
**Mineralogical and geochemical examination of the
gold mineralization within the silica zone and
open pit at Cape Spencer, New Brunswick**

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The previously mined open pit at Cape Spencer (NB) is being re-examined as a high-grade, vein-related gold deposit instead of the previously reported low-grade bulk gold deposit. The open pit was mined from 1986–1988, which had proven reserves of 606 790 short tons (550 470 tonnes) grading 2.34 grams per ton (2.12 g/t). The silica zone located 600 m north-west of the open pit was explored in 1977 as a possible silica quarry for the purpose of glass making, but the Fe content was too high. Thus far neither research nor exploration has attempted to establish the possible relationship between the silica zone and quartz veins and associated alteration found within the open pit.

Detailed geological and structural mapping accompanied by recent 3-D Induced Polarization geophysics of the silica zone and the open pit was carried out to define the trends of the quartz veins, associated gold and sulphide mineralization, and gold depositional controls. Twenty channel samples were taken for petrographic and geochemical analysis, and assaying of selected samples. The multi-element geochemical analyses were done using a multi-acid 32 element Inductively Coupled Plasma-Emission Spectroscopy and a 30 element Instrumental Neutron Activation Analysis. A Sulphur bioLeco analysis was also completed to determine the percent sulphur.

The quartz veins at the open pit has gold values of up to 100.5 g/t, with the adjacent wall rock containing up to 51.5 g/t gold. The open pit also showed low arsenic values (< 5 ppm) in comparison to the silica zone where gold values ranged from less than 5 ppb to 120 ppb, with arsenic ranging from 3 to 228 ppm, Cu to 1004 ppm, and Mo to 150 ppm. The gold-bearing quartz veins are seen crosscutting the Millican Lake granites (623 Ma), Cape Spencer Formation sediments (post 623 Ma), and Lancaster Formation (310 Ma) suggesting that they were deposited syn- to post-Carboniferous.

The silica zone is approximately 200 m in length, 50 m in width, and greater than 20 m in depth. Within this silica body there are at least five different locations that are enriched in sulphides. There has been no age dating done in the silica zone, but it is assumed that it is close to the age of the illitic alteration (277 Ma), which is based on previous ⁴⁰Ar/³⁹Ar ages of illite in altered Precambrian rocks. Previous work, believed that the D₂ structures host the gold ores, but recent sampling suggests much later stage deposition of gold.