

Stepping in from the Cold: Exploration and Mining in Canada's Territories, Greenland and Sweden



**Special Pre-release of GBR's
Industry Explorations**

Welcome

Despite its chilling reputation, the Circumpolar Region, which includes parts of Canada, Greenland and Sweden, is on its way to becoming one of the hottest mining destinations in the world. The Arctic region alone is expected to attract over \$100 billion in investments over the next ten years, and contains


over 20% of the world's untapped, recoverable oil and gas resources and significant reserves of rare earth, coal, uranium, gold, diamonds, zinc, platinum, nickel and iron ore.

Looking at Canada's territories; Yukon, Northwest Territories and Nunavut, and Alaska and Greenland, the landscape

may appear similar, but each jurisdiction has its own unique socio-economic background, challenges and opportunities.

This summary of five mining jurisdictions is just the start of the extensive research Global Business Reports is doing for its project on exploration and mining in the Circumpolar Region.

We would like to thank everyone who took the time to participate in our research. The full report will be published in **February 2015**. If you would like to be interviewed for the report please contact Katie Bromley (kbromley@gbreports.com).



Avalon Rare Metals' Nechalacho campsite, at Thor Lake, Northwest Territories. Photo courtesy of Avalon Rare Metals.

Exploration and Mining in Canada's Territories, Greenland and Sweden

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Cover page: Aerial view of the Eagle Gold project site. Photo courtesy of Victoria Gold Corp.

Canada's Territories

An overview of the region's rich mining history and opportunities in the final frontiers.



Yukon

Yukon is the most developed of Canada's territories, with a rich mining heritage and efficient regulatory framework. While 2013 has been a tough year, with GDP growth at 1.3% down from 3.3% in 2012, the mining sector continued to perform well and mining, quarrying, and oil and gas extraction rose by 8%.

With a population of just 36,286 in a land area of 482,443 km², Yukon boasts a wide variety of mineral wealth with the following breakdown of total production in 2013: gold 70%, zinc 10%, copper 10%, tungsten 7%, and platinum and silver 3%. Yukon's mining industry is vital to the province's economic development accounting for 18.8% of Yukon's GDP in 2012. Recognizing the importance of the mining sector, its government spends more per capita on direct financial incentives for mining exploration than any other Canadian jurisdiction.

With 14 different Yukon First Nations and people of aboriginal descent representing 25% of the province's population, Yukon is home to a number of unique traditions and regulations. Yukon has set the standard for establishing land claim agreements to enable First Nations' self-governance and formally recognizing their legal rights to govern their lands. Therefore, before any mining operation can take off, there have to be agreements with First Nation governments.

While one might expect this to be a cumbersome process considering the number of different First Nations and aboriginal communities that are in Yukon, director, president and CEO of Victoria Gold, John McConnell, assured that this is not the case. "The biggest advantage is the one-window permitting process; it is the only jurisdiction in Canada that has such a system. Every other jurisdiction in Canada has a provincial or territorial process and a parallel federal process. In Yukon, the federal authorities participate, but they participate within Yukon's process. The Northwest Territories are trying to move to this system, but they have other complications relating to First Nations' land claims," he said.

Developmental corporations have been established by and for First Nations that encourage collaboration between First Nation communities and mining companies, ensuring sustainable and responsible use of labor and mineral resources through legislation such as the Yukon Environmental and Socio-economic Assessment Act. The Government of Yukon has established one board, YESAB, to assess the impact of projects and activities on the territory.

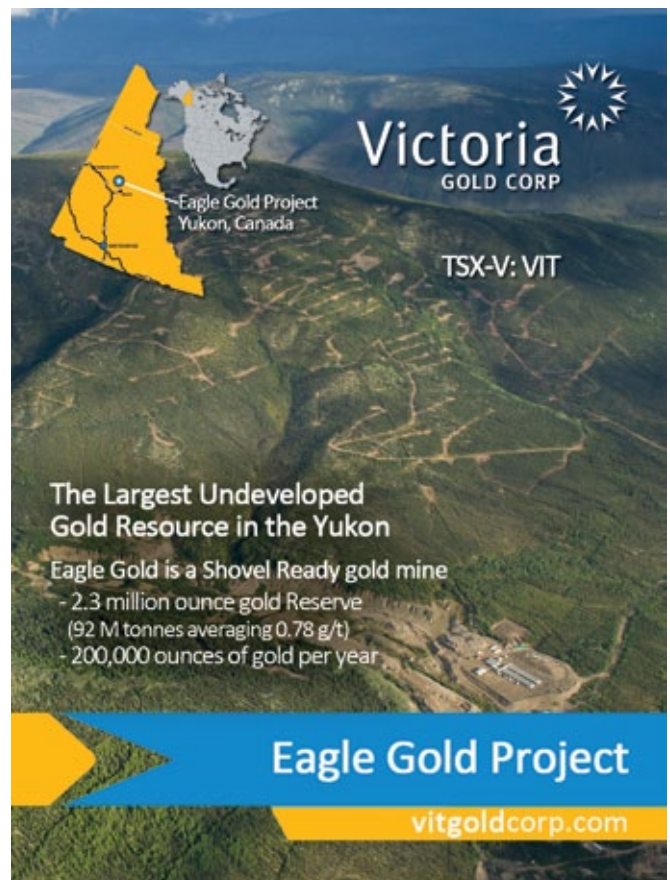
Unlike the other territories, Yukon is situated near deep-water ports; Skagway and Haines, Alaska. This geological windfall allows easy access to key shipping routes to Asia and connects the Alaskan economy to the rest of North America. Yukon also

has an all-season highway infrastructure that is pivotal for the mining sector as truck shipping accounts for 87.5% of mined products in the territory. Daily flights to major urban centers in southern Canada and numerous flights to rural communities throughout Yukon also facilitate business, although they do not come cheap. The Erik Nielsen International Airport in Whitehorse also connects Yukon internationally to Germany.

Grid connectivity and access to roads is a game changer for mines in the North that are already drumming up high exploration and operation costs. John McConnell, director, president and CEO of Victoria Gold Corp, and its flagship Eagle Gold project in Yukon explained: "Some parts of Yukon, Nunavut and the

Northwest Territories are isolated, but Dublin Gulch (where the Eagle Gold project is located) enjoys good infrastructure. We have year round road access to the project site and are within 30 km of grid power. The community of Mayo is 50 km away with a full service airport. Very few northern projects enjoy this level of infrastructure. The benefit to Eagle in terms of lower capital and lower operating costs are very attractive and affords a significant competitive advantage. This, in part, enables Eagle to compete on an attractive return basis with several comparable more southern projects currently in production."

While powering the mines remains a costly challenge, Yukon is powered by clean hydro, with diesel generation serving as emergency back-up and to meet peak demand during the coldest months of the year.



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Northwest Territories

Despite the tough times that juniors are currently experiencing, mining has been the economic backbone of the Northwest Territories for almost 80 years and its legacy continues today as the industry contributes to over 25% of the GDP directly and is the largest private sector employer, employing over 2,000 people, including a significant number of aboriginals.

In 2013, GDP grew 1.9% in Northwest Territories, which is equal to the growth the territory saw in 2012. Known for its diamond reserves, mining of this precious stone advanced 6.0% in 2013. The reserves are of top quality, as explained by Patrick Evans of Kennady Diamonds that operates the Kennady North project close to Mountain Province Diamonds and De Beers' JV Gahcho Kué diamond mine: "The results we received in November 2013 are a sample grade. Grades received at Kelvin and Faraday are among the highest in the world. The highest grade can be found in Russia (8 carats/ton). There are also similarities between Kennady North and Gahcho Kué in terms of the quality of the diamonds that have been recovered. However, Kennady North has a higher grade and better clarity."

Over the last six years, diamond mines in the Northwest Territories have generated close to \$10 billion in business contracts, of which over \$4 billion have benefitted aboriginal-owned businesses.

While diamonds are key to the industry, the Northwest Territories' mining potential also includes gold, lead, zinc, copper, and iron ore. The Canadian government has identified the development of the domestic rare earths industry as a priority for economic development and an ambitious target of securing 20% of supply by 2018. "The 20% goal is achievable, although it is a tight timeframe. The Canadian government has a big initiative to expand its international trade agreements in Europe and the Pacific Rim where there are big markets for rare earths," said Donald Bubar, president and CEO of Avalon Rare Metals that operates the Nechalacho project with a rich rare earth deposit.

First Nations regulations in the Northwest Territories differ from those of Yukon and, this year, the Northwest Territories and Nunavut Mining Regulations have been repealed and replaced with two separate regulations starting on April 1, 2014. The hope is that the Nunavut Mining Regulations and the Northwest Territories Mining Regulations will

better meet current administrative, industry and legal standards. "We operate within a very strict environmental licensing regime. We have secured land use and water licenses, which have been very difficult to obtain, as well as maintain. It is a highly regulated development and mining regime," said Evans of Kennady Diamonds.

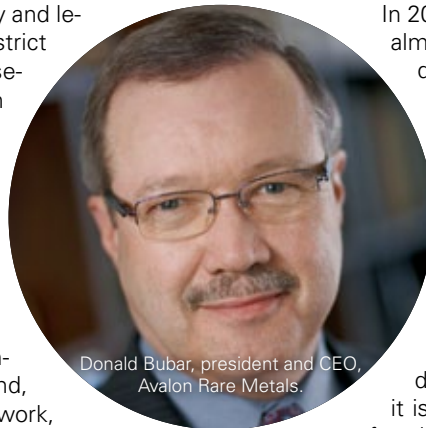
The devolution is the last major transfer of powers from the federal government to the territorial government and aims to provide new opportunities for Northerners to work together to responsibly and sustainably manage the Northwest Territories' land, water and natural resources. In this framework, resource revenues will be shared according to the Northwest Territories Intergovernmental Resource Revenue Sharing Agreement. These coincide with Impact and Benefits Agreements between developers and the impacted aboriginal community and stipulate the terms of employment and economic benefit throughout the mining operations.

Among the challenges encountered by exploration and mining companies in this jurisdiction are finding properly trained people to meet the demand for skilled and semi-skilled workers, as well as meeting infrastructure and energy demands. "Through the years, the real issue remains energy and transportation access - the nemeses of almost every project in the North. Transportation is incredibly expensive," said Jay Collins, president of Merit Consultants International. Access to shipping routes and railways are a way to side step the lack of road infrastructure. "Nearly all areas of the Northwest Territories have infrastructure challenges, but Nechalacho is in close proximity to Great Slave Lake and we can use the lake to access the railway at Hay River. Avalon will use a barge to bring food and equipment to the site and ultimately ship product once production begins. There is also the possibility of creating an ice road in the winter, but building a road is not critical to the project's development," said Bubar of Avalon Rare Metals. However such access is of course dependent on the geographical "luck of draw" and infrastructure development in the Northwest Territories has to be prioritized.

As is often the case, a mismatch between supply and demand leads to further opportunity for development. The Northwest Territories government plans to spend \$600 million over the next decade to improve the territory's all-season roads, highways and bridges as well as its marine and airport infrastructure, all in the hopes of making the Northwest Territories a more attractive mining destination.

Nunavut

As the new kid on the block, having only become a territory as recently as 1999, Nunavut has faced some difficult economic times. Initially, money was poured into the newly established territory by institutions of public government. However, the territory stood in icy shock as it saw all three of its first operating mines close, with no prospective private players lining up to take over and take the lead in the industry. Today, however, there are many silver linings as the past decade of investment is finally starting to pay off. The two mines currently operating in Nunavut are the Meadowlark Gold mine and the Mary River iron project.



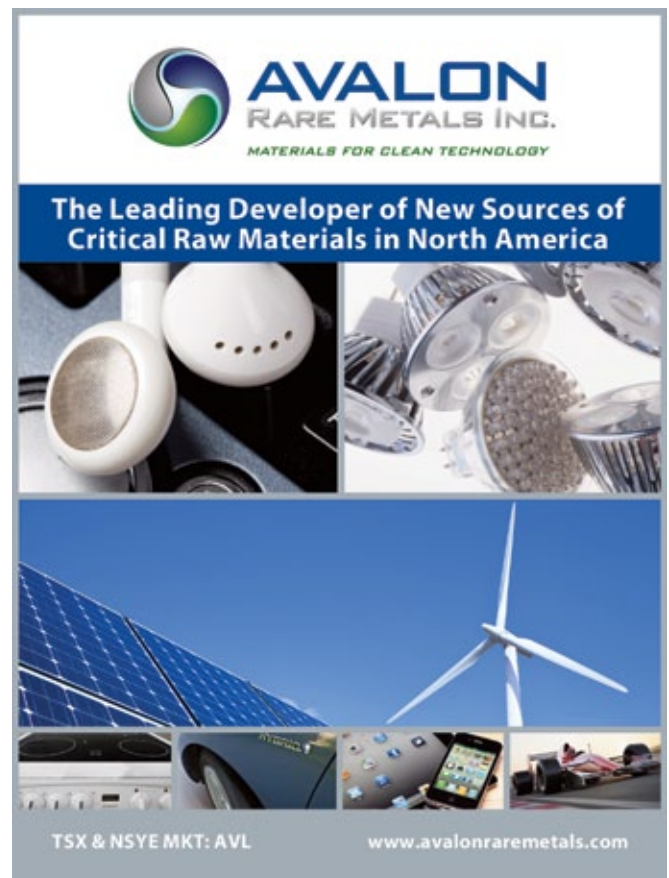
Donald Bubar, president and CEO,
Avalon Rare Metals.

In 2013, Nunavut's GDP grew by 10.5%, which is almost 10% more than growth in 2012. Mining, quarrying and oil and gas extraction, including support activities, rose by 16%, contributing greatly to the territory's impressive growth, albeit from a lower base. Nunavut has a population of about 35,000 people and remains one of the world's most sparsely populated regions, however since 2009 population growth has exceeded the 2% mark.

Being at such an early stage of development, the territory has a lot of catching up to do in terms of socio-economic performance if it is to afford the Nunavummiut the same level of well being as the majority of Canadians enjoy.

The mining sector will again play a pivotal role and, with a number of projects moving closer to development, it has the potential to create a large number of jobs in the near future.

There is still a challenging road ahead, however, as mining in Nunavut is a costly exercise in this remote location. When developing a mining asset in Nunavut, costs such as the development of a railway or marine facilities as well as powering the mine in its remote location have to be taken into account. The Mary River iron project for example, now in construction phase, still has a way to go before operations can begin. Yet the deposit has been prospected as early as 1962. Due to its geographic location on Baffinland, Canada's largest island, careful coordination between service and equipment providers is essential. Baffinland is a picture of extremes, with little vegetation and wildlife, almost 24 hours of darkness from November to January and 24 hours of sunlight from May to August.



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Mining projects in Nunavut are therefore more sensitive and at-risk when it comes to price changes than the other jurisdictions as construction and operating costs as well as labor costs tend to be much higher.

While regulation is evolving in this young territory, its framework is similar to that of the Northwest Territories and the devolution that it has undergone. Processes in some cases tend to be lengthy, but should not hinder the serious investor.



Jay Collins, president of Merit Consultants International.

Greenland

From the Archean to the Quaternary, the geological development of the world's largest island spans a period of almost 4 billion years. A former Danish colony, Greenland was granted home rule in 1979. While the Danish government is still in charge of foreign affairs, financial policy and security, Greenland assumed self-determination in 2009 with responsibility for judicial affairs, police, and natural resources.

Looking at Greenland's geology, a large ice sheet, a remnant of the previous ice age, covers the central part of the country. The ice-free zone around the ice cap is up to 300 km wide and covers an area of 410,000 km². The burnishing forces of the glaciers have left behind large areas of clean exposed rock that hosts mineral belts that are highly prospective for gold, nickel, platinum group elements, copper, lead, zinc, molybdenum, tantalum and niobium, iron ore, several forms of industrial minerals, diamonds, rubies and rare earths.

The Bank of Greenland estimates that GDP declined just under 1% in 2012 and a further 0.5% in 2013. Expectations of zero growth have been set for 2014. Greenland's economy has always relied heavily on its hunting and fishing industries, but with the reduction in the Arctic sea ice, new opportunities are arising in the mining and oil and gas sectors. It is also becoming increasingly important for Greenland to supplement economic growth through leveraging its natural resources in the mining and energy sectors, as growth in fisheries industry in the country will be modest at best. Since 2002, the number of exploration licenses in Greenland has increased more than six fold.

This is partly due to Greenland's government wishing to see its resource sector expand, however the true test for foreign investors will be to obtain political clarification of the final design of the planned taxation through royalties in the extraction phase. To really attract the necessary investment in the country's mining industry, there needs to be clarity on policies and not just strings of bureaucratic red tape. Merit Consultants International is one of very few Canadian construction management companies that have done work in Greenland's mining sector. According to Jay Collins: "[The] challenge is that all permit approval and documentation goes through the Danes and the process then becomes quite bureaucratic. The Northwest Territories, Nunavut and Yukon's mining jurisdictions are far easier to deal with. Here one is dealing with small groups of people who are the decision makers. While First Nation regulations still present a challenge at times, these juris-



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dictions are some of the friendliest in the world." Greenland needs mining legislation that is transparent and predictable if it wants to compete with other Circumpolar mining jurisdictions.

When it comes to transportation and shipping, a lot has changed in Greenland because of the reduction of the Arctic ice cap. Not only has this reduction increased accessibility to the region's minerals and oil and gas deposits, it has also created new shipping routes that decrease transportation times between Europe and Asia. Comparing transportation and shipping between Canada and Greenland, from the interior of Canada's North you need to road transport your product across vast distances before getting it to a railway or port. However, transportation distances in Greenland from mining sites to open water are usually around tens of kilometers.

A big challenge in Greenland, with a population of 56,000 including foreigners, is finding the right skills. Companies will have to resort to getting more foreign workers in to develop operations at a satisfactory pace.

Despite all these challenges, opportunities in Greenland cannot be overstated with possibilities of accessing 13% of the world's undiscovered oil, 30% of its untapped natural gas and 20% of the global liquid gas reserves as well as other metals and minerals.

Sweden

The Swedish mining heritage dates back hundreds of years, with the first mining data recorded in the early 1200s. Today, Sweden is one of Europe's leading producers of ores and minerals and by far the biggest producer of iron ore. Other minerals that play a significant role in Sweden's mining economy are copper, zinc and lead as well as gold and silver.

In 2013, the Swedish economy grew by 1.5%. The Swedish mining industry has largely recovered from the global contraction, posting double digit growth in 2010 and 2011, followed by a decline in 2012 similar to mining jurisdictions worldwide. While a decline is expected for 2013, this year seems to carry high hopes that the industry will expand again.

The Mining Inspectorate of Sweden is the official body responsible for issuing permits for exploration and mining and decides on matters falling under the Minerals Act (1991:45). Owning and operating the Woxna graphite mine in Sweden, Canadian-based Flinders Resources has first hand experience in a country that has been ranked as one of the world's top mining friendly destinations by the Fraser's Institute. As company's CEO and president Blair Way described: "Sweden is a very civilized country with a great infrastructure. Having worked extensively in developing mining jurisdictions, it is truly refreshing conducting business without the hassles of security and logistics. In terms of regulations, Sweden has standard European mining legislation that is clear and transparent with a rulebook that is quite amenable even to non-Swedish speakers. Sweden is in essence a mining country with a mining heritage and this is apparent when you work there. While labor is expensive, similarly to Canada, Australia and the UK, productivity and skill



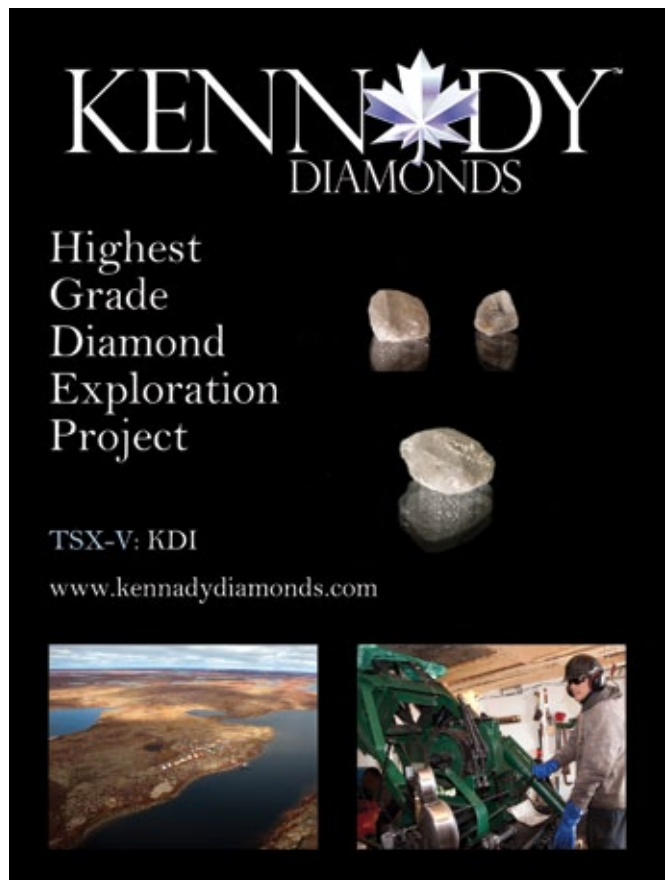
Blair Way, CEO and president,
Flinders Resources.

is also high which basically offset the cost. Interestingly, price is not the main driver for our customers, who are more interested in consistency of supply. This is where Flinders have a big advantage over Chinese producers as our product is between 150-200 CAD cheaper due the proximity to our customers. Another benefit is that if customers need our product on short notice, we are right there [in Europe], where China is a month's shipping away."

The Swedish Mining Association's recently released its vision for the mining sectors' growth up until 2025. This report sees mining production over the next 10 years as well as the creation of 50,000 new jobs. Establishing a research and innovation program will be central to this strategy and highlights Sweden's long standing commitment to leadership in research education and innovation as a mining jurisdiction. Sweden remains one of the Circumpolar jurisdictions to watch not only as a strong player in primary extraction, but also in secondary extraction.

Continuing Research

With many fascinating Circumpolar mining jurisdictions to explore, over the next few months GBR will be breaking the ice to discover what lies ahead for these challenging and unique mining destinations.



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Aerial view of ongoing drilling program at Kennady North.
Photo courtesy of Kennady Diamonds.

