exposure

Profiling new and undeveloped industrial mineral deposits worldwide

Hutton garnet beaches

The Hutton beach claims are located on tidewater in an uninhabited area on the east coast of northern Labrador, Canada. Freeport Resources Inc., based in Vancouver, British Columbia holds six claims on the Hutton property. The garnet potential of the property was first recognised when Freeport began exploring in 1997, and since 1999, the production of industrial garnet has been a major focus for the company. The grade and reserves were defined in the prefeasibility and marketing study of 2001. At the end of 2003, development of the project received a major boost after the reassessment of the region's national park status.

Geology & reserves

Freeport's garnet claims consist of the North and South Beach onshore deposits, and deposits offshore from South Beach and Seven Islands. The Hutton garnet deposits contain unusually high concentrations of almandine garnet. Most North American commercial deposits average less than 20% garnet, while South Beach averages over 60% garnet, and exceeds 75% locally. North Beach is a much larger, lower-grade resource with samples averaging 25% garnet. Offshore areas have a similar grade to North Beach. Garnet from the South Beach deposit alone could sustain a 20,000 tpa development for over 20 years *(see table 1)*.

Garnet is a dominant rock-forming mineral in the region. Glaciers carried garnet-rich till to the ocean, where waves separated heavy minerals from the fines and deposited them along the shoreline as beaches. The garnet is of a high quality due to its sub-angular shape and lack of fractures and inclusions.

Inuit land claim

Freeport was forced to stall the project for around four years after the government announced that the mining area would fall inside the boundaries of a national park, and proposed termination of all mineral interests in the area. However, in December 2003, negotiations surrounding the creation of a Labrador Inuit Settlement Area deemed that the Hutton beaches would instead fall outside the park boundaries and within the Labrador Inuit Land Claim Area. Freeport has formed a good relationship with the Labrador Inuit Association (LIA), which has priority access to the development. The company will pay royalties to the LIA and come to an agreement on employment for the Inuit population. The claim is due to be ratified by mid-2004.

Commenting on what the land claim would mean for Freeport, company president Brenda Clark said, "In many ways, ratification of the land claim is a benefit as it removes a question mark where respective rights may lay. We've always approached this development as having to have the support of the local community. Obviously, given its location, we would depend on a lot of services being provided by Labrador residents. Arguably, there may be an incremental cost to be paid in terms of doing the development, but we see that as a reasonable trade-off."

Development timeline

In light of the recent developments on the land claims, Freeport Resources has set a timetable for production from the Hutton garnet beaches. During 2004, Freeport plans to perform bulk sampling, finalise the beneficiation flow sheet, continue its environmental studies and carry out market testing and analysis. Freeport is in the process of establishing its extraction plan, which will take the results of this year's bulk sampling and environmental studies into account. Pending environmental approval, and positive marketing results, Freeport would then plan to start production in 2005.

The initial target for production is the South Beach onshore zone. Freeport's long-term goal is to produce 25,000 tpa of garnet. The company intends to build up to this level gradually, and to evaluate additional development at North Beach and/or offshore on an as-needed basis, to supplement production from South Beach in later years.

British Columbia's Center for Industrial Minerals Innovations (CIMI) is carrying out a beneficiation report on Freeport's garnet sands, and has established a process flow sheet after testing several tonnes of unprocessed material collected in 1999. The simple process incorporates wet gravity separation, drying, sieving, dry magnetic separation and electrostatic separation. Preliminary extraction and processing costs are estimated at C$165/tonne ($129/tonne).

Market goals

Freeport will initially target its garnet at the major industrial centres in eastern Canada and the USA, and possibly Europe. The principal market will be waterjet cutting, plus limited blasting material. A leading manufacturer of waterjets tested the Hutton garnet concentrate and found it to perform at 96% of the premium US hardrock waterjet product.

Freeport also intends to evaluate the titanium minerals (ilmenite and rutile) present in the Hutton beaches, because of the potential merits in pursuing a two-pronged approach. "Due to the high grade of the material, it is still a possibility to ship some unprocessed material to a custom processor or equivalent," said Brenda Clark. "We are considering this option for some aspects of the European market and encourage any interested groups to contact us directly."

Table 1. Established resources in Freeport's Hutton property

	Garnet content (weight %)	Bulk density (tonnes/cm^3)	Total area (m^2)	Estimated resource (tonnes/metre depth)	Estimated total depth (metres)	Estimated total garnet (tonnes)	Estimated total garnet (s.tons)
Measured resources							
South Beach onshore	60	~2.3	185,625	256,150	2	512,300*	563,530
North Beach onshore	25	~1.8	296,525	133,450	2	266,900	293,590
Sub total				389,600		779,200	857,120
Indicated resources							
South Beach offshore	25	~1.8	775,000	348,750	1	348,750	383,625
Seven Islands offshore	20	~1.8	500,000	180,000	1	180,000	198,000
Sub total				528,750		528,750	581,625
Total				918,350		1,307,950	1,438,750

*256,150 tonnes included as probable reserve