

## HISTORY OF THE DISCOVERY OF DIAMONDIFEROUS KIMBERLITES IN THE NORTHWEST TERRITORIES, CANADA

Fipke<sup>1</sup>, C.E., Dummett<sup>2</sup>, H.T., Moore<sup>3</sup>, R.O., Carlson<sup>1</sup>, J.A., Ashley<sup>3</sup>, R.M., Gurney<sup>4</sup>, J.J., Kirkley<sup>3</sup>, M.B.

1. Dia Met Minerals Ltd., 1695 Powick Road, Kelowna, B.C., Canada, V1X 4L1
2. BHP Minerals, 550 California Street, San Francisco, CA, USA 94104-1020
3. BHP Diamonds Inc., 1697 Powick Road, Kelowna, B.C. Canada, V1X 4L1
4. Dept. of Geological Sciences, University of Cape Town, Rondebosh 7700, South Africa

The largest staking rush in Canadian mining history was initiated by the discovery of diamonds in the Point Lake kimberlite pipe in late 1991. The discovery was the result of systematic heavy mineral sampling over a ten year period and covered an east-west distance of about 1200 km across the Canadian Northwest Territories (NWT). This paper describes the series of events leading up to the Point Lake discovery and outlines recent project developments.

Evaluation of the Mountain diatreme located in the MacKenzie Mountains, western NWT, was being conducted in 1981 as part of a joint venture program between Superior Minerals, Falconbridge and CF Minerals under the direction of Hugo Dummett (Superior). The regional sampling program was carried out by CF Minerals. This early venture also included Stewart Blusson who assisted with sampling between 1981 and 1983, and who is presently a minority shareholder (10%), as is Fipke, in the current BHP (51%)/Dia Met (29%) joint venture. De Beers' subsidiary Diapros and other diamond exploration companies were active south of Norman Wells. As part of this evaluation, garnets and chromites were recovered from a series of samples collected in the vicinity of Blackwater Lake (Fig 1). Dummett was transferred later that year when Superior withdrew from minerals exploration in Canada, but he provided analytical and technical support for Fipke as the search continued for the source of the indicators.

Fipke and Blusson began a helicopter-supported regional sampling program which gradually tracked the indicator mineral train 300 km eastward to the Lac la Martre area. Additional funding for the search was obtained in 1984 when Fipke listed Dia Met Minerals on the Vancouver Stock Exchange. Dia Met then took over funding of the exploration program. By 1985, sampling had been undertaken as far as the Aberdeen Lake area, 900 km east from the western edge of the Slave craton. Three highly anomalous heavy mineral samples had been identified immediately north of Lac de Gras, and of great significance was the lack of anomalous samples to the east of the Lac de Gras area, which suggested the source area had been located. Extensive higher density sampling was undertaken in the northeast and west of Lac de Gras, refining the extent of the anomalous glacial sediments.

Dia Met began to acquire ground in 1989 and in the following year an extremely anomalous sample was taken from the north shore of a circular, crater-like lake named Point Lake. The dataset of indicator mineral geochemistry within the existing claim area was evaluated independently by John Gurney and Rory Moore who concluded that the indicator minerals originated from highly diamondiferous kimberlitic sources. Dummett, then BHP's North American Exploration Manager, led BHP to sign the joint venture agreement with Dia Met on September 5, 1990. Additional claims were subsequently staked and the joint venture property presently consists of nearly 350,000 hectares within two claim blocks.

In May 1991, a BHP geophysical crew surveyed a grid over Point Lake and results from the ground survey enabled Dummett of BHP to successfully target the discovery drill hole in September of that year. The ensuing announcement that 81 diamonds (16 >0.5mm, 65 <0.5mm) had been recovered from 59 kg of kimberlite core and subsequent reverse circulation drilling sparked the historical staking rush. Approximately 20 million hectares of the Slave craton have now been staked for diamonds and in addition to BHP and Dia Met, major companies including De Beers, Kennecott and Ashton are involved, along with numerous smaller companies.

The Point Lake pipe was bulk sampled by 37 reverse circulation drill holes (15 cm diameter) during January to March, 1992. The sample returned a grade of 0.63 carats per dry metric tonne but is currently considered sub-economic because of relatively low stone quality.

Property-wide heavy mineral till sampling continued through the summers of 1990, 1991 and 1992 and nearly 6000 till samples were collected. Four areas where the geochemistry indicated proximal kimberlitic sources were chosen for airborne geophysical coverage in the fall of 1991. Targets identified from the airborne survey were followed up with ground geophysics during the winter. Nine additional kimberlites were drill confirmed in the summer of 1992 and four of the pipes (Fox, Leslie, Koala and Grizzly) were bulk sampled by reverse circulation drilling from January-April, 1993 (Table 1).

From February to June 1993, an extensive ground geophysical campaign detailed nearly two dozen exploration targets across the main claim block. Airborne geophysical surveys were also completed over the entire claims block. Core drilling of primarily geophysical targets confirmed an additional 16 pipes. A decline designed to obtain a large tonnage underground sample from the Fox pipe was started in November along with the construction of a dense media separation plant and an adjacent camp with 110 person capacity.

In 1994, the 10 tonne per hour plant was constructed and commissioned. An airstrip capable of handling Hercules and Boeing 727 and 737 aircraft was constructed and Koala camp was expanded to a capacity of 180 persons. Reverse circulation drilling of the Panda, Misery and Falcon pipes was conducted as well as large diameter (up to 76 cm) reverse circulation drilling to obtain additional sample material from the Koala pipe (Table 1). Underground bulk sampling of the Fox and Panda pipes were completed during 1994. Delineation drilling programs were carried out on the Koala, Panda, Fox and Leslie pipes. Ground geophysical and till sample coverage continued and summer exploration drilling confirmed 13 new pipes, bringing the total to 39, all but one of which are confirmed to be diamond-bearing.

Based on results of the on-going bulk sampling programs, five pipes (Panda, Misery, Koala, Fox and Leslie) are planned for development. Bulk samples ranging from 60 to 800 tonnes were collected from additional kimberlite pipes in early 1995. The project is currently under review by a four member panel, appointed by the Canadian Federal Government in December 1994, to oversee the Environmental Assessment and Review Process (EARP) for the project. Diamond production will begin in late 1997 pending completion of feasibility studies and governmental approval.

Figure 1. Map showing the prospecting route to the Lac de Gras diamond discoveries in the Northwest Territories, Canada.

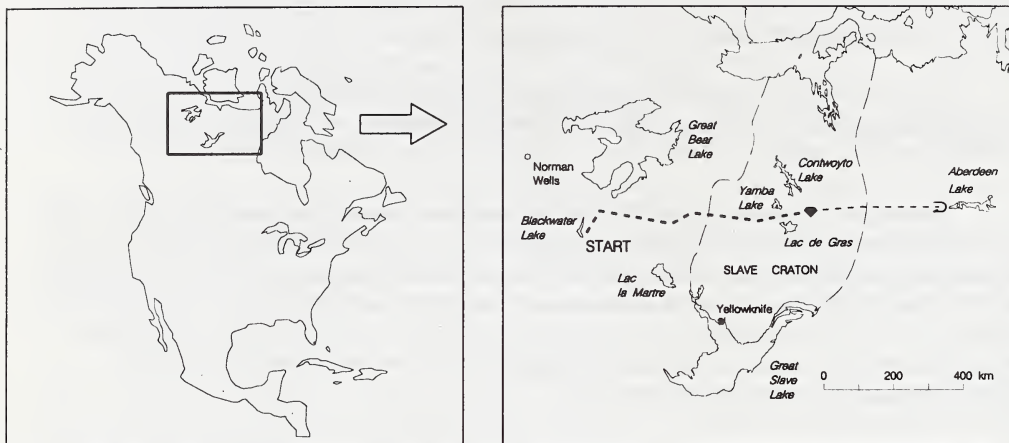


Table 1. Results of bulk sampling of the BHP/Dia Met kimberlites.

Pipe	Year	Sample Type	Dry Tonnes	Grade cts/dmt	Value US\$/ct
Point Lake	1992	15 cm RC	160	0.63	nr (low)
Fox	1993	27 cm RC	180	0.34	\$81
Fox	1994	Decline	6915	0.26	\$126
Leslie	1993	27 cm RC	152	0.43	\$89
Koala	1993	27 cm RC	50	1.25	\$112
Koala	1994	27-76 cm RC	1193	0.75	\$110
Grizzly	1993	27 cm RC	21	0.85	nr (low)
Panda	1994	27 cm RC	230	1.18	\$127
Panda	1994	Decline	2835	0.93	\$132
Misery	1994	15 cm RC	132	3.3	\$43
Falcon	1994	27 cm RC	426	0.28	\$17