

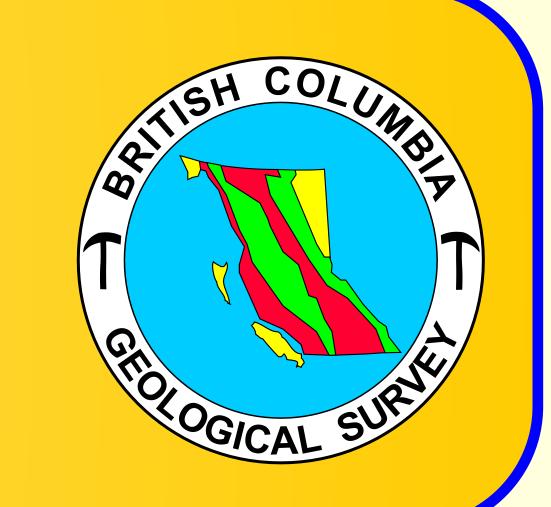
# Serpentinite-hosted nickel deposit potential in BC

Danny Hora (BCGS alumnus)

Plate E, F, it occurs in

Cassiar samples as

Available online from www.Mapplace.ca as Geofile 2010-08



For More Information

zdhora@telus.net

# Introduction

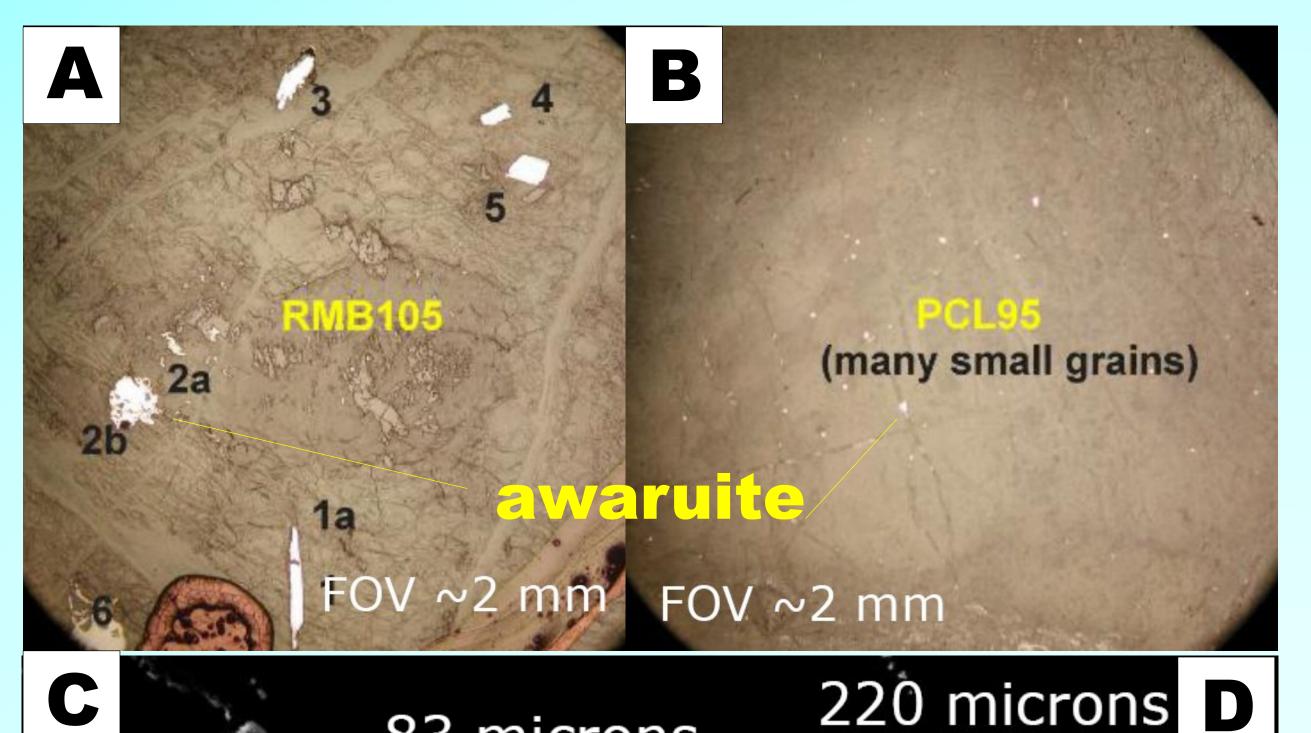
A number of opaque nickel minerals (sulphides, arsenides and antimonides, as well as NiFe alloys) can occur as a by-product of serpentinization of ultramafic rocks, a variety of phases of Fe, Ni and Co have been reported over large tract of ultramafic minerals originate as these metals are released from the oxide-silicate-bound olivine structure.

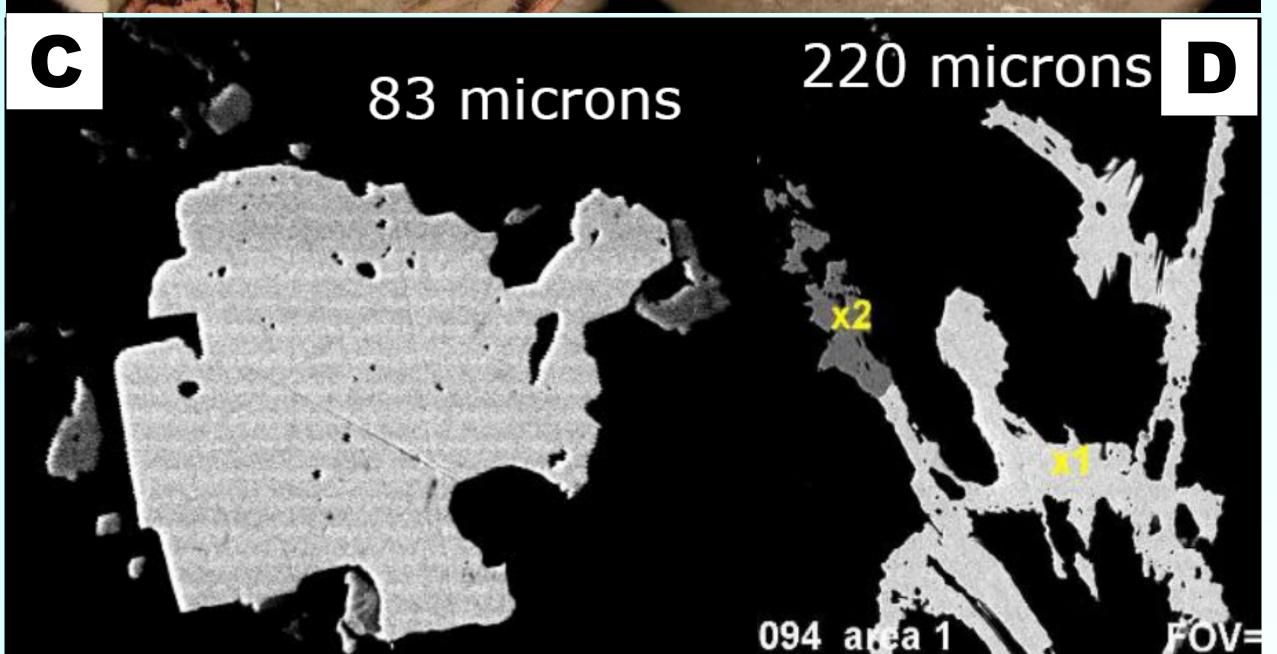
In British Columbia, "some nickeliferous sand" was identified in alluvial gold from Fraser River in 1888, and Bridge River, awaruite (Ni<sub>3</sub>Fe) on Wheaton Creek (with native Cu nuggets) in Cassiar District (Holland, 1940), Letain Creek (Krishnarao, 1964) and awaruite in Yukon from Pelly River



in 1908. In Cassiar asbestos deposit, O'Hanley et al.(1992) listed pentlandite and heazlewoodite. Recent discoveries of several coarser awaruite zones rocks in the area between Fort St.James and Ogden Mountain (First Point Minerals, 2009). Awaruite is

also reported in 2008 from Dease Lake area in northern BC. Hard Creek Nickel – Turnagain Project in a serpentinized Alaskan type ultramafic intrusion contains some Ni minerals with low sulphur content like millerite and heazelwoodite (Hard Creek Nickel, 2009), the typical serpentinization





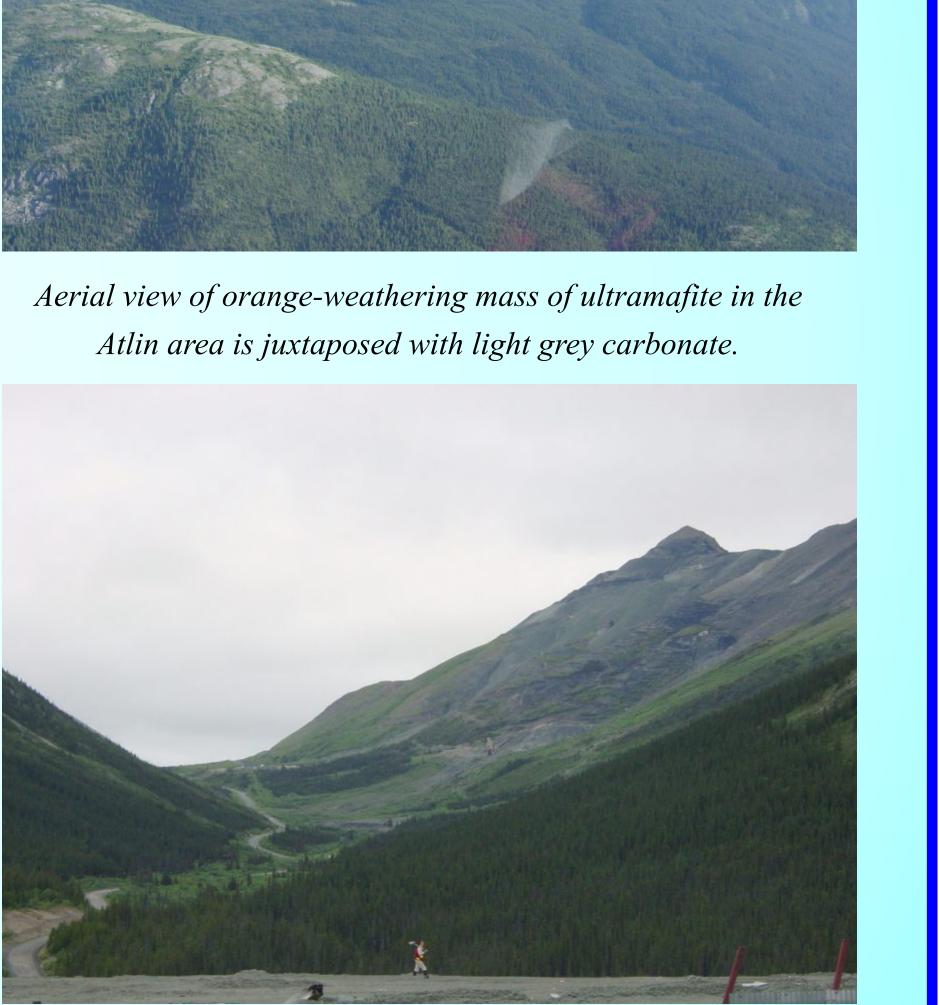
During serpentinization only a small part of the silicate FeO enters into the serpentine formula, the rest of iron forms magnetite, and other minor metals like Ni, Co and Cu occur as sulphides, or As and Sb minerals, and native metals and alloys, like awaruite.

Such occurrences are common worldwide. Under most conditions these minerals have limited mobility and usually remain as originally very small interstitial grains in place of its origin or as thin rims on primary olivine relics. Due to their minute size, they typically escape notice. Only locally such minerals are coarse grained enough to be metallurgically

in Cassiar samples is described as a typical Provincial Ni distribution component of serpentinites from many localities and is particularly common in association with chrysotile asbestos. As shown on



Regional geochemical survey (RGS) results revealed numerous anomalies of Ni in order of 1000 to 3000 ppm in Shulaps Mountains area, Atlin, and central and northern BC from Fort St.James to the Yukon border. These coincide with the distribution of ultramafic rocks.

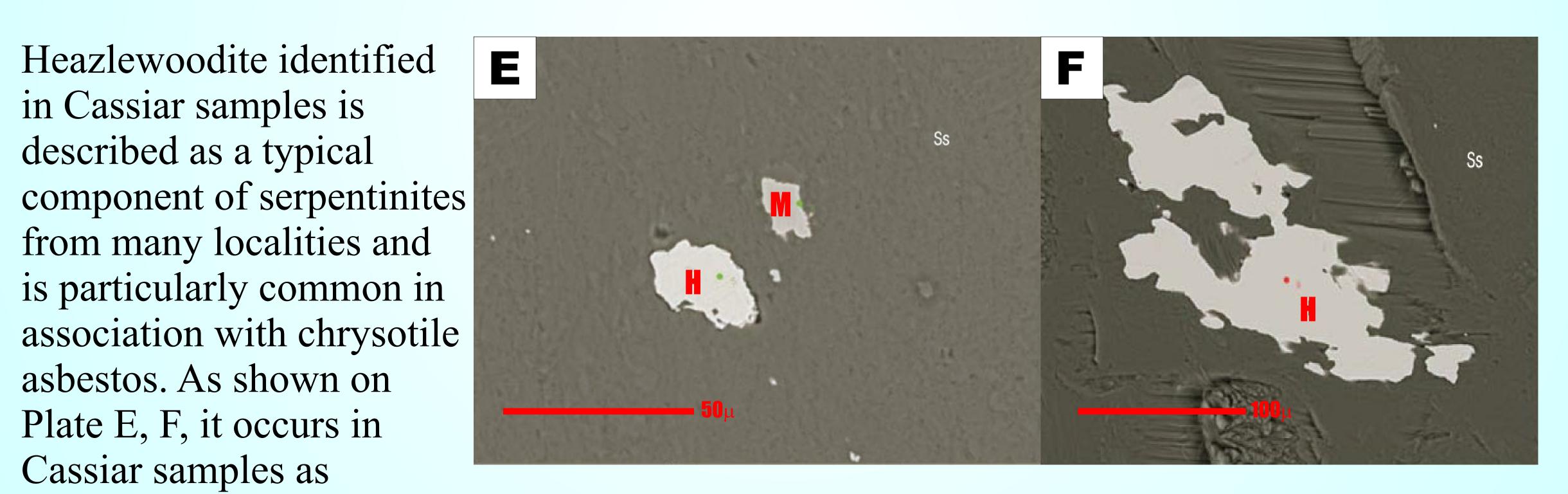


Cassiar Asbestos tailings pile in near foreground with a view

northward to the open pit mine.

### TYPICAL NICKEL AND NICKELOAN OPAQUE MINERALS IN SERPENTINIZED ULTRAMAFIC ROCKS

MACKINAVITE (Fe,Ni)S PENTLANDITE (Fe,Ni),S, NATIVE



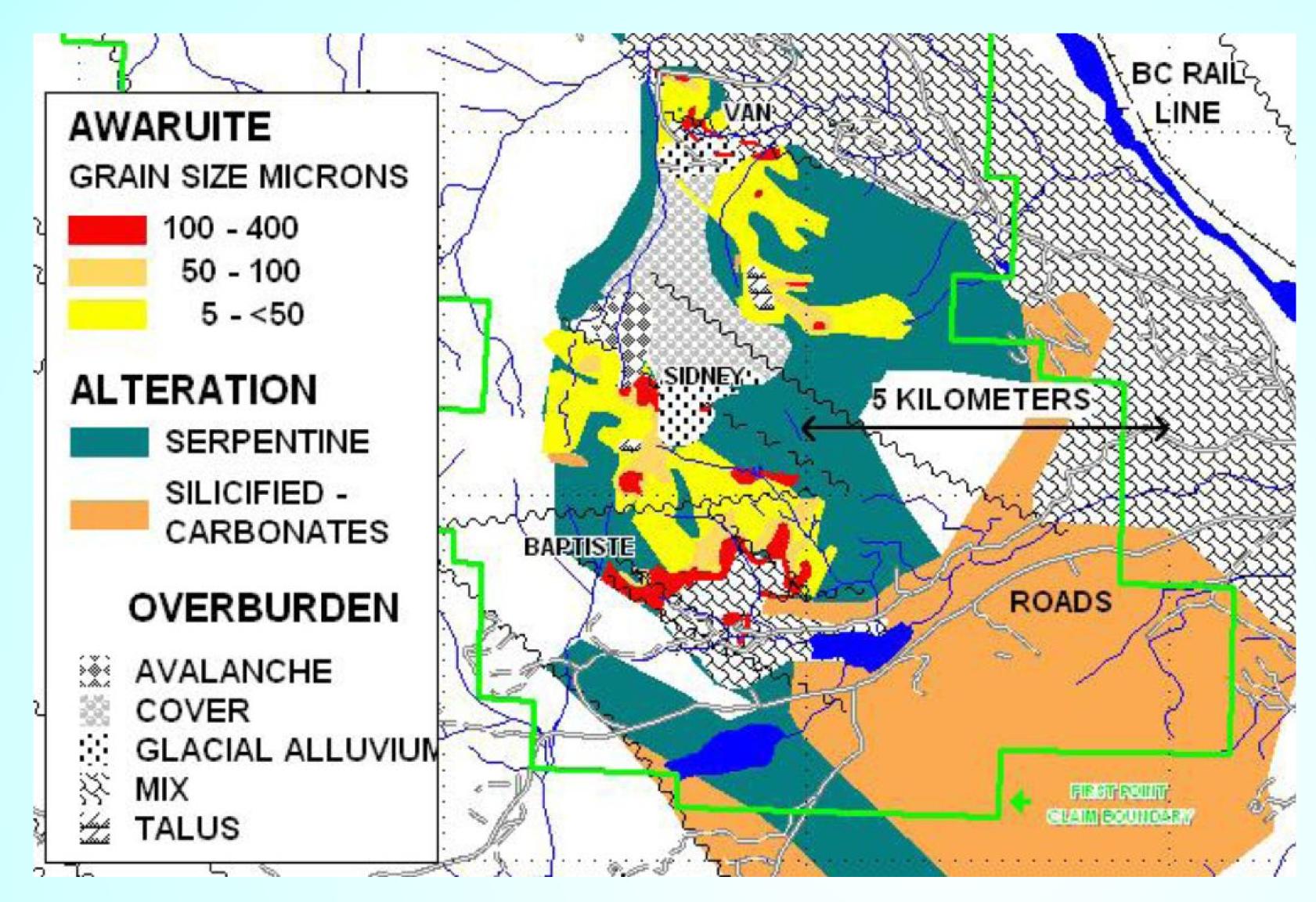
isolated, very small grains of irregular shape between 25 and 100 µm in diameter.

(Ni, FeO).Fe<sub>2</sub>O<sub>3</sub> Ni-Cr MAGNETITE (Ni, FeO)(Cr, Fe<sub>2</sub>O<sub>3</sub>) GODLEVSKITE (Ni,Fe)<sub>7</sub>S<sub>6</sub> Ni MAGNESIOFERRITE (Ni, MgO).Fe<sub>2</sub>O<sub>3</sub> Fe, Ni

# What's in it for you?

In view of a number of RGS geochemical anomalies in association with areas underlain by serpentinized ultramafic rocks, a significant potential for such new deposit type of nickel exist and presents new exploration target for British Columbia.

# Province-wide Potential



In British Columbia, recent discoveries of several coarser awaruite zones over large tract of ultramafic rocks in the area between Fort St. James and Ogden Mountain suggests an economic potential of ultramafic belts for a possibility of bulk mineable nickel deposits (map from First Point Minerals, 2009).

- More attention should be paid to the potential for non-sulphide nickel minerals.
- In view of a number of RGS geochemical anomalies in association with areas underlain by serpentinized ultramafic rocks, a significant potential for such new deposit type of nickel exist and presents new exploration target for British Columbia.
- Serpentinization has been documented to produce secondary sulphide and nonsulphide minerals and British Columbia has considerable distribution of serpentinized ultramafics with RGS results suggesting nickel anomalies.
- Ophiolite belts and serpentinized Alaskan type intrusive are exploration targets for these types of nickel deposits.