

# Canada: a key mining player despite local challenges



Premium Resources

With Canada's mining industry booming, **Michael Schwartz** takes a look at the recent developments contributing to its ever-growing success.

Canada has a massive presence in the global mining industry, being respected not only for the sheer extent of its mining sector but also for its transparency and trustworthiness.

Far north of Ontario, in particular the James Bay Lowlands, hosts a massive area of 5,000km<sup>2</sup> named the Ring of Fire (RoF). *Materials World* interviewed Julia Bennett of the Communications Branch, Ministry

of Northern Development and Mines, 'Since 2002, exploration programmes worth more than US\$370 million have identified significant deposits of nickel, copper, platinum group elements, chromite and zinc. Other known exploration targets include gold, vanadium and diamonds.

'With one of the largest chromite deposits in the world, and known chromite and nickel mineral potential believed to be worth around US\$60 billion, the RoF has been called a multi-generational economic opportunity for the province.'

And yet, there are problems with the RoF unrelated to its actual mineral wealth. A key candidate for mining, Cliffs Natural Resources, left the site in 2013,

and in 2015 sold off its investment (around US\$550 million) to Noront Resources, for just US\$27.5 million. Noront Resources anticipates an 11-year mine life for its proposed Eagle's Nest Nickel Mine, dependent on the mining rate and method, and whether additional resources are found.

In fact, Cliffs described its decision as the consequence of sharply declining iron ore prices rather than geological problems. It was not, however, assisted by a whole range of other factors. For example, the Government of Ontario is considered slow in decision-making. Julia Bennett responds, 'Ontario has established the RoF Infrastructure Development Corporation and made a US\$1 billion commitment to develop transportation infrastructure in the region... [in addition it has] approved, with amendments, the terms of reference for an environmental assessment for Noront's Eagle's Nest project and contributed more than US\$92.9 million since 2011 directly to communities and tribal councils to support community readiness and capacity building activities that will

help them prepare for proposed RoF development opportunities.'

This has been mirrored by similar delays by representatives of local First Nations – ironic in that opening up the RoF will bring crucial improvements to infrastructure. 'We have signed an historic regional framework agreement with the Matawa-member First Nations, laying the foundation for on-going and future discussions [and] invested more than US\$785,000 with the federal government to enable the Webequie, Eabametoong, Neskantaga and Nibinamik First Nations to work together and complete an all-season community service corridor study,' explained Bennett.

At the time of writing, there are also differences of opinion regarding transport links to the RoF. Some favour a rail link running directly south from the deposits, others an east-west road link, possibly funded with Chinese capital. This particular lack of decision can be called a microcosm of the RoF as a whole. While blame cannot be apportioned to one player alone, the fact remains that the RoF lies idle.

**Below: Pretium Resources' Blackjack gold mine.**



## British Columbia

Very often identified as Canada's key mining province and thus one of the most important generators of revenue for the country, British Columbia (BC) enjoys some of the most prolific mining activity in Canada as well as some of its greatest challenges.

For example, BC is witnessing the construction of Pretium Resources' Blackjack gold project. Blackjack's commercial production is targeted for Q4 2017 now that construction is well underway. Brucejack lies 65km north of Stewart BC within the Valley of the Kings area. The latter comprises high-grade visible gold within a lower-grade gold quartz stockwork system. In 2016, an update revealed measured and indicated mineral resources in the Valley of the Kings now totalling 9.1 million ounces of gold (16.4 million tonnes grading 17.2g/t gold).

Pretium has divided its annual production from Blackjack into eight years at 504,000oz/y and then 404,000oz/y for each of the remaining 10 years of the life of mine. The project is valued at US\$2.36 billion NPV with 5% discount. In addition, pre-tax IRR is estimated at 33%, with payback 3.4 years. The all-in sustaining cash cost per ounce over life of mine is US\$446.

## Canadian minerals power e-car revolution

Tesla CEO, Elon Musk, has set an annual target of 500,000 battery-powered cars by 2018. Two key components for the batteries required at Tesla's new factory in Nevada, USA, are lithium and cobalt. Tesla is likely to require 25,000t/y of lithium hydroxide to support Musk's aspirations.

Enter, Canada's North-West Territories (NWT), where Hidden Lake, north of NWT capital Yellowknife, hosts major hard-rock lithium deposits and where, at Whati, 164km from Yellowknife, cobalt resources lie in abundance.

Lithium-bearing land (1,100ha) located at Hidden Lake has been acquired by a Vancouver-based junior exploration company, 92 Resources. The President and CEO of 92 Resources, Adrian Lamoureux, reviewed the challenge, 'Tesla needs supply. Now, do they want to be paying up to US\$20,000/t for lithium in Asia? No. They want something a little bit closer to home.'

While 92 Resources is in early development, Lamoureux is enthusiastic about progress, 'I wouldn't rule out this decade. Within a few years is definitely possible,' when asked to put a date on a potential mine. 'The market doesn't lie. This supply-and-demand issue is critical and I want 92 Resources and the NWT to be part of the green energy supply chain.'

And then there is cobalt, found in the cathodes of high performance lithium-ion rechargeable batteries, cobalt providing greater energy density and superior chargeability. These batteries are also expected to dominate rechargeables for at least the next decade, not least as demand for cobalt increased 12% in 2015 and double-digit growth is expected in the coming years.

Ontario-based Fortune Minerals has spent around 20 years (and more than US\$115 million) working the NICO cobalt-gold-bismuth-copper project at

Whati. President and CEO, Robin Goad, has declared his respect for Elon Musk, describing his company as innovative and remarkable and Musk himself as an incredible salesman. Fortune Minerals' ambitions are also helped by security of supply. Another major cobalt producer is the Democratic Republic of the Congo, long regarded as risky for mining companies.

Troy Nazarewicz, Investor Relations Manager at Fortune Minerals, comments, 'NICO's proven and probable mineral reserves total more than 33Mt to support a 21-year mine life at a planned mill throughput rate of 4,650t/d of ore. Life of mine average annual production is projected to be 41,300oz gold, 1,615t bayyert-grade cobalt, 1,750t bismuth contained in metal ingots and oxide powder, and 265t copper.'

'If purchased for use in North America there would be lower transportation costs and trade advantages under NAFTA associated with Fortune's cobalt production. In addition, Chinese-produced cobalt chemicals are subject to Chinese VAT and excise duties in North America.'

Nazarewicz is, however, realistic regarding NICO's ability to supply Tesla's demands, 'Market estimates are that Tesla will require 5,000t/y-10,000t/y of cobalt to meet its requirements for the first gigafactory in Nevada, USA, whereas average annual production from NICO is 1,615t. Consequently, three-to-six NICO-sized assets would be required to meet Tesla's cobalt needs for the first gigafactory. Nazarewicz points to where cobalt will be needed in abundance, 'All major auto makers are working to build electric vehicles, plus new entrants such as Apple and Google and many proposed new manufacturers in China. At least 12 battery megafactories, including Tesla's, have been either announced or are under construction to meet the expected increase in demand.'

Below left: Steel set installation in the conveyor decline at Pretium Resources.





Ministry of Northern Development and Mines

Above: Northern Ontario Ring of Fire has significant deposits of nickel, copper, chromate and zinc.

### New road for Far North minerals

Canada's NWT and federal government have long recognised the need for effective road links, including NWT's Far North Sahtu region north and west of Great Bear Lake and home to five First Nations. Sahtu contains mineral wealth, boreal forest and part of the Mackenzie River. Currently, it runs by the Mackenzie Valley winter road, vital for winter cargoes, but recently under real pressure because of substantial increases in industrial traffic. All-weather access to the Mackenzie Valley and Arctic Coast would also mean access to minerals, metals, oil, gas, and hydroelectric power. Thus, the Mackenzie Valley Highway (MVH) will run 800km from Wrigley to the Arctic subject to funding. Here, finance from Canada's national infrastructure fund, specifically for nationally significant projects, is a possibility. When all phases of the road are completed, 1,000km of new roads could increase access to Sahtu by 50%.

Construction materials for MVH are transported using the existing road infrastructure, air and barges along the Mackenzie River. Ioana Spiridonica, Manager of Public Affairs and Communications at the Department of Transportation, NWT, described MVH's special demands as, 'An example of the challenges that are often faced when developing infrastructure

in the north where low temperatures and permafrost are prevalent. It prompted developers to adapt their construction methods and techniques to these harsh climatic conditions.'

Each section of MVH has unique permafrost features, and each has had to be studied above and below the surface. For example, "cut and fill" techniques common in the south have been rejected because they cut into the protective layers of surface vegetation and organics, with possible thawing in the crucial permafrost below. In fact, a special fabric, geotextile, is placed in between existing ground and the construction materials along the whole highway.

Spridonica updates the funding and finance, 'The NWT Government continues to work with the federal government to secure the necessary funding for construction of the remaining sections of the MVH. NWT has submitted a business case for the Wrigley to Norman Wells section of the MVH to Infrastructure Canada. We are waiting for a formal response on it from the federal government. The current cost estimate for completion of MVH is expected to be US\$700 million.'

As ever, Canada's mining is booming – its problems with the Ring of Fire should not disguise its ever-growing successes.