

# GM 59272

ABLOVIAQ REPORT

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**Band Ore Resources Ltd. and Southern Africa Minerals Inc.**

**Geological Summary and Proposed 2000 Summer Program  
Ungava Diamond Projects  
Alluviaq Fjord Area, Québec**

**INTRODUCTION:**

Following the discovery of kimberlitic dykes by Normand Goulet of the Université du Québec à Montréal while mapping the Abloviak Shear in 1991, the Abloviak Fjord area of Nunavik, Quebec, has received increased attention by the mining community of Canada. Indeed, the kimberlite dykes have recently shown to be not only diamondiferous but contain an appreciable amount of diamonds of macro and micro size of excellent quality. Although the area is not as advanced as Lac de Gras NWT, the dykes of Abloviak have demonstrated that the potential of finding economic grade kimberlites remains highly favorable in the eastern part of the Canadian Shield.

**LOCATION AND ACCESS:**

The Abloviak Area is located along the east shore of the Ungava Bay at 59°30'N and 65°00'W. The fjord enters the mainland of Québec in an ESE direction over a distance of 20 kilometers. The original discovery is located along the northeastern ridge of the Fjord, 10-km inland which is located in the center of the first permit (PEM 1459) staked by Twin Mining on June 30<sup>th</sup> 1999. The topography of the Alluviaq area is characterized by a series of ESE trending rivers and fjords along the shore which enter mainland, carving tall cliff faces measuring close to 600 meters. Being 100 km north of the tree line, the area contains mainly grasses and lichens as vegetation.

Among the local Inuit communities found in the area are Kangiqsualujjuaq (George River) located 100 km to the southwest, and Kujjuuaq located 200-km southwest. The latter provides daily commercial flights through First Air to Montreal and to Kangiqsualujjuaq by Air Inuit's Twin Otter. The closest ground access is located at Schefferville, 500 km to

the south. In addition, a series of ships transport material from Montreal to all northern Inuit communities including George River, during the months of July and August.

#### **PREVIOUS WORK HISTORY – ABLOVIAK FJORD AREA:**

Prior to Taylor's mapping programs held in 1968, 1969 and 1971, the interior region of northeastern Quebec and Labrador was virtually unknown geologically. The coastal areas of Labrador have been settled for several centuries and many rock samples have been collected by seamen and missionaries before any formal study was done. Although some reconnaissance work was completed by Bell (1885), Low (1896), Daly (1902), and much later Wheeler (at least nine different references between 1933 to 1968), most of it was in the Nain Province along the Labrador Coast. British Newfoundland Explorations Ltd. is among the rare private companies previously active in the area. They completed a reconnaissance mapping of the Labrador portion of the map area but the Quebec side was not studied.

Taylor (1979)'s work covers an area of more than 168 000 km<sup>2</sup> and includes NTS map sheets 13O to 13M, 14C to 14F, 14L, 14M, 23P, 24A, 24B, 24G to 24J, 24P, and 25A. Mapping was completed using a 6.4 km line-interval throughout the map area. Taylor's contribution to the understanding of the area includes principally the establishment of a relatively detailed group of units based on mineralogy and metamorphic facies. In addition, well over 100 samples were taken by Taylor for age determination which significantly helps establish the history of the area, more particularly of the later intrusives. Of importance here is a determination of 524 +/- 78 Ma (Cambrian) from a subophitic, medium grained diabase dyke located approximately 60 km northwest of the Torngat 1, 2, and 3 dykes.

In 1990, Goulet and Cieselski (1990) completed a more detailed mapping of the area more particularly the Abloviak Shear Zone located at the junction of two geological provinces. The ultramafic dykes currently known as the Torngat 1 and 2 were then identified and sampled. Goulet and Cieselski (1990) also identified a series of sulphide showings near the mouth of the Abloviak Fjord. In 1993, Falconbridge participated in a field trip organized by Goulet that was focused on the nickel-bearing graphitic sediments identified by Goulet in 1990 and later sampled and studied in greater detail by Bodycomb (1992, 1993 and 1994). Mrs. Bodycomb's work identifies five different types of mineral targets as follows:

- 1) massive sulphides and graphite
- 2) disseminated sulphides in paragneiss
- 3) disseminated sulphides in deformed mafic intrusions
- 4) sulphide stringers and graphite in brittle fault zones
- 5) lamprophyre dykes (analysis not permitted for publication)

Anomalous base metal and tungsten values were returned from the first three types. The first type revealed anomalous nickel (up to 1100 ppm) and zinc (up to 7300 ppm) values while Type 3 returned low nickel (up to 206 ppm) and anomalous copper (1900 ppm) values.

The Falconbridge field trip also included a visit of a late mafic dyke located at 59°26'24" N and 65°10'73" W. The dyke contained mica, olivine and garnets which indicated a resemblance with kimberlites. Two samples (1.7 and 2.5 kg) were taken and sent to Lakefield Research for analysis. Lakefield's results confirmed the kimberlitic affinity of the dyke but all indicator minerals identified (garnet and chromites) plotted outside the field of diamondiferous kimberlites. It is important to note here that the coordinates given to Moorhead et al. (1999) by Falconbridge point to a location southwest of the fjord, roughly halfway between Tornгат 1, 2, and 3 and Tornгат South.

Meanwhile, a mapping program completed in 1991 to 1993 by Wardle, Ryan, and Ermanovics on the Labrador side of the Abloviak area identified a group of ultramafic lamprophyre dykes. The description provided is very similar to that of the Tornгат dykes (olivine-phlogopite-carbonate-perovskite) and the orientation of the dykes is said to be towards the east or northeast.

In 1994, Digonnet studied and resampled the kimberlite dykes identified by Goulet in 1991 as part of his Master's Thesis at the U.Q.A.M. The Thesis published in 1997 provides a detailed petrological study of the dykes but only a general overview of their geometry in the host gneiss. Nonetheless, the detailed work provides important new information regarding the dykes. Firstly, a 1.5mm gem quality diamond was observed within the dyke along with both G9 and G10 garnets. Secondly, the dyke was dated at 544 +/- 12 Ma (Cambrian). Finally, an interpretation is provided regarding the mode of emplacement of the dykes. Digonnet (1997) suggests that the magma has intruded the open fractures during the reactivation of the major fault structures (Abloviak Shear) at the opening of the Iapetus Ocean.

During the summer of 1997, Gaudreault (1997) mapped permit 1197 for Heron Exploration Inc. The permit is located immediately northwest of the Tornгат dykes and covers most of the base metal showings identified by Bodycomb (1994). All showings, including the Little Balls, Pointe Verte, and Char Bay showings were sampled and compared to the results obtained by Bodycomb but unfortunately, all values obtained are lower or similar to those obtained by Bodycomb. The report also discusses the work done by Digonnet but the author does not provide an evaluation of the diamond potential of the property.

Following the publication of the Thesis by Digonnet, Fjordland Minerals Ltd. obtained a permit covering 400 km<sup>2</sup> centered on the diamondiferous dykes. Photo-interpretation and till sampling was completed (41 samples) but the known kimberlite dykes were not sampled (Moorhead et al., 1999). Indicator minerals found in the till samples were

considered disappointing and no further work was completed. The permits were abandoned and no report was filed for assessment.

In 1998, the government commenced a mapping program of the NTS map sheet 24I immediately south of the Alluviaq area. Lineaments similar to those associated with the Torngat dykes and lamprophyre dykes similar to those described by Digonnet were identified throughout the map sheet.

Also in 1998, SOQUEM, Mine d'Or Virginia and Cambior completed a geophysical and geological program on their permits in northeastern Quebec including the Le Droit Permit (PEM 1331). Following an airborne survey completed in June 1998, a team composed of geologists from all three companies spent two weeks exploring the EM anomalies identified as priority on the AEM survey. The assessment reports (#56596 and #56597) reviews the results of the airborne survey and mentions the presence of crosscutting linear thin magnetic features which are believed to represent late mafic dykes. Most AEM anomalies visited by the geologists were explained by the presence of graphitic and sulphidic metasediments. Nevertheless, some mafic and ultramafic rocks were identified on the property, some of which returned weak nickel values (highest are 750, 770, 860, and 990 ppm). Whole rock assays from these samples returned SiO<sub>2</sub> above 45% and MgO values below 22%. In addition to these results, a single sample of silicified anorthosite returned 220 ppb Au. The authors recommend dropping the permit.

Twin Mining Corporation (formerly Twin Gold Corp.) obtained its first mining permit in 1999 and initiated a preliminary sampling program on the kimberlite dykes during the summer months. In August of that year, a dyke of more than 2.5m wide, traceable over 1.5 km was observed and sampled. Three other dykes were also identified. New permits were obtained for a total of 101 km<sup>2</sup>. Following a photo-interpretation study other lineaments parallel to the known kimberlites were identified and other land was secured for a total of 331 km<sup>2</sup>. A new series of dykes (Torngat South) was later identified to the south west of the original discovery. The South dykes are located southwest of the Abloviak Shear, within the Rae Province. In the fall of 1999, a new permit was obtained from the Quebec Government. Total land holding controlled by the company amounts to 444 km<sup>2</sup>.

The preliminary sampling program completed in the summer of 1999 returned promising results. The kimberlite samples from TORNGAT dykes 1, 2 & 3 and TORNGAT South, have produced 475 diamonds of which 80 are macro diamonds. Most of the diamonds are of high quality, and are white and transparent. The following is a detailed description of some selected results:

<u>Sample No.</u>	<u>Weight (kg)</u>	<u>No. Diam.</u>	<u>No. Marco.</u>	<u>Description</u>
<b>TORNGAT 1</b>				
AD1 Coarse	109.8	214	44	Float grab sample, coarse grained part of dyke.

AD1 Fine	244.8	17	2	Float grab sample, Fine grained part (contacts ?) of dyke.
AD2	39.61	62	3	Mixed medium and fine grained material of subcropping kimberlite.
			<b>TORNGAT 2/3</b>	
AD6-14	10.804	26	4	Float grab samples at the base of the cliff where dykes 2 and three are located.
AD6	26.94	16	5	
			<b>TORNGAT South</b>	
AD10	27.48	7	0	Float grab samples from linear depression above weathered dyke at top of cliff overlooking Beaufremont River estuary.

During the winter 1999-2000, a fixed wing magnetic survey was completed across the entire group (444 km<sup>2</sup>). Clearly, the known dykes appear as moderate linear magnetic anomalies trending 040 to 060 Az. (Twin Mining Website), virtually perpendicular to the gneissosity and the general magnetic trend across the entire property. In addition, other continuous and parallel magnetic anomalies are identified throughout the property. Some of these are not only much stronger and continuous than those associated with the known dykes, but are also associated with subtle linear trends observed on the air photos.

A mini-bulk sampling program was completed during the months of April and May 2000 which consisted of five 10-ton samples taken along the main dyke systems including along a strong magnetic anomaly located south of, and along strike with the main showing. The identification of one microdiamond found while panning a small quantity of weathered kimberlite uncovered along the south magnetic anomaly (called the Kakivuaq Zone) was among the highlight of the program as it confirms the extensive strike potential of the dyke.

The samples taken during the mini-bulk program are currently being processed for macro diamond extraction and study.

Finally, Copper Hill Corporation announced in a release dated November 5<sup>th</sup> 1999 that ultramafic dykes occurring on their claims (owned since 1996-97) located on the Labrador side of the Alluviaq area, were identified as kimberlites. These dykes were originally identified by Wardle et al. (1994) as lamprophyres. Based on the composition of the clin-

and orthopyroxene, calculated temperatures and pressures of crystallization are compatible with the diamond stability field.

**Band-Ore Resources Ltd and Southern Africa Minerals Inc.** obtained two contiguous permits in the area during the winter 1999. The permits (PEM 1504 and PEM 1525) cover a total of 470.5 sq km. Both permits are 20 kilometers south of Twin Mining's original discovery.

As shown on the geological compilation map provided, many other companies have acquired ground following Twin Mining's 1999 Discovery in the Torngat including Noranda Inc., Trivalence Mining Corp., Dumont Nickel Inc., Marum Resources, International Tower Mines Ltd., and Ayrex Resources Ltd. On April 3<sup>rd</sup> 2000, **Band Ore/Southern Africa** and two other companies (Dumont, and Marum) announced the commencement of a fixed wing airborne survey on a group of permits surrounding the Twin Mining block. As of the end of June, the survey was still in progress.

#### **GEOLOGICAL ENVIRONMENT:**

According to work completed by Taylor (GSC) and Digonnet (UQAM MSc Thesis directed by N. Goulet and J. Bourne), the Abloviak Shear represents the tectonic contact zone between Rae and the Nain Province of the Canadian Shield. Basement rock is composed principally of amphibolite to granulite facies metamorphosed sediments of paleoproterozoic age. The Abloviak Shear is a major regional structure of senestral displacement oriented WNW near the Fjord area and NNW further south.

The kimberlite dykes intruded the area during the Cambrian age (544+/- 12 Ma). The orientation of the dykes (N030 to N060) and related late fractures appear to correspond to the Riedel system associated with the regional senestral Shear Zone. It is therefore thought that the magma has intruded the open fractures during the reactivation of the major fault structures at the opening of the Iapetus Ocean.

The dykes are composed of frequently serpentinized olivine macrocrysts and phlogopite in a matrix of phlogopite, olivine, spinels, perovskite, and interstitial carbonate. The geochemical work recently done on these rocks classifies the Torngat dykes as being hypabyssal phlogopite kimberlites of Group I.

Geochemically, the kimberlites are quite homogeneous as to their content in major elements (Digonnet, 1997). They are characterized by low silica (<35% SiO<sub>2</sub>) and are ultrapotassic (K<sub>2</sub>O/Na<sub>2</sub>O>4.4 but generally greater than 10). Among the other major elements, the Al<sub>2</sub>O<sub>3</sub> (<4.0%), MgO (>22%), and TiO<sub>2</sub> (>1.9%) are also good indicators of their kimberlitic affinity. The compatible element results (Sc, V, Cr, Co, and Ni) obtained by Digonnet (1997) all indicate a kimberlitic affinity based on results presented by Mitchell (1986). The kimberlite dykes in Abloviak are also enriched in LREE (La = 55



- 120 ppm), reaching values of up to 450 times chondrites. On the other hand, the HREE do not show such a high enrichment compared to chondrites (only 3x to 15x).

#### **PROPOSED PROGRAM FOR THE 2000 FIELD SEASON:**

Current knowledge of the geology, mineralogy, geophysical signature, and mode of occurrence of the dykes strongly suggests that other lineaments occurring in the area are probably caused by kimberlite dykes. In addition, one of Twin Mining's kimberlite dykes (e.g. Torngat South) also occur within the high magnetic domains, within which the magnetic anomalies associated with the kimberlite is very difficult to pinpoint. Recent work by Twin Mining has demonstrated that many other dykes and dyke systems occur in the immediate area. These systems are parallel to the main central system both to the north and south. Upcoming work by other companies will most probably demonstrate that other dyke systems occur throughout the entire region. Twin Mining's recent airborne survey shows the northwest extension of the main system as structurally complex. Faults and/or swaying of the dykes occur in this area. This structural complexity appears favorable to the occurrence of blowouts and or thickening of the kimberlite dykes.

The two permits staked by Band Ore/Southern Africa are underlain by important northeast trending lineaments which merit attention. Among these are two strong N70E lineaments crossing both PEM 1504 and 1525. The strongest of these follows the east arm of Keglo Bay, continuing east over a distance of 25 kilometers. Both of these lineaments, and any parallel structures, need to be visited in the field.

The following budget is based on the assumption that Bad Ore/Southern Africa would explore independently of other exploration activities in the area. It should be kept in mind that if the company elects to take part in a joint effort with other active companies in the area, the total cost would be significantly less than the estimates provided herein. A lodge exists within 40km of the property. Therefore, the Lodge would be used as a base camp.

The objective of Band Ore/Southern Africa is to complete a preliminary overview of the property in order to identify all favorable structure and potentially identify a kimberlite dyke. Although a quick overview of this type would help evaluate the potential of the property, it would not necessarily establish whether or not kimberlite dykes occur on the properties.

#### **Property-wide Prospecting**

The main objective of this phase is to locate, describe and sample as many new dykes as possible on the property. The most obvious lineaments (magnetic anomaly/air photo lineaments) and some of the most conspicuous isolated circular features will be given the first priority. Because some of the known dykes (e.g. Torngat 1 - Twin Mining Website)

show only weak magnetic responses, it is also proposed to explore as many NE trending airphoto lineaments as possible. The work will principally investigate the significant fractures that could host kimberlite dykes.

According to Digonnet, many of the known dykes show some features worth keeping in mind while prospecting. These features could even be used to identify interesting areas from the helicopter while traversing the property.

The pictures presented by Digonnet clearly show the dyke as occurring in a linear depression within the gneiss. These depressions have vertical walls (contacts of the dyke) and are sometimes filled by soil and grass, along with minor dark gray-charcoal boulders (approx. 6 inches diameter) poking through the grass. These boulders are typically kimberlites. Also visible on the pictures is a set of strong fractures on each side of the dyke affecting the gneiss. The fractures could be caused by the forceful intrusions and therefore not as obvious around other late dykes such as diabases and lamprophyres.

In order to cover as much ground as possible, it is proposed to spend three days helicopter-prospecting on each property. This would involve traversing each property by air along a NW direction. Regular stops at interesting lineaments and structures would be done to determine if any of these are intruded with kimberlite dykes. Although this process will require approximately 6 hours of helicopter per day, it will enable an adequate coverage of both properties. The following is a detailed budget for the proposed program. Because the program is scheduled to last only one week, a very high contingency will be needed. A three-day storm, or continuous fog for many days could easily double a one week program.

### PROSPECTING

Prospecting, geological mapping, crew of two geologist and two technicians, for 8 days (including mob-demob)

Salaries: \$400/day geologist, \$150/day technician (native labour)  
Trivalence Team may be available at the end of August

\$ 8,800

Lodging: 1 week at \$1895/person/day (6 men)

\$ 11,370

All air transportation fees including transportation to George River and back with gear \$2,500 per person (4 men ). If the Trivalence team is needed this item is reduced by 50%.

\$ 10,000

Sample shipment and analysis at Lakefield Research. Total of approximately 5 pails.

\$ 12,500

Helicopter services based out of Kujjuuaq. Estimated consumption of 40 hours total (Long Ranger). Total all-in cost of \$850 per hour. Would be closer to \$750 per hour if the Trivalence helicopter is used.

\$ 34,000

Fuel acquisition and transportation to the camp from Kujjuuaq 30 drums at \$700 per barrel.

\$ 21,000

Total for Prospecting

\$ 97,670

**GEOLOGY, COMPILATION AND REPORT**

Report writing and drafting of the above-described program.

\$ 3,000

**Subtotal**

\$ 100,670

Contingencies (~50%)

\$ 50,000

**GRAND TOTAL FOR THE PROGRAM**

**\$150,670**

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