

# Mining

## WHAT'S A DIAMOND CONGLOMERATE?

*By Martin Irving*

**W**ith the opening of De Beers' Victor mine last year, the province of Ontario joined the Northwest Territories (NWT) as a producing diamond jurisdiction within Canada. As with other diamond mining jurisdictions, Ontario is hoping to use the diamond mining operations to explore other diamond-related opportunities. These include looking at establishing a diamond bourse in Toronto and developing one or more diamond cutting and polishing factories to process production from Victor, under an agreement negotiated with De Beers.

While Ontario is heading along similar value-added paths as the NWT and Botswana, unlike those jurisdictions, Ontario does not have 20+ years of production in its future (yet). The Victor mine has a ten-year mine life. To make the current effort worthwhile, and to add value to their diamonds, the Ontario government must be confident that they will soon have more diamond resources.

It is certainly possible that De Beers will discover more diamonds around the Victor mine and extend its mine life. However, there are other diamond exploration projects in Ontario that may develop into mines in the not too distant future. One of these projects is Dianor Resources' Leadbetter property on the north shore of Lake Superior.

While diamonds are usually found in kimberlite pipes or dykes or, more rarely, in lamproites (such as at

the Argyle mine), the Leadbetter diamond project is focused on a diamond-bearing conglomerate.

For non-geologists, conglomerate is a rock consisting of individual stones (larger than sand) that have become cemented together. Conglomerates are not volcanic rocks like kimberlites or lamproites, but are sedimentary rocks consisting of generally rounded fragments of rock that have eroded from other rocks (perhaps volcanic) and have been deposited, often under water.

The current geological theory is that over 2.7 billion years ago, diamonds and their associated indicator minerals were brought to the surface in kimberlite pipes by a series of volcanic eruptions. These pipes were eroded or collapsed into one or more debris flows, which, in this case, over billions of years, became the Leadbetter conglomerate.

The history of this conglomerate is as follows. A number of alluvial diamond discoveries were made near the town of Wawa, Ontario in the early 1990s. A local prospector named Leadbetter panned river sediment to recover diamonds and/or diamond indicator minerals and then attempted to trace the alluvial diamonds and indicator minerals back to their source rocks. The panning of river sediments by Leadbetter resulted in the discovery of two diamonds, a 1.09 and a 0.25 carat diamond, in the Magpie River north of Wawa. Subsequent panning and prospecting in a tributary of the Magpie River in December 2003 led to the recovery

of a 1.39 carat gem-quality diamond. Leadbetter then followed the tributary upstream to its headwaters and sampled the outcropping rocks there. Analysis of rock samples confirmed that they contained diamonds. Leadbetter staked the property and it became the Leadbetter Diamond Property. Leadbetter remains a partner of Dianor Resources in the project.

A number of mini bulk samples (approximately 70 tons) have been taken from different sections of the conglomerate. These have yielded a grade of 0.2 and 0.4 carats per ton. Several diamonds over 1 carat have been recovered.

Drilling across the conglomerate has provided enough data to support a preliminary estimate of 566 million tons of diamondiferous conglomerate. Currently Dianor is completing the permitting process, with the Ontario government, to take a large bulk sample of between 35,000 and 50,000 tons, in order to obtain between 9,000 and 13,000 carats of diamonds.

What is even more intriguing is the discovery that not only does the Leadbetter conglomerate contain

potentially economic quantities of diamonds; it also contains rubies and sapphires, and elevated levels of gold. It's a veritable jewelry store in the ground.

The Leadbetter conglomerate extends to the north of the Leadbetter property onto property owned by a joint venture between Mori Diamonds and Metalex Ventures. The Chairman of Metalex ventures is Chuck Fipke, co-discoverer of the Ekati diamond mine in the NWT. Dianor has an option to earn a 30 percent interest in the Mori property.

Exploration on the Mori property is at an earlier stage than the Leadbetter property. However, initial results are positive. A conglomerate similar to the Leadbetter conglomerate outcrops on the property, and the results from 16 drill holes confirm that it is diamondiferous. Yet the surprises continue. Of the more than 5,000 (micro) diamonds recovered in the drill holes, over 50 percent are colored. The recovered colored diamonds have a range of colors including brown, grey, yellow, green, orange, purple, amber, black and pink. Further work is planned to assess the significance of these preliminary results.

While one side of the mining equation – the value of the rock – appears to be good, so does the other side – the cost of extraction. The Leadbetter property is located 12 kilometers northeast of Wawa, which has excellent infrastructure. The Trans-Canada highway is within 15 kilometers of the property, and a hydroelectric plant is located three kilometers to the west. The conglomerate outcrops on the surface and is not covered by any overburden. All of this supports a low cost of development and operation if the project moves forward.

Over the past 20 years, the evolution and advances in the geological understanding of how and where diamonds can be found has been tremendous. The exploration work by Dianor Resources in Ontario is pushing those limits, increasing the geological knowledge, and will hopefully lead to a new diamond mine in Ontario to support the diamond aspirations of the province and the industry. ■



After ten years in government managing the diamond file, Martin Irving is now the principal of Diamond Consultants Canada, providing strategic and business advice and support to and about the Canadian diamond industry. He can be contacted at [www.diamondconsultants.ca](http://www.diamondconsultants.ca) or [mirving@sasktel.net](mailto:mirving@sasktel.net)

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