivitsansarvi). The deposit was subsequently held and evaluated by the Outokumpu Company (1995–1998). In 2000, Scandinavian Gold Prospecting AB (subsidiary of Scandinavian Minerals Ltd) acquired the deposit. In 2008, First Quantum Minerals Ltd. purchased Scandinavian Minerals Ltd. and after further work on the deposit, placed it into production in early 2012.



Figure 1: Location of the Kevitsa Deposit

Geological Summary

The Kevitsa deposit is located in northern Finland in the central Lapland, comprised of Paleoproterozoic basement gneisses, greenstone belts and major igneous intrusions. At about 2.05 Ga, igneous activity generated a series of layered intrusions, one of which, the Kevitsa intrusion, hosts the Kevitsa deposit. The Kevitsa intrusion is an oval shape intrusion oriented NE-SW with long axis of 7 km.

The bedrock geology (Fig. 2) comprises mafic to ultramafic rocks, including olivine pyroxenite, peridotite, gabbro and granophyre. The intrusion is characterized by internal layering defined by changes in composition resulting from successive pulses of magma and not simple differentiation of a single pulse.

Mineralization in the Kevitsa deposit occurs within an olivine-pyroxenite zone of the Kevitsa intrusion, which contains up to 5% sulfide, the majority of which is found as granular masses interstitial to the silicate mineral crystals. The silicate mineralogy is predominantly composed of olivine and orthopyroxene with finely disseminated sulfides. The sulfides comprise pyrrhotite (manily), pentlandite, chalcopyrite, troilite and pyrite. Other copper and nickel sulfides include cubanite, millerite and heazlewoodite, with minor associated gold, cobalt and PGE concentrations.

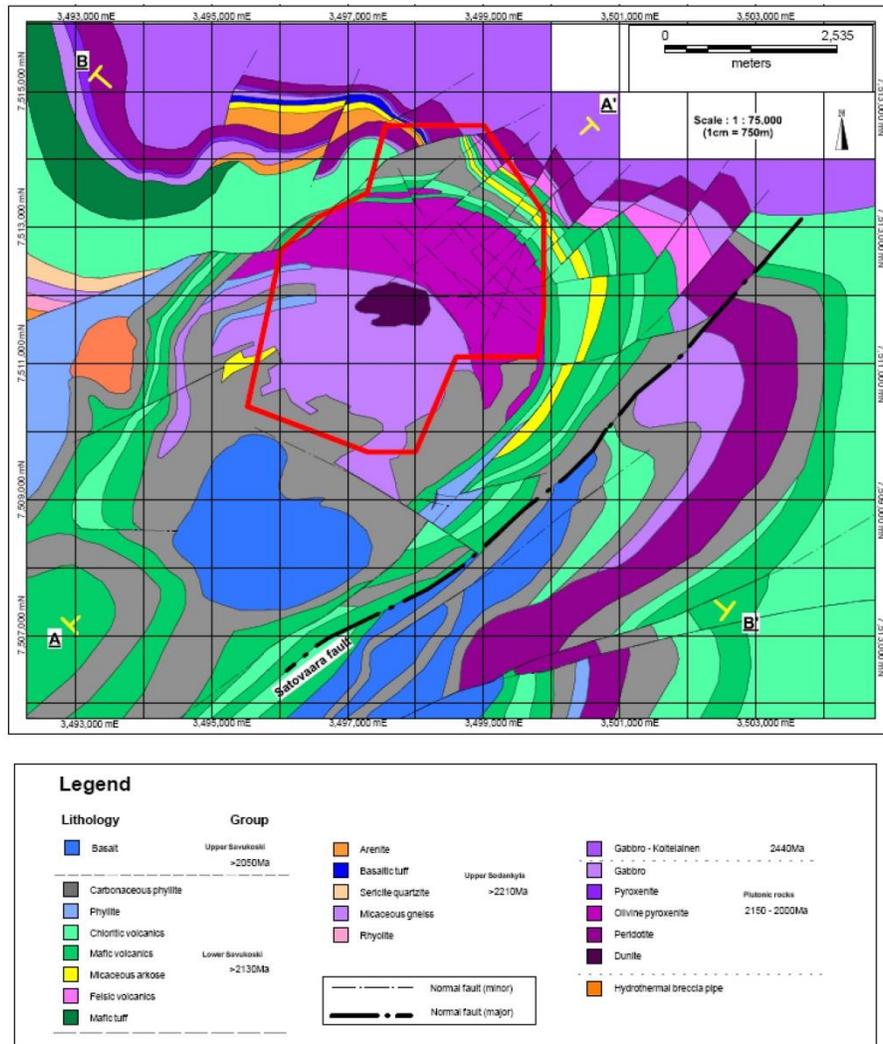


Figure 2: Geology map (FQML 2009).

Geophysical Summary

A variety of geological and geophysical data sets are available for the site; these include

Geological Data: There is a combination of geological coverages for the regional and deposit scale produced by the Finnish government and FQML.

Geochemical Data: None is in the archive but it is expected that there would be coverage in the Finnish government data base.

Geophysics: This is the most extensive suite of data available and includes:

-Airborne: LIDAR, Magnetics, VTEM and SkyTEM

-Ground geophysics: Quantec Titan and MT survey, gravity, magnetics and seismic reflection

Previous Work

Geology: For the geological coverage, there are several field guides on the deposits and general summaries from the Finnish government and FQML. More extensive summaries are expected to exist in the Finnish government files.

Geophysics: There is limited interpretative documentation of the various surveys apart from contractor reports provided with the primary surveys or legacy archiving work done by FQML.

Exploration Challenge

A challenge remaining for near-mine exploration at Kevitsa is the identification of possible massive sulphides as either open-pittable targets within the mine lease, or else underground targets below the ultimate open pit. A different but equally valuable challenge is to turn the geophysical data into a subsurface map of changes in rock characteristics. These characteristics may include rock hardness related to lithology or more likely alteration, or any other geophysically mappable properties or “clusters” that can be related to domains of different rock characteristics.

Data Source Acknowledgments

The data provided in this package was courtesy of First Quantum Minerals Ltd.

Preferred Projection

The Cartesian coordinates used here are in the TMFIN3 projection, based on the FINKKJ datum (International 1924 spheroid). This is similar to UTM zone 35 (central meridian 27 degrees E) but with a false easting of 3500000 m and a scale factor of 1.0000 instead of the more usual 0.9996.