



**COMPETENT PERSON'S REPORT  
ON A PORTFOLIO OF  
DIAMOND EXPLORATION PROPERTIES  
IN BOTSWANA AND THE DEMOCRATIC REPUBLIC OF CONGO FOR  
BOTSWANA DIAMONDS PLC  
AND  
FINNCAP LIMITED**

**27<sup>th</sup> January 2011**

**Cape Town, South Africa**

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## TABLE OF CONTENTS

<b><u>Section</u></b>	<b><u>Subject</u></b>	<b><u>Page</u></b>
<b>1.0</b>	<b>EXECUTIVE SUMMARY</b>	<b>7</b>
1.1	<b>Preamble</b>	<b>7</b>
1.2	<b>Introduction</b>	<b>7</b>
1.3	<b>Properties</b>	<b>8</b>
1.4	<b>Geology</b>	<b>8</b>
1.5	<b>History</b>	<b>9</b>
1.6	<b>Diamond Exploration to Date</b>	<b>10</b>
1.7	<b>Resource Statement</b>	<b>10</b>
1.8	<b>Conclusions and Recommendations for further Work</b>	<b>12</b>
1.9	<b>Budgeted Exploration Expenditure</b>	<b>12</b>
<b>2.0</b>	<b>INTRODUCTION AND TERMS OF REFERENCE</b>	<b>15</b>
2.1	<b>Principal Sources of Information</b>	<b>16</b>
2.2	<b>Site Visits</b>	<b>16</b>
2.3	<b>Qualifications and Independence of VP3 and the Author</b>	<b>16</b>
2.4	<b>Disclaimer and Reliance on other Experts</b>	<b>17</b>
2.5	<b>No Material Change</b>	<b>18</b>
<b>3.0</b>	<b>REGIONAL GEOLOGY, RESOURCES &amp; EXPLORATION METHODOLOGY</b>	<b>19</b>
3.1	<b>Regional Geology</b>	<b>19</b>
3.2	<b>Resources</b>	<b>19</b>
3.2.1	<i><u>BD's Botswana Properties</u></i>	<i>19</i>
3.2.2	<i><u>BD's DRC Properties</u></i>	<i>20</i>
3.3	<b>Deposit Types &amp; Exploration Methodology</b>	<b>20</b>
3.2.1	<i><u>Kimberlite</u></i>	<i>21</i>
3.2.2	<i><u>Alluvial Deposits</u></i>	<i>21</i>
3.3.3	<i><u>Diamond Recovery Methods</u></i>	<i>21</i>
<b>4.0</b>	<b>DESCRIPTION &amp; LOCATION OF ASSETS</b>	<b>24</b>
4.1	<b>Botswana Property Descriptions</b>	<b>24</b>
4.1.1	<i><u>BD's Orapa District Licences</u></i>	<i>24</i>
4.1.2	<i><u>Botswana – Other Assets</u></i>	<i>24</i>
4.1.3	<i><u>Botswana – Liabilities</u></i>	<i>25</i>
4.2	<b>DRC – Bugeco Property Descriptions</b>	<b>26</b>
4.2.1	<i><u>Bugeco's Licences</u></i>	<i>26</i>
4.2.2	<i><u>DRC - Other Assets</u></i>	<i>26</i>
4.2.3	<i><u>DRC - Liabilities</u></i>	<i>26</i>

<b><u>Section</u></b>	<b><u>Subject</u></b>	<b><u>Page</u></b>
<b>5.0</b>	<b>OVERVIEW OF THE BOTSWANA DIAMOND PROJECTS</b>	<b>29</b>
5.1	<b>Location, Access, Infrastructure, Climate &amp; Physiography</b>	<b>29</b>
5.1.1	<u>Location of the Licences</u>	29
5.1.2	<u>Access &amp; Communications Infrastructure</u>	29
5.1.3	<u>Climate</u>	29
5.1.4	<u>Vegetation</u>	29
5.1.5	<u>Local Resources &amp; Infrastructure</u>	30
5.1.6	<u>Physiography</u>	30
5.2	<b>Local Geology, History of Exploration &amp; Results Summary</b>	<b>32</b>
5.2.1	<u>Local Geology</u>	32
5.2.2	<u>History of Diamond Exploration</u>	32
5.2.3	<u>Adjacent Properties &amp; Competitor Activity</u>	33
<b>6.0</b>	<b>OVERVIEW OF THE DRC DIAMOND PROJECTS</b>	<b>35</b>
6.1	<b>Location, Access, Infrastructure, Climate &amp; Physiography</b>	<b>35</b>
6.1.1	<u>Location of the Licences</u>	35
6.1.2	<u>Access &amp; Communications Infrastructure</u>	35
6.1.3	<u>Climate</u>	35
6.1.4	<u>Vegetation</u>	35
6.1.5	<u>Local Resources &amp; Infrastructure</u>	36
6.1.6	<u>Physiography</u>	36
6.2	<b>Local Geology, History of Exploration &amp; Results Summary</b>	<b>36</b>
6.2.1	<u>Local Geology</u>	36
6.2.2	<u>History of Diamond Exploration</u>	36
6.2.3	<u>Adjacent Properties &amp; Competitor Activity</u>	36
<b>7.0</b>	<b>CURRENT EXPLORATION OF THE BOTSWANA PROPERTIES</b>	<b>38</b>
7.1	<b>PL4/2002 (S. Block) AK09 Kimberlite</b>	<b>38</b>
7.1.1	<u>Introduction</u>	38
7.1.2	<u>Discovery History</u>	38
7.1.3	<u>Local Geology</u>	38
7.1.4	<u>Exploration Programmes</u>	38
7.1.5	<u>Drilling Results</u>	42
7.1.6	<u>Conclusions &amp; Recommendations</u>	45
7.2	<b>PL4/2002 (S. Block) AK08 Kimberlite</b>	<b>46</b>
7.2.1	<u>Introduction</u>	46
7.2.2	<u>Discovery History</u>	46
7.2.3	<u>Local Geology</u>	46
7.2.4	<u>Exploration Programmes</u>	46
7.2.5	<u>Drilling Results</u>	51

<b><u>Section</u></b>	<b><u>Subject</u></b>	<b><u>Page</u></b>
7.2.6	<u>Conclusions &amp; Recommendations</u>	54
7.3	<b>PL4/2002 (N. Block) &amp; PL605/2009 BK05 Kimberlite</b>	<b>56</b>
7.3.1	<u>Introduction</u>	56
7.3.2	<u>Discovery History</u>	56
7.3.3	<u>Local Geology</u>	56
7.3.4	<u>Exploration Programmes</u>	56
7.3.5	<u>Drilling Results</u>	57
7.3.6	<u>Conclusions &amp; Recommendations</u>	59
7.4	<b>PL07/2004</b>	<b>61</b>
7.3.1	<u>Introduction</u>	61
7.3.2	<u>Discovery History</u>	61
7.3.3	<u>Local Geology</u>	61
7.3.4	<u>Exploration Programmes</u>	61
7.3.5	<u>Drilling Results</u>	61
7.3.6	<u>Conclusions &amp; Recommendations</u>	61
<b>8.0</b>	<b>CURRENT EXPLORATION OF THE DRC PROPERTIES</b>	<b>63</b>
8.1	<u>Introduction</u>	63
8.2	<u>Discovery History</u>	63
8.3	<u>Local Geology</u>	63
8.4	<u>Exploration Programmes</u>	63
8.5	<u>Drilling Results</u>	64
8.6	<u>Conclusions &amp; Recommendations</u>	67
<b>9.0</b>	<b>A NOTE ON THE DIAMOND MARKET</b>	<b>69</b>
<b>10.0</b>	<b>RESOURCE STATEMENT</b>	<b>71</b>
10.1	<b>The AK09 Kimberlite Project</b>	<b>71</b>
10.2	<b>The AK08 Kimberlite Project</b>	<b>72</b>
10.3	<b>The BK05 Kimberlite Project</b>	<b>72</b>
<b>11.0</b>	<b>DATA VERIFICATION</b>	<b>73</b>
<b>12.0</b>	<b>CONCLUSIONS &amp; RECOMMENDATIONS</b>	<b>74</b>
<b>13.0</b>	<b>EXPLORATION BUDGET</b>	<b>75</b>
<b>14.0</b>	<b>DATE AND SIGNATURE PAGE</b>	<b>77</b>
<b>15.0</b>	<b>QUALIFIED PERSON CERTIFICATE</b>	<b>78</b>
<b>16.0</b>	<b>REFERENCES &amp; BIBLIOGRAPHY LIST</b>	<b>80</b>
<b>17.0</b>	<b>GLOSSARY OF GEOLOGICAL AND MINING TERMS</b>	<b>82</b>
	<b>APPENDIX A</b>	<b>89&amp; 90</b>

## LIST OF MAPS

<b><u>Map No.</u></b>	<b><u>Title</u></b>	<b><u>Page</u></b>
1	LOCATION OF BD's DIAMOND LICENCES	14
2	LOCATION OF THE BOTSWANA PROSPECTING LICENCES & INFRASTRUCTURE	31
3	LOCATION OF THE BUGEKO EXPLORATION AREA IN THE DRC	37
4	LOCATION OF THE AK09 KIMBERLITE	40
5	LOCATION OF THE AK08 KIMBERLITE	48
6	LOCATION OF THE BK05 KIMBERLITE	60
7	LOCATION OF THE PL07/2004 LICENCE	62
8	BUGEKO PROJECT – KIMBERLITE INDICATOR MINERAL SAMPLING RESULTS	65
9	LOCATION OF THE BUGEKO LICENCES & KIMBERLITES FOUND TO DATE	68

## LIST OF FIGURES

<b><u>Figure No.</u></b>	<b><u>Title</u></b>	<b><u>Page</u></b>
1	Geologically Modelled Extent of AK09 Kimberlite	41
2	NW-SE Section Through the AK09 Kimberlite	42
3	Revised size-frequency curve for micro-and macro diamonds recovered from AK09	44
4	Plan View of the Modelled AK08 Kimberlite	49
5&6	Simplified AK08 Geological Models	50
7	Revised size-frequency curve for micro-and macro diamonds recovered from AK08	53

## LIST OF TABLES

<b><u>Table No</u></b>	<b><u>Title</u></b>	<b><u>Page</u></b>
1	Speculative Exploration Target Sizes	11
2	Summary 18-month Budget	13
3	Detailed Location of the Botswana Prospecting Licences	25
4	Detailed Location of the Bugeco DRC Licences	27 & 28
5	Summary of the 2004 & 2007 Drilling at AK09	39
6	Summary of the AK09 Micro-diamond Sample Data	43
7	Summary of the AK09 Macro-diamond Bulk Sample Data	43
8	Summary of Drillholes at AK08	47
9	MiDa Results for Kimberlite AK08	52
10	Summary of the AK08 Macro-diamond Bulk Sample Data	52
11	Summary of Drillholes at Kimberlite BK05	57
12	Summary of the BK05 Macro-diamond Bulk Sample Data	57
13	Kimberlites Discovered on Bugeco Licences & Summary Results	66
14	Bugeco Kimberlite Petrography & MiDa Statistics	66
15	AK09 Speculative Exploration Target Size Estimate	71
16	AK08 Speculative Exploration Target Size Estimate	72
17	BK05 Speculative Exploration Target Size Estimate	72
18	Summary 18-month Exploration Budget Estimate	76

## **1.0 EXECUTIVE SUMMARY**

### **1.1 Preamble**

African Diamonds plc (“AFD”) was a diamond exploration company and emerging producer with a total of seven active prospecting licences located in Botswana and the Democratic Republic of Congo (“DRC”), Africa. The projects are in various stages of development with one kimberlite project (AK6, Botswana) recently converted to a mining licence and now nearing the production stage and the remaining projects at various stages of exploration.

AFD has completed an implementation agreement with the Lucara Diamond Corporation (“Lucara”) pursuant to which Lucara has acquired all of the issued share capital of AFD by way of a Scheme of Arrangement. The consideration was 0.80 of a Lucara share plus 1 share in Botswana Diamonds plc for every 1 share held in AFD. This has given AFD shareholders 26.57% of Lucara which will then own 100% of AFD’s AK6 diamond property near Orapa in Botswana which is nearing the production stage. Botswana Diamonds has taken transfer of all of the interests of AFD apart from AK6. These interests include cash, currently at US\$2.2 million, exploration ground in Botswana, including identified kimberlites in the Orapa cluster known as AK8, AK9 and BK5 and an indirect exposure to a diamond project in the DRC.

Botswana Diamonds plc (“BD”) will seek admission to AIM and a listing on the Botswana Stock Exchange and this Competent Person Report is written in pursuit of that objective.

AFD has been operating in Africa for several years and executive management has good relationships with various government departments at national, regional and local levels in all the African countries it has operated in. The company has excellent relationships with the communities close to the projects and apart from offering many employment opportunities to local citizens they are substantial contributors to local community affairs and to improving local infrastructure. The same proven executive management will guide the future exploration projects of BD.

VP3 Geoservices (“VP3”) has assessed the projects and their prospectivity and has estimated exploration target sizes wherever it has been appropriate to do so and as sufficient information exists. All of the projects are deemed by VP3 to have merit and, in our opinion, should be advanced to the stage where informed decisions as to their potential for commercial exploitation can be made. The exploration portfolio offers the newly formed company the potential of becoming a mid-tier diamond producer in the short to medium-term, should one or more of the projects or investments continue to show economic potential.

### **1.2 Introduction**

VP3 Geoservices Proprietary Limited (“VP3”) has been retained by Botswana Diamonds plc and their nominated advisors FinnCap Limited to complete a Competent Person’s Report on BD’s diamond properties located in the Republic of Botswana and the DRC, Africa. This Report is prepared in accordance with the June 2009 Note for Mining, Oil and Gas Companies issued by the London Stock Exchange plc, Alternative Investment Market (AIM).

### 1.3 Properties

The reader is referred to Appendix A for all of the licence details and their status.

BD has a 100% interest in the following Botswana properties through their wholly owned Botswana subsidiary, Atlas Minerals Botswana (Pty) Ltd.:-

- The AK8 kimberlite pipe project, held under a prospecting licence PL004/2002 valid to 30 June 2011.
- The AK9 kimberlite pipe project, held under a prospecting licence PL004/2002 valid to 30 June 2011.
- The BK5 kimberlite pipe project, held under prospecting licences PL004/2002 valid to 30 June 2011 and PL605/2009 valid until 30 June 2012.
- A further prospecting licence, PL007/2004 valid to 30 June 2011 has no known kimberlites, but exploration completed to date is encouraging and further work to find kimberlite(s) is justified.

BD has a 35.4% shareholding interest in Bugeco S.A. which is the parent company of 100% subsidiary Bugeco Exploration RDC S.A.R.L., a registered company in the Democratic Republic of Congo which has:-

- Three diamond exploration licences in Kasai Province with reference numbers PR906, PR899 and PR927. The original prospecting licences obtained in 2003 covered an area of 20,000 square kilometres. Extensive prospecting work has been carried out at great expense in a joint venture with De Beers. Much of the original licence area has been relinquished in accordance with DRC legislation. The current area of approximately 137 square kilometres hosts a cluster of 9 partially evaluated kimberlites.

### 1.4 Geology

The Botswana projects are on the Zimbabwe craton, an ancient Archaen aged (>3.0Ga) stable portion of the continental crust. The Botswana projects are part of the Orapa kimberlite cluster on the south-western corner of the craton and these kimberlites were intruded during the Late Cretaceous (~93 Ma) era through deformed Archaen basement rocks and a series of overlying sediments and volcanic rocks belonging to the Karoo Supergroup.

The Bugeco project is situated in the north east portion of the central nucleus of the Kasai Craton in the Kasai Oriental Province, DRC. Exploration to date has confirmed the presence of 9 kimberlites. Bugeco has expressed a preference for finding a joint venture partner to further the evaluation of these kimberlites and BD therefore has no expenditure commitment to this project.



## 1.5 History

Botswana: An extensive exploration programme by the De Beers Group during the 1960's led to the discovery of the Orapa cluster of kimberlite pipes. The largest of these, AK1 was found to be diamondiferous in 1967 and this 118 ha pipe was developed as the Orapa Mine which opened in July 1971. Other kimberlites in the cluster include BK1, BK9, BK12 & BK15 which are mined together as the Damtshaa mine, opened in October 2002 as well as DK1, the Letlhakane mine. The De Beers exploration process was initially to collect large loam samples on a regional grid for kimberlite indicator minerals followed up by closer spaced sampling, airborne and ground magnetic surveys, gravity surveys and various drilling programmes.

AFD's (now Lucara's) AK6 kimberlite is located in the Orapa kimberlite field some 25 kilometres south of the Orapa mine and was also discovered by De Beers in the 1970s, but like many of the other small pipes prospected by De Beers, was considered unworthy of further attention at that time. Kukama Exploration obtained a number of prospecting licences in the Orapa area after De Beers were forced to relinquish the ground at the end of their lease period, and Kukama entered into a joint venture with AFD to fund further exploration and evaluation. De Beers Exploration, who wished to participate in this exploration endeavour, negotiated the Boteti joint venture with AFD and funded the evaluation of the prospecting licences, including AK6. This culminated in the completion of a positive feasibility study in October 2007, but poor diamond markets in 2008 delayed a start-up. In October 2008 a mining licence over AK6 was granted and in November 2009, De Beers sold its 71% stake in AK6 to Lucara.

Although the Boteti joint venture extended to the remaining kimberlites in the prospecting licences, which are the subject of this report, the exploration and evaluation of these has been intermittent and none of the kimberlites have reached the stage where decisions as to their economic potential can be made.

DRC: Diamond mining began in the Belgian colonial period when substantial alluvial diamond deposits were discovered in the early 1900's, principally near the town of Bakwanga (Mbuji Maye) in southern Kasai-Oriental Province. In 1961, the Societe Miniere de Bakwanga (MIBA) was formed to mine the kimberlites at Bakwanga and this is to date the only large commercial kimberlite mine in the DRC. Artisan mining of alluvial deposits is widespread and accounts for some 75% of the country's total diamond production.

During the early 2000's many large diamond mining companies took out licences to explore for kimberlites in the Kasai Province, among them De Beers, Gem Diamonds, BHP and Southern Era. De Beers funded the joint venture exploration of Bugeco's licence area which extends from some 40Km to 100Km east-south-east of the MIBA mine. The JV began in September 2003 and De Beers expended some US\$10.5 million on kimberlite indicator mineral ("KIM") sampling, geophysical surveys, drilling and micro-diamond analysis. In late 2008, with the severe downturn in diamond markets, De Beers relinquished their JV with Bugeco.

## 1.6 Diamond Exploration to Date

Botswana: De Beers, as the previous operating partner of the Boteti joint venture, have advanced the three kimberlite projects, AK08, AK09 & BK05 to the stage where better definition of kimberlite size and continuity, grade and value can be achieved within a relatively short timeframe. The surface extent and depth of overburden are relatively well defined and the three kimberlites are known to be diamondiferous. The diamond grade testing done to date is of poor quality and a bulk sampling programme to obtain a better estimate of the overall grade and also to recover sufficient diamonds to obtain a mean value per carat is now required.

Bugeco, DRC: De Beers, as the previous operator of this project, have completed all of the regional exploration and narrowed down the target area to two clusters of kimberlites with nine, drill-confirmed kimberlites found to date. The evaluation of these nine kimberlites is now required – drill definition of their extent and bulk sampling to estimate their diamond grade and diamond value is needed.

## 1.7 Resource Statement

None of the kimberlite exploration projects have advanced to the point where a confident estimate of their diamond grade and value can be calculated. Table 1 below summarizes the current knowledge of exploration results to date, however, it must be emphasized that the range of estimates is based on insufficient evidence and the reader is cautioned that we do not wish to misrepresent these exploration results or imply that economic mineralisation has been discovered.

**Table 1: Speculative Exploration Targets**

Project	Botswana Diamonds Attributable (%)	Operator	Lower Screen Size (mm)	Min –Max Size Range (Tonnes)	Probable Stripping (Tonnes)	Estimated Capex US\$	Estimated Opex US\$/tonne	Estimated Grade (cpht)	Speculative Target Size (cts)	Speculative Value (US\$/ct)
AK 08	100	Botswana Diamonds	1	13.5 to 20.6 million <sup>1</sup>	72.2 million <sup>1</sup> to mine to 275m depth	20.5 <sup>1#</sup> million	23.6 <sup>1</sup>	4 to 8.2 <sup>2</sup>	540,000 to 1.689 million	100 <sup>3</sup>
AK 09	100	Botswana Diamonds	1	7.3 to 11.0 million <sup>1</sup>	63.7 million <sup>1</sup> to mine to 250m depth	20.5 <sup>1#</sup> million	23.6 <sup>1</sup>	3.5 to 8.0 <sup>2</sup>	255,500 to 880,000	26.37 <sup>3</sup>
BK 05	100	Botswana Diamonds	1	9.0 to 12.7 million <sup>1</sup>	31.8 million <sup>1</sup> to mine to 250m depth	37.0 <sup>1</sup> million	12.9 <sup>1</sup>	4.4 to 7.2	396,000 to 914,400	unknown

**Notes:** 1. These figures are derived from a scoping study commissioned by AFD – see reference J.E.Clarke, Nov 2010.

1<sup>#</sup> Since the two kimberlites are only 1km. apart, it is intended that they will share a common infrastructure and plant – hence a Capex estimate of US\$41 million for both AK08 & 09.

2. These figures are derived from a re-interpretation of the De Beers bulk sampling results – see reference N.Ayres, 2010.

3. These figures are based on estimates done by De Beers and are based on the April 2008 base price book – the AK 09 value was only estimated from a 4ct sample and is probably very inaccurate.

## 1.8 Conclusions and Recommendations for Further Work

*Botswana:* The AK08, AK09 and BK05 kimberlites are at the stage where systematic RC and diamond drilling to better define the lateral continuity and contacts between kimberlite and country rock are required as a first step towards obtaining a confident estimate of the volume of the kimberlite resource and the volume of overburden down to a vertical depth extent of some 250m to 300m. This programme should also be used to better define the internal geology of the kimberlite and whether variations in composition may signify variations in diamond grade. Once this phase of drilling has been completed, a bulk sampling programme can be designed to sample sufficient volumes of material to obtain diamond grade estimates of each of the kimberlite varieties defined in the petrographic study and also to obtain an estimate of average diamond values.

Prospecting Licence PL07/2004 has a well defined kimberlite indicator mineral anomaly and exploration by means of geophysics and drilling needs to be applied to discover any kimberlite occurrences associated with this anomaly.

*Bugeco Project, DRC:* The nine kimberlites discovered by extensive exploration require further drilling and sampling to determine their likely economic significance. Since BD has a minority shareholding in the controlling company and Bugeco has expressed a preference for seeking a joint venture partner to further the project's development, no budget expenditure needs to be allocated to this project.

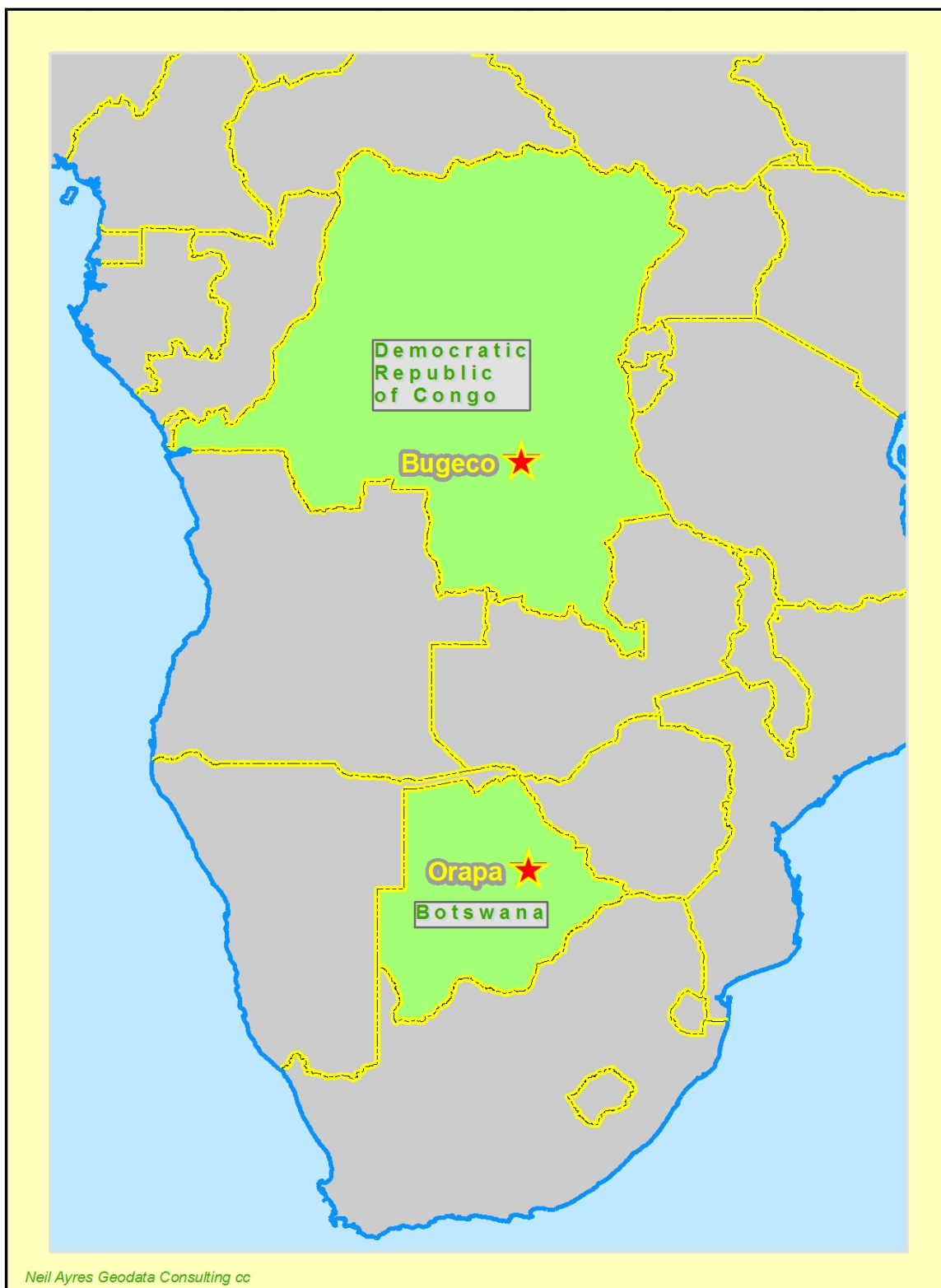
## 1.9 Budgeted Exploration Expenditure

The BD management has prepared an exploration and evaluation programme with a budget estimate of project expenditure for an 18-month period. The work programmes and budgeted costs are summarized below in Table 2. BD management have forecast capital and operating expenditures of some Pula 3 million (~US\$436,000 or ~£281,000), with the majority of those costs associated with the evaluation of the three, identified kimberlites, AK08, 09 & BK05.

The work programme, timing and cost estimates are summarised as shown in Table 2 below:-

**Table 2: Summary 18 Month Budget (All figures are Pula 000's)**

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Total
<b>ACTIVITY</b>																			
SUPERVISING GEOLOGIST	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	360
ADMINISTRATION	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	180
CONSULTANTS	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	180
DRILLING	0	0	0	188	188	187	187	0	0	0	0	0	0	0	0	0	0	0	750
Pre-FEASIBILITY STUDY	0	0	0	0	0	0	0	0	0	0	0	0	250	250	250	250	250	250	1,500
<b>TOTAL</b>																			<b>3,000</b>



**MAP 1: LOCATION OF BD'S DIAMOND LICENCES**

## 2.0 INTRODUCTION AND TERMS OF REFERENCE

On the instructions of Mr. J.A.H.Campbell, the Managing Director of African Diamonds plc of 20-22 Bedford Row, London WC1R 4JS, United Kingdom, VP3 Geoservices Proprietary Limited (“VP3”) has prepared an Independent Competent Person’s Report compliant with the June 2009 Note for Mining, Oil and Gas Companies issued by the London Stock Exchange plc, Alternative Investment Market (AIM). This report describes the exploration assets and liabilities of BD. The effective date of this report is 27<sup>th</sup> January 2011.

African Diamonds plc (“AFD”) was a company incorporated in England which came into existence in 2000 as Zinquest plc, an unlisted company formed to explore and exploit mineral deposits. In February 2002 it changed its name to African Diamonds plc. In July 2002, African Diamonds acquired Kukama Mining and Exploration Proprietary Limited, which held three prospecting licences in Botswana. On the 14<sup>th</sup> July 2003, AFD was listed on the Alternative Investment Market and in December 2003 found the first diamond on its properties in Botswana. The company listed on the Botswana Stock Exchange in February 2004 and with Joint Venture partner, the De Beers Group, began evaluation of the AK6 kimberlite, some 25Km south of the Orapa diamond mine, in December 2004. A Mining Licence (ML2008/6L) over AK6 was granted to the joint venture company, Boteti Exploration (Pty) Ltd (“Boteti”), on 28th October 2008. In December 2009 De Beers sold their 70% interest in Boteti to Lucara Diamond Corporation (“Lucara”) (60%) and to AFD (10%) so that the shareholding in Boteti was 60% Lucara and 40% AFD.

Lucara of 885 W. Georgia Street, Suite 2101 Vancouver, BC Canada V6C 3E8 is an African focused diamond exploration and development company. The Company is building a portfolio of advanced stage diamond assets with a view to become a leading mid-tier African diamond producer. Lucara is a member of the Lundin Group of Companies and is listed on the TSX Venture Exchange under the symbol "LUC".

AFD and Lucara have now implemented the terms of an agreement pursuant to which Lucara has acquired all of the issued and outstanding shares of AFD on the basis of 0.80 of a common share of Lucara for each AFD common share by way of an English court-approved Scheme of Arrangement, the "Acquisition". AFD shareholders now own approximately 26.57% of the outstanding common shares of Lucara, with Lucara now holding an undivided 100% interest in the AK6 mining project. Furthermore, all of AFD's assets other than its interest in the AK6 project, have been transferred into a newly formed company, Botswana Diamonds plc (“BD”) which will be owned by the former AFD shareholders and which will seek a listing on both the AIM and Botswana Stock Exchange, and will raise additional capital by means of a share issue in order to advance their plans for exploration and development of their African diamond assets. In view of these intentions, this report is also addressed to the new company’s nominated advisor, FinnCap Limited.

## **2.1 Principal Sources of Information**

In preparing this Report, the author reviewed both internal confidential technical reports and other sources of data and information as provided by AFD and BD, and obtained independent information from the public domain as listed in the Reference and Bibliography section of this Report. In addition, the author, Mr. Peter Walker completed site visits and interviews with key personnel, as well as drawing on his own experience in primary and alluvial diamond exploration and mining.

VP3 understands that this Report may be used by BD for securities regulatory filings and for exploration and development fundraising purposes on the Alternative Investment Market exchange (“AIM”), a subsidiary of the London Stock Exchange plc. This Report describes their assets and liabilities, their properties’ technical and economic potential and recommends a comprehensive exploration programme. As such, it meets or exceeds the standards set by the London Stock Exchange’s AIM as detailed in their June 2009 “Note for Mining, Oil and Gas Companies”.

## **2.2 Site Visits**

The Botswana diamond properties were visited by the author during the period November 1<sup>st</sup> to November 4<sup>th</sup> 2010, in the company of a representative of BD, being Mr. Neil Ayres a consulting geologist with extensive knowledge of the Botswana operations.

No site visit was made to the DRC project area as this was deemed to be a passive, minority shareholding and does not form part of any intensive exploration plan going forward, however Mr. Christophe de La Vallee Poussin of Bugeco supplied most of the data and reports and addressed all queries and comments concerning the DRC properties. The Managing Director of AFD, Mr. James Campbell arranged the tour of the Botswana licences and with his nominated consulting geologist, Mr. Ayres, provided all of the supporting reports, maps and documents and addressed all queries and comments.

On the 1<sup>st</sup> – 4th November 2010 the Botswana licence areas were inspected and work to date plus future exploration and exploitation plans were discussed.

## **2.3 Qualifications and Independence of VP3 and the Author**

VP3 is an international geological consulting company incorporated in the Republic of South Africa in 2006. VP3 provides a wide range of geological, geophysical, and exploration project management services to the international mining industry, including evaluation and pre-feasibility studies on mineral properties. The Company’s services are provided from offices located in Cape Town, South Africa. Neither VP3 nor the author are insiders, associates or affiliates of AFD, BD or Lucara and none of the directors, shareholders, or employees of VP3 owns, directly or indirectly, any shares in AFD, BD or Lucara, their parent or subsidiary and associated companies.

This report has been prepared solely by Mr. Peter Walker B.Sc. (Hons.) Geol, MBA, Pr.Sci.Nat., consulting geologist. Mr. Walker has over 33 years of experience in the mining



industry with extensive experience in diamonds, gold, uranium, base and industrial mineral exploration and mining projects including 3 years of kimberlite diamond exploration management and some 13 years of alluvial diamond exploration management and consulting on diamond projects in South Africa, Namibia, Angola, Gabon, Guinea, Democratic Republic of Congo, Liberia, Central African Republic, Zimbabwe, Mozambique, Botswana, Brazil, Venezuela, Indonesia, and Australia.

The author of this report has a demonstrated track record of undertaking technical assessments of resource and reserve statements, project evaluations and audits, technical reports and independent feasibility evaluations to bankable standards on behalf of exploration and mining companies and financial institutions worldwide. More importantly, the author has experience relevant to the deposit types reviewed in this report.

For the purpose of this report Mr. P.W.A.Walker is the author and Qualified Person.

Neither VP3 nor the author of this Report, their family members or associates, have any business relationship, other than acting as an independent consultant, with AFD, BD or Lucara nor any associated company or company mentioned in this Report, which is likely to materially influence their impartiality or create the perception that the credibility of the report could be compromised or biased in any way. The views expressed herein are genuinely held and deemed independent of AFD, BD or Lucara.

Neither VP3 nor the author of this Report, their family members or associates, have any financial interest in the outcome of any transaction involving the properties considered in this Report, other than the payment of normal professional fees for the work undertaken in preparation of the Report which are based on a daily charge-out rate and reimbursement of expenses. The payment of such fees is not dependant upon the content or the conclusions of either this Report, or any consequences of any proposed transaction.

AFD, BD, Lucara and Finncap have accepted that the qualifications, expertise, experience, competence, membership of appropriate professional bodies and professional reputation of VP3 and the author are appropriate and relevant for the preparation of this Report.

## **2.4 Disclaimer & Reliance on Other Experts**

Exploration and sampling data was made available to the author by AFD, BD, Bugeco and their consultants and is cited in this Report. Duplicates or portions of the original drill samples collected and processed to obtain this data are not available for check analysis and since the author was not present during the drilling and sample collection programmes, he cannot vouch for the integrity of any of the data available.

The author has assumed that all of the information and technical documents reviewed and listed in the References and Bibliography section of this Report are accurate and complete in all material aspects. While due care has been taken in the use of this information, the author has not conducted any extensive independent investigation to verify their source data for accuracy and completeness.

The author has had sight of copies of the original documents granting the prospecting and exploration rights and is able to verify their existence and accepts BD's assurances that they are in good standing, however, the author is not qualified to report on their legal status.

The information and conclusions contained in this Report are based on data and information available to VP3 and the author at the time of preparation of this Report and are subject to the assumptions, conditions and qualifications set forth in this Report.

BD has warranted that a full disclosure of all material information in its possession or control has been made to VP3 and the author. BD has agreed that neither it nor its associates will make any claim against VP3 or the author to recover any loss or damages suffered as a result of VP3 and the author's reliance on information provided by BD for use in the preparation of this Report. BD has also indemnified VP3 and the author against any claim arising out of the assignment to prepare this Report, except where the claim arises as a result of any proven, wilful misconduct or negligence on the part of VP3 or the author. This indemnity is also applied to any consequential extension of work through queries, questions, public hearings, or additional work required from VP3's performance of the engagement.

BD has reviewed draft copies of the Report for factual errors. Any changes made as a result of these reviews did not involve any alteration to the conclusions made; hence, the statements and opinions expressed in this Report are given in good faith and in the belief that such statements and opinions are not false and misleading at the date of the Report.

VP3 reserves the right, but is not obligated to revise this Report and conclusions therein if additional information becomes known to VP3 subsequent to the date of this Report.

## **2.5 No Material Change**

VP3 is not aware of any material change with respect to the subject matter of this report that is not reflected in the report, the omission to disclose which would make the report misleading.

### 3.0 REGIONAL GEOLOGY, RESOURCES & EXPLORATION METHODOLOGY

#### 3.1 Regional Geology

*Botswana:* All of the subject Properties lie within the Orapa kimberlite cluster on the south-western edge of the Zimbabwe Craton of Southern Africa (T.M.Gernon et al, 2009) with a stable, cool cratonic setting favourable for the intrusion of diamondiferous kimberlite and associated alluvial deposits. The Orapa cluster, comprising approximately 60 known pipes and dykes is located in north-eastern Botswana, east of the Kalahari sub-basin. During the late-Cretaceous epoch (~93 Ma), the Orapa kimberlites were erupted through deformed Archaean basement overlain by volcanic and sedimentary rocks of the Karoo Supergroup. The pipes are located near to the contact between the Archaean Limpopo belt and Zimbabwe craton which forms the suture zone with the Kaapvaal craton. The Limpopo belt (3500 – 2500 Ma) consists of complex metamorphic terrains composed of gneissic, granitic and meta-sedimentary rocks. In the Orapa region, the Karoo Supergroup comprises mudstones, fluvial and aeolian sandstones and basaltic lavas, the latter being multiple amygdaloidal lava flows (T.M.Gernon et al, 2009).

*Democratic Republic of the Congo:* The Bugeco exploration programme was focussed on the north-east portion of the central nucleus of the Kasai-Congo craton, which consists of granulite, gneiss, granite and amphibolite with several mafic intrusive complexes with ages ranging between 3.4 to 2.6 Ga. These basement rocks are unconformably overlain by the Mbuji Mayi Supergroup which consists of 1.3 to 0.95 Ga old sedimentary rocks and 0.95 Ga old basaltic lavas and Cretaceous (~120 Ma) Lualaba sandstones (J.M.Batumike et al, 2009 and M.Pivin et al, 2009).

The Mbuji-Mayi (MIBA) diamondiferous kimberlites are located some 160Km to the north-west of the 10 confirmed kimberlite intrusives discovered by the Bugeco / De Beers joint venture exploration programme.

#### 3.2 Resources

##### 3.2.1 *BD's Botswana Properties*

BD has –

- A wholly owned interest in a 6 hectare kimberlite, AK 08, which is speculatively estimated to contain ~1 million carats of diamond at an April 2008 value of US\$100/ct. if mined down to the 275m below surface level.
- A wholly owned interest in a 3.2 hectare kimberlite, AK 09, which is speculatively estimated to contain ~500,000 carats of diamond at an April 2008 value of US\$26.37/ct. based on only a 4 carat parcel.
- A wholly owned interest in a 6.5 hectare kimberlite, BK 05, which is speculatively estimated to contain ~500,000 carats of diamonds. No valuations have been made of the diamonds recovered to date.

- A 100% ownership of one exploration licence in Botswana, PL07/2004, which has a surface area of 31.4 km<sup>2</sup> where extensive soil sampling has identified a large kimberlite indicator mineral anomaly.

There is insufficient evidence at present of geological continuity, diamond grade or diamond value to calculate any more than a speculative exploration target estimate of size and value for the known kimberlites.

There is exploration evidence to suggest that there may be new, as yet undiscovered, kimberlites within the prospecting licence area PL07/2004.

There are no other tangible net assets or any liabilities in Botswana.

### 3.2.2 *BD's DRC Properties*

BD has a 35.4% interest in Bugeco S.A. which wholly owns a DRC company, Bugeco Exploration RDC SARL, which has –

- Three exploration licence areas totaling 137 km<sup>2</sup> in the Kabinda District of eastern Kasai Province with 9 identified kimberlites which have only been partially explored and still require full evaluation.

Bugeco's JV partner until August 2008, De Beers, completed a US\$10,576,260 exploration programme over the original licence block which covered a 17,514sq.km.surface area, now reduced to 137sq.km.

The lack of proof of sub-surface lateral and depth continuity to the kimberlites and the lack of data to prove diamond grades in each kimberlite means that no estimates of the potential size or value of these discoveries can be proposed.

There are no other tangible net assets or any liabilities in the DRC.

## 3.3 Deposit Types & Exploration Methodology

Mineralisation is in the form of gem, near-gem and industrial quality diamonds, contained either as xenocrysts within the kimberlite intrusives, or as clasts within conglomerates and in alluvial and alluvial gravel beds derived by the weathering and erosion of these kimberlites and conglomerates.

Diamonds are present in a wide range of sizes, from microscopic to, in some cases, quite large stones. However, rough diamonds below 0.82mm (.006ct weight or Diamond Trading Company No 1 sieve size) are considered to have little commercial value. Often the minimum size of rough diamond considered to be of value is 1mm or 0.01ct.

The diamond deposits on the BD Properties are of two types:

1. Kimberlite intrusives, occurring as pipe-like bodies, as at AK08, AK09 and BK05 in the Orapa District of Botswana as well as the 9 kimberlites identified in the eastern Kasai Province of the DRC.

2. Diamond bearing alluvial and elluvial deposits close to the kimberlite pipes already identified on the prospecting licences.

Limited evaluation programmes of the known kimberlite pipes in Botswana and the DRC have been completed but are inadequate for estimating Resources in order to complete preliminary feasibility studies.

### 3.3.1 *Kimberlite*

Kimberlite is an alkaline ultramafic igneous rock that is generated at great depths in the earth and emplaced at the surface as highly explosive volcanic eruptives. Weathering and erosion of the upper portions of the eruptive – the caldera and associated breccias, tuffs and country rock clastics is common leaving the lower “pipes” and feeder dykes and sills. Diamond-bearing kimberlites are only found on ancient, stable, cool portions of the crust known as “cratons”. Kimberlites, and a closely related variety called lamproite, are the only known primary source of commercial diamond deposits.

Exploration for diamond bearing kimberlites starts with the definition of unexplored portions of cratons. The kimberlites usually have distinctive and discrete dipolar, circular magnetic signatures accompanied by circular gravity “lows”. Geophysics, particularly airborne magnetics, is usually the first method used to locate new kimberlites, followed up by ground magnetic and gravity surveys.

Stream and soil sampling for kimberlite indicator minerals (“KIM’s”) is also employed to locate new kimberlite occurrences. Kimberlites have a very distinctive mineral composition and recovery of these minerals from stream and soil sampling campaigns is used not only to locate the buried kimberlite source rock, but also, by determining the chemical composition of individual KIM grains, to estimate the diamond bearing potential of the kimberlite occurrence.

Evaluation of kimberlites usually follows a standard procedure. RC and Core drilling campaigns define the extent and morphology of the intrusive, while samples of the core are subjected to micro-diamond analysis to obtain an indication of the possible diamond grade of the kimberlite. These campaigns, if positive, are followed up by large-diameter drilling or bulk sampling or trial mining to test representative quantities of the different varieties of kimberlite so as to obtain sufficient data for an estimate of ore volume, diamond grade and diamond values.

Kimberlite intrusions are often composite, and made up of several different kimberlite lithologies or “facies” which have been intruded during successive eruptive episodes, so that one may cut into the other.

The Orapa kimberlites are characterized by being high up in the volcanic crater area and having had to break through the extensive Karoo-aged basaltic lava flows to reach the surface. The kimberlites are often small in surface area but swell out below the basalts to be much larger than their surface expression suggests. The kimberlites often contain large quantities of fragmented basalt in their upper parts.

The Bugeco kimberlites are located in two separate clusters and not much information as to their internal geology is known; however they all appear to have resedimented volcanoclastic kimberlite in their near-surface expression and many of the kimberlites are garnet-poor. A

favourable, but poorly constrained, local cratonic geotherm of  $39\text{mW/m}^2$  is recorded in the vicinity of the Ksendou cluster. The mineral chemistry data suggest that both high-interest sub-cratonic lithospheric mantle and low-interest cratonic-margin mantle have been sampled by the kimberlites.

### *Conclusions*

All of the BD kimberlite projects are at an advanced stage, where kimberlite pipes have been located and exploration of the occurrences is now at the evaluation stage. Further drilling to define continuity, bulk sampling and trial mining preparatory to feasibility studies are planned.

#### *3.3.2. Alluvial Deposits*

Alluvial, colluvial (slope or gravity-fed) and eluvial (weathered in-situ) diamond deposits are all derived from the weathering and erosion of primary source kimberlites (and lamproites) or secondary alluvial deposits and the release of diamonds into the modern alluvial environment. Good quality diamond, because of its hardness and above average specific gravity, 3.5 versus overall crustal average of 2.6, survives abrasion in river and glacial transport and usually concentrates in the base of the stream load or in stream-bed trap structures along with other heavy minerals – the poor quality diamonds, because of cracks and carbon impurities in their crystal lattice are preferentially destroyed by prolonged river, glacial and marine transport.

The location of alluvial diamond deposits may be proximal or distal to the primary kimberlite or secondary alluvial source, but exploration for these deposits usually begins close to known diamondiferous kimberlites.

Systematic evaluation of secondary and modern alluvial diamond deposits usually begins with drilling, using augur or percussion or reverse circulation drills to estimate the lateral extent of the alluvial deposit and the thickness of overburden and target basal gravels. The morphology of the bedrock is usually also determined during this phase as it can indicate the location of the best stream-bed trap structures where higher grades of diamonds can be predicted. Drilling is usually followed by bulk sampling to test for the grade of the deposit and to obtain a sufficiently large parcel of diamonds to predict an average value. Bulk sampling can take the form of small hand-dug pits on a grid or the test mining of selected, widely spaced locations using large earthmoving equipment.

Alluvial diamond deposits may exhibit considerable grade variations within the resource, due to the sedimentological evolution of the diamondiferous gravels. While the grade will be much less than in the source kimberlite, the average quality of the diamonds may be higher due to the destruction of poorer stones with increasing distance from source. Variations in coarseness, degree of cementation and clay content of the gravels can result in varying metallurgical properties, and may impact on plant efficiencies.

The potential of the secondary deposition of diamonds from BD's Botswana and DRC kimberlites has not yet been assessed or tested.

### *Conclusions*

The alluvial diamond potential within BD's licences has not yet been assessed or explored, but is a very low priority.

#### 3.3.3 *Diamond Recovery Methods*

Diamonds are universally recovered by using gravity separation techniques to arrive at a concentrate of heavy minerals which can then be sorted, either manually or mechanically to extract diamonds. A typical diamond recovery plant employs crushing for kimberlites and cemented alluvial feed followed by sizing of the material over various sieves, and then gravity separation. The common gravity separation techniques employed are various forms of jigs, rotary pans and dense media separation (DMS) using cyclones.

Mechanical final recovery of diamonds from concentrates usually employs one or more unique physical characteristics of diamond to distinguish it from other heavy minerals. Water does not "stick" to the surface of diamonds and passing a stream of water carrying the concentrate over grease tables or belts results in the diamonds adhering to the grease while other, "wetable" minerals are washed over the grease bed. Diamonds fluoresce when subjected to x-rays and this property allows for mechanical separation of the fluorescing particles in a sorter. The recovered diamonds are then hand sorted and safely stored.

Strict plant security at all stages of the process is required to ensure the full recovery of all diamonds.

## 4.0 DESCRIPTION AND LOCATION OF ASSETS

### 4.1 Botswana Property Descriptions

In Botswana the administration of prospecting and mining licences are under the jurisdiction of the Ministry of Minerals, Energy and Water Resources. A department within the Ministry, The Geological Survey, deals with prospecting licences. The Mines and Minerals Act 17 of 1999 governs the terms and conditions for the grant of licences. Prospecting Licences (“PL’s”) for specific categories of minerals are granted for an initial period of three years, renewable for two further periods of two years each if work commitments are being met. The surface area of PL’s must be reduced by 50% at each renewal. Mining licences are granted for a period not exceeding 25 years on the submission of a positive feasibility study and the State is then entitled to participate, to a maximum 15%, in any mining entity.

#### 4.1.1 BD’s Orapa District Licences

The three PL’s in the Central District of Botswana were granted to Atlas Minerals Botswana (Pty) Ltd, a wholly owned local subsidiary company of BD, to prospect for diamonds. The corner co-ordinates of the PL blocks are listed in Table 3 below and the current situation with these licences is as follows:-

**PL No.004/2002:** This licence was originally granted in 2002 and has been renewed twice with reductions in the surface area. On 23<sup>rd</sup> July 2009, the Minister granted an extension of the licence which is currently valid to 30<sup>th</sup> June 2011. The extended PL is in two square blocks with a combined surface area of 11.12 sq.km. The southern rectangular block covers both the AK08 and AK09 kimberlites.

**PL No.007/2004:** This licence was originally granted on the 1<sup>st</sup> July 2004 and has been renewed twice with reductions in the surface area. On 4<sup>th</sup> June 2009, the Minister approved the second renewal of the PL which is currently valid until the 30<sup>th</sup> June 2011. The renewed PL is a single, rectangular block of ground with a surface area of 31.4 sq.km. No kimberlites have been found to date in this PL, but there are several indicator mineral anomalies that require further investigation.

**PL No.605/2009:** This licence is in the second year of its initial three-year period of grant, having been granted by the Minister for the period 1<sup>st</sup> July 2009 to 30<sup>th</sup> June 2012. The PL is a single, rectangular block of ground with a surface area of 1.6 sq.km. and covers the northern extension of the BK05 kimberlite.

#### 4.1.2 Botswana – Other Assets

We have been informed by BD’s management that there are no other tangible assets in Botswana. BD has made use of contractor staff and De Beers has to date financed and managed the exploration programmes; therefore there are no vehicles, office equipment or plant and machinery which belong to BD.



#### 4.1.3 Botswana - Liabilities

We have been informed by the management of BD that neither BD nor Atlas Minerals Botswana (Pty) Ltd has any Environmental, Social Development, Infrastructural or other liabilities in respect of the Botswana licences described above with the exception of the minimum expenditure commitments for exploration which form part of the conditions of grant of the licences.

**TABLE 3: Detailed locations of the Botswana Prospecting Licences**

Licence No.	Point	Latitude South (Decimal Degrees)	Longitude East (Decimal Degrees)	Surface Area Km <sup>2</sup>	BD's Beneficial Interest*
<b>PL004/2002</b>	A	-21.396940	25.420373		100%
Southern block	B	-21.396940	25.446650		
	C	-21.417220	25.446650		
	D	-21.421862	25.446651		
	E	-21.421858	25.420399		
Northern Block	A	-21.252780	25.539380		
	B	-21.252940	25.553860		100%
	C	-21.252950	25.557520		
	D	-21.270230	25.557500		
	E	-21.270230	25.539380	<b>11.12 km<sup>2</sup></b>	
<b>PL007/2004</b>	A	-21.110798	25.523245		100%
	B	-21.111190	25.565660		
	C	-21.111160	25.573440		
	D	-21.111386	25.599747		
	E	-21.147559	25.99662		
	F	-21.146182	25.523245	<b>31.4 km<sup>2</sup></b>	
<b>PL605/2009</b>	A	-21.243307	25.539380		100%
	B	-21.243300	25.553910		
	C	-21.252940	25.553860		
	D	-21.252780	25.539350	<b>1.6 km<sup>2</sup></b>	
<b>TOTAL AREA</b>				<b>44.12 km<sup>2</sup></b>	

\*(Note: the Botswana government is entitled to obtain a 15% interest in any mining venture)

## 4.2 Democratic Republic of Congo - Bugeco Property Descriptions

In the DRC the administration of prospecting and mining licences are under the jurisdiction of the Ministry of Mines. As a result of the 2003 implementation of the new DRC Mining Code, which was drafted in conjunction with the World Bank, The Mining Code provides the Prospecting Rights (“PR”) (Permis de Recherches) holder with broad access to explore its properties under a transparent and efficient permitting process. In the case of diamond exploration, the Mining Code gives the PR holder exclusive rights for a period of four years, renewable for two additional two-year periods. On discovery of an economically viable deposit, the holder can apply for an Exploitation Permit <sup>(9)</sup>.

BD has a 35.4% indirect shareholding in Bugeco Exploration RDC SARL.

### 4.2.1. Bugeco's Licences

The three PR's in the Kasai Oriental Province of the DRC were granted to Bugeco Exploration RDC SARL in 2003 and covered an area of 20,000 square kilometres. After a 5-year programme of exploration funded by a joint venture with De Beers and the discovery of nine confirmed kimberlites, the PR's have been reduced to three licences, PR927, PR906 and PR899 with a total area of 137 square kilometers. The corner co-ordinates of the retained PR blocks are listed in Table 4 below and the current situation with these licences is as follows:-

**PR No.927:** This licence was originally granted in 2003 and has been reduced in accordance with the requirements of the Mining Code. The licence was renewed with a reduction in area from 83Km<sup>2</sup> to 37Km<sup>2</sup> on 9<sup>th</sup> November 2009 and remains valid until November 2011.

**PR No.906:** This licence was originally granted in 2003 and has been reduced in accordance with the requirements of the Mining Code. The licence was renewed with a reduction in area from 104Km<sup>2</sup> to 47Km<sup>2</sup> on 9<sup>th</sup> November 2009 and remains valid until November 2011.

**PR No.899:** This licence was originally granted in 2003 and has been reduced in accordance with the requirements of the Mining Code. The licence was renewed with a reduction in area from 110Km<sup>2</sup> to 53Km<sup>2</sup> on 9<sup>th</sup> November 2009 and remains valid until November 2011.

### 4.2.2 DRC – Other Assets

We have been informed by BD's management that there are no other tangible assets in the DRC. Bugeco has an office in Kinshasha, but the furniture and equipment has a minimal residual value and Bugeco uses contractor staff when required. De Beers has to date financed and managed the exploration programmes; therefore there are no vehicles, office equipment or plant and machinery which belong to BD.

### 4.2.3 DRC - Liabilities

We have been informed by the management of BD that neither BD nor Bugeco Exploration RDC SARL has any Environmental, Social Development, Infrastructural or other liabilities in respect of the DRC licences described above with the exception of those minimum expenditure commitments for exploration which form part of the conditions of grant of the licences.

**Table 4: Detailed Location of the Bugeco DRC Licences.**

<b>Licence No.</b>	<b>Corner Point</b>	<b>Latitude South (Degrees, Minutes, Seconds)</b>	<b>Longitude East (Degrees Minutes, Seconds)</b>	<b>Surface Area Km<sup>2</sup></b>	<b>BD's Beneficial Interest</b>
<b>PR 906</b>	1	-6:18:00	25:05:30	47	35.4%
	2	-6:15:30	25:05:30		
	3	-6:15:30	25:07:30		
	4	-6:17:00	25:07:30		
	5	-6:17:00	25:08:00		
	6	-6:18:00	25:08:00		
	7	-6:18:00	25:10:30		
	8	-6:19:30	25:10:30		
	9	-6:19:30	25:09:30		
	10	-6:20:30	25:09:30		
	11	-6:20:30	25:08:00		
	12	-6:20:00	25:08:00		
	13	-6:20:00	25:07:30		
	14	-6:18:00	25:07:30		
<b>PR899</b>	1	-6:25:30	25:01:30	53	35.4%
	2	-6:24:00	25:01:30		
	3	-6:24:00	25:03:30		
	4	-6:24:30	25:03:30		
	5	-6:24:30	25:06:00		
	6	-6:24:00	25:06:00		
	7	-6:24:00	25:08:00		
	8	-6:25:30	25:08:00		
	9	-6:25:30	25:07:00		
	10	-6:27:00	25:07:00		
	11	-6:27:00	25:06:30		
	12	-6:27:30	25:06:30		
	13	-6:27:30	25:05:30		
	14	-6:27:00	25:05:30		
	15	-6:27:00	25:05:00		
	16	-6:26:00	25:05:00		
	17	-6:26:00	25:02:30		
	18	-6:25:30	25:02:30		

**Table 4 (contd.): Details of Bugeco's Licences in the DRC**

<b>Licence No.</b>	<b>Corner Point</b>	<b>Latitude South (Degrees, Minutes, Seconds)</b>	<b>Longitude East (Degrees Minutes, Seconds)</b>	<b>Surface Area Km<sup>2</sup></b>	<b>BD's Beneficial Interest</b>
<b>PR 927</b>	1	-6:23:00	25:11:30	37	35.4%
	2	-6:22:00	25:11:30		
	3	-6:22:00	25:12:00		
	4	-6:21:30	25:12:00		
	5	-6:21:30	25:13:30		
	6	-6:22:00	25:13:30		
	7	-6:22:00	25:14:00		
	8	-6:24:00	25:14:00		
	9	-6:24:00	25:16:00		
	10	-6:25:30	25:16:00		
	11	-6:25:30	25:15:30		
	12	-6:26:00	25:15:30		
	13	-6:26:00	25:14:00		
	14	-6:25:00	25:14:00		
	15	-6:25:00	25:13:30		
	16	-6:24:00	25:13:30		
	17	-6:24:00	25:12:30		
	18	-6:23:30	25:12:30		
	19	-6:23:30	25:12:00		
	20	-6:23:00	25:12:00		
			<b>TOTAL</b>	<b>137</b>	

## 5.0 OVERVIEW OF THE BOTSWANA DIAMOND PROJECTS

### 5.1 Location, Access, Infrastructure, Climate and Physiography

#### 5.1.1 Location of the licences

*PL 004/2002 (Southern block):* The southern prospecting licence is located some 12 km southeast of Debswana's Orapa mine, 25 km northwest of Debswana's Letlhakane mine and 6 km northwest of both Lucara's new AK6 mine and Firestone Diamond's new BK11 mine. The licence is accessed by a 3 km long sandy track from a tarred road servicing Letlhakane village and extends to intersect a new gravel road between Letlhakane village and the new AK6 & BK11 mines.

*PL 004/2002 (Northern block and PL 605/2009):* These adjoining licences are located 5km north of Debswana's Damtshaa mine and accessed via a good quality gravel road from the tarred Francistown – Orapa highway.

*PL 007/2004:* This prospecting licence is located some 15km north of Debswana's Damtshaa mine and accessed via the same gravel road from the tarred Francistown – Orapa highway.

#### 5.1.2 Accessibility & Communications Infrastructure

The three licences are central to a large kimberlite mining province and served by a major tarred highway (A30) to the nearest large town, Francistown, some 250km to the east. Francistown has an international airport with several daily connections to Johannesburg, South Africa and to the capital Gaborone. The District is adequately served by fixed-line and cellular telephone operators who also offer internet connectivity.

#### 5.1.3 Climate

The climate is semi-arid with unpredictable rainfall. Average annual temperatures range between 14<sup>0</sup> and 25<sup>0</sup>C with the average annual rainfall of 465mm from summer thunderstorms that begin in October, peaking in January (100mm average) and ending in March <sup>(1)</sup>. Any exploration, bulk sampling or mining programmes should not be affected by weather related events.

#### 5.1.4 Vegetation

The vegetation in the Orapa mining District is classed as mixed mopane tree and bush savannah grassland with sparse thorn trees, but in many places over-grazing has denuded the landscape <sup>(2)</sup>.

### 5.1.5 Local Resources & Infrastructure

The Orapa mining District has a long history of exploration and mining activities and there should be an adequate supply of well-trained local personnel to provide the required skills and labour for exploration, mining and for metallurgical processing activities. Unskilled and semi-skilled labour is plentiful, and is drawn from the local communities. Skilled equipment operators and mechanics are readily available in the greater mining district. Access to spare parts, engineering services and other specialized services is very good and can either be sourced in Francistown or obtained by road from Gaborone or by air from Johannesburg. Diesel fuel is trucked in by tanker on a regular basis from fuel depots in Francistown and Gaborone.

There are several drilling contractors in Botswana providing standard RC, large-diameter RC, large diameter RF-AA and diamond core drilling services.

All of the licences are close enough to the village of Letlhakane so that housing, shopping, schooling and other support services are readily available.

Bulk Electricity and water supplies are provided and controlled by Government agencies and are readily available in the mining District.

### 5.1.6 Physiography

The Orapa mining district lies on the northern fringe of the Kalahari Desert of central Botswana and the topography is flat with few hills rising above 25m of the general elevation of 1 000m above sea level. Streams are poorly incised and most run-off water soaks into the sandy soil fairly rapidly. The vegetation is mixed mopane tree and bush savannah with trees, shrubs and grasses modified extensively by many years of livestock over-grazing. The trees and shrubs are dominantly mopane (*Colophospermum mopane*) and acacia (*Acacia tortilis*) with occasional *Combretum*, *terminalia prunioides* trees which tend to form thickets with intervening grassy patches <sup>(2)</sup>.

The ground slopes imperceptibly to the north into the Makgadigadi Depression. The dry valley of the now fossil Letlhakane River, directed into the Depression, passes between the Orapa and Damtshaa mining leases as shown in Map 2 below and is the only notable physiographic feature in the immediate area.





**MAP 2: LOCATION OF THE BOTSWANA PROSPECTING LICENCES AND INFRASTRUCTURE.**

## 5.2. Local Geology, History of Exploration & Results Summary

### 5.2.1 *Local Geology*

Surface outcrops are often extensively affected by secondary calcrete and silcrete duricrusts formed from prolonged exposure to peneplanation and erosion on the late Tertiary (~65 mya) African Erosion Surface. The Orapa area is overlain by thin terrestrial sediments of the Kalahari Group (~2 mya) (T.C.Partridge et al, 2006).

In the Orapa mining District the bedrock consists of various lithologies of the Phanerozoic Karoo Supergroup (150 – 200ma), much condensed by being on the edge of the greater Karoo basin, ranging from shales to sandstones within the basal Tlapana formation through the Thlabala formation shales, Mosolotsane mudstones and upper Ntane formation aeolian sandstones to the Stormberg basaltic lavas at the top of the Supergroup (R.A.Smith, 1984). The Orapa cluster of kimberlites, more than 60 separate pipes have been discovered, are all intruded through the Karoo Supergroup during the Cretaceous (65 – 144 mya) period. As a general rule all of the Orapa kimberlites contain breccias dominated by basalt caprock and in several cases, the kimberlite intrusive event was not powerful enough to break through the basaltic cap-rock and “blind” kimberlite bodies are known to occur (M.Field & B.H. Scott-Smith, 1998).

The Orapa kimberlite cluster lies on the southern flank of the Okavango dyke swarm, an intense concentration of WNW-ESE trending post-Stormberg dolerite dykes dated at 179 mya which can be followed from Zimbabwe through Botswana to Namibia (Jourdan, F. et al, 2004).

### 5.2.2 *History of Diamond Exploration*

De Beers began prospecting in Botswana for diamondiferous kimberlites in March 1955 with the first kimberlite discovered in the Mochudi area in 1966. On 1<sup>st</sup> March 1967 the first kimberlite in the Orapa area was discovered (BK1) while the main kimberlite which became the Orapa mine (AK1) was found in April 1967<sup>(3)</sup>.

The first kimberlite finds were made by the application of soil sampling methods to recover kimberlite indicator minerals (“KIM’s”). The methodology evolved for sampling in the Kalahari sand covered areas relied on the fact that bioturbation, essentially the activities of termites excavating their nests down to the water table, would preferentially bring heavier mineral grains to the surface. Since kimberlites have a unique set of heavy minerals (KIM’s), such as pyrope garnets, ilmenite, chromite and chrome diopside, these could be recovered by taking large-volume stream and soil samples and separating out the heavy minerals as a concentrate. The concentrate is then examined for KIM’s under a microscope.

De Beers applied this prospecting methodology through vast tracts of the Botswana landscape, establishing widely spaced regional cut-lines through the bush and following up any KIM’s with closer-spaced grid sampling. The initial Orapa kimberlites were located using this methodology.

Once the kimberlite district had been located, De Beers applied several geophysical techniques to refine their search for individual pipes.



### 5.2.3 Adjacent Properties and Competitor Activity

The three Botswana licences are located within the Orapa kimberlite cluster (see Map 2 above) where De Beers have located 84 separate kimberlite occurrences, of which 65 are classified as pipes and 19 as dykes, some only a few metres in diameter while the largest, bi-lobate AK1 being mined as the Orapa Mine is over 117 ha in extent and the second largest diamond mine in the world and the first diamond mine in Botswana. All of the existing mines in the Orapa Field are owned by the Debswana Diamond Mining Company, a 50:50 joint venture between De Beers Centenary and the Republic of Botswana. The mines are operated by De Beers.

#### **Orapa Mine**

The Orapa mine produced 7.575 million carats of diamonds from 8.817 million tonnes treated (grade of 86 cpht) in 2009, a significant decrease from the more normal production rate of 16.869 million carats from 18.569 million tonnes treated in 2008 (a grade of 91 cpht), largely due to the poor state of the diamond market in the latter half of 2008 <sup>(4)</sup>.

#### **Damtshaa Mine**

The four pipes at Damtshaa, some 18km east of Orapa, are the 5.5ha BK01, which was actually the first kimberlite to be discovered in the Orapa/Letlhakane province, the BK09 pipe with a sub-outcrop area of 11.4ha, accounting for 88% of the new mine's output, the BK12 pipe, 800m northwest of BK09, has a sub-outcrop area of 3.2ha, and the BK15 kimberlite with an area of 3 ha. The Damtshaa pipes produced 54 000 carats from 60 000 tonnes treated in 2009 (grade of 90 cpht) against the 533 000 carats recovered from 2.883 million tonnes treated in 2008 (grade of 18.5 cpht) <sup>(5)</sup>.

#### **Letlhakane mine**

The Letlhakane mine, some 45km southeast of Orapa, was first discovered during the sampling and evaluation process at Orapa, and became Debswana's second mine when it opened in 1975. The two pipes at Letlhakane (DK1 and DK2) had an original surface area of 12ha and 4ha respectively. In 2009, 1.066 million carats were recovered from 3.8 million tonnes of ore (average diamond grade of 28cpht) against the 2008 production of 1.2 million carats from 3.794 million tonnes treated (grade of 32 cpht).

#### **Firestone's BK11 mine**

During July 2010 Firestone Diamonds plc (listed on the London AIM), the controlling partner and operator of Monak Ventures (Pty) Ltd announced that they have been granted a 12-year mining licence and are developing the 8.0ha BK11 kimberlite, some 7 km southeast of Atlas's AK8 & AK9 projects. The BK11 project was held by De Beers and Debswana under a succession of prospecting licences but was not thoroughly investigated until when, under PL 1/97, it was incorporated in the Boteti Joint Venture. De Beers carried out detailed geophysics and drilled one large diameter borehole on the pipe under the joint venture, before relinquishing the ground in 2005. The single LDD hole was drilled to 170 m and produced 115.2 t of sample from which a grade of 2.40 ct/100t (+1.47 mm diamonds) was estimated. Monak is fast tracking the property with a view to full production in late 2010 <sup>(7)</sup>.

The BK11 project has a published resource estimate, compliant with the South African SAMREC code, of 11.5 million tonnes of ore at an average grade of 8.5cpht with diamonds valued at US\$155/ct in March 2010 to a depth of 120m below surface. The mine will

concentrate firstly on the KW area where an estimated 5.4Mt of kimberlite at a grade of 12.6cpht will be mined. Diamond parcels (size unknown) from bulk sampling in this area are valued at an average US\$175/ct in March 2010. The BK11 mining project has an estimated life of mine of 10 years<sup>(7)</sup>. Please note the large difference between the De Beers estimate of diamond grade from their LDD samples and Firestone's grade estimated from excavated bulk samples.

### **Other Firestone properties**

Firestone Diamonds has joint ventures with Tawana Resources over kimberlites BK24, BK19, BK20, BK21, BK22, BK25 and BK26, and with Kenrod Engineering on kimberlite BK16. Sampling has been done on BK16, and large diameter drilling is planned for BK24 (I.McGeorge, 2010).

### **The AK6 mine**

The Lucara AK6 kimberlite is a single, tri-lobate kimberlite pipe which is currently being developed as a mine and which is located some 10Km SSE of AK09. The kimberlite is "pinched" at surface, and its sub-outcrop consists of a core of kimberlite, covering an area of 4.2 ha, surrounded by an area where the kimberlite is capped by basalt or basalt breccia. Drilling has shown that the kimberlite bulges to a maximum area of 7 ha at a depth of 120 m (I.McGeorge, *op cit*).

An indicated mineral resource to a depth of 400m, and an inferred resource from 400m to a depth of 750 m were developed by De Beers (as operators of the Boteti joint venture) between 2004 and 2007 through successive drilling programmes, and a trench bulk sampling programme, which produced a total of 1,754 carats of diamonds. The diamonds have been valued at different times by three different entities. The most recent valuation was completed in February 2010 and this valuation has been modelled to produce average production revenue of US\$194 per carat (+1.0 mm cut-off). A positive feasibility study has upgraded the resource to a probable reserve category which totals 35.3 Mt at a weighted average grade of 21.7cpht (I.McGeorge, *op cit*).

### **Other Exploration Projects**

Early stage prospecting projects within the Orapa cluster include evaluation programmes being conducted by Sekaka Diamonds (Pty) Ltd (controlled by Petra Diamonds) who have a large landholding and are engaged in evaluation of the BK1 South kimberlite<sup>(8)</sup> and Geo Perspectives (Pty) Ltd who are at an early stage of investigating the AK17, 18 & 19 kimberlite pipes.

## 6.0 OVERVIEW OF THE DRC DIAMOND PROJECTS

### 6.1 Location, Access, Infrastructure, Climate and Physiography

#### 6.1.1 Location of the licences

The licences are located in the northeast portion of the central nucleus of the Kasai craton in the Provinces of Kasai Oriental and Katanga, DRC. The nearest town is Kabinda some 75km northwest of the licences with the larger town of Mbuji Mayi some 170km to the WNW (see Map 3 below).

#### 6.1.2 Accessibility & Communications Infrastructure

There are licenced airports at Mbuji Mayi and Kananga with fairly regular air services. There is an airstrip at Kabinda for charter flights.

The cell phone coverage is reasonably good with repeater stations powered by generators and cell phones work over large portions of the area.

Inside the licence perimeter of the permits, the dirt tracks are passable using 4-wheel drive vehicles but there may be difficult sections getting into the permit areas; for example, the road from Kabinda takes on average half a day to traverse the 100Km distance. The National road between Kabinda and Mbuyi Mayi has a very variable condition dependant on whether it is the wet or dry season and one can expect a full day's journey by 4-wheeled drive vehicle to traverse the 120km distance.

#### 6.1.3 Climate

The DRC lies on the equator and the climate is tropical, being hot and humid throughout the year. The Kabinda area lies just south of the Equator and has a wet season between September and January with a “small” rainy season in the months of March and April. Temperatures remain high year round, varying between min 17<sup>0</sup> (nighttime) and max 30<sup>0</sup> C. Short dry spells of several weeks may occur during the rainy season. The climate is not very different from that of Mbuji Mayi, where open pit mining operations continue year round.

#### 6.1.4 Vegetation

The vegetation is typically tropical savannah grasslands with deciduous gallery forests and dense undergrowth confined to the steep sided stream valleys.

### 6.1.5 Local Resources & Infrastructure

The local resources and infrastructure are poor with Kabinda being the closest town where there is a mechanical workshop. Supply of fuel and spare parts in Kabinda is, however not guaranteed. There is no power supply in the area.

Untrained labour is readily available in all the local towns and villages. There is a history of seasonal artisan diamond digging in the alluvial areas of streams around the town of Kasendu. Some of the older villagers in the area may have worked in Mbuji Mayi and may be semi-skilled.

### 6.1.6 Physiography

The topography of the immediate licence area can be described as a deeply incised plateau with flat-topped grassed surfaces incised by steeply sided, forested stream valleys.

## 6.2 **Local Geology, History of Exploration & Results Summary**

### 6.2.1 Local Geology

The permits are situated in the Northeastern portion of the central nucleus of the Kasai block of the Congo Craton which consists of granulite, gneiss, granite and amphibolite. These basement rocks are unconformably overlain by the Precambrian middle to lower Bushimayi formations with the following simplified stratigraphy established (based on field observation and drill core logging) by the De Beers technical teams in the Bugeco project area:-

In the Kabinda area, the simplified stratigraphy seems to comprise:

- (f) Ferricrete horizon caps various units
- (e) Red Kalahari sandstone (830-890m)
- (d) Polymorph sandstone (825-830m)
- (c) Sand-, silt- and mudstones, fluvioglacial? basal conglomerates, intruded by kimberlites (725-825m)
- (b) Basaltic lavas (or sills?), c. 20m thick?
- (a) Basal Dolomitic limestones (<600-725m)

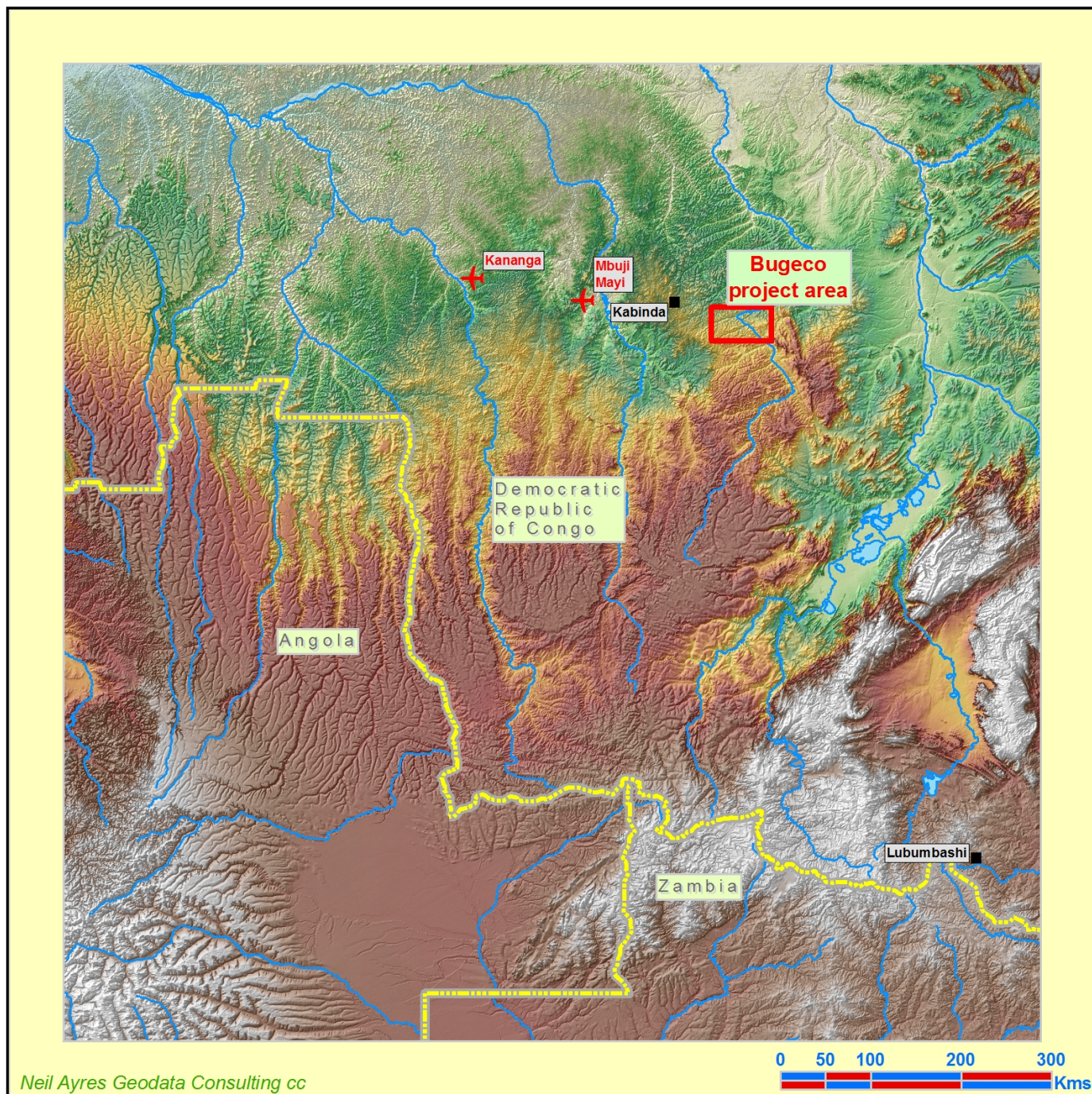
### 6.2.2 History of Diamond Exploration

During the 1980's, a De Beers subsidiary company, Zairebrit SARL, prospected a very wide area on a reconnaissance scale which included all of the Bugeco areas. The campaign consisted of widely spaced stream sampling for KIM's. The Zairebrit stream sampling indicated several stream anomalies through the area, but these were not pursued at the time.

### 6.2.3 Adjacent Properties and Competitor Activity

Apart from on-going diamond mining at Mbuji Mayi, some 200km to the WNW, there is no competitor activity.





**MAP 3: LOCATION OF THE BUGEKO EXPLORATION AREA IN THE DRC**

## 7.0 CURRENT EXPLORATION ON THE BOTSWANA PROPERTIES

The recent exploration and development of the three Prospecting Licences in Botswana is described in this section.

### 7.1 PL 4/2002 (Southern Block) – AK09 Kimberlite

#### 7.1.1 *Introduction*

The AK09 kimberlite was included in the Atlas Joint Venture (formerly Boteti Joint Venture) between De Beers and AFD. The kimberlite is located some 20km southeast of the Orapa Mine, some 25 km northwest of Debswana's Letlhakane mine and 6 km northwest of both Lucara's new AK6 mine and Firestone Diamond's new BK11 mine.

#### 7.1.2 *Discovery History*

The AK09 kimberlite was discovered by De Beers in 1970 from KIM sampling results and an airborne geophysics survey and was initially thought to be some 0.2ha in extent with 13m of Kalahari overburden. Because of its supposed small size, the pipe received very little attention in the presence of the much larger kimberlites in the cluster. The first recorded drillhole was a diamond core hole drilled in 1971 to obtain kimberlite sample for micro-diamond analysis (S.Dludla, De Beers, May 2008).

#### 7.1.3 *Local Geology*

In the vicinity of the AK09 pipe, the Mosolotsane Formation sandstone unit of the Karoo Supergroup forms the lowest lithology intersected in the drilling to date. Overlying this unit are Stormberg basalts of various thicknesses from 15m to 75m and silcretes and calcretes from 1m to 15m thick. Kimberlite is sub-cropping in the northern portion of the pipe while kimberlite occurs up to 70m below the basalt cap in the southern portion (S.Dludla, *op.cit.*).

#### 7.1.4 *Exploration Programmes*

The 1971 NX (54.7mm) diameter core drillhole was drilled to 61m depth to both identify the kimberlite petrographically and to serve as a sample for micro-diamond analysis ("MiDa"). The 60 kg of sample sent for MiDa produced 487 stones weighing 0.017857ct. which was modelled using statistical analysis to predict a diamond grade of 160cpht. This excellent grade generated further interest in the pipe and later in 1971 it was decided to collect a larger sample by pitting; the pit was dug to a depth of 20m and yielded a 209 tonne sample which produced 17 macro-diamonds weighing 0.97ct which meant an average grade for the kimberlite of 0.46cpht. Both the MiDa and macro-diamond samples were from sub-outcropping portions of the kimberlite and not representative of the kimberlite as a whole (S.Dludla, *op.cit.*).

In the light of improved sampling and geophysical techniques, the whole Orapa area was re-assessed in the early 2000's. A review of the existing geophysical data over AK09 in 2005 resulted in an increased size of the sub-outcropping kimberlite from 0.2ha to 0.6ha.

In 2004 De Beers completed a ground magnetic survey on a 50m x 50m grid over AK09 which increased the estimated size of the kimberlite body to 3.0ha, however much of this upper portion is capped by basalt at depths of up to 95m (S.Dludla, *op.cit.*).

A re-assessment of the 100m x 50m gravity survey data from the 1970's resulted in a model of a kimberlite surface area of between 4 & 5ha.

The geophysically modelled body was used to plan a drill campaign of core and percussion drillholes during the period 2004 to 2007.

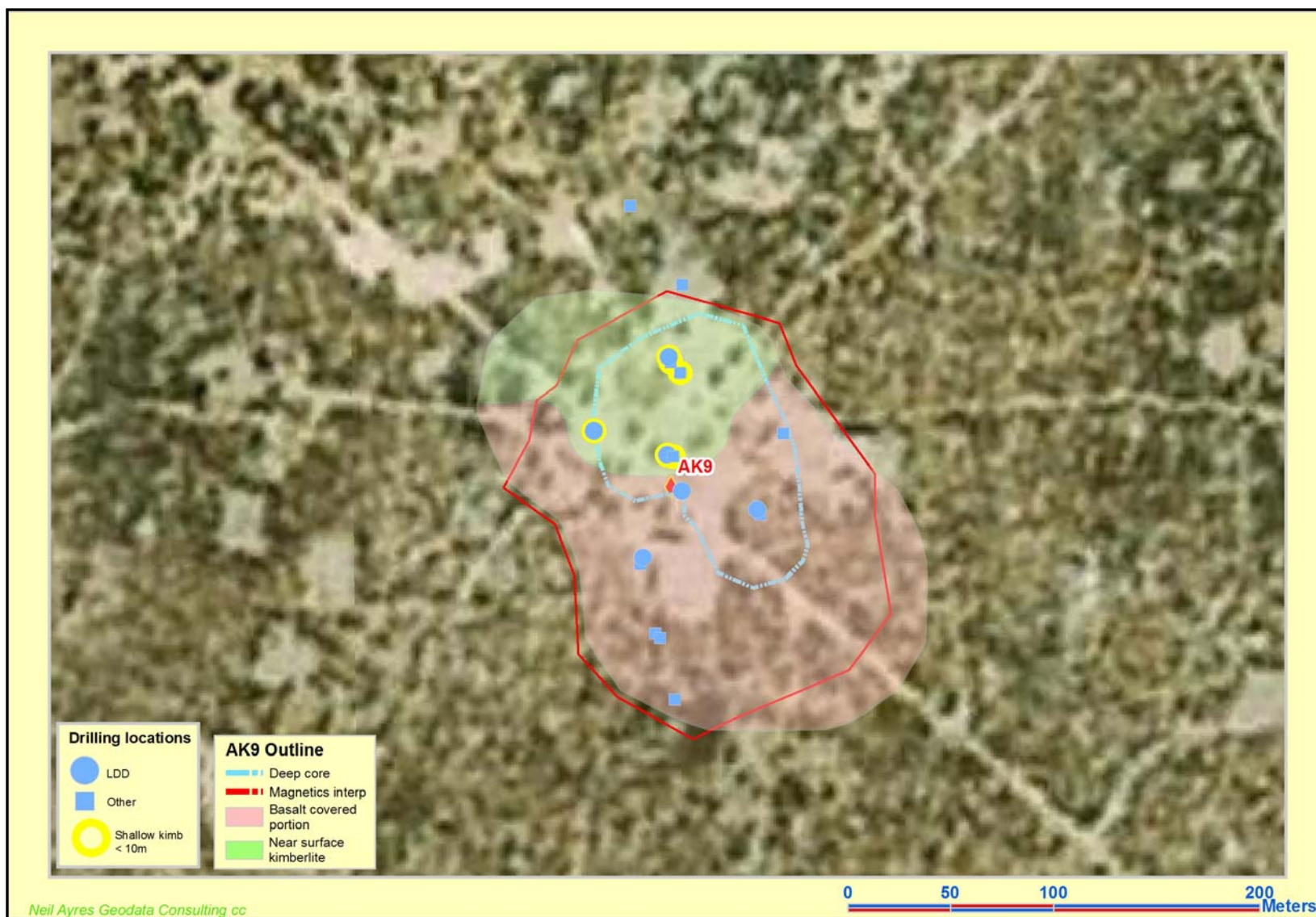
**Table 5: Summary of the 2004 & 2007 drilling at AK09 (all vertical holes)**

HOLE No.	DATE	HOLE SIZE	END DEPTH	METHOD	KIMBERLITE INTERSECTION
H 01 (LDD)	Jul. 2004	12.25 inch	147m	percussion	16m – 147m
H 03	Oct. 2004	6.5 inch	95m	percussion	None?
H 04	Oct. 2004	6.5 inch	95m	percussion	None?
H 05	Oct. 2004	6.5 inch	167m	percussion	None?
H 06	May. 2005?	6.5 inch	120m	percussion	None?
H 07	Oct. 2004	6.5 inch	92m	percussion	None?
H 08	Oct. 2004	6.5 inch	102m	percussion	None?
H 10	Oct. 2004	6.5 inch	107m	percussion	None?
H 11	Oct. 2004	6.5 inch	52m	percussion	None?
H 12	Oct. 2004	6.5 inch	58m	percussion	None?
H 13	Oct. 2004	6.5 inch	58m	percussion	None?
H 14	Oct. 2004	6.5 inch	64m	percussion	None?
LDD 01	Oct. 2004	12.25 inch	164m	RC	15m – 164m
LDD 02	Oct. 2004	12.25 inch	180m	RC	28m – 180m
LDD 03	Nov. 2004	12.25 inch	170m	RC	15m – 170m
H 02	Dec. 2004	8 inch	161m	percussion	15m – 161m
H 001	May 2007	6.5 inch	209m	percussion	14m – 189m
H 002	Jun. 2007	6.5 inch	228m	percussion	52m – 228m
H 003	Jun. 2007	6.5 inch	160m	percussion	88m – 145m
H 004	Jun. 2007	6.5 inch	200m	percussion	78m – 181m
LDD 05	Jun. 2007	12.25 inch	253m	RF – AA*	51m – 247m
LDD 06	Jun. 2007	12.25 inch	180m	RF - AA	14m – 180m
LDD 07	Jul. 2007	12.25 inch	186m	RF - AA	74m – 180m
LDD 08	Jul. 2007	12.25 inch	120m	RF - AA	89m – 120m
H 009	Aug. 2007	NQ 47.6mm	191m	Diamond core	15m – 180m
H 010	Sep. 2007	NQ 47.6mm	167m	Diamond core	50m – 167m

\*RF – AA: Reverse Flood Airlift Assisted Drilling (see Glossary of Terms)

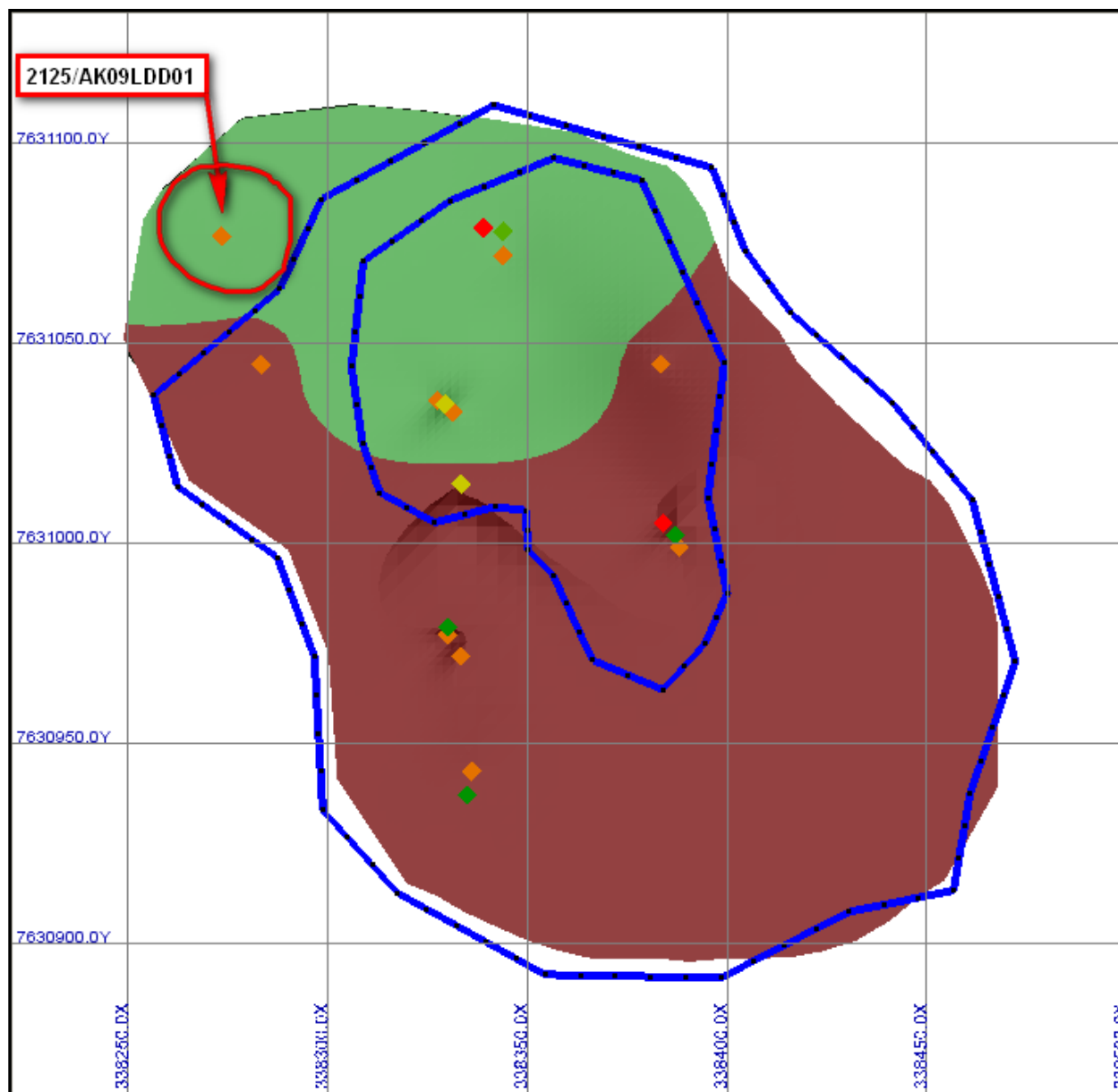
**Note 1: The 2004 percussion drill logs indicate that no kimberlite was intersected – this seems to be incorrect (?) since the geology modelled from these results shows kimberlite – see Figure 1 below.**





**MAP 4: LOCATION OF AK09 KIMBERLITE SHOWING DRILLHOLES AND MODELLED EXTENT**





**Figure 1: Geological modelled extent of AK09 kimberlite (green is sub-outcrop & brown is under basalt) & gravity modelled extent (blue lines).**

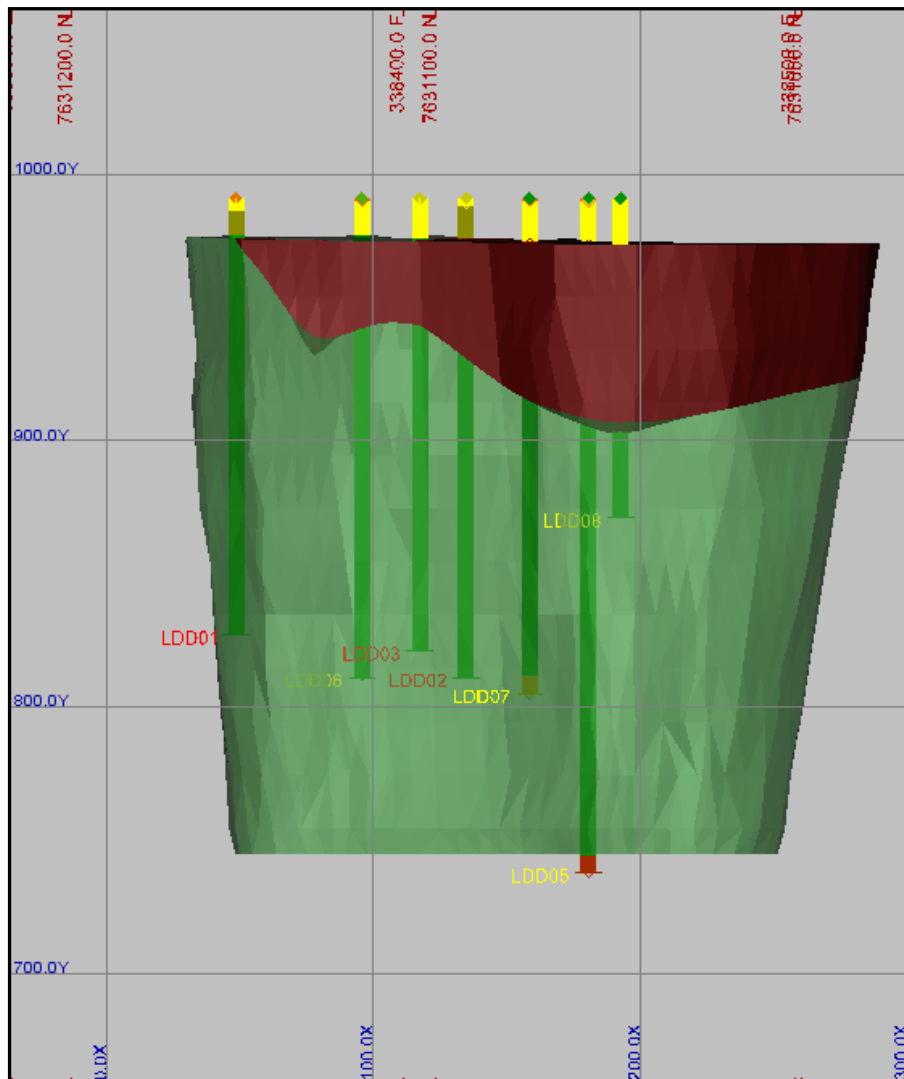
**2004 & 2007 Drillholes: Red are diamond core holes, Orange are percussion holes, Green are RF-AA holes and Yellow are LDD holes.**

### 7.1.5 Drilling Results

The objectives of the two drilling campaigns were:-

- to resolve the geophysical anomaly models and to obtain an estimated surface area of the kimberlite (2004 – 11 percussion holes),
- to obtain core samples for petrographic description and MiDa (2 diamond core holes in 2007),
- to obtain bulk samples for processing to obtain macro-diamonds (4 LDD holes in 2004 and 4 LDD holes in 2007).

The geophysical magnetic model estimated the pipe surface area at 3ha and the drilling results indicate a geological model estimated pipe surface area of 3.22ha, decreasing in size to 1.07ha at a depth of 247m below ground surface. It must be noted that the northern portion of the kimberlite of approximately 1ha. is sub-outcropping while the southern part is capped by up to 80m of basalt (Figure 2).



**Figure 2: NW – SE section through AK09 Kimberlite - showing basalt cap rock (brown) over kimberlite (green)**

The petrographic studies of core and chip samples indicate that the AK 09 kimberlite is magmatic in nature, ranging from segregationary to globular macrocrystic forms. Olivine is abundant with phlogopite, calcite, spinels and perovskite in the groundmass. The petrographer rated the kimberlite as being of moderate interest.

The mineral chemistry studies of indicator minerals from AK 09 show that the garnet population has a significant sub-calcic signature and analysis of spinel and clinopyroxene grains indicate that the kimberlite has sampled approximately 60Km of potentially diamondiferous lithosphere and the kimberlite is therefore rated as having a high potential for carrying diamonds.

The MiDa analytical study ( Table 6 below) indicated an estimated diamond grade of 85cpht for the AK 09 kimberlite, which is certainly a grade indicating a high potential kimberlite.

**Table 6: Summary of AK09 microdiamond sample data**

Consignment	Sample Type	Aliquots	Treated Mass (kg)	MD06+ Micros <sup>2</sup>	MD06+ SP20KG <sup>1,2</sup>	Total Micros <sup>2</sup>
M75X0498	Drill sludge	3	60	101	33.67	487
BOT071093	Core	11	223.44	44	3.94	71
BOT071094	Core	8	167.14	30	3.59	56
	<b>TOTALS</b>	<b>22</b>	<b>450.58</b>	<b>175</b>		<b>614</b>

<sup>1</sup> average number per 20 kilograms of micro-diamonds in size-class MD06 and above (32×10<sup>-6</sup> carats or more)

<sup>2</sup> excludes any synthetic diamonds (KMDL shape X) and possibly synthetic diamonds (KMDL shape Y)

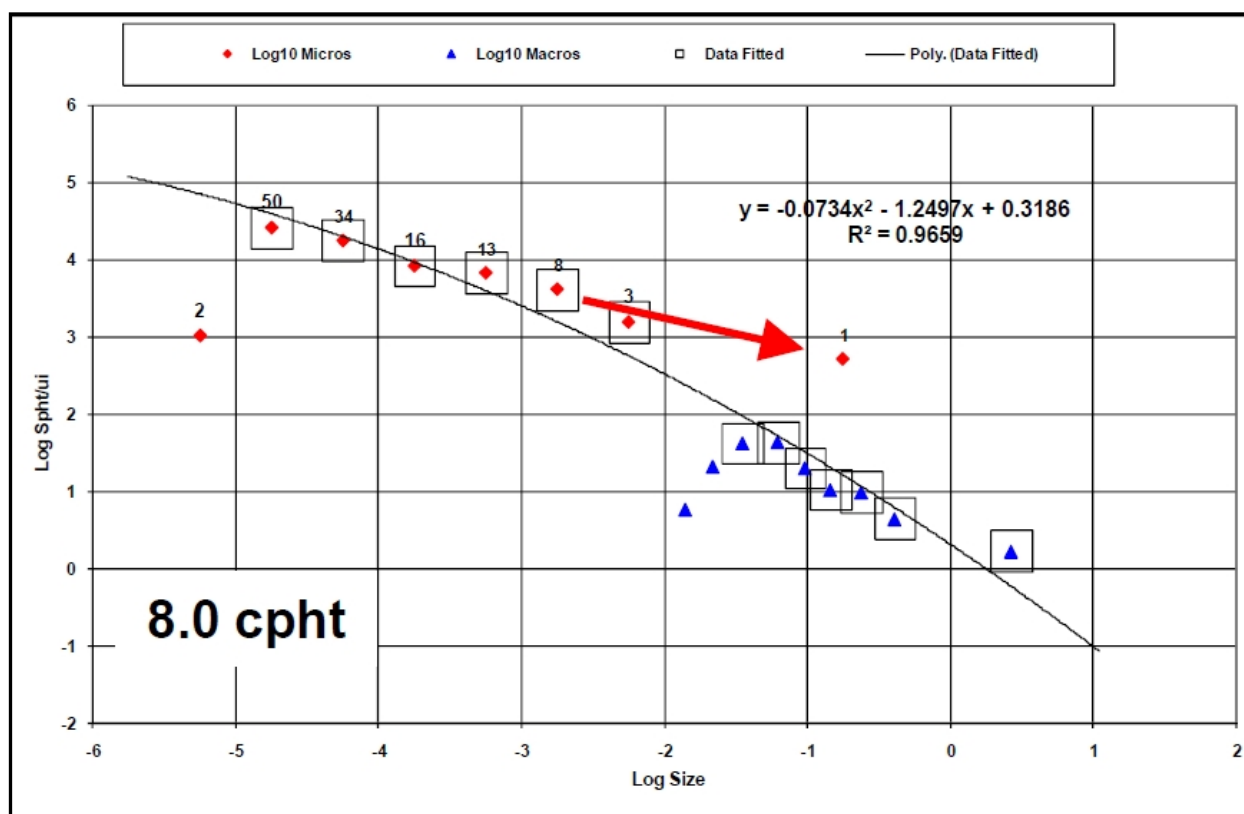
The Macro-diamond bulk sampling and treatment, both from the early pit sample and the later large diameter drilling samples (Table 7 below) indicates a mean bulk sample diamond grade of 1.71 cpht, very different from the MiDa study. The macro and micro diamond distributions were plotted on a grade-size graph and the combined curve indicates a possible grade of between 2.5 and 3.5 cpht.

**Table 7: Summary of AK09 macrodiamond bulk sample data**

Sample Type	Treatment Method	Calculated Mass *(Tonnes)	No. of Stones	Carat Weight	Grade cpht
1971 - 20m pit sample	Pan plant	209.9	17	0.97	0.46
2004 - LDD	DMS plant	89.688	43	2.295	2.56
2007 - LDD	DMS plant	139.019	30	4.245	3.05
	<b>TOTALS</b>	<b>438.607</b>	<b>90</b>	<b>7.51</b>	<b>1.71</b>

\* Sample Mass was calculated from the calculated hole volume & an assumed density of 2.7g/cm<sup>3</sup>.

In 2010, BD obtained all of the De Beers raw data of diamonds recovered to date and commissioned Mr.N.Ayres to re-assess the expected grade of the AK 09 kimberlite. The diamond drillholes which had a high content of basalt were deemed to be diluting the grade and once the data from these was removed, the new size/frequency curve in Figure 3 below was produced and the consultant estimates an average grade of 8.0cpht for AK09 instead of the 2.5cpht to 3.5cpht grade estimated by De Beers; furthermore, he commented that the MiDa trend is flatter than shown (see red arrow) and could indicate a much higher grade (N.Ayres, 2010).



**Figure 3: Revised size-frequency curve for Micro- and Macro- diamonds recovered from AK09**

In November 2010, BD commissioned a conceptual study of the likely mining and processing costs in developing their three Botswana kimberlites (J.E.Clarke, 2010). The study used the geological models for the kimberlites and then planned open pit mining for AK08 & 09; the study also assessed various scenarios including contract mining and processing of ore from AK08 & AK09 at the new AK06 mine. The conceptual study indicated that the AK09 kimberlite, if mined together with the nearby AK08 kimberlite could produce a 20% IRR if the *in situ* value of the kimberlite was US\$38/tonne. The findings of this conceptual study are summarized as follows:-

- The AK9 pipe produces 7.3 million tonnes of kimberlite down to a depth of 250m and requires waste stripping of 63.7 million tonnes.
- The plant treatment rate is 1.5 million tonnes per annum thereby producing a combined life of mine for AK08 & AK09 of 16 years.
- It was assumed for purposes of the study that both the mining and plant operations are contracted out in order to reduce capital expenditure. The initial capital expenditure is estimated to be US\$41 million, including working capital for both AK08 & 09.
- The operating costs are estimated as US\$23.6 per tonne treated over the life of mine.

### 7.1.6 Conclusions and Recommendations

The following conclusions can be drawn from the assessment work completed to date and the recommendations for further work follow from these:

1. The original 2004 drilling was surely intended to outline the kimberlite and provide data for building a 3-D geological model of the pipe. The geologist who logged the drill chips was either unable to identify kimberlite or the holes were very poorly located, because it is reported that no kimberlite was intersected; furthermore, both the 2004 and the 2007 drilling campaigns only used vertical holes, so that there is no information on where the sidewall contacts actually are. In my opinion, therefore, the geological model is poorly constrained and the estimated surface area of 3.22ha is probably under-estimating the size.
2. The mineral chemistry study showed that the AK09 kimberlite has a significant population of eclogitic garnet and was assessed as having a high potential for carrying diamonds. The possible eclogitic diamond component, together with the relatively flat size: frequency curve derived from the MiDa study indicates that the AK09 kimberlite may have a significant large stone size population and that large bulk samples are required to arrive at a conclusion about this population. It is encouraging to note that a 1.89ct stone was recovered from LDD06 in 2007.
3. The drill chips collected during the two LDD drilling campaigns were passed over a 1mm screen prior to treatment in a DMS recovery plant. There is no data indicating the mass of sample actually treated in the DMS versus the calculated mass of the kimberlite drilled; if the drilling method was such that the kimberlite was ground up, then it is fair to assume that only a small fraction of the calculated mass was treated and that the diamonds too were broken up during the drilling process. This would result in a totally meaningless macro-diamond grade estimate and may account for the large disparity between the MiDa and macro-diamond grade estimates (85cpht for MiDa versus 1.71cpht for macro estimate). The re-assessed grade of 8.0cpht is the best estimate to date of the grade in AK09, but it should be borne in mind that the macro-diamond size/frequency data is probably underestimating the grade because of diamond breakage in the LDD drilling process.
4. The conceptual study by Paradigm Project Management (J.E. Clarke *op cit*) indicates that AK09 requires an *in situ* value of US\$38 /tonne to become financially viable, which translates to grade/value combinations of between 38cpht for US\$100/ct diamonds and 25cpht grades with US\$150/ct diamonds. These target grade/values are achievable and justify the further evaluation of AK09.

The above conclusions lead to the following recommendations for further assessment work of the AK 09 kimberlite:

1. A series of shallow, vertical percussion holes across the kimberlite followed by diamond drilling of four inclined holes from the estimated centre of the kimberlite in an E-W and N-S pattern will provide sufficient lateral information on the kimberlite contacts to reach a conclusion as to the size and shape of the kimberlite body. Core drilling will also provide an indication of internal kimberlite variability, and a larger sample for additional MiDa analysis.
2. Large Diameter drill holes to obtain a large sample for macro-diamond analysis should use the Bauer 2.5m diameter LDD rig, capable of drilling to 70m depth; alternatively, and preferably, a trench or excavation to obtain the best possible assessment of grade in the sub-outcropping northern portion of the kimberlite. In order for AK 09 to be financially viable, the upper portions of the kimberlite must yield a viable grade / value of diamonds and it is therefore vital to assess this part of the kimberlite at an early stage.

## 7.2 PL 4/2002 (Southern Block) – AK08 Kimberlite

### 7.2.1 *Introduction*

The AK08 kimberlite was included in the Atlas Joint Venture (formerly Boteti Joint Venture) between De Beers and AFD. The kimberlite is located some 15km SSE of the Orapa Mine, some 27 km northwest of Debswana's Letlhakane mine and 8 km northwest of both Lucara's new AK6 mine and Firestone Diamond's new BK11 mine.

### 7.2.2 *Discovery History*

The AK08 kimberlite was discovered by De Beers in 1969 after following up on KIM sampling through the area. The initial evaluation indicated the kimberlite was uneconomic and the licence over AK08 was relinquished by De Beers in the 1990's. Kukama Mining & Exploration, later incorporated into AFD, acquired AK08 when they were granted PL04/2002.

### 7.2.3 *Local Geology*

In the vicinity of the AK08 pipe, the Mosolotsane Formation dark red mudstones unit is overlain by white, fine to coarse-grained cross-bedded sandstones of the Ntane Formation of the Karoo Supergroup form the lowest lithologies intersected in the drilling to date. Overlying this unit are Stormberg basalts of various thicknesses from 0m to 100m thick. Where basalt sub-outcrops it is generally covered by some 5m of cream-white calcrete. (C.T.Rhikotso, Feb 2008).

### 7.2.4 *Exploration Programmes*

After concluding a joint venture with AFD in 2003, De Beers employed numerous geophysical surveys including ground gravity, magnetic and Controlled Source Audio frequency Magneto-Tellurics ("CSAMT"), which is a frequency-domain method that constructs the apparent resistivity profile and is effective in mapping kimberlite intrusions. The geophysical model of the kimberlite was used to direct the subsequent drilling programmes.

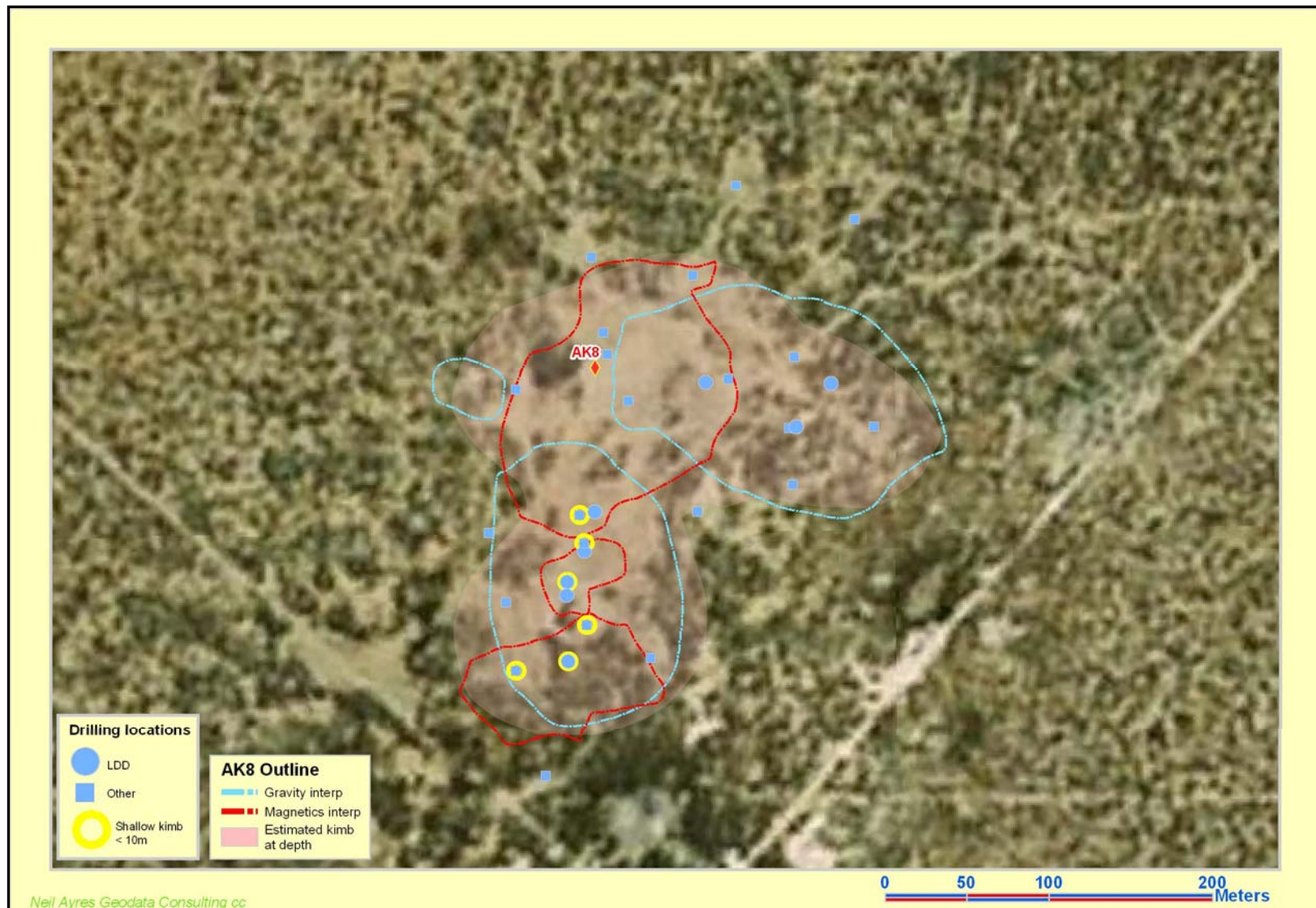
The drilling campaigns began in late 2004 with a series of ten vertical 6.5inch percussion holes and four vertical 12.25 inch Large Diameter RC holes. The delineation drilling continued with a further ten vertical percussion holes in May and June 2005. Six diamond drillholes were completed, four vertical and two at  $-70^{\circ}$  inclination, between October 2005 and September 2006. Between October 2006 and February 2007, three additional LDD holes were completed, one of which was a 22 inch diameter RF – AA and the others 12.25 inch diameter RF – AA holes. The drilling is summarized in Table 8 below.

The twelve positive 6-inch percussion holes and an interpretation of the geophysics suggest that the AK 08 kimberlite has a surface area of some 5ha. The kimberlite is bi-lobate with the northern lobe being capped with basalt and calcrete/sand between 90m and 125m thick; the southern lobe has no basalt cap and sub-outcrops under calcrete/sand overburden between 1.5m and 18m thick (see Map 5 below).

The diamond drilling served to further refine the shape and size of the kimberlite and also provided further evidence of the internal geology of the body. In the southern lobe, re-sedimented volcanoclastic kimberlite down to 121m overlies fine grained magmatic kimberlite, with sections of the kimberlite having up to 95% basalt breccia xenoliths. In the north lobe, magmatic kimberlite and sections of volcanoclastic kimberlite are often highly diluted by basalt and country rock xenoliths. The diamond core samples also provided indicator mineral grains for mineral chemistry studies. The two lobes appear to be similar with a large population of sub-calcic G10 garnets (C.T.Rhikotso, *op cit*).

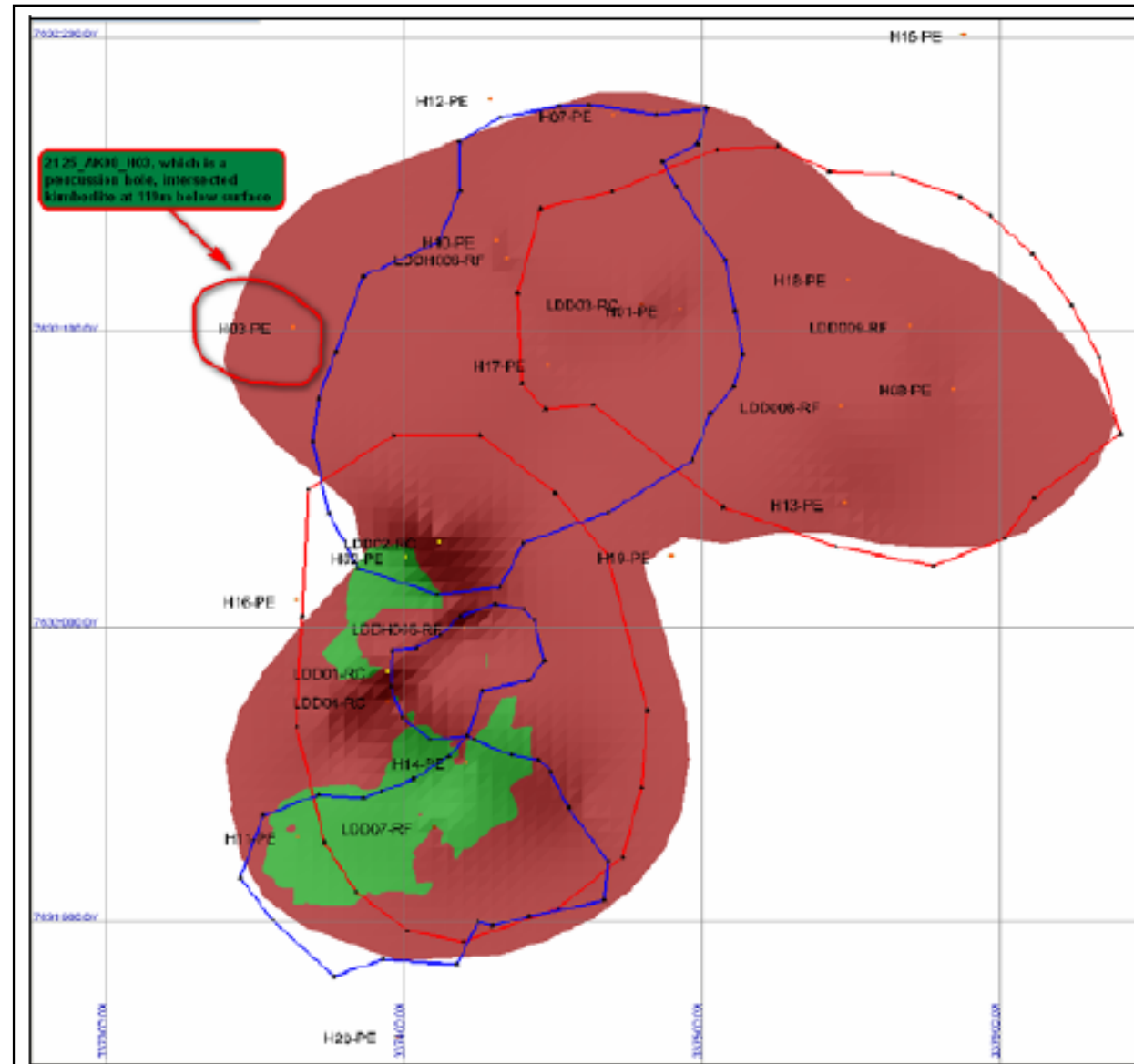
**Table 8: Summary of Drillholes at AK 08**

HOLE No.	DATE	HOLE SIZE	END DEPTH	METHOD	KIMBERLITE INTERSECTED
H 01	Oct.2004	6.5 inch	178m	percussion	75m - 178m
H 02	Nov.2004	6.5 inch	173m	percussion	10m – 155m
H 03	Nov.2004	6.5 inch	170m	percussion	119m – 170m
H 04	Nov.2004	6.5 inch	162m	percussion	No kimberlite
H 05	Nov.2004	6.5 inch	131m	percussion	No kimberlite
H 06	Nov.2004	6.5 inch	165m	percussion	No kimberlite
H 07	Nov.2004	6.5 inch	156m	percussion	106m – 136m
H 08	Nov.2004	6.5 inch	200m	percussion	138m – 200m
H 09	Nov.2004	6.5 inch	156m	percussion	No kimberlite
H 10	May 2005	6.5 inch	150m	percussion	91m – 150m
H 11	Dec.2004	8.0 inch	152m	percussion	9m – 152m
H 12	May 2005	6.5 inch	138m	percussion	No kimberlite
H 13	Jun.2005	6.5 inch	173m	percussion	135m – 173m
H 14	Jun.2005	6.5 inch	173m	percussion	3m – 125m
H 15	Jun.2005	6.5 inch	163m	percussion	No kimberlite
H 16	Jun.2005	6.5 inch	155m	percussion	No kimberlite
H 17	Jun.2005	6.5 inch	160m	percussion	56m – 160m
H 18	Jun.2005	6.5 inch	155m	percussion	92m – 155m
H 19	Jun.2005	6.5 inch	161m	percussion	No kimberlite
H 20	Jun.2005	6.5 inch	155m	percussion	No kimberlite
LDD 03	Nov.2004	12.25 inch	200m	RC	75m – 200m
LDD 04	Nov.2004	12.25 inch	170m	RC	28m – 164m
LDD 01	Dec.2004	12.25 inch	170m	RC	5m – 170m
LDD 02	Dec.2004	12.25 inch	169m	RC	119m – 149m
DDH 04(-90 <sup>0</sup> )	Oct.2005	HQ-63.5mm	148m	Diamond	10m – 135m
DDH 01(-70 <sup>0</sup> )	Dec.2005	HQ-63.5mm	185m	Diamond	115m – 161m
DDH 02(-70 <sup>0</sup> )	Jan.2006	NQ-47.6mm	172m	Diamond	122m – 151m
DDH 05(-90 <sup>0</sup> )	Apr.2006	NQ-47.6mm	280m	Diamond	89m – 280m
DDH 03(-90 <sup>0</sup> )	Sep.2006	BQ-36.5mm	267m	Diamond	122m – 267m
DDH 08(-90 <sup>0</sup> )	Sep.2006	BQ-36.5mm	116m	Diamond	5m – 116m
LDD 07	Oct 2006	22.0 inch	200m	RF-AA	3m – 197m
LDD 08	Jan.2007	12.25 inch	287m	RF-AA	124m - 287m
LDD 09	Feb.2007	12.25 inch	182m	RF-AA	123m – 165m

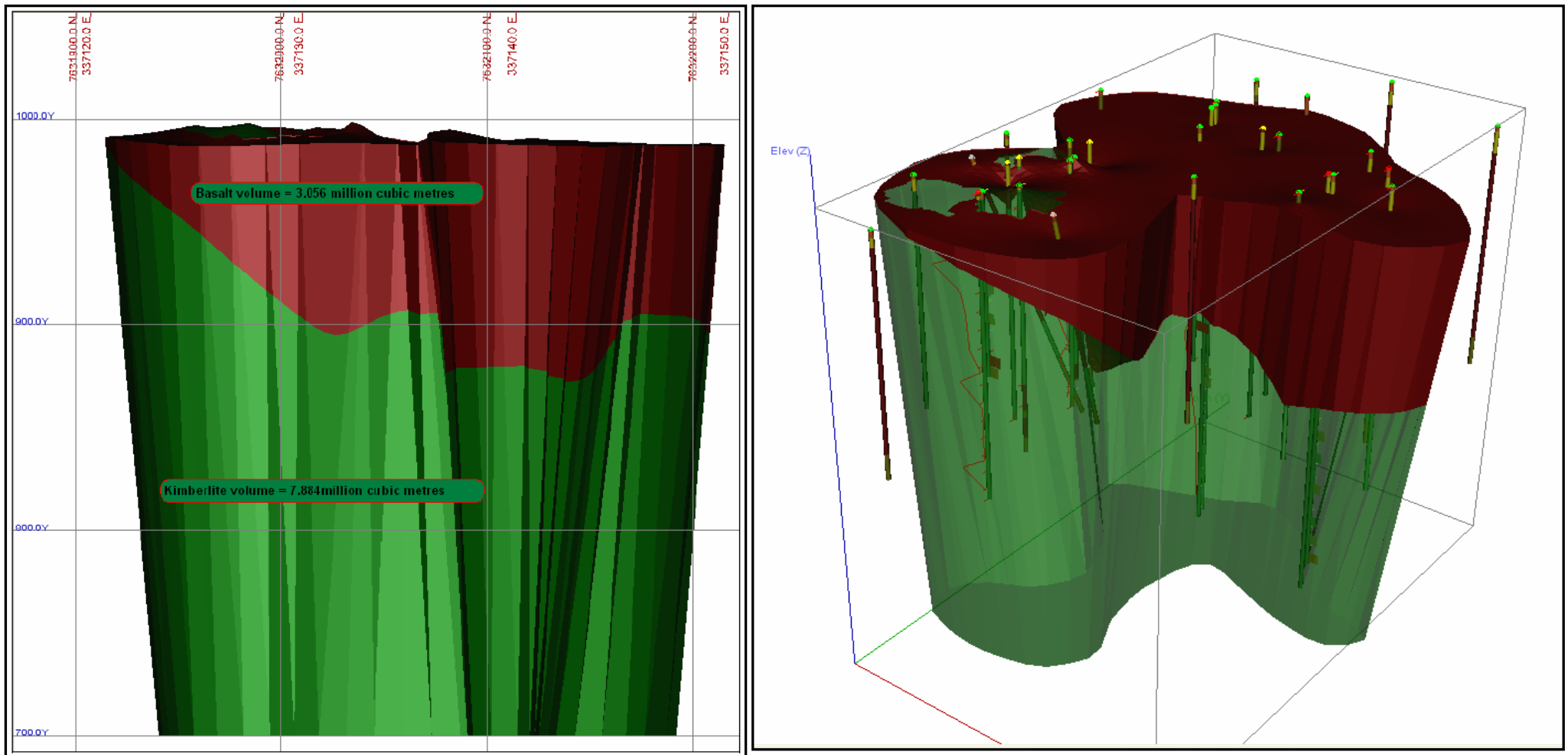


**MAP 5: LOCATION OF AK 08 DRILLHOLES AND MODELLED OUTLINES OF KIMBERLITE.**





**Figure 4: Plan view of the modelled AK08 kimberlite RED LINE = gravity, BLUE LINE= magnetics. Solid Red colour is basalt covered kimberlite and solid green colour is sub- outcropping kimberlite.**



**Figures 5 & 6: Simplified AK08 geological model - showing kimberlite overlain by basalt cap/breccia and on the right, drillhole traces against the 3D model.**

### 7.2.5 Drilling Results

The objectives of the drilling campaigns were:-

- to resolve the geophysical anomaly models and to obtain an estimated surface area of the kimberlite and a realistic 3-D geological model (20 percussion and 6 diamond drillholes),
- to obtain core samples for petrographic description, mineral chemistry and MiDa (6 diamond core holes),
- to obtain bulk samples for processing to recover macro-diamonds (4 LDD holes in 2004 and 3 LDD holes in 2007).

The interpretation of the magnetic and gravity data showed slightly different extents of the kimberlite, but the percussion and diamond drilling has largely resolved the discrepancies and it is generally held that the AK 08 kimberlite is some 6ha in total extent, with some 1ha of the pipe (south lobe) sub-outcropping with from 0m to 15m of sand/calcrete overburden while the northern and northeastern lobes are capped by up to 125m of basalt (see Figures 5 & 6 above).

The petrography and internal kimberlite facies definition is poorly understood and further inclined diamond drilling will be needed to adequately resolve these issues. The kimberlite is classed as magmatic with volcanoclastic and pyroclastic units in the southern lobe with good diamond grade potential. The limited knowledge of the northern lobe is that the kimberlite is classed generally as a breccia much diluted with country rock and therefore having less potential for viable diamond grades.

The mineral chemistry plots show a significant population of sub-calcic G10 garnets and a 10%-15% eclogitic garnet component. Both these indicate that the AK08 kimberlite sampled the diamond stability field and has the potential to carry diamonds (C.T.Rhikotso, *op cit*).

Micro-diamonds were recovered from some of the samples of the percussion drilling campaign with two samples from the east lobe, two from the north lobe and one from the south lobe (see Table 9 below). Samples of diamond drill core were also taken for MiDa purposes and are shown in the Table. The MiDa analytical study when combined with the macro-diamond results indicates an estimated diamond grade of 5cpht for the south lobe, 1cpht for the northern lobe and 1cpht for the eastern lobe.

The macro diamond study used mostly the samples of kimberlite obtained from large diameter drillholes plus some of the drill chips from earlier percussion drilling which were composited according to the location of the holes. The south, north and east lobe samples have been kept separate and it is quite obvious from the results that the south lobe has the highest average grade, which from the macro-diamond results (LDD results only) indicates a grade of 6.13cpht. De Beers Mineral Resource Management section report confidence limits of 3 and 7cpht for the south lobe at 90% probability and the Diamond Trading Company report an average of US\$100/ct ranging from US\$35/ct to US\$190/ct diamond values at 90% probability based on the very few available stones and using the January 2008 DTC price book.

The geological model indicates that the AK08 kimberlite offers a potential exploration target size of some 20million tonnes of kimberlite down to 300m below surface. The potential target size of the south lobe only is roughly 7million tonnes to 300m depth.

**Table 9: MiDa Results for kimberlite AK08**

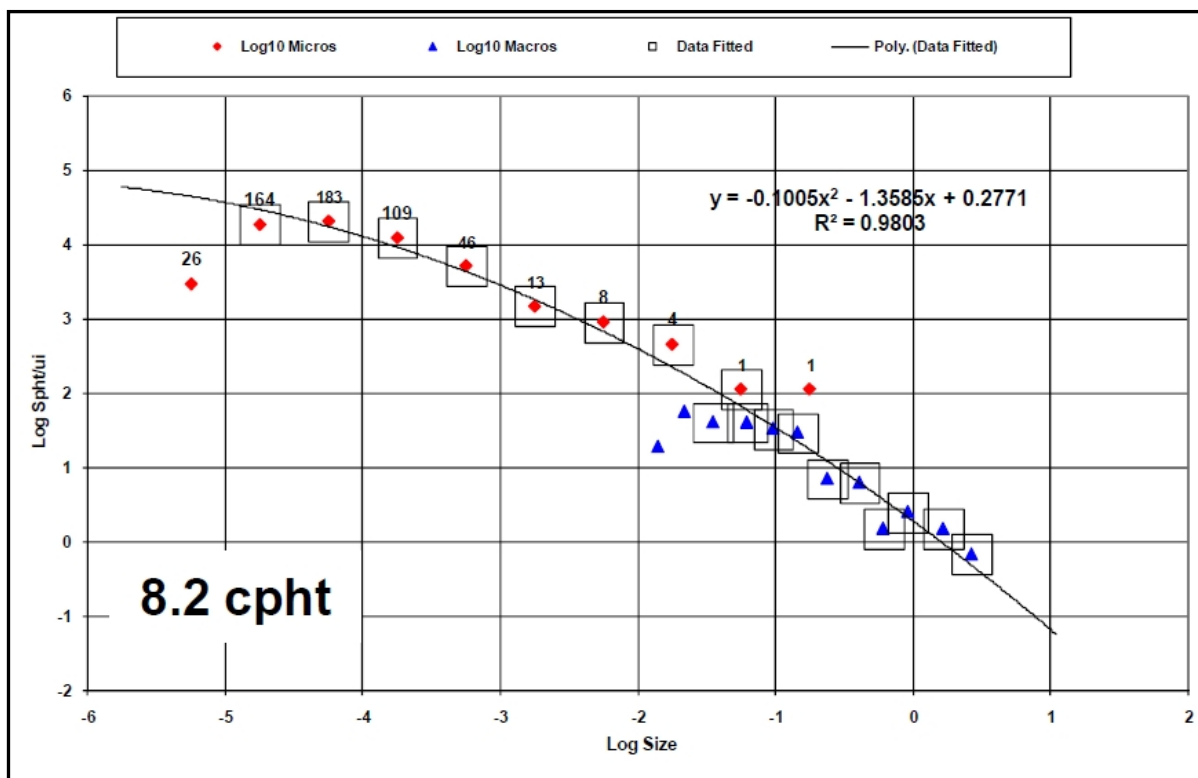
Consignment	Sample Type	Aliquots	Treated Mass (kg)	MD05+ Micros	MD06+ Micros	Total Micros
H13 (E. lobe)	Drill sludge	4	489.4	27	14	30
H14 (S. lobe)	Drill sludge	7	143.84	41	22	44
H10 (N. lobe)	Drill sludge	10	197.42	74	52	83
H17 (N. lobe)	Drill sludge	9	169.66	81	54	83
H18 (E. lobe)	Drill sludge	8	154.42	53	38	55
DDH04 (S lobe)	Core	23	374.46	111	72	115
DDH05 (N lobe)	Core	20	343.86	92	58	95
DDH02 (S lobe)	Core	4	56.04	7	5	7
DDH01 (S lobe)	Core	12	172.4	4	2	4
DDH03 (S lobe)	Core	26	526.01	117	89	124
DDH08 (E lobe)	Core	53	1102.86	90	49	96
	<b>TOTALS</b>	<b>176</b>	<b>3730.37</b>	<b>697</b>	<b>455</b>	<b>736</b>

**Table 10: Summary of AK08 macrodiamond bulk sample data**

Sample Type	Location	Calculated Mass *(Tonnes)	No. of Stones	Carat Weight	Grade cpht
LDD 01	South lobe	25.03	23	1.54	6.15
LDD 02	North lobe	25.1	0	0	0
LDD 03	North lobe	22.89	7	0.39	1.70
LDD 04	South lobe	29.25	24	4.395	15.03
H01+03+8+10+13+17+18	North lobe	13.85	2	0.115	0.83
H02+H14	South lobe	8.27	14	0.945	11.43
LDD 05	South lobe	101.29	108	6.585	6.50
LDD 06	North lobe	195.587	40	4.715	2.41
LDD 07	South lobe	140	43	5.605	4.0
LDD 08	East lobe	49.805	1	0.130	0.26
LDD 09	East lobe	31.746	0	0	n/a
	<b>TOTALS</b>	<b>642.818</b>	<b>262</b>	<b>24.42</b>	<b>3.80</b>

\* Sample Mass was calculated from the hole's volume & an assumed density of 2.7g/cm<sup>3</sup>. Please note that a 1mm bottom screen was used.

In 2010, BD obtained all of the De Beers raw data of diamonds recovered to date and commissioned Mr.N.Ayres to re-assess the expected grade of the AK 08 kimberlite. The diamond drillholes which had a high content of basalt were deemed to be diluting the grade and once the data from these was removed, the new size/frequency curve in Figure 7 below was produced and the consultant estimates an average grade of 8.2cpht for AK08 instead of the 3.0cpht to 7.0cpht grade estimated by De Beers (N.Ayres, 2010).



**Figure 7: Revised size-frequency curve for micro- and macro-diamonds recovered from AK08**

In November 2010, BD commissioned a conceptual study of the likely mining and processing costs in developing their three Botswana kimberlites (J.E.Clarke, 2010). The study used the geological models for the kimberlites and planned open pit mining for AK08 & 09; the study also assessed various scenarios including contract mining and processing of ore from AK08 & AK09 at the new AK06 mine. The conceptual study indicated that the AK08 kimberlite, if mined together with the nearby AK09 kimberlite, could produce a 20% IRR if the *in situ* value of the kimberlite was US\$38/tonne. The findings of this conceptual study are summarized as follows:-

- The AK08 pipe produces 13.5 million tonnes of kimberlite down to a depth of 275m and requires waste stripping of 72.2 million tonnes.
- The plant treatment rate is 1.5 million tonnes per annum thereby producing a combined life of mine for AK08 & AK09 of 16 years.
- It was assumed for purposes of the study that both the mining and plant operations are contracted out in order to reduce capital expenditure. The initial capital expenditure is estimated to be US\$41 million, including working capital for AK08 & AK09.
- The operating costs are estimated as US\$23.6 per tonne treated over the life of mine.

### 7.2.6 Conclusions & Recommendations

The following conclusions can be drawn from the assessment work completed to date and the recommendations for further work follow from these:

1. The initial percussion drilling succeeded in outlining and establishing the framework for a 3-D geological model of the pipe; however, only two of the diamond drillholes (DDH01 & 02) were inclined holes through the contact zone of the southern lobe and the remaining four diamond core holes were vertical and therefore provided no useful data about the kimberlite sidewall contact zone over the remainder of the pipe. This means that the geological model is poorly constrained and the pipe target volume may be very different from the global 20million tonne estimate to 300m depth..
2. The mineral chemistry study showed that the AK08 kimberlite has a significant population of sub-calcic and eclogitic garnet and was assessed as having a high potential for carrying diamonds. The possible eclogitic diamond component, together with the relatively flat size – frequency curve derived from the MiDa study indicates that the AK08 kimberlite may have a significant large stone size population and that large bulk samples are required to arrive at a conclusion about this population. It is encouraging to note that the size frequency distribution model plot shows that the South lobe could have 15% to 20% of the stones above 1ct/stone. A 2.26ct stone was recovered from LDD 04 drilled into the south lobe and a 2.375ct stone was recovered from LDD05 in the north lobe of AK08.
3. The drill chips collected during the two LDD drilling campaigns were passed over a 1mm screen prior to treatment in a DMS recovery plant. There is no data indicating the mass of sample actually treated in the DMS versus the calculated mass of the kimberlite drilled; if the drilling method was such that the kimberlite was ground up, then it is fair to assume that only a small fraction of the calculated mass was treated and that the diamonds too were broken up during the drilling process; this results in an underestimation of macro-diamond grades. The use of percussion sample in macro-diamond studies is also totally meaningless since the pulverizing action of the drill method will destroy diamonds. The re-assessed grade of 8.2cpht is the best estimate to date of the grade in AK08, but it should be borne in mind that the macro-diamond size/frequency data is probably underestimating the grade because of diamond breakage in the LDD drilling process.
4. The conceptual study by Paradigm Project Management (J.E.Clarke *op cit*) indicates that AK08 requires an *in situ* value of US\$38/tonne to become financially viable, which translates to grade/value combinations of between 38cpht for US\$100/ct diamonds and 25cpht grades with US\$150/ct diamonds. These target grade/values are achievable and justify the further evaluation of AK08.

The above conclusions lead to the following recommendations for further assessment work of the AK 08 kimberlite:

1. Shallow, vertical percussion drilling to delimit the near-surface extent of the kimberlite followed by diamond drilling of several inclined holes from the estimated centre of the southern lobe of the kimberlite in an E-W and N-S pattern will provide sufficient lateral information on the kimberlite contacts of the southern lobe to reach a conclusion as to the size and shape of the southern lobe kimberlite body. Core drilling will also provide a better indication of internal kimberlite variability, and a larger sample for additional MiDa analysis.

2. Large Diameter drill holes to obtain a large sample for macro-diamond analysis of average stone size, grade and value should use the Bauer 2.5m diameter LDD rig, capable of drilling to 70m depth, alternatively, and preferably, a trench or excavation to obtain a better assessment of grade in the sub-outcropping southern portion of the kimberlite. In order for AK 08 to be financially viable, the upper portions of the kimberlite must yield a viable grade / value of diamonds and it is therefore vital to assess this part of the kimberlite at an early stage.

### **7.3 PL 4/2002 (Northern Block) and PL 605/2009 – BK 05 Kimberlite**

#### **7.3.1 Introduction**

The BK05 kimberlite was included in the Atlas Joint Venture (formerly Boteti Joint Venture) between De Beers and AFD. The kimberlite is located some 18km ENE of the Orapa Mine and some 6 km north of Debswana's Damtshaa mine.

#### **7.3.2 Discovery History**

The BK05 kimberlite discovery history is not known.

#### **7.3.3 Local Geology**

In the vicinity of the BK05 pipe, the white, fine to coarse-grained cross-bedded sandstones of the Ntane Formation of the Karoo Supergroup form the lowest lithologies intersected in the drilling to date. Overlying this unit are Stormberg basalts of various thicknesses from 0m to 100m thick. The BK05 area is generally covered by some 1m to 5m of sand and up to 5m of cream-white calcrete.

#### **7.3.4 Exploration Programmes**

In 1976 De Beers dug two small pits into the outcropping kimberlite and processed the 358.48 tonnes of kimberlite through a small pan plant at the Orapa prospecting camp recovering 150 stones weighing 14.78 cts. In 1982 De Beers then drilled two jumper drill holes to collect a total of 180 tonnes of kimberlite which were processed and returned 379 stones weighing 12.86cts. These early evaluation programmes indicated a diamond grade of between 4.1 and 7cpht.

In 2002, prior to the advent of AFD and the joint venture with De Beers, Kukama Mining and Exploration Proprietary Limited ("Kukama") decided to bulk sample the outcropping portion of the kimberlite body. The bulk sample pit was excavated, some 2,800 bank cubic metres (roughly 7,280 tonnes) of kimberlite sample was stockpiled and a slimes dam was constructed. Before the erection of a sampling plant could begin, AFD negotiated to buy out Kukama and the programme was shelved.

De Beers conducted various ground geophysical surveys over the kimberlite, including ground magnetic, gravity and EM34 methods, which served to model the possible extent of the kimberlite and provide drill targets for proving this possible size.

In November 2004, De Beers drilled six vertical percussion holes to define the limits of the kimberlite and to assist with the siting of large diameter sampling holes.

In December 2004, De Beers drilled three x 12inch diameter RC drillholes and processed the sample of (calculated) some 90 tonnes at the AK6 sampling plant, recovering only 1 diamond weighing 0.045cts.

In October 2007, De Beers drilled a vertical diamond drillhole to obtain a sample for MiDa analysis.

The drilling results are summarized in Table 11 below.



**Table 11: Summary of Drillholes at BK 05**

HOLE No.	DATE	HOLE SIZE	END DEPTH	METHOD	KIMBERLITE INTERSECTED
H 01	Nov.2002	6.0 inch	100m	RC	0m - 12m
H 03	Nov.2004	6.5 inch	106.5m	percussion	No kimberlite
H 05	Nov.2004	6.5 inch	155m	percussion	0m – 155m
H 06	Nov.2004	6.5 inch	65m	percussion	0m - 24m
H 07	Nov.2004	6.5 inch	126m	percussion	0m – 90m
H 08	Nov.2004	6.5 inch	60m	percussion	23m – 27m
H 10	Dec.2004	6.5 inch	83m	percussion	0m – 26m
LDD 01	Dec.2004	12.25 inch	170m	RC	0m – 170m
LDD 02	Dec.2004	12.25 inch	90m	RC	0m – 82m
LDD 04	Dec.2004	12.25 inch	170m	RC	0m – 170m
H001	Oct.2007	64mm	200.78m	Diamond	0 – 200.78m

**Table 12: Summary of Macro-diamond Bulk Sampling Results at BK05**

SAMPLE TYPE	CALCULATED MASS *(Tonnes)	NO. OF STONES	CARAT WEIGHT	GRADE cph
1976: 2 x pits	358.48	150	14.78	4.1
1982 – 2 x jumper drill	179.8	379	12.86	7.2
2004 - LDD holes	90.28	1	0.045	0.05
	<b>628.56</b>	<b>530</b>	<b>27.685</b>	<b>4.40</b>

\* Sample Mass was calculated from the hole's volume & an assumed density of 2.7g/cm<sup>3</sup>. Please note that a 1mm bottom screen was used for the 2004 LDD samples.

### 7.3.5 *Drilling Results*

The objectives of the drilling campaigns were:-

- to resolve the geophysical anomaly models and to define the outcrop surface extent of the kimberlite,
- to obtain core samples for petrographic description, mineral chemistry and MiDa (1 diamond core hole),
- to obtain bulk samples for processing to obtain macro-diamonds.

The interpretation of the magnetic and gravity data showed slightly different extents of the kimberlite, but the percussion drilling has largely resolved the discrepancies and it is generally held that the BK 05 kimberlite is some 5.8ha in total sub-outcrop extent.

The petrographic descriptions confirmed the drill logger's identification of Tuffisitic kimberlite breccia and the petrographer rated the kimberlite as being of moderate economic potential.

The mineral chemistry indicated that the geothermal gradient of the mantle was 40mW/sq.m., which is favourable for sampling the diamond stability field. The De Beers geologists ranked the garnet chemistry as only having a moderate number of sub-calcic G10 and eclogitic garnets.

Although De Beers have produced a MiDa size / frequency curve for the 14 micro diamonds recovered there is no interpretation or conclusions as to predicted grades and it is assumed that this is probably because of the low number of micro- and macro-diamonds recovered.

The results of the various bulk samples taken to estimate grade indicate a wide range of grade estimates; this is almost certainly because the samples were all too small and because the LDD drilling will almost certainly crush diamonds and discard them on the 1mm bottom screen. In this regard it is interesting to compare the jumper drill grade of 7.2cpht to the LDD grade of 0.05cpht in Table 12 above; the jumper drill is not high impact and therefore unlikely to crush diamonds while the LDD method is high impact and will crush diamonds.

In November 2010, BD commissioned a conceptual study of the likely mining and processing costs in developing their three Botswana kimberlites (J.E.Clarke, 2010). The study assumed that the BK05 kimberlite would have to be a stand-alone operation since it is far from AK06 mine and operations at AK08 & 09, however, certain mine services such as recovery and sorthouse facilities would be common. There is no geological model for the BK05 kimberlite and the consultants assumed open pit cut backs and strip ratios would be similar to AK06. The conceptual study indicated that Capex investment in the BK05 kimberlite could produce a 20% IRR if the *in situ* value of the kimberlite was US\$24/tonne. The other findings of this conceptual study are summarized as follows:-

- A stand-alone mine at BK05 with its own treatment plant. Concentrates would be transported to the AK08/09 final recovery plant.
- The mine would produce 12.7 million tonnes of kimberlite down to a depth of 250m and would require stripping of 31.8 million tonnes of overburden.
- It was assumed that the treatment rate was 1.8 million tonnes per annum, so life of mine is 9 years.
- Both mining and plant operations are contracted out in order to reduce capital expenditure to an estimated US\$37 million inclusive of working capital.
- The operating costs are estimated to be US\$12.90 per tonne.

### 7.3.6 Conclusions and Recommendations

1. The De Beers drilling is too widely spaced to outline and establish the framework for a 3-D geological model of the pipe particularly as there are no inclined holes to accurately determine the location of the pipe margins or to accurately determine a possible volume / tonnage estimate. Similarly, the possibility of multiple intrusive phases has not been tested by diamond drilling and petrographic studies.
2. The mineral chemistry study reportedly showed that the BK05 kimberlite has only a moderate population of sub-calcic and eclogitic garnet and was assessed as having a moderate potential for carrying diamonds. The author estimates from inspection of the mineral chemistry plots that some 2% of the garnet grains are sub-calcic and a similar percentage are eclogitic, however the role of biased picking cannot be estimated. It is recommended that further mineral chemistry studies be done with good picking controls to re-assess the De Beers conclusion on favourability.
3. The drill chips collected during the early jumper and pit sampling and later LDD drilling campaigns were passed over a 1mm screen prior to treatment in the various sampling plants available at that time. In the case of the LDD samples, there is no data indicating the mass of sample (>1mm) actually treated in the DMS versus the calculated mass of the kimberlite drilled; if the drilling method was such that the kimberlite was ground up, then it is fair to assume that only a small fraction of the calculated mass was treated and that the diamonds too were broken up during the drilling process; this results in an underestimation of macro-diamond grades. The use of percussion sample in macro-diamond studies is also totally meaningless since the pulverizing action of the drill method will destroy diamonds.
4. The conceptual study by Paradigm Project Management (J.E.Clarke, 2010) indicates that BK05 requires an *in situ* value of US\$24/tonne to become financially viable, which translates to grade/value combinations of between 24cpht for US\$100/ct diamonds and 16cpht grades with US\$150/ct diamonds. These target grade/values are achievable and justify the further evaluation of AK08.

The above conclusions lead to the following recommendations for further assessment work of the BK 05 kimberlite:

1. The reported results indicate a kimberlite that is sub-outcropping and some 5.8 hectare in near-surface area. The drilling to date has not completely defined the extent of this kimberlite body and additional shallow, vertical RC drilling combined with several sets of inclined diamond drillholes on widely spaced (150m) E-W section lines should be completed to further define the contacts, both at surface and at depth. Unlike AK08 & 09, this kimberlite has a large, near-outcropping surface area which will require far less stripping than AK08 or 09.
2. The results of the very limited large diameter drilling and early pit sampling only serve to indicate that the kimberlite is diamondiferous and no reliance should be placed on the grades predicted by the De Beers sampling (see Table 12 above). It is recommended that the stockpile of kimberlite already excavated should be treated and that the sampling quarry be extended to increase the number of tonnes treated. Similar sampling pits should be excavated at the northern and southern ends of the kimberlite to evaluate the effects of there being differing phases of intrusive with different grades and or values of diamonds.



**MAP 6: LOCATION OF THE BK05 KIMBERLITE – SHOWING VARIOUS GEOPHYSICAL MODEL OUTLINES, THE DRILLHOLES, BULK SAMPLE PIT AND KIMBERLITE STOCKPILE.**

## **7.4 PL 7/2004**

### **7.4.1 Introduction**

This licence was granted to AFD in 2004 and was originally applied for so that the KIM anomaly described below could be followed up. Other priorities, such as concentrating on the AK06 kimberlite evaluation, resulted in postponement of the planned exploration programme.

### **7.4.2 Discovery History**

The original KIM sampling programmes of De Beers and subsequent airborne and ground geophysical programmes resulted in the discovery of the BK15 and BK17 kimberlites, located just north of the PL boundary (see Map 7 below), which have been retained by De Beers under a Mining Licence, but not yet developed.

### **7.4.3 Local Geology**

The licence area is underlain by Karoo Supergroup lithologies, including Stormberg basalts.

### **7.4.4 Exploration Programmes**

Apart from the original KIM sampling programmes and the subsequent geophysical programmes by De Beers, no modern exploration has been done.

### **7.4.5 Exploration Results**

The KIM sampling results show that the BK15 & BK17 kimberlites have produced an indicator mineral anomaly that has been dispersed along the shore of the Ntsokotska Pan in a southwesterly direction as shown on Map 7 below. There is another swathe of anomalous KIM counts that occur at a much higher elevation (929 to 940m) than the BK15 & 17 pipes (922m), and these anomalous results have not yet been followed up.

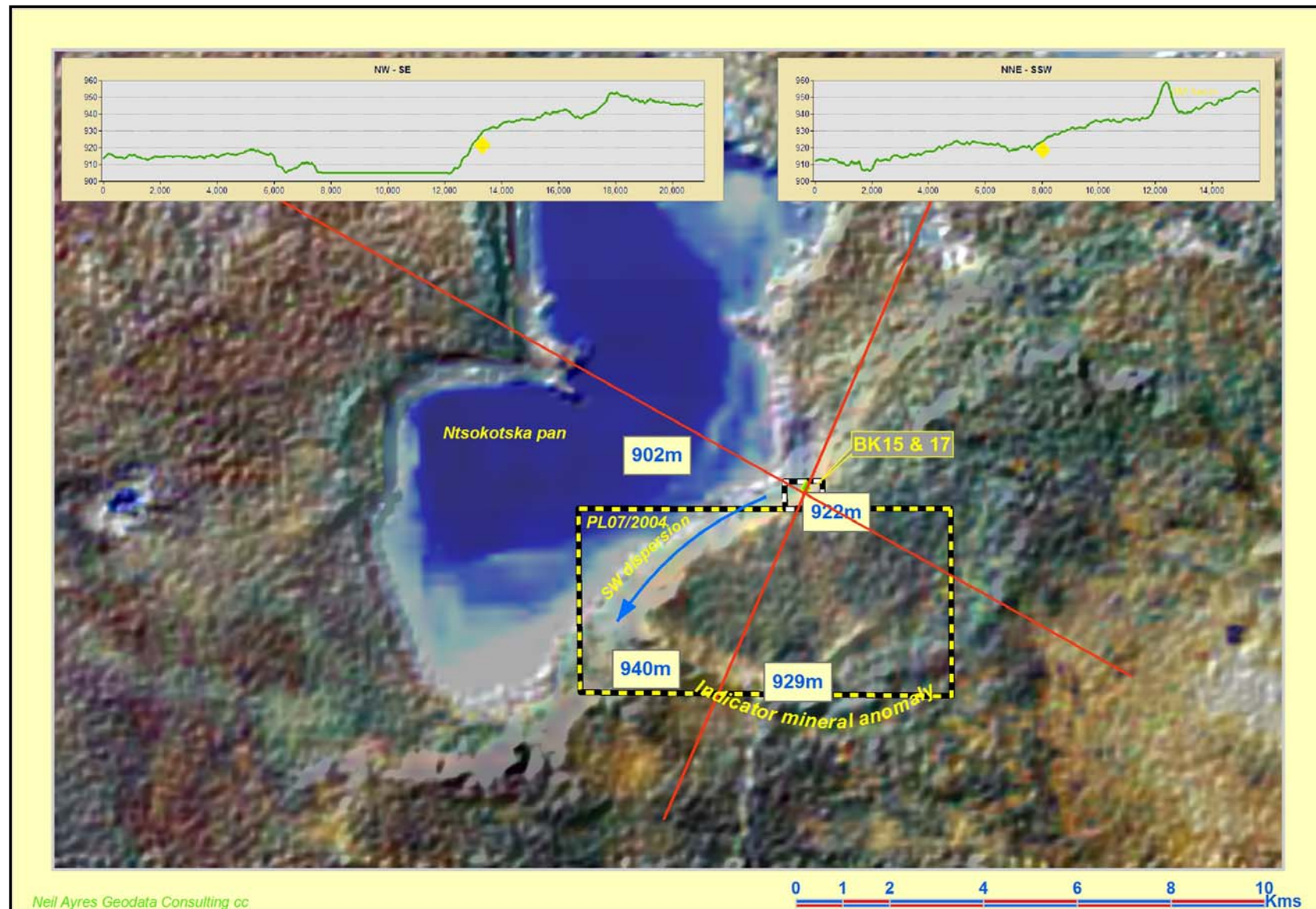
### **7.4.6 Conclusions & Recommendations**

The KIM sampling to date has defined a significant unexplained anomaly.

It is recommended that a limited programme of further KIM sampling be initiated over the anomalous area in an attempt to recover coarse >1mm grains so as to characterize the source of the grains by mineral chemistry “fingerprinting” of the ilmenite grains and trying to match them with known kimberlites of the area – BK15 & 17, the BK19, 20 & 21 cluster which is 12km to the southeast, and BK05 which is 14.5km to the south.

In the event that the KIM anomaly cannot be explained by any of the known kimberlites, then further ground geophysics will be required to help locate the source kimberlite.





**MAP 7: LOCATION OF THE PL07/2004 LICENCE - SHOWING THE KIMBERLITE INDICATOR MINERAL ANOMALY**

## 8.0 CURRENT EXPLORATION OF THE DRC PROPERTIES

The recent exploration and development of the Bugeco properties in the DRC are described in this section.

### 8.1 Introduction

In September 2003, Bugeco entered into an option and joint venture agreement with De Beers who were nominated as the operator of the project to explore the 17,514km<sup>2</sup> area of 49 licence blocks for kimberlites. De Beers commenced work on the ground in 2004.

### 8.2 Discovery History

Bugeco were attracted to the area because of very small scale alluvial artisanal workings in the streams and by the results of historical widely spaced stream sampling for KIM's conducted by Zairebrit (a former De Beers subsidiary company) and by Bugeco's own KIM sampling results generated during 2003 and 2004 (Bugeco report, 2009).

### 8.3 Local Geology

The permits are situated in the Northeastern portion of the central nucleus of the Kasai block of the Congo Craton. The geology of the permit areas is dominated by Precambrian middle to lower Bushimayi formations with the following simplified stratigraphy as established, based on field observation and drill core logging, by the De Beers technical teams working in the Bugeco project area:-

In the Kabinda area, the simplified stratigraphy seems to comprise:

- (f) Ferricrete horizon capping over various units
- (e) Red Kalahari sandstone (830-890m)
- (d) Polymorph sandstone (825-830m)
- (c) Sand-, silt- and mudstones, fluvioglacial? basal conglomerates, intruded by kimberlites (725-825m)
- (b) Basaltic lavas (or sills?), c. 20m thick?
- (a) Basal Dolomitic limestones (<600-725m)

### 8.4 Exploration Programmes

Heavy mineral (KIM's) reconnaissance stream sampling was the first pass method used by De Beers. At each carefully selected sample site, some 200litres of coarse-grained alluvial material was screened into the 0.425 – 0.71mm and 0.71 -2.00 size fractions. After hand concentration of samples in the field all material was sent to a central processing facility at Kananga where a concentrate was produced by dense media separation. The concentrates were sent to a De Beers laboratory in South Africa for indicator mineral picking, sorting, mounting and microprobe analysis. Positive sample results were followed up by closer spaced sampling to improve anomaly resolution. Some 3,076 samples were collected between 2004 and 2008 and some 300 kimberlitic garnets, 33,000 kimberlitic ilmenites and 4,000 spinels were microprobed. This sampling campaign defined two areas of interest (see Map 8 below) (Bugeco, *op cit*).

An airborne magnetic survey was flown over the entire project area in December 2004 at 250m line spacing with 6m station spacing and a 40m sensor height. The survey generated 280 anomalies classified as Grade 1 (24), Grade 2 (66), Grade 3 (99), Grade 4 (70) and “no further work” for 21 anomalies (Bugeco, *op cit*).

In August 2006, an airborne Spectrem EM test survey was flown over 16,437 line kilometres covering an area of 2,239 sq.km. The survey was ineffective because of the highly conductive overburden associated with the Cretaceous cover rocks (Bugeco, *op cit*).

Airborne gradiometer, ground magnetic, ground EM and ground gravity surveys were used to follow up the KIM and geophysical anomalies. Initial anomaly and kimberlite discovery drilling used a Hydracore Prospector and Gopher BQ diamond drills. A large diameter Prakla RB20/30 rig was used later in the programme in order to get micro-diamond samples from kimberlite Kasendou-03 (Bugeco, *op cit*).

### 8.5 Drilling Programmes and Results

A total of 280 anomalies were selected from geophysical and KIM results and priorities were assigned to them; eighty-six drillholes totaling 7,047m were drilled on fifty high-priority targets and 9 confirmed kimberlites were discovered (see Table 13 below). A large diameter (99mm) core hole was drilled on kimberlite Kasendou-03 to obtain a large volume for MiDa purposes; kimberlite was intersected between 24.5m and 273m where the hole passed into Proterozoic limestone country rock. Two hydrocore holes (BQ) were drilled into kimberlite Kasendou-02 also for MiDa purposes – both holes intersected kimberlite from 10m and continued to 170m and 257.5m respectively (Bugeco, *op cit*).

Indicator mineral samples of the kimberlites were probed and their mineral chemistry was analysed; please note that a number of the kimberlites are garnet-poor and meaningful interpretation is not possible because of this lack of sample. A favourable but poorly defined local cratonic geotherm of 39mW/m<sup>2</sup> was recorded for the Kasendou cluster. The data suggests that high-interest sub-cratonic lithospheric mantle and low-interest cratonic margin mantle has been sampled (Bugeco, *op cit*).

Micro-diamond samples were collected and analysed; the results are summarized in Table 14 below. The results indicate low micro-diamond counts and the estimated grades are therefore low, however, the small sample mass and poor representivity make confident predictions of macro-diamond grades extremely difficult (Bugeco, *op cit*)



COMPETENT PERSON'S REPORT 27 JANUARY 2011

**Table 13: Kimberlites Discovered on Bugeco licences and Summary Results**

<b>Kimberlite</b>	<b>PR</b>	<b>No Drillholes</b>	<b>Overburden Depth (m.)</b>	<b>Est. Size (ha.)</b>	<b>Petrographic Interest Rating</b>
Lukashi -01	919	2	50.5	2.4	Low
Lukashi -02	919	1	40	2.0	Low
Kasendou-01	899	5	27	2.8	Moderate
Kasendou-02	899	5	3	2.2	Moderate
Kasendou-03	927	3	27	5.4	High
Kasendou-04	906	6	10	6.7	High?
Kasendou-05	927	8	45	12.0	Moderate
Kasendou-06	906	4	10	3.0	Low
Kasendou-07	899	5	27	11.0	Very Low
Kasendou-09	899	2	27	?	Very Low

**Table 14: Kimberlite Petrography & MiDa Statistics**

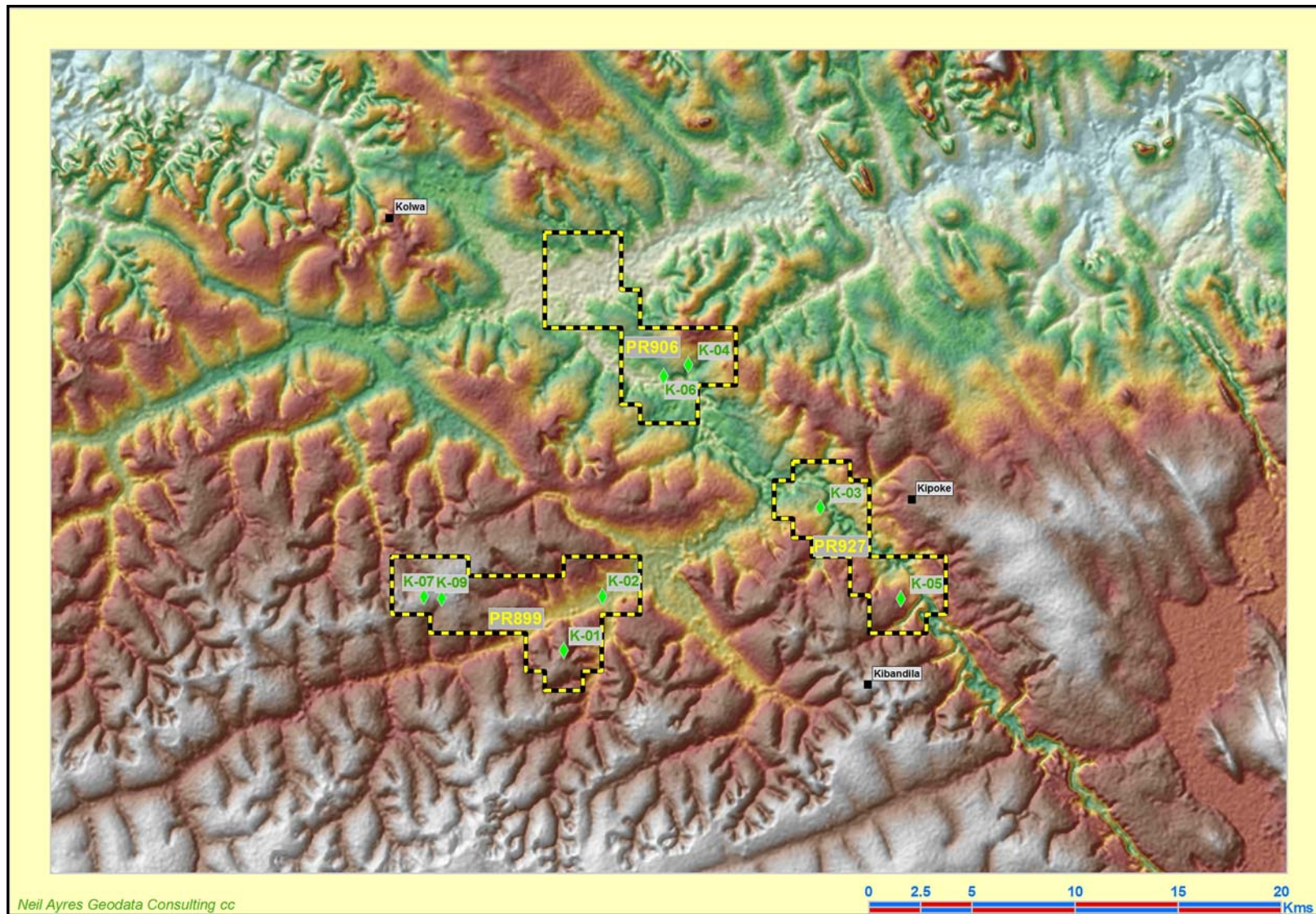
<b>Kimberlite</b>	<b>Kimberlite type</b>	<b>Sample Mass (kg.)</b>	<b>No. Stones</b>	<b>Est. Grade (cpht)</b>
Lukashi -01	Resedimented volcanoclastic	85.7	1	0-1
Lukashi -02	Resedimented phlogopite-rich	56.8	0	0
Kasendou-01	Qtz-bearing volcanoclastic	337	3	0-1
Kasendou-02	Crater facies volcanoclastic	545.7	38	2-3
Kasendou-03	Crater facies tuff + olivine macrocrysts	851.6	16	<5
Kasendou-04	Qtz-rich volcanoclastic	224	20	<5
Kasendou-05	Magmaclast-rich volcanoclastic	80	0	0
Kasendou-06	Macrocrystic calcitic magmatic	218	6	0-1
Kasendou-07	Qtz-rich resedimented volcanoclastic	0	n/a	n/a
Kasendou-09	f.g.sandstone with no mantle components – possibly in upper crater sediments	0	n/a	n/a

## 8.6 Conclusions and Recommendations

The following conclusions and recommendations are made from the exploration and evaluation results to date:-

Although nine confirmed and one likely kimberlite have been located in the Bugeco licences, the evaluation by MiDa evidence alone is inconclusive and there is still a great deal of potential for further evaluation of the diamond grade and value of, in particular, the larger kimberlite bodies, such as Kasendou 03, 04, 05 and 07.

It is recommended that bulk sampling by means of large diameter rotary drilling is used to fully determine the macro-diamond grade of the larger kimberlites, Kasendou 03, 04, 05 and 07. If a sufficient number of diamonds are recovered then a valuation estimate of diamond quality should be made.



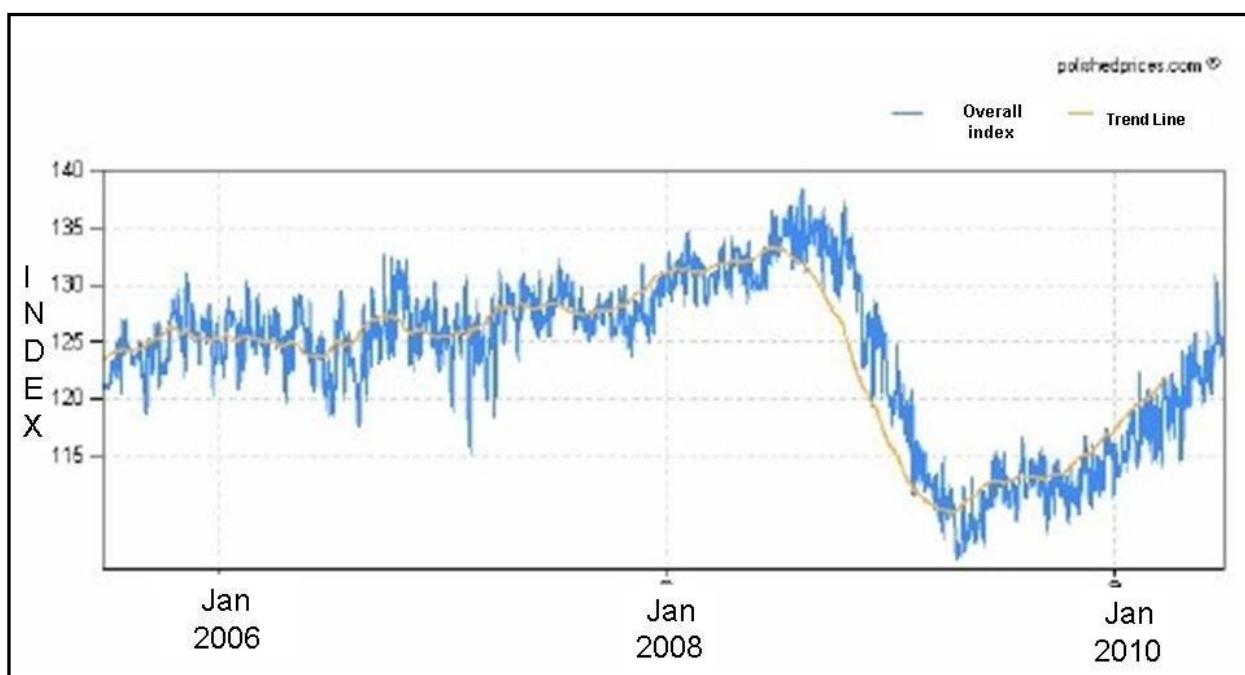
**MAP 9: LOCATION OF THE BUGECO LICENCES AND KIMBERLITES FOUND TO DATE**



## 9.0 A NOTE ON THE DIAMOND MARKET

The immediate effect of the financial market crash in September 2008 was that the demand for and therefore sales of luxury goods, particularly diamonds, fell precipitously. This was aggravated by banks withdrawing diamond cutting centre credit. The immediate action of De Beers in shutting down mining and cutting the supply of diamonds by 90% in Q1 2009 had an immediate and highly beneficial effect. Rough diamond prices and sales have since recovered to levels where, by June 2010, overall demand for rough is only 3% below the peak demand in 2008 and prices are nearing the peak 2008 levels. (C.Wyndham, 2009 & J.Allan, 2010).

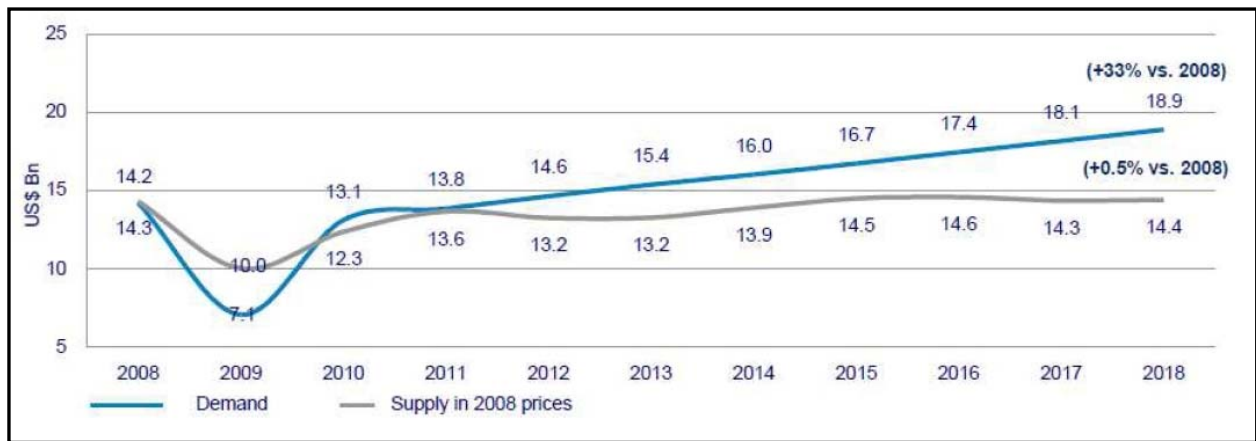
The behaviour of polished diamond prices over the recent past is best expressed in the following chart (from [www.polishedprices.com](http://www.polishedprices.com)) –



Despite the recent market volatility, the longer term outlook for diamond demand is very positive with the American jewellery market continuing to underpin demand and with increasing sales of diamond jewellery in China and India as these two countries enjoy rapid economic growth and a growing middle- and upper-class (J. Allan, *op cit*). This growth in demand is coupled to a predicted reduction in the supply of rough diamonds as aging mines and lack of major new discoveries mean that supply will fall over the longer term; this combination of factors indicates strong growth in rough diamond prices (J. Allan, *op cit*).

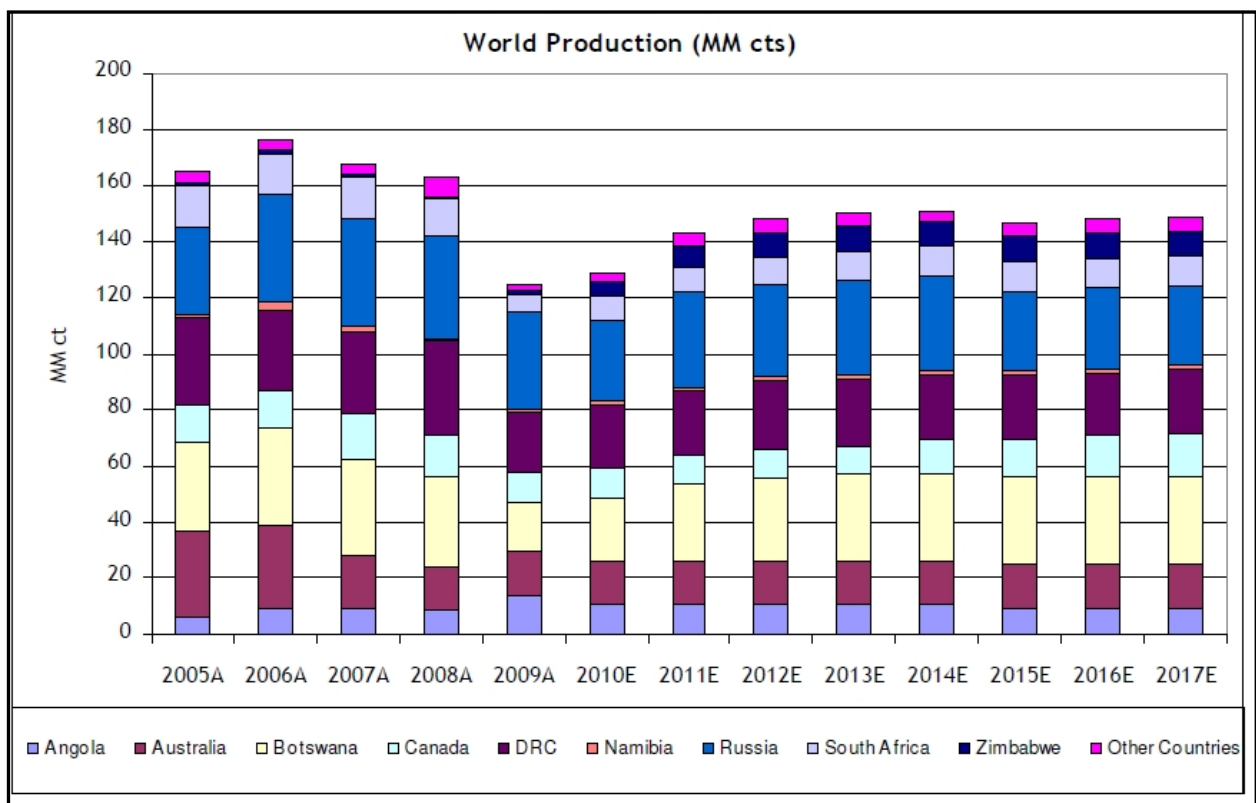
In a recent market commentary Russian diamond producer, Alrosa's forecast conclusions for longer term diamond prices is congruent with that of De Beers and the other large producers: the outlook is for firm prices once the world negotiates current volatile economic conditions and US, Japanese and European demand recovers to augment growing sales of diamond jewellery in China. Alrosa notes: "As a result of this emerging imbalance between supply and demand, the rough diamond prices in 2018 (the last of the forecast years in the Alrosa presentation) may be as much as 31% higher in real terms as compared to pre-crisis 2008 levels (or 55% higher if US\$ inflation is taken into account)" (D.Kilalea *et al*, 2010).

The following graph of Alrosa's forecasts for supply and demand illustrates their point:-



While a recovery in major consuming markets will be important to the projected rise in rough diamond prices, it will likely be the emergence of the Asia Pacific region, including China, which contributes most to growth in demand, followed by the Middle East. Alrosa's forecasts suggest that within the next seven years these economies will account for more than 40% of demand for cut diamonds. This projection is based on the prospect of Asia-Pacific GDP dwarfing that of Japan, the US and Europe, with the Middle East also forecast to outpace traditional diamond markets (D.Kilalea *op cit*, 2010).

The Alrosa supply forecast is in line with a similar forecast by RBC Capital Markets Europe diamond analyst, Des Kilalea, as shown below:-



## 10.0 RESOURCE STATEMENT

This report follows the SAMREC code of Diamond Resource reporting, where categories are defined, with increasing levels of confidence in the estimates, as follows:-

Exploration Targets, Inferred Resources, Indicated Resources and Measured Resources.

### Inferred Resources and Exploration Targets

*An “Inferred Diamond Resource” is that part of a Diamond Resource for which tonnage, grade and average diamond value can be estimated with a low level of confidence. It is inferred from geological evidence and assumed but not verified geological and grade continuity and a sufficiently large diamond parcel is not available to ensure a reasonable representation of the diamond assortment. It is based on information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drillholes that may be limited or of uncertain quality or reliability.” (SAMREC Code, 2006).*

In our opinion, the exploration and evaluation work carried out on all of BD’s projects is insufficient to assign an Inferred Diamond Resource classification to them and wherever possible we have indicated our opinion as to the possible size of each exploration target where both the minimum and maximum estimate of a range of possible tonnages and grades are given.

The AK08, AK09 and BK05 kimberlites have sufficient information to form an opinion on their possible speculative size, grade and value as exploration targets.

#### 10.1 The AK09 Kimberlite Project:

The De Beers 3-D geological model, based on their drilling programme indicates that there is between 7.3 and 11.0 million tonnes of kimberlite down to the 250m below surface depth. The De Beers estimate of grade is 3.5cpht while BD’s review of the data suggests a higher grade of some 8.0cpht. These estimates can be summarized as follows:-

**Table 15: AK09 Project – Exploration Target Size Estimate**

Target	Tonnage (tonnes)	Average Grade (cpht)	Contained Diamond Estimate (carats)
AK09	7,300,000	3.5 to 8.0	255,500
	11,000,000	3.5 to 8.0	880,000

**Note: 1. The bottom screen size is assumed to be 1mm.**

## 10.2 The AK08 Kimberlite Project

The De Beers 3-D geological model, based on their drilling programme indicates that there is between 13.5 and 20.6 million tonnes of kimberlite down to the 275m below surface depth. The De Beers estimate of grade is 4.0cpht while BD's review of the data suggests a higher grade of some 8.2cpht. These estimates can be summarized as follows:-

**Table 16: AK08 Project – Exploration Target Size Estimate**

Target	Estimated Tonnage	Average Grade (cpht)	Contained Diamond Estimate (carats)
AK08	13,500,000	4.0 to 8.2	540,000
	20,600,000	4.0 to 8.2	1,690,000

**Note: 1. The bottom screen size is assumed to be 1.0mm**

## 10.3 The BK05 Kimberlite Project

There is insufficient drill evidence to construct a geological model with any confidence, however, drilling and geophysical evidence suggests that the surface area of this kimberlite is some 6.0ha and the majority of it is sub-outcropping. The consultants, PPM using the drill data and making several assumptions have estimated a tonnage of between 9.0 million and 12.7million tonnes down to a 250m depth below surface level. De Beers estimated, on sparse evidence that the grade was between 4.4 and 7.2cpht.

**Table 17: BK05 Project – Exploration Target Size Estimate**

Target	Estimated Tonnage	Average Grade (cpht)	Contained Diamond Estimate (carats)
BK05	9,000,000	4.4 to 7.2cpht	396,000
	12,700,000	4.4 to 7.2cpht	914,000

**Note: 1. The bottom screen size is assumed to be 1.0mm**



## **11.0 DATA VERIFICATION**

The data concerning mineral chemistry results reported by De Beers is essentially graphical and it is impossible to accurately determine the proportion of, for example subcalcic G10 garnets or to assess whether the indicator minerals have been picked in an unbiased fashion. If the KIM grain picker has a particular bias towards picking, for example, dark purple garnets over lavender coloured garnet grains, then the proportion of G10 to G9 garnets will be biased and one can arrive at the conclusion that the diamond carrying capacity of the kimberlite is poor.

The data concerning grades, tonnages, diamond sizes and values, as presented in the referenced reports and repeated in this report could not be verified as the drilling and pitting samples were not preserved nor was the author present when the bulk samples were treated by De Beers. There are no records of tailings audits and tracer recoveries from the various plants, so no definitive evaluation of plant efficiency can be stated.

The author is therefore unable to express an opinion as to the efficiency of the processing of samples or to the integrity of the sample from extraction through treatment, and it is beyond both the scope of this report and our professional skills to provide a definitive opinion as to the security of the process.

No sale or valuation certificates by independent third parties for diamonds produced from the Botswana projects have been obtained by BD and the only information on possible values has been provided by De Beers and is now out of date.

## 12.0 CONCLUSIONS AND RECOMMENDATIONS

*Botswana:* The AK08, AK09 and BK05 kimberlites are at the stage where systematic RC and diamond drilling to better define the lateral continuity and contacts between kimberlite and country rock are required as a first step towards obtaining a confident estimate of the volume of the kimberlite resource and the volume of overburden down to a vertical depth extent of some 250m to 300m. This programme should also be used to better define the internal geology of the kimberlite and whether variations in composition may signify variations in diamond grade. Once this phase of drilling has been completed, a bulk sampling programme can be designed to sample sufficient volumes of material to obtain diamond grade estimates of each of the kimberlite varieties defined in the petrographic study and also to obtain an estimate of average diamond values.

Prospecting Licence PL07/2004 has a well defined but unexplained kimberlite indicator mineral anomaly and exploration by means of coarse (>1mm) ilmenite grain “fingerprinting” is required to establish if there is another undiscovered kimberlite nearby. If the KIM anomaly remains unexplained then detailed ground geophysics and drilling needs to be applied to discover the kimberlite(s) which caused this anomaly.

*Bugeco Project, DRC:* The nine kimberlites discovered by extensive exploration require further drilling and sampling to determine their likely economic significance. Since BD has a minority shareholding in the controlling company and Bugeco has expressed a preference for seeking a joint venture partner to further the project’s development, no budget expenditure needs to be allocated to this project.

### 13.0 EXPLORATION BUDGET

The Botswana Diamonds plc management has prepared an exploration and evaluation programme with a budget estimate of project expenditure over an 18-month period. The working capital requirement is summarized in Table 18 below. BD has forecast capital and operating expenditures of Pula 3.0 million (equivalent to ~US\$ 436,000 or ~£281,000) with the majority of those costs associated with the three known and partially evaluated kimberlite projects in Botswana.

**Note: Exchange Rate of Pula 1 = US\$0.145440 = £ 0.09351 as at 1st December 2010**

**Table 18: Summary 18 Month Budget (All figures are Pula 000's)**

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Total
ACTIVITY																			
SUPERVISING GEOLOGIST	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	360
ADMINISTRATION	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	180
CONSULTANTS	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	180
DRILLING	0	0	0	188	188	187	187	0	0	0	0	0	0	0	0	0	0	0	750
Pre-FEASIBILITY STUDY	0	0	0	0	0	0	0	0	0	0	0	0	250	250	250	250	250	250	1,500
<b>TOTAL</b>																			<b>3,000</b>

#### 14.0 DATE AND SIGNATURE PAGE

The effective date of this technical report is 27<sup>th</sup> January, 2011.

The Qualified Person responsible for the preparation of all sections of this report is Mr. Peter W.A. Walker.

The undersigned, Peter W.A. Walker, contributed to all sections of this technical report, titled **“Competent Person’s Report on a Portfolio of Diamond Exploration Properties in Botswana and the Democratic Republic of Congo for Botswana Diamonds plc and FinnCap Limited”** with an effective date of 27<sup>th</sup> January, 2011.

The format and content of the report are intended to conform to the London Stock Exchange, Alternative Investment Market’s “Note for Mining and Oil & Gas Companies – June 2009”.

Signed,

Peter W.A. Walker,                      27<sup>th</sup> January, 2011.

## 15.0 QUALIFIED PERSON CERTIFICATE

I, Peter W.A. Walker, B.Sc.(Hons) Geology, M.B.A., Pr. Sci. Nat., as the author of this report titled **“Competent Person’s Report on a Portfolio of Diamond Exploration Properties in Botswana and the Democratic Republic of Congo for Botswana Diamonds plc and FinnCap Limited”** with an effective date of 27<sup>th</sup> January, 2011, do hereby certify that:

1. I am an independent Consulting Geologist conducting work under the auspices of VP3 Geoservices (Pty) Ltd of – Office 4 Conberg House, 5 Dreyersdal Road, Bergvliet 7945. South Africa.

Tel: +27 (21) 712 3826 Cell: +27 (72) 411 1108 e-mail: [paw@vp3.co.za](mailto:paw@vp3.co.za)

2. I graduated with a Bachelor of Science (Hons.) degree in Geology in 1972 and an MBA in 1982, both from the University of Cape Town, South Africa.

3. I am a Professional Geologist registered with the South African Council for Natural Scientific Professions, registration No.400064/99;

4. I have worked as a geologist for a total of 31 years since my graduation from university. My relevant experience for the purposes of this Technical Report is:

- Seven years (1995 – 2002) as exploration manager for first Trans Hex International Ltd and then Group exploration manager for Trans Hex Group, engaged in the assessment of new alluvial and kimberlite diamond projects, their exploration and management through to production.
- Two years as an independent, sole practitioner consultant (2002 – 2004) advising and writing competent person reports for exploration & mining companies engaged in alluvial diamond exploration.
- Two years as exploration manager (2004 – 2006) for Tsodilo Resources Ltd engaged in kimberlite exploration in N.W. Botswana.
- Three years as Chairman of VP3 Geoservices (Pty) Ltd, an independent geological consulting company engaged in advising and writing competent person reports for exploration and mining companies, specializing in alluvial and kimberlite diamond exploration.

5. I have read the definition of a “competent person” as set out in the “Note for Mining, Oil and Gas Companies”, of June 2009 prepared by the AIM regulators and certify that by reason of my education, experience in alluvial diamond exploration and mining and my affiliation with a professional association I fulfill the requirements to be a “competent person” for the purpose of preparing this Competent Person’s Report. I confirm that as the Competent Person I am not a sole practitioner.

6. I am responsible for writing all sections of this independent technical review report.

7. I visited the Botswana sites described in this report between 1<sup>st</sup> and the 4<sup>th</sup> November 2010.

8. As of the date of this certificate, to the best of the qualified persons knowledge, information and belief, the technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

9. I am independent of the Issuers, Botswana Diamonds plc, applying all of the standard tests of independence and VP3 Geoservices (Pty) Ltd is independent of Botswana Diamonds plc, its directors, senior management and advisors.

10. I have read the “Note for Mining, Oil and Gas Companies”, of June 2009 prepared by the AIM regulators and this Technical Report has been prepared in compliance with the minimum content requirements of a Competent Persons Report as set out in Appendix 2 of their Note.

Dated: - 27th January 2011

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## 17.0 GLOSSARY OF GEOLOGICAL & MINING TERMS

**ADT's** Articulated Dump Trucks.

**AEM or Airborne Electromagnetic Survey** Refers to an electrical geophysical survey method whereby an electric current is passed through a coil resulting in a magnetic field which induces a response from the earth immediately below the coil. AEM refers to a survey read from an instrument carried in a moving aircraft,

**amsl** Above mean sea level.

**Alluvial** A descriptive term used to classify a detrital deposit as being deposited in a stream or river.

**Alteration** Changes in the mineralogical composition of a rock typically brought about by the action of hydrothermal (hot water) solutions.

**Amphibolite** A crystalline rock consisting largely of amphibole and plagioclase feldspar.

**Archaen** A time period extending from the creation of the earth to some 2,500mya (2.5 Ga).

**Artisan Miners** Small scale manual diamond miners, usually working part-time when farming chores or seasons are less demanding of their time.

**bmsl** Below mean sea level.

**Bulk sampling** A descriptive term used to imply a large volume sample that is processed in order to determine the grade of a deposit where mineralization is unevenly distributed and of low grade within the deposit. Bulk sampling is invoked to overcome the “nugget effect”.

**Carat (ct.)** A unit used to weigh diamonds. The international metric carat is 200mg.

**Carats per hundred tonnes “cpht”** Is the number of carats (weight) of diamonds per hundred tonnes of material mined. See also “Grade”.

**Concentrate** The result of a mechanical process in which diamonds (or some other desired mineral) that is heavier than the general minerals in the sample is “concentrated” into a smaller volume of material called “concentrate”.

**Conglomerates** Rounded, water-worn fragments of rock or pebbles cemented by another substance.

**Colluvial** angular fragments of rock and weathered material transported partially by water, but close to their source rock.

**Craton** A relatively immobile part of the earth's crust, generally of large size and at least 2.5 billion years old.

**Cretaceous** A time period extending from 80 to 120 million years before the present time.

**Cuttable Rough** Those rough diamonds which because of their good crystal shape can be cut into two smaller diamonds without much loss of weight. It is reasonable to expect the two polished portions to retain 50% of the rough carat weight.

**Deflation** The removal of lighter particles from a land surface by the action of wind, leaving a surface layer composed of larger, heavier particles.

**Deltaic** A term used to describe those sediments deposited in the delta of a stream or river as opposed to alluvial, lagoonal or marine.

**Dense Media Separation (DMS)** The process of using a dense media, such as Ferro-silicon, to separate high specific-gravity minerals from low specific-gravity minerals.

**Devonian** A geological time period extending from 417 to 354 my ago.

**Diamond Drilling** Using a synthetic diamond impregnated drill bit and a core barrel to drill into rocks and to obtain a continuous core sample of them.

**Diamondiferous** An adjective describing any substance containing diamonds.

**Dyke** An intrusive rock exploiting a fracture zone so that the resultant rock forms a near-vertical dyke-like body.

**Emplacement** The development of an ore body in a particular geological environment. To place the ore deposit by any geological process.

**Elluvial** Fragmental material accumulated in place or very near to their bedrock source; the fragments have not been transported by the agency of water.

**En Echelon** Ladder-like, or step like: used to describe faults or dykes which are parallel and off-set from each other, so that one ends and the other starts parallel to it.

**FEL's** Front-end loaders.

**Fluvial** Produced by the action of a stream or river.

**Flowsort x-ray diamond sorter** A common make or brand of diamond sorter. Diamonds fluoresce under an X-ray beam and this property is used to pick them off of a moving belt.

**Ga.** A giga or billion or thousand million years before the present.

**Geographic Information Systems (GIS)** A computerized system for capturing, storing, analysing, displaying and manipulating geographical and geological information which is spatially referenced to the earth.

**Geographic Positioning System (GPS)** A hand-held computerized system for navigation using a constellation of earth orbiting satellites that provides information as to location, elevation and speed of movement across the earth's surface.

**Gneiss** A Granitic rock that has been subjected to tectonism and metamorphism, resulting in an alignment and segregation of minerals, particularly micas so that a distinct foliar texture is imparted to the rock.

**Graben** A structural term used to describe a valley bounded on both sides by vertical or near-vertical tensional faulting. A rift valley is one example of a graben structure.

**Grade** In economic geology, the term is used to express the relative quantity of an ore in a rock or unconsolidated sediment mass; in diamond exploration it is commonly expressed as carats per hundred tonnes (cpht) or carats per cubic metre (cts/m<sup>3</sup>).

**Granite** A deep-seated, coarse-grained intrusive rock composed of alkalic feldspar, quartz and accessory minerals (such as biotite).

**Gravel** An accumulation of rounded, water-worn pebbles.

**Hardrock** A descriptive term used to distinguish igneous and metamorphic rocks from sedimentary rocks, but often loosely used to distinguish between lithified and unlithified sediments.

**Interbedded** An adjective describing something that is situated between beds of rock.

**Intersected** An adjective describing the process whereby a strata or bed of rock is found in a borehole or drill hole.

**Intersection** The noun describing the position at which a specific, usually mineralized, rock unit is located in a borehole or drill hole.

**Kimberlite** A variety of carbonated alkali peridotite; intrusive rocks of deep mantle origin typically occurring as narrow pipes or fissures and are the main primary source of diamonds.

**Kimberlite Indicator Minerals ("KIM's")** There are specific varieties of minerals which are unique to kimberlites, among which pyrope garnet, ilmenite and chrome diopside are commonly used by exploration geologists to find buried kimberlites. KIM stream or loam sampling involves taking a large sample and then concentrating out the heavy minerals which are examined under a microscope – any KIM's are picked out and counted.

**Lineament** Significant lines of landscapes that reveal the architecture of the rock basement.

**Lithology** The physical character of the rock; a description of the rock's character.

**mya or Ma** Million years before the present time.

**Makeable rough** is a term used to describe those rough diamonds that can easily be cut and polished into the common finished diamond shapes, without losing too much of the original, rough carat weight.

**Marble** A metamorphic (changed) rock composed dominantly of calcite and/or dolomite.

**Mesozoic age** A division of geologic time; from 180 to 30 million years before the present.

**Microdiamond analysis (MiDa)** A laboratory process whereby small samples of kimberlite can be completely digested leaving only a residue of diamonds, usually microscopic in size. By relating the number and size of micro-diamonds to the sample weight and comparison to distribution curves, an estimate of the possible macro-diamond grade of the sampled kimberlite can be made.

**Mineral Resources** Most commonly accepted codes for the classification and reporting of mineral deposits defines a mineral resource as a concentration of material of intrinsic economic interest in such form and quantity that there are reasonable prospects of eventual economic extraction.

**Mineralization** The process of formation of a mineral.

**Mineralization model** A geological model used by geologists to assist them in understanding both the mechanisms of emplacement, and the possible location of ore deposits for the commodity/ies being investigated.

**Miocene** A time period extending from 18 to 19 million years before the present.

**Open hole percussion drilling** A process using a vibrating drill-bit that breaks the rock at the bottom of the drill hole. The coolant fluid (air, water, foam, etc) circulates down through the drill rods and the bit and returns up the borehole carrying the drill cuttings. These cuttings are collected at surface for logging, analyses, etc.

**Outcrop** The exposure of bedrock projecting through the overlying cover of detritus and soil.

**Overburden** The overlying cover of whatsoever nature over useful materials or ores.

**Paleo- or Palaeo-** A prefix denoting old, ancient, fossil, early, or primitive.

**Pleistocene** A time period extending from 2 to 3 million years before the present.

**Pliocene** A time period extending from 3 to 5 million years before the present.

**Plunge pools** The term used to describe the hole eroded into the bedrock at the base of a waterfall. Plunge pools are often associated with exit ramps, which together form excellent trap structures for alluvial diamonds.

**Pre-Cambrian age** One of the major divisions of the earth's time-scale; all geological events that pre-dated 520 million before the present are of Precambrian age; the Precambrian age lasted for some 3,500 million years.

**Provenance** The terrain or parent rock from which any association of sediments was derived.

**Quartz** A mineral composed of silicon dioxide (SiO<sub>2</sub>).

**Quaternary period** The period of time from 2 million years ago to the present.

**Regolith** The layer of loose rock and soil that covers the underlying rock.

**RC or Reverse Circulation Drilling** A process using a vibrating drill-bit that breaks the rock at the bottom of the drill hole. The coolant fluid (air, water, foam ,etc) circulates down through the outer section of the double walled drill rods to the bit and returns up the inner section of the drill rods carrying the drill cuttings. These cuttings are collected at surface for logging, analyses, etc. Because of the sample collection just above the bit, the samples are less contaminated than samples from open-hole percussion drillholes.

**Reserve/s** Refers to known ore deposits that are being or may be economically mined/ exploited.

**Reworking** The process whereby previously deposited sediment is sorted further.

**RF – AA** Reverse flood airlift assist system which is used in Large Diameter Drilling (LDD). A large diameter tricone bit with tungsten carbide or mild steel teeth are used, dependant on the hardness of the particular kimberlite being drilled. Sample return to the surface is achieved by filling the borehole with water, and creating a lift on the inside of the drill rod by means of a narrow air pipe which goes down the centre of the rod. The amount of air injected is very small, and only a modest compressor is required. A current is created in the hole which lifts the sample up the centre of the drill rods, around the air pipe, and out onto a de-sliming screen. Downward pressure on the bit is achieved through the weight of the drill string, assisted by heavy collars which are put into the string above the bit. The system reduces abrasion during lift, and can deliver a relatively coarse sample with minimal fines.

**Saprolite** is the residual clays and silts derived from bedrock weathering in situ.

**Schist** A metamorphosed rock having a preferential alignment of Micaceous minerals which imparts a strong foliation texture to the rock.

**Scour pools** deeply eroded, large-scale potholes in the channel bed of the river. This is often the term used to describe paleo-waterfall plunge pools.

**Section** An imaginary line across a geological structure or orebody, along which holes are drilled, plans drawn or other activities carried out.

**Sediment/s** Solid material settled from a suspension in a liquid or gas.

**Sieve sizes** Sieve sizes are quoted as either the size of the opening (square or round) in mm or microns ( $\mu$ ) or the number of openings per inch. The Diamond Trading Company (DTC) uses sieve sizes to grade diamonds by size fraction. DTC #1 sieve has a round aperture diameter of 1.09mm and a 0.013ct stone will be retained. To convert mm screen sizes to carats retained apply the formula :  $d \text{ (mm)} = (\text{cts} \div 0.0107)^{0.333}$  (where “d” is the sieve diameter).

**Specific Gravity “S.G.”** The specific gravity of a substance is a comparison of its density to that of water which by definition in the metric system has a density of 1. Diamond has an S.G. of 3.52 and is therefore “heavier” than most rock forming minerals, for example quartz, with an S.G. of 2.65.

**Stratabound** An adjective indicating that the subject of the sentence is confined within the encompassing strata (layers of rock).

**Stratigraphic** Pertaining to stratified rocks; those rocks which were formed or are lying in beds, layers or strata.

**Strike length** Pertaining to the direction of the strike of the rocks; that direction which forms a horizontal line over the surface of an inclined plane within the fabric of the rock mass, which may be a bedding, joint, fault, cleavage, or other structural plane.

**Terrace/s** Relatively flat, horizontal or gently inclined surfaces, sometimes long and narrow, which are generally bounded by a steeper ascending slope on one side, and by a steeper descending slope on the opposite side. Both forms when typically developed are step like in character.

**Tertiary period** A division of geological time extending from 29 million to 2 million years before the present.

**Ton** An Imperial unit of weight equivalent to 20 hundredweights or 2240 pounds or 1.016047 tonnes.

**Tonne** A metric unit of weight equivalent to 1000 kilograms.

**Traverse** An imaginary line across a geological feature.

**Triassic** A division of geologic time extending from 248 to 206my ago.



## **APPENDIX A**

**SUMMARY TABLE OF BOTSWANA DIAMOND'S EXPLORATION PROPERTIES**

ASSET LICENCE No	HOLDER	BD's BENEFICIAL INTEREST	STATUS	TYPE OF LICENCE	EXPIRY DATE	LICENCE AREA Km <sup>2</sup>	COMMENTS
Botswana PL No.004/2002	Atlas Minerals Botswana Pty Ltd	100%	Exploration	Exclusive Prospecting Licence	30th June 2011	11.12	Two blocks of ground. Currently in the first special extension period; will have to apply for further special extension rights before end March 2011. Drilling to define kimberlites in 2011.
Botswana PL No.007/2004	Atlas Minerals Botswana Pty Ltd	100%	Exploration	Exclusive Prospecting Licence	30 <sup>th</sup> June 2011	31.4	Currently in the last renewal period; will have to apply for special extension rights before end March 2011. KIM sampling in 2011.
Botswana PL No. 605/2009	Atlas Minerals Botswana Pty Ltd	100%	Exploration	Exclusive Prospecting Licence	30 <sup>th</sup> June 2012	1.6	This licence is in the first three year period of grant and can be renewed after 2012 for two further periods of two years each. Drilling to define kimberlite in 2011.
DRC PR No. 927	Bugeco Exploration RDC SARL	35.4%	Exploration	Permis de Recherches	30 <sup>th</sup> November 2011	83	This licence is now in the last 2-year period of renewal and special permission will be required for further renewal after November 2011. Joint venture partner sought to advance evaluation.
DRC PR No. 906	Bugeco Exploration RDC SARL	35.4%	Exploration	Permis de Recherches	30 <sup>th</sup> November 2011	47	This licence is now in the last 2-year period of renewal and special permission will be required for further renewal after November 2011. Joint venture partner sought to advance evaluation.
DRC PR No. 899	Bugeco Exploration RDC SARL	35.4%	Exploration	Permis de Recherches	30 <sup>th</sup> November 2011	53	This licence is now in the last 2-year period of renewal and special permission will be required for further renewal after November 2011. Joint venture partner sought to advance evaluation.
<b>TOTAL</b>						<b>227.12</b>	