

DRIFTWOOD CREEK MAGNESITE

By Andris A. Kikauka, Geofacts Consulting, Sooke, BC, Canada
Peter Klewchuck, Driftwood Creek Magnesite, Kimberley, BC, Canada
and Glen M. Rodgers, Skookumchuck, BC, Canada

The Driftwood Creek magnesite deposit is the largest of a northwest trending cluster of similar magnesite occurrences hosted by Helikian age Mount Nelson Formation. The property is located 30 kilometres northwest of the Canadian Pacific rail line in Brisco, British Columbia. The Driftwood Creek deposit contains a resource estimated at 20 to 30 million tonnes of raw magnesite within several west-northwest trending stratabound lenses that are up to 200 metres wide.

The Brisco and Driftwood Creek deposits are hosted by dolomites of the Helikian Mount Nelson Formation of the Purcell Supergroup within the Purcell anticlinorium; they are situated west of the Rocky Mountain Trench fault (Simandl and Hancock, 1991). Mount Nelson is unconformably overlain by the Toby Formation of the Windermere Supergroup. The unconformity records the East Kootenay orogenic event, which consisted of regional uplift and metamorphism dated at 750 to 850 Ma, and submarine volcanic activity within the Purcell anticlinorium (Pope, 1989). The magnesite deposits are located within an area that was affected by low-grade regional metamorphism. The Driftwood Creek deposit occurs in the middle dolomite sequence of the lower Mount Nelson Formation.

In 1978, Kaiser Resources Ltd. performed a program of drilling, geological mapping and sampling. Results of the program indicated that there are approximately 22 500 000 tonnes of magnesite-bearing rock within the claim group (Morris, 1978). In 1987 and 1988, Canadian Occidental Petroleum Ltd. carried out detailed geological mapping and sampling of the prospect. Numerous faults were mapped in the area of the magnesite lenses (Rodgers, 1989). Older Mount Nelson Formation strata were thrust northeast over younger rocks of the Horsethief Creek Formation and resulted in the formation of two sets of cross faults that trend north-south and northeast-southwest. Cross sections show that the thickest part of the magnesite body is located along a ridge top near a topographic high. Surface exposure there exceeds 200 metres in width. The thickest part of the magnesite occurrence is flanked by a stratabound dolomite breccia

that is interpreted to be a dissolution breccia and collapse breccia.

Magnesite and sparry carbonate form stratabound lenses that are characterized by coarse to sparry crystals. Vestiges of hemispherical stromatolites are visible in the fine grained magnesite bearing rocks, and a stromatolitic horizon underlies the magnesite. Cherty dolomite overlies the magnesite. Although quartz veins and stringers 1 to 3 centimetres in width occur sporadically throughout the entire stratigraphic column, they are locally concentrated near fault zones and/or chert-bearing stratigraphy. Chert nodules and quartz veinlets up to 2 centimetres in width are the main impurities in the magnesite. Field relationships support a dolomite replacement origin. Trenching and diamond drilling intersected a pink granitic intrusion, which may have been a heat source for hydrothermal replacement of dolomite by magnesite. As is typical for macrocrystalline magnesite deposits, the coarse grained textures of the magnesite zone indicate that recrystallization occurred during regional metamorphism. Eleven 3.0 metre wide channel samples across a 33.0 metre outcrop exposure within the central "core" or thickest exposure of the magnesite horizon returned values of 44.3% MgO, 1.1% SiO₂ and 50.6% LOI.

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