PRESENTATION OF THE RESULTS OF THE BRAZIL DIAMOND PROJECT

DIAMANTE BRASIL

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DIAMOND PROJECT BRAZIL

SUMMARY
- Objective
- Study areas
- Methodology
- Obtained Results
- Generated Products
- Why invest in diamonds in Brazil?
- Acknowledgment
The Diamante Brasil Project is a national-wide program focused on the exploration and study of diamonds. Undertaken by the Geological Survey of Brazil (GSB / CPRM) through the Department of Mineral Resources - DEREM of the Geology and Mineral Resources Directory - DGM.

Objective

- Evaluation and consistency of existing data from primary / secondary sources provided by companies and recorded in the GEOBANK.
- Provide information about geology, mineralogy, geochemistry, geophysics and geochronology of kimberlite / lamproite intrusions (Kimberlite Fields) and diamond areas of Brazil.
- Contribute with the improvement of knowledge and support future work in both scientific research and mineral exploration.

Specific objectives

- To present an integrated view of the main aspects of Diamond Geology in Brazil, including primary (kimberlite/lamproite), secondary sources (prospects, deposits in paleoplacers) and economic aspects of diamond.
STEP 1
PREPARATORY

Compilation of data and preparation of work maps

Kimberlites / lamproites and diamond areas

STEP 2
MAIN

Data acquisition

Geological Survey

Geochemical Survey

Rock sample

Minerals indicators

Geochemistry

Geochronology

Petrography

Textures

Chemistry

Diamond Studying

STEP 3
END

Interpretation and Data Integration

Mapping in GIS environment

Final report and database
Study areas

- **North**: RO, AM, RR, PA, AP e TO
- **Northeast**: MA, PI, CE, RN, PE e BA
- **Southeast**: SP e MG
- **Midwest**: MT, GO e MS
- **South**: RS, SC e PR

**TOTAL: 20 States**
**Kimberlite Fields**
- 42 campsites (24)
- 1,365 bodies (1,228)

**Diamond Fields**
- 20 known fields
- 804 occurrences
- 142 garimpos
Methodology

Kimberlite - Related Rocks
Location
Intrusion Shape
Dimensions
Petrographic type
Mineralogy
Facies
Sampling (2)
Geochronology
Suitable for mineral chemistry (diamond potential)
Presence of diamonds

Diamond Mining
Location
Status (active, inactive, abandoned)
Deposit type
Average size of stones
Greatest stone recovered
Prevailing colors
Predominant morphology
Inclusions
Mining, concentration and calculation systems

Alto Paranaíba (MG)
## Sampling

<table>
<thead>
<tr>
<th>SAMPLES COLLECTED</th>
<th>PERIOD</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2011</td>
<td>2012</td>
</tr>
<tr>
<td>Rock</td>
<td>758</td>
<td>96</td>
</tr>
<tr>
<td>Pan concentrate</td>
<td>2,407</td>
<td>281</td>
</tr>
<tr>
<td>Mineral (diamonds)</td>
<td>858</td>
<td>14</td>
</tr>
<tr>
<td>TOTAL</td>
<td>4,023</td>
<td>391</td>
</tr>
</tbody>
</table>

### DIAMOND PROJECT BRAZIL

<table>
<thead>
<tr>
<th>TYPE OF DATA AND ANALYSIS</th>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineralogical analysis - KIM</td>
<td>Recovery and classification of KIM</td>
<td>203,732 grains recovered</td>
</tr>
<tr>
<td>Mineralogical analysis - KIM</td>
<td>Magnetic mineral separation</td>
<td>3,404 samples analyzed</td>
</tr>
<tr>
<td>Mineral Chemistry Analysis</td>
<td>In situ electron microprobe analysis</td>
<td>1,453 spot analysis</td>
</tr>
<tr>
<td>Diamond Samples</td>
<td>Individual diamond grains</td>
<td>875 grains</td>
</tr>
</tbody>
</table>
Results - Database

- **1,365** kimberlite bodies (surcharge of 138)
- **81** containing diamonds (6%)

- **Samples Database**: 1,094 rock samples
- **2,181** of sieve and pan concentrates
- **Analytical results database**: 3,404 samples of MIK's
  - **27,585** of mineral chemistry
  - **875** Diamonds described.
Generated Products
Generated Products
- Sampling of Heavy Minerals indicators of Kimberlite and Diamond
- KIM, Distribution and Populations of Diamonds
- Chemical studies and gemological characterization of Diamond
1- Mapa das áreas kimberlíticas e diamantíferas do estado da Bahia
2- Mapa das áreas kimberlíticas e diamantíferas do estado de Minas Gerais e regiões adjacentes
3- Mapa das áreas kimberlíticas e diamantíferas dos Estados de Roraima, Pará, Piauí, Rio Grande do Norte, Santa Catarina e Rio Grande do Sul
4- Mapa das áreas kimberlíticas e diamantíferas do Estado de Goiás e do Distrito Federal
5- Mapa das áreas kimberlíticas e diamantíferas do Estado de Mato Grosso
6- Mapa das áreas kimberlíticas e diamantíferas do Estado de Rondônia
7- Informe de Recursos Minerais – Áreas kimberlíticas e diamantíferas do Estado do Mato Grosso
8- Informe de Recursos Minerais – Áreas kimberlíticas e diamantíferas do Estado de Rondônia
9- Informe de Recursos Minerais – Áreas kimberlíticas e diamantíferas do Estado da Bahia
WHY INVEST IN DIAMONDS IN BRAZIL?
WHY INVEST IN DIAMONDS IN BRAZIL?

- Existing operations and projects do not meet projected demand for the next 20 years.

- The worldwide success rate of 0.5%, applied to Brazil, indicates the potential for another 6 new mines.

- Low investment maturity (<0.5% of the world total).

- The primary diamond in Brazil presents value (US $ / cts) twice as much as the Canadian.

- The geological conditions of Brazilian kimberlites point to potential new economic discoveries.

- Infrastructure available / low investment in deployment.
WHY INVEST IN DIAMONDS IN BRAZIL?
Existing operations and projects do not meet projected demand for the next 20 years.

Fonte: DeBeers Group, 2014
WHY INVEST IN DIAMONDS IN BRAZIL?
Low investment maturity (<0.5% of the world total)

Source: Lípari (PDAC 2017)
WHY INVEST IN DIAMONDS IN BRAZIL?
The worldwide success rate of 0.5%, applied to Brazil, indicates the potential for another 6 new mines.
WHY INVEST IN DIAMONDS IN BRAZIL?

The primary diamond in Brazil presents value (US $ / cts) twice as large as the Canadian.

Brazil is currently the 4th in the world ranking in value (US $ / cts)

Source: Lípari (PDAC 2017)
WHY INVEST IN DIAMONDS IN BRAZIL?

The geological conditions of Brazilian kimberlites point to the potential of new economic discoveries.
WHY INVEST IN DIAMONDS IN BRAZIL?
Infrastructure available / low investment in deployment

- Diamond "Oppenheimer Blue"
- 14.6 cts (2.92 g) - Cullinan Mine (former Premier) in South Africa
- US $ 57.6 mi - Auctioned on May 18, 2016
- Project Braúna (BA)
- US$ 57,05 mi
Brazilian production grew-up 6 times between 2015 and 2016, the Braúna mine accounts for about 63% of the total production in 2016

- The CKB is located in the Serrinha Block (3Ga- Archean to Paleoproterozoic), northeast region of the São Francisco Craton;
- 28 intrusions (pipes, dikes, blows), Proterozoic ages (642 Ma). Most were discovered by De Beers in the 1990s;
- 11 diamondiferous;
- The Nordestina mine represents the first diamond mine in primary source of Brazil (Braúna 3). Life span 7 -12 years = 13.5 Mton, 5 Mts, 21-45.5 cpht;
- Braúna 3 = 7,184 recovered diamonds (407 tons of rock).
Primary Source Potential

Canastra 1

Carolina 1

Collier-4
94 Ma
27.3 cpht

Catalão
82-95 Ma
23.5 cpht

Cosmos-1
240 Ma

Canastra-1
120 Ma
16-40 cpht

Salvador-1
1,152 Ma
6 cpht

Braúna-3
640 Ma
45 cpht
Secondary Source
Potential Deposits

Braúna 8

170 cts. Rio Douradinho
106 cts. COOPEGAC

Rio Maú
1.5 M ct; 802 kg Au

Mina de Chapada-MT

Coop. de Juína

Mina de Romaria
(1867-1984)
Teor Médio ≈ 0.04-0.12 ct/m³

Santo Inácio
713 mil Cts

Coop. Andaraí

Mina Duas Barras

Coop. de Coromandel

Mina de Romaria
(1867-1984)
Teor Médio ≈ 0.04-0.12 ct/m³
GEOLOGICAL SURVEY OF BRAZIL - CPRM

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THANKS!