

Rare Metals in British Columbia

Historically, exploration for rare metals has been sporadic. Although a number of occurrences and prospects have been identified, few have advanced to developed resources or reserves.

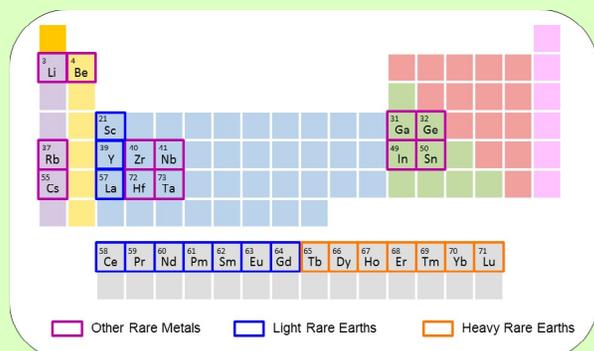
Carbonatite and syenite complexes host British Columbia's most advanced rare earth, niobium, and tantalum prospects. Specialty metals concentrations are also known in mineral occurrence types such as pegmatite/granite, placer/paleoplacer, sedimentary phosphate, and skarn (see Simandl et al., 2011, British Columbia Geological Survey GeoFile 2011-10).

World Supply

China has supplied most of the world's rare earths since the 1980s and a handful of deposits dominate the world market. Ion adsorption clays in China supply nearly all the world's heavy rare earths and the Bayan Obo iron-rare earth-niobium deposit in northern China supplies much of the world's light rare earths lanthanum, cerium and neodymium.

Niobium supplies are also geographically restricted: Brazil produces more than 90% of the world's niobium. Brazil's Araxá Mine's reserves could supply current world demand for several centuries.

Tantalum production is less geographically restricted, but there is concern over the use of tantalum mining to fund conflict in central Africa.



For more information on B.C. mineral deposit profiles, visit:
www.empr.gov.bc.ca/Mining/Geoscience/MineralDepositProfiles

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All BCGS publications are available, free of charge, from the British Columbia Geological Survey website: www.empr.gov.bc.ca/Mining/Geoscience/PublicationsCatalogue

Rare Metals

British Columbia Geological Survey Information Circular 2016-4



Ministry of
Energy and Mines

Rare Metal Deposits in British Columbia

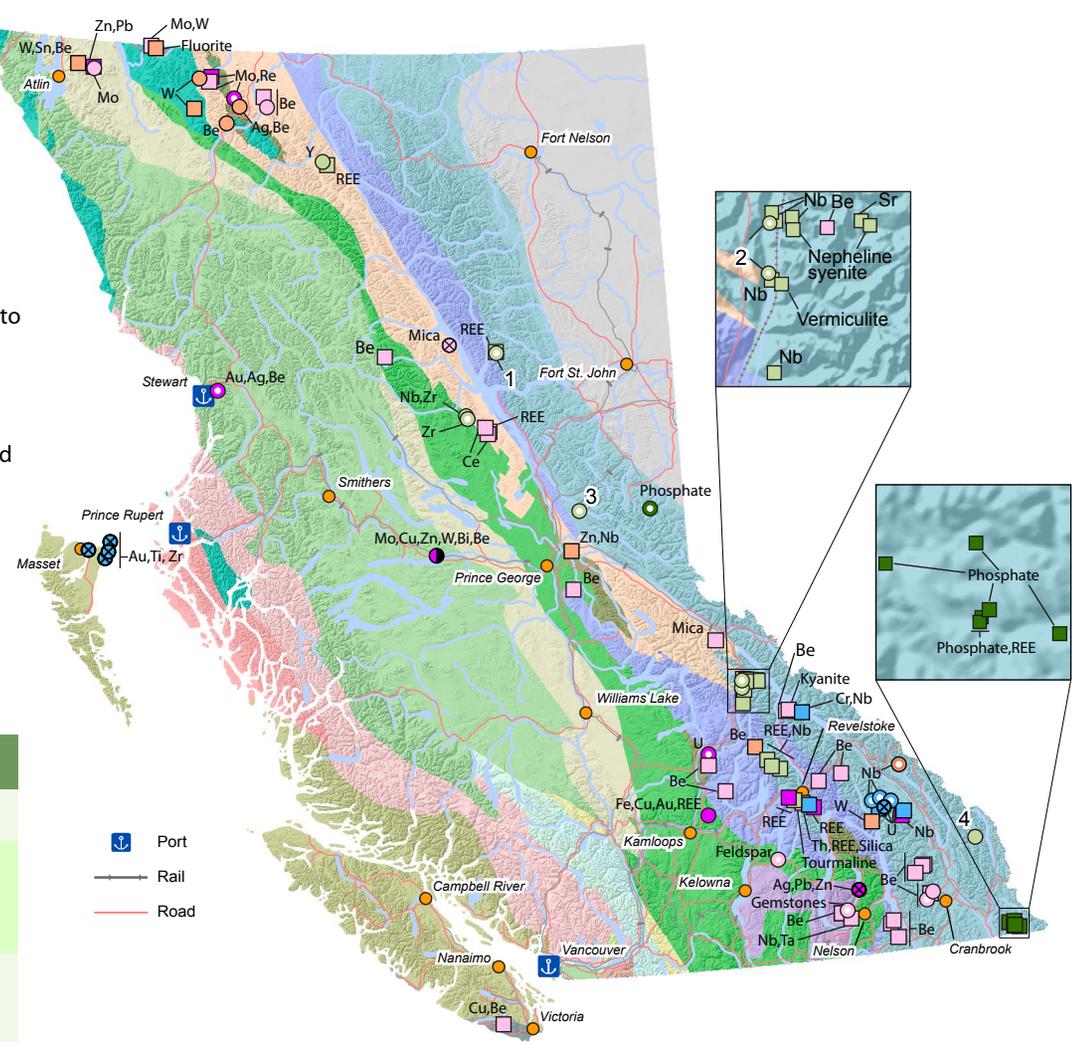
Rare, critical, and specialty metals are a loosely defined suite of incompatible elements. Although used in limited quantities worldwide, many have applications in advanced technology and are critical to certain sectors of industry. The suite includes the rare earth elements and others with similarly specialized uses. These elements are not rare in terms of crustal abundances, but economic deposits are few and geographically restricted.

New producers may face serious competition from the few companies already in the limited market. Furthermore, long lead times and considerable capital investment may be necessary to develop deposits needing complex metallurgy.

Customers could be vulnerable to supply disruption. Concerned with security of supply, governments in Europe and North America have commissioned studies identifying critical and strategic materials to which their economies or national security may be vulnerable. Rare and specialty metals are among these.

Natural Resources Canada sponsored a study, with provincial partners like the British Columbia Geological Survey, designed to enhance understanding of specialty metals deposits, and their exploration potential in Canada (see Selected References).

Selected B.C. Rare Metal Deposits				
Point	Name	MINFILE	Deposit Type/Commodity	Details
1	Aley	094B 027	Carbonatite / Nb	Pre-feasibility (Oct 2014) Conventional open pit, 10,000 tpd 83,815,000 t 0.50% Nb ₂ O ₅ Proven + Probable (0.30% cut off)
2	Blue River	083D 035 083D 005	Carbonatite / Ta, Nb	Underground resource: 48,400,000 t 197 ppm Ta ₂ O ₅ 1,610 ppm Nb ₂ O ₅ Indicated 5,400,000 t 191 ppm Ta ₂ O ₅ 1,760 ppm Nb ₂ O ₅ Inferred
3	Wicheeda	093J 014	Carbonatite / REE	Early stage exploration highlights: 48.64 m grading 1.36% Ce, 1.78% La, 0.13% Pr, and 0.28% Nd (TREE 3.55%) 144 m grading 1.3% Ce, 0.64% La, and 0.26% Nd (TREE 2.2%) 72 m grading 1.83% Ce, 0.73% La, and 0.35% Nd (TREE 2.92%)
4	Rock Canyon Creek	082JSW018	Carbonatite / REE, F, Au, Ag	12 of 17 drill holes (1213 m) in 2009 intersected 1-2% TREE and 3-5% F over 1200 m strike length, 50 m width and a depth exceeding 100 m. A mineralized fluorite vein assayed 201 g/t Ag and 0.8 g/t Au.



For more information, see Simandl et al., 2012.

REE: Rare Earth Elements
TREE: Total Rare Earth Elements
TREO: Total Rare Earth Oxides