

Jade (Nephrite) in British Columbia, Canada

Kirk Makepeace
Jade West Resources Ltd.
George J. Simandl
British Columbia Ministry of Energy and Mines

DEFINITION

Jade is a commercial term encompassing green, white, black or yellow-brown material that consists either of Na-rich pyroxene (jadeite) or prismatic to acicular amphiboles of the tremolite-actinolite series forming bundles that are randomly oriented and interlocked (nephrite).

Nephrite is tougher (harder to break) than jadeite material. Its fracture strength is about 200 MN/m² whereas that of jadeite material is about 100 MN/m². On the other hand, jadeite material has a higher hardness (7 compared to 6.5 on the Mohs scale).

JADE IN BRITISH COLUMBIA

There are over fifty known nephrite occurrences in British Columbia and are located in Cassiar, Cry and Dease Lake Mount Ogden areas and in Southern British Columbia (Figure 1). These occurrences consist of individual

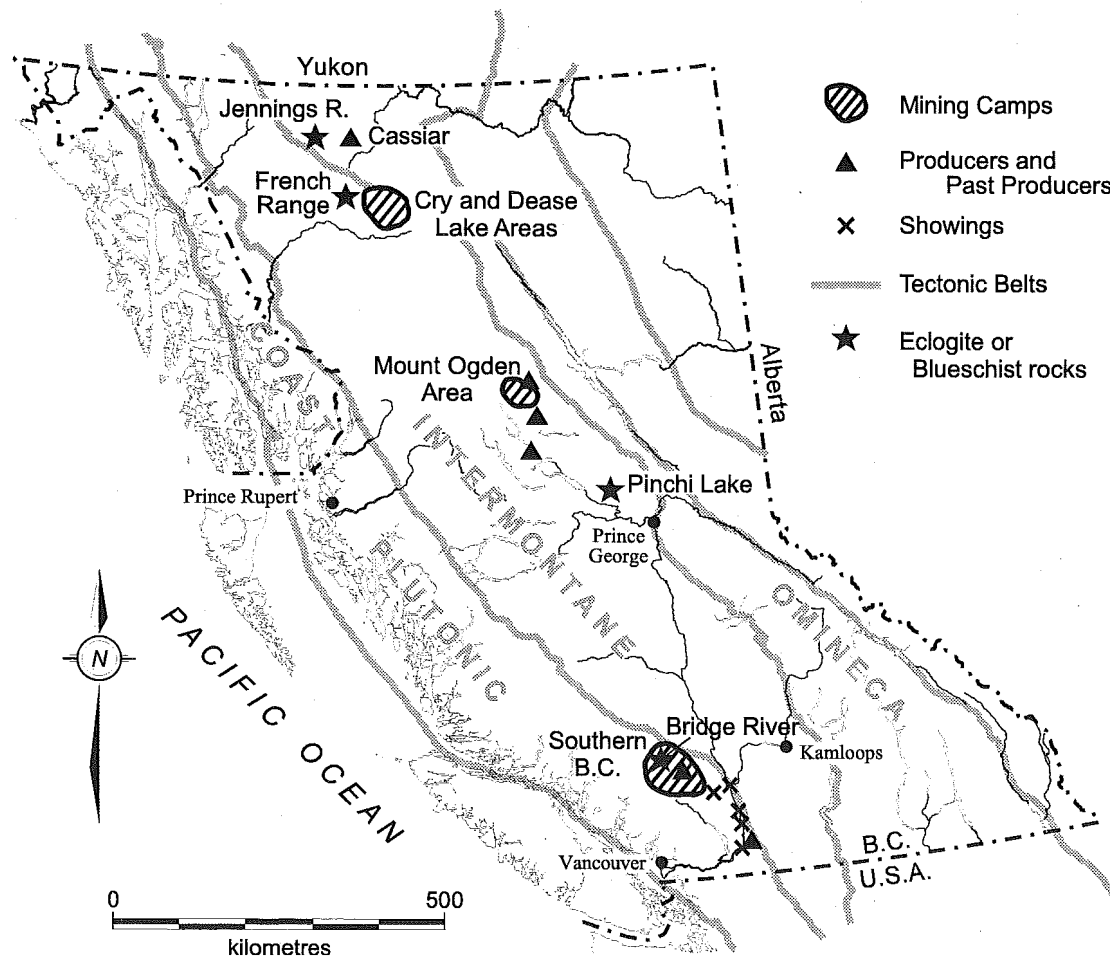


Figure 1. Nephrite in British Columbia

blocks, boulder fields, talus blocks and in situ occurrences. Most of the in situ occurrences are lens or cigar shaped. They occur at, or near the contact of ultramafic/mafic rocks (mainly serpentinites) with cherts, and other metasedimentary or igneous felsic rocks of oceanic terranes such as Cache Creek (Mississippian to Jurassic) and Slide Mountain (Devonian to Permian). These contacts are commonly interpreted as shear/fault related. In general, it is believed that the B.C. nephrite formed by metasomatic exchange between ultramafic and silica-bearing rocks. Impurities in B.C. nephrite are spinel group minerals (chromite, magnetite, picolite), diopside, uvarovite, titanite, chlorite and talc (Leaming, 1978, Simandl *et al.* 2000).

MINING THE NEPHRITE DEPOSITS

Mining a gemstone that is accurately described as the "toughest natural stone" on earth presents a challenge to any miner. As with any gemstone, explosive devices must be avoided to prevent unnecessary damage to the jade. However, traditional, non-explosive rock splitting methods are virtually useless on jade as its tightly locking fibres prevent any easy method to reduce the jade into manageable pieces. As some glacial boulders weigh in excess of 100 tonnes and all in-situ deposits are locked into complex puzzle shaped formations, the necessity of reducing the jade into manageable sized pieces is the main occupation of a mining operation.

Modern, extreme high pressure hydraulic splitters are helpful when existing fractures can be found. Large 2 metre circular diamond saws and diamond wire saws are used with the dual purpose of reducing the jade and providing a visible cut surface for evaluation purposes.

Mining or perhaps more accurately, quarrying, of nephrite jade consists of two methods determined by the source of the jade.

Jade boulders, a product of glacial and talus erosion represent the simplest occurrences to mine. These boulders are tested by diamond drilling or sawing, with the commercial grades removed from the mine site for sale.

In-situ jade deposits have overtaken alluvial mining as the main source of jade production in Canada today. The Northern British Columbia deposits are massive, but the difficulty in removing the jade and the current world demand for selective high quality gem grade jade results in only a small percentage of jade deposits considered economically viable for mining.

Due to the remoteness and harsh winter conditions of the northern jade deposits, mining typically occurs during a very short summer season lasting from Mid June to late September.

MARKETING JADE

B.C. nephrite has been utilized for the past 100 years in local jewelry and ornamental applications. British Columbia jade represents the best quality nephrite jade available in the world today. Annual exports of approximately 200 tonnes per year over the past 25 years represent more jade produced than at any other time in the history of man. This has resulted in new uses for a stone once reserved for the Emperors of China.

Traditional jade carvings and jewelry are responsible for the bulk consumption of Canada's jade production, with exports to historical jade nations of China, Taiwan and New Zealand. Canada's domestic consumption is a relatively small amount of a 4-5 tonnes per year by a few successful jade artists of world renown.

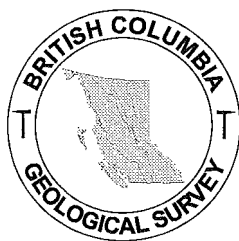
The famous gem grade jade discovery at the Polar Mine has secured Canadian Jade's fame as a world class gemstone. Polar Jade™ is now exclusively used for the jewelry and museum quality carvings.

As the availability of Canadian jade becomes known, non-traditional uses of the stone are ever increasing. From massive Buddha statues, fireplaces in the Getty Mansion, to translucent window panels in the Smithsonian Museum, Canadian Nephrite is becoming world famous as a stone of wide versatility.

With its strength and toughness, coupled with the massive deposits of relatively low cost raw material, the development of jade as a dimension stone for interior and exterior tiles is probably the next step in the evolution of the Canadian Jade industry.

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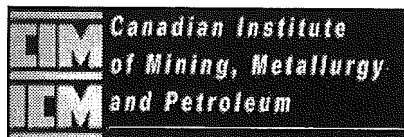


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Compiled by

George J. Simandl, Janet Holland, Susan Dunlop and Melissa Rotella