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Tania R Marshall,
Pr.Sci.Nat.
Explorations Unlimited

James A H Campbell
Pr.Sci.Nat.
Botswana Diamonds PLC

Competent Persons Report (CPR) on the Thorny River Kimberlite Project (Polokwane District, Limpopo Province) RSA

for Vutomi Mining (Pty) Ltd

Effective Date: 15 February 2018

Signature Date: 15 February 2018

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Units and Abbreviations

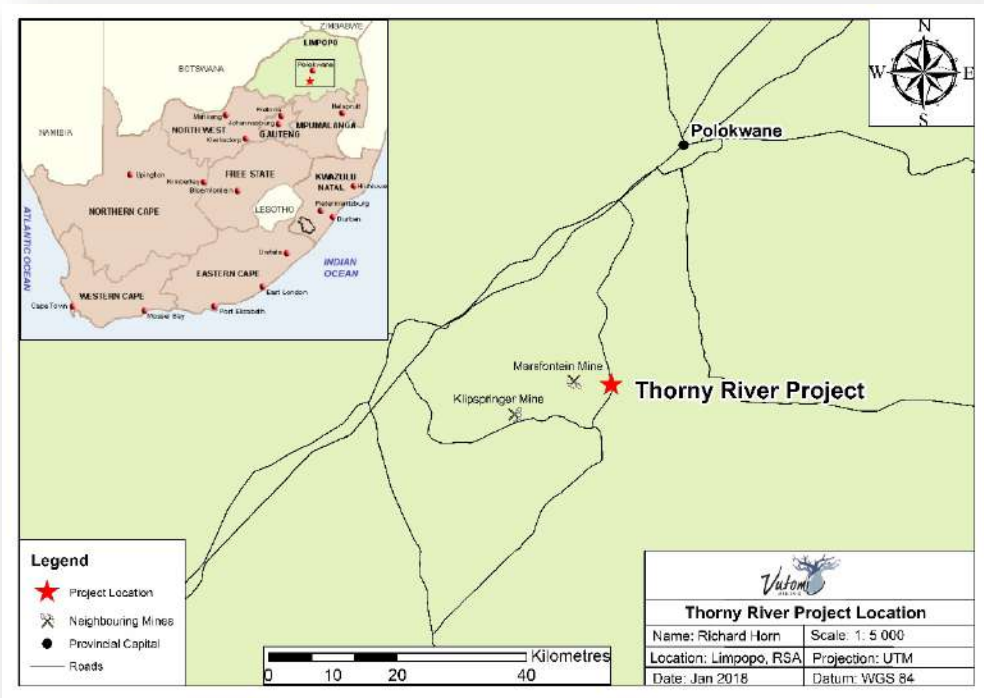
ABBREVIATION	DESCRIPTION
AIM	Alternative Investment Market. AIM is the London Stock Exchange's international market for smaller growing companies
amsl	Above mean sea level
BBBEE	Broad Based Black Economic Empowerment (the more correct term of the usually shortened BEE (Black Economic Empowerment))
BSE	Botswana Stock Exchange
Bottom cut-off size ("bcos")	Bottom cut-off refers to the smallest size diamond (in mm) that is recovered in the sampling and mining process
CP	Competent Person, as defined by SAMREC
cpht	Carats per 100 Tonnes
ct	Carat(s)
$ct/100m^3$	Carats per 100 cubic metres
ct/st	Carats per Stone
DMR	Department of Mineral Resources (Previously known as Department of Minerals and Energy ("DME"))
DTM	Digital Terrain Model
DWS	Department of Water and Sanitation (previously Department of Water and Forestry "DWAF")
EMPlan	Environmental Management Plan (as required for a prospecting right)
ESKOM	Electricity Supply Commission
ESG	Environmental, Social, Governance
GSSA	Geological Society of South Africa
KIM	Kimberlitic Indicator Mineral
LSE	London Stock Exchange
m	Metres
M	Million
Ma	Millions of Years before Present
MiDA	Microdiamond analysis
MPRDA	Mineral and Petroleum Resource Development Act (Act 28 of 2002)
Pr. Sci. Nat.	Professional Natural Scientist
SACNASP	South African Council for Natural Scientific Professions
SAGC	South African Geomatics Council
SAIMM	South African Institute for Mining and Metallurgy

SAMREC	South African Code for Reporting of Mineral Resources and Mineral Reserves
SARS	South African Revenue Service
SG	Specific Gravity
tph	Tonnes (metric) per hour
USD	United States Dollar
ZAR	South African Rand

Executive Summary

Background

Explorations Unlimited ("EU") was retained by Vutomi Mining (Pty) Ltd. ("Vutomi" or the "Company") to prepare a Competent Persons Report (CPR) for the Thorny River Diamond Project ("Thorny River" or "the Property" or "the Project") in the Polokwane District (Capricorn District Municipality) of the Limpopo Province, South Africa. The Thorny River Project comprises portions of the farms Frischgewaagt, Hartebeesfontein and Doornrivier, covering some 2,771ha. This CPR comprises background information and exploration results to highlight the progress of the prospecting programme as well as the exploration potential of the project.



Location of the Thorny River kimberlite Project in the Limpopo Province of South Africa

The data/information presented in this report are considered to be a true reflection of the Exploration Results and Targets identified on the Thorny River Project as at 15 February 2018. These have been carried out in accordance with the principles and guidelines of the SAMREC Code, 2016. The Competent Persons for this report have sufficient experience relevant to the style and type of mineral deposit under consideration and to the activity which is being undertaken to qualify as a Competent Person as defined in the SAMREC Code

Project Outline

Thorny River forms part of the Zebedelia kimberlite cluster and is located several kilometres away from the remaining open pit at Marsfontein and Klipspringer Diamond Mines in the Limpopo Province of South Africa. The Project is at a relatively early exploration stage – having completed a number of geophysical surveys, four drilling (percussion and core) programmes, a kimberlitic indicator mineral analysis and two bulk-sampling programmes.

The Property area is currently held under Prospecting Rights includes sufficient space for (current and future) mine offices and out-buildings, processing and final-recovery facilities, as well as for the necessary fines disposal (tailings) ponds, transitory coarse dumps and more permanent water supply dams.

The area is situated on the north-western flank of the Strydpoort Mountains where the elevation rises to 1,700m. Northwards, the landscape is generally gently undulating at an elevation of some 1,100m. the land is covered in bush that becomes dense in patches. The north-facing slope is rocky, with cliffs near the top and narrow kloofs cut the slope, which are less densely wooded than the rest of the property. To the south, the Nkumpi River forms the boundary of the project area.

The Prospecting Rights to the Project are held by Vutomi Mining (Pty) Ltd and Razorbill Properties 12 (Pty) Ltd (together referred to as Vutomi). Vutomi have entered into a relationship with Botswana Diamonds PLC ("BOD"), a public, limited liability company incorporated in the UK (and dual listed on the London AIM Stock Exchange (BOD) and the Botswana Stock Exchange (BOD)). The relationship is in respect of designing, evaluating, funding and carrying out exploration and, if successful, mining activities on the properties/rights held by Vutomi and Razorbill. Pursuant to the terms of the Agreement, Botswana Diamonds has agreed to pay Vutomi a total of £942,000 in cash, of which £581,000 will be used to fund exploration activities. In addition, BOD will issue 100 million ordinary shares of 0.25p each ("Ordinary Shares") to Vutomi shareholders. The Agreement will be executed in three Phases after which BOD will own 72% of Vutomi. The remaining 28% will continue to be held by Vutomi's Black Economic Empowerment ('BEE') partners.

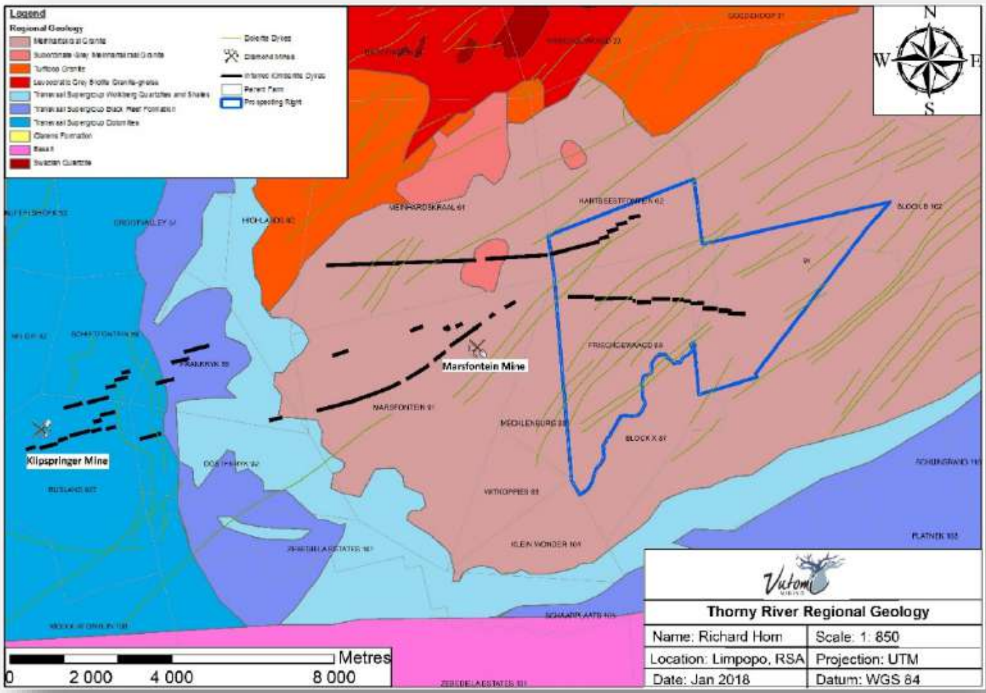
The Zebedelia kimberlite cluster comprises a number of *en echelon* dykes trending in a north-easterly to easterly direction. Several blows occur along these dykes and two mines, Klipspringer (currently active) and Marsfontein (mined out) give evidence of the diamondiferous nature of these deposits.

Geology

The Zebedelia kimberlite system is located approximately 30km east of Mokopane (formerly Potgietersrus). The Marsfontein kimberlite has been dated at ca. 148Ma (Basson & Viola, 2003).

The region is underlain by the Kaapvaal craton. To the west, in the vicinity of the Klipspringer mine, sediments of the Transvaal Supergroup occur. These comprise the Chuniespoort dolomites, basal Black Reef Formation and the pre-Black Reef units of the Wolkberg Group (possibly Ventersdorp age). In the east, the geology comprises exposed Archaean Turfloop and Meinhardskraal granites and Archaean granite gneisses'. Remnants of ancient Greenstone belts occur to the north east of the region. The Zebedelia kimberlites are intrusive into the Archaean Meinhardskraal granites and younger dolerites in the east, and the Transvaal Supergroup sedimentary rocks in the west.

Thorny River is part of a kimberlite system which extends from west of Klipspringer Mine to East of Frischgewaagt (the Zebedelia kimberlite cluster). This kimberlite system predominantly is made up of en-echelon dykes which are magmatic (hypabyssal) in nature and represent the near root zone, as described by Hawthorne (1975). However, there are blows (or pipes) which exist in this system where the dykes intersect the regional structure and these kimberlites tend to be volcanoclastic (TKB) in nature. Both types of kimberlites have sampled the same source in the mantle, so the diamond size frequency distribution would be expected to be similar, though the magmatic component could be finer. Marsfontein is an example of volcanoclastic facies diamond size frequency and Klipspringer a magmatic one.



The regional geological setting of the Thorny River project

The kimberlite system on Thorny River is comprised primarily of two sets of *en-echelon* dykes (or fissures) which represent the near root zone (called the Northern and Southern fissure systems, for ease of reference). In addition, there are blows which exist in this system, generally where the dykes intersect the regional structure and these kimberlites tend to be volcanoclastic in nature. Both blows and fissures can be commercially diamondiferous, as evidenced by the Marsfontein (volcanoclastic blow) and Klipspringer (magmatic dyke/fissure) mines.

The kimberlite fissures on Thorny River have a (currently known) combined strike length of some 3.4km. As is typical of most kimberlite fissures, these deposits pinch, swell and anastomose both laterally and vertically, resulting in variable thickness of intersections. The kimberlite fissures range in thickness from a few centimetres to greater than 3m, with the wider areas interpreted as blows along the fissures.

All kimberlites are Group 2 variety, coherent hypabyssal kimberlites with mineralogies dominated by olivine and phlogopite macrocrysts in a groundmass of apatite monticellite, clinopyroxene and richterite amphibole. Fine grained perovskite and opaques are also present. All kimberlites can be classified as apatite-bearing calcite phlogopite kimberlites (Robey, 2017). Textures vary between macrocrystic and aphanitic – with the aphanitic sections being of limited interest because of their low economic potential.

Previous Exploration and Development

Prospecting licences over Thorny River have been held by De Beers (RSA Exploration) during 1983-88 and 1998-2000. Previously, SouthernEra Diamonds Inc held prospecting rights over Doornrivier. Limited verifiable information is available from these operators.

No previous Resource statements exist for the Properties.

Geophysical Surveys

A number of geophysical surveys were conducted over the trace of the known kimberlite fissure system in order to identify drill and sample locations. Such surveys included ground magnetics, ground penetrating radar (GPR), time-domain electromagnetics (TDEM), EM34, frequency domain electromagnetics (FDEM) and electrical resistivity tomography (ERT).

Drilling

Drilling has taken place over a number of phases since 2014. Drilling of a kimberlite deposit is, primarily, used to delineate the body, define thicknesses and depths of intersections for volume determination.

1. Vutomi undertook a limited (percussion) drilling exercise during September 2014 to test a consolidated suite of targets generated by all the geophysical work.
2. A second percussion programme was completed by Vutomi during Jan/Feb of 2017 – this programme was done to delineate the kimberlite extent on the property. 34 Percussion holes (1,459m) and nine diamond drill (core) holes (482m) were drilled.
3. During March 2017, a core drilling programme was initiated. The objective of this programme was to delineate the extent of the kimberlite and recover sample for microdiamond and petrographic analysis. A total of nine holes were drilled to a total of 412.28m
4. A Delineation drilling programme during September/October 2017 was planned to provide additional information relating to the morphology of the kimberlite and to assist in the volume estimation.

The initial drilling indicated that the dyke is not a single continuous body but comprises a series of en-echelon segments of varying width and lengths. Core logging is qualitative in nature and is geared toward petrographic interpretation. The mineralogy of the kimberlite is also seen to vary across the dyke segments. It is, further, apparent that the thickness of the kimberlite intersections varies across the dyke system, with kimberlite intersected at shallower depth in the East (approx. 20-30m) and slightly deeper towards the West (+30 to +40m), where it is darker and fresher in the core.

In exploration/prospecting of kimberlite deposits, drill samples are taken to separate kimberlitic indicator minerals ("KIM") for mineral chemistry analysis and microdiamond assessment.

- KIM analysis is used to get a qualitative indication of grade potential prior to initiating a full exploration programme. The results are insufficient to use in Diamond Resource estimation.
- Microdiamond analysis is a more quantitative method of estimating Diamond Resource grade. However, diamond value cannot be obtained from microdiamonds.

In all cases, the entire kimberlite intersection sample is taken for KIM or microdiamond analysis – the details of the methods are described below. Percussion (or core) samples are not split or divided in any way. Diamonds are not evenly distributed in a kimberlite so, keeping half/quarter samples as a check would not serve any purpose. Additionally, the numbers of individual grains/microdiamonds in the check sample would be too small to be meaningful.

A single 4kg sample comprising -1mm material obtained from kimberlite drill chips (from the 2015 percussion drilling programme) were collected and submitted for heavy mineral and mineral chemistry analysis. In addition, a sample of 240kg of fresh kimberlite drill chips was collected and stored for microdiamond assessment during October 2017.

In 2014, The MSA Group (Pty) Ltd (MSA) was contracted to undertake the processing of approximately 4kg of screened kimberlite sample (smaller than 1.0mm) for KIM recovery, and analyses of their mineral chemistry by electron microprobe to interpret the diamond potential of the primary source of these indicators (Cronwright, September 2014). Two-hundred garnet grains from the -1.0 +0.5mm size fraction were selected for microprobe analyses.

Based on electron microprobe mineral chemistry analysis (carried out by the Analytical Facility at the University of Johannesburg), all garnets are confirmed to be of kimberlitic origin which confirmed the initial visual classification. The garnet results were classified based on their mineral chemistry into different garnet types (G1-G10) based on the system of (Grutter, Gurney, Menzies, & Winter, 2004). The geochemical classification of eclogitic garnet corresponded well to the visual classification. Only one orange garnet (Gar177) was re-classified (based on mineral chemistry of 1.46% Cr_2O_3 wt %) to be of peridotitic rather than eclogitic origin.

Around 54% of garnets fall into the G9/G5 category (garnets that originate from lherzolites and websterites); 19% fall in the G10 field (garnets originating from harzburgites) and 14 garnets (7%) in the G10D (diamond inclusion) field. 42 eclogitic garnets (with Cr_2O_3 less than 2%) fall in the G3 & G4 (eclogitic and megacrystic garnet) fields. The G10D garnets, plotting within the diamond inclusion field, indicate the possibility of peridotitic diamonds sampled by the kimberlite from which this sample has been taken. In addition, there is a population of eclogitic Group 1 garnets (18 out of the 42 eclogitic grains) which suggests the source may also contain diamonds of eclogitic origin (Fig. 6.15). Sample S2913 has a significant population of eclogitic Group 1 garnets (18 of the 42 eclogitic grains) which suggests the source has good eclogitic diamond potential. Eclogitic garnet included in diamond are known to commonly have $Na_2O > 0.07$ wt. % (Grutter, Gurney, Menzies, & Winter, 2004). 43% of the eclogitic garnets for sample S2913 plot in the Group I eclogitic field and such garnets are related to diamond from eclogitic sources in the upper mantle. The kimberlite from which these garnets originate from may, therefore, have eclogitic diamond potential.

Ten core samples (from the 2017 drilling programme) were selected for petrographic analysis. Each sample was studied for detail petrographic observation under the stereomicroscope for macroscopic and microscopic observations by Gargi Mishra (GM Geoservices) and Jock Robey (Rockwise Consulting) respectively (Mishra, March 2017) (Robey, 2017).

All kimberlite samples (Robey, 2017) are Group 2 variety, coherent hypabyssal kimberlites with mineralogies dominated by calcite and phlogopite but with accessory apatite and in some samples (B3009 and 10) monticellite, clinopyroxene and richterite amphibole. Fine grained perovskite and opaques are also present. All kimberlite samples can be classified as apatite-bearing calcite phlogopite kimberlites (for comparison, Marsfontein pipe had two kimberlite phases – a monticellite phlogopite phase and a phlogopite monticellite phase). Where the dyke gets wider such as in borehole FDC007, variable mineralogy is seen, with the crystallization of accessory clinopyroxene, amphibole richterite and monticellite. The absence of common monticellite in the Thorny River dyke is not of any concern. Larger kimberlites such as Marsfontein will crystallize monticellite due to slower cooling than in the more rapidly cooled thinner Thorny River dyke.

Subsequently, MSA was contracted to process eight kimberlite drill core samples weighing a total of 160.46 kg by caustic fusion and perform microdiamond analysis ("MiDA") to recover microdiamonds down to a minimum size of 75 microns (Cronwright, May 2017). In total, the 8 samples yielded 223 natural diamonds (weighing 0.0514218 carats) from the combined weight of 160.46 kg kimberlite treated, which corresponds to an average grade of 1.4 stones/kg. The microdiamond population from all 8 samples consists of (in order of decreasing abundance) 36% broken dodecahedra, 15% octahedral crystals, 9% dodecahedral crystals and 9% broken composite crystals. A total of 152 broken crystals (68%) were observed, this includes 40 fragments (18%). The relatively high proportion of broken stones (68% broken crystals and fragments) is not considered a result of breakage during sample treatment as no crushing of the kimberlite core was done prior to caustic fusion. The breakage of diamonds has therefore most likely occurred as a result of a natural process (possibly during kimberlite emplacement) or during core drilling.

Sampling

In 2015, Vutomi entered into an operations agreement with Landoclox (Pty) Ltd whereby Landoclox would conduct bulk-sampling activities. During this exercise, a total of 236ct (466 stones) were recovered from a total of 3,647T of material during the bulk sampling. The lag layer component of this work comprised 1,965T yielding 68.6ct (137 stones) giving a grade of 3.5cpht for the lag layer. The weathered kimberlite, silicified kimberlite, green clay, weathered and fresh granite from the trenches, yielded 157ct (313 stones) from 1,580T. These tonnes were, subsequently, adjusted for kimberlite only using visually estimated contamination and dilution – the adjusted weight was estimated at 423T. This figure was further adjusted to around 253T to compensate for losses through scrubber oversize. Using this final value, a sample grade of some 62cpht was calculated.

The 2015 diamond valuation and sales data were assessed for internal consistency. The following concerns were raised with respect to the 2015 grade/value estimation. The tonnage figure has a very low confidence, being an estimate of an estimate. Not all of the diamond parcels have J registers – raising concerns over the completeness of the information provided. Moreover, the variation in the pre-sales valuation and the actual sales figures (from one of the diamond bourses is significant). The diamonds are from different pipes/dykes within the prospecting area and variations in the revenue per carat and grade between the different geological units is expected. However, since the estimated revenue is global, this is not a significant problem at this stage. The preliminary revenue range of USD259/ct is a modelled value and is based on a very, small sample size, thus affecting the level of confidence in the diamond value.

This entire process was audited by Gemcore (Mills, June 2015). The results from this bulk-sampling exercise are not considered representative of the Thorny River kimberlite due to the reasons identified above. Further, no sampling protocols were in place and no sample security was present.

In November 2017 Vutomi excavated a 305T sample of kimberlite from the same location and processed it through an independent, fit-for-purpose sampling plant, comprised of a DMS, X-ray and grease final recovery plants. The results from the sample processing programme delivered results that did not tally with the estimated average total content, namely a sample grade of some 18.04cpht was recovered in comparison with an estimated total content average of 78cpht. Re-processing of the concentrate increased the recovered grade to 20.69cpht – still way below expected.

Extensive internal and external audits were carried out on the sampling programme, plant and results. A number of issues were highlighted (Coward, 2018).

Area	Variations to Quantify for RF Estimation	Data to Consider	Other Operation Benchmarks
Geology	Definition of ore and contacts Internal dilution Volume of ore extracted	Face maps Wireframes Geology Samples	Geological loss between 10 to 15%
Mining	External dilution Extraction Loss Sorting Efficiency External ore ingress	Cavity mapping and models Samples of discard and concentrate	Other Dyke mines have reported ~ 23% of mined tonnage is kimberlite

Treatment	Moisture content -> Dry mass Effective bottom cut off Total grind -> Liberation vs lock-up Free loss to DMS tails due to separation efficiency Damage	Delivered moisture content. Slurry or grits samples Plant mass balance DMS feed size distribution DMS feed rock type analysis DMS tails density distribution Diamond Size Distribution	Sorting loss~5% ore Liberation ~85 to 95 Recovery efficiencies DMS function of partition effectiveness Samples of size by density of con and tails for free loss calculation
Recovery	Grease efficiency X-ray losses Hang up Contamination Diamond sieving efficiency Diamond weighing accuracy	Comparison of DSF for each recovery stream Large stones in audit Ct/St vs Average	Expect 95% recovery on first pass X-ray Grease in upper 90% recovery envelope Damage and stress losses ~2-3%

It was noted that dilution of this sample presents the biggest uncertainty in deriving an adjusted in-situ kimberlite grade. Using a combination of recent and historic data, a rough approximation for the proportion of kimberlite in the recent bulk sample was derived. Accounting for dilution and reasonable range of plausible plant recoveries during sample treatment suggests that the undiluted raw in-situ grade of the kimberlite dyke sample is between 46 and 74 cpht.

A sample simulation model was developed using a parcel of 500 thousand stones, generated based on a model fitted to an annual production distribution. One hundred samples of 500 stones were extracted from this parcel. The analysis of the distribution of these samples suggest that the sample analysed contains marginally more fine stones that that which would be expected from the matched Annual Production Parcel. The simulated sampling model was used also to evaluate how sample support might impact on the shape of the recovered diamond size frequency.

The size frequency distribution of the sample diamonds was also reviewed. It appears that the distribution is not smooth, which suggests either a slight loss of middle size stones or an over recovery of fine diamonds. The recovery of coarse stones is not expected to be representative given the relatively small support and geometric extent of this sample.

The revenue model was based on a number of available datasets, totalling some 317ct. The available data does not reflect the various lithological differences, nor does it reflect the variation in assortment within the parcel. This is especially concerning with the poor recovery from the 2017 sampling exercise, where only 63ct were recovered from some 300T. The poor recovery, coupled with the lack of stones above 4mm in the parcel, cannot be confirmed as representative of the larger distribution and assortment of the diamond population. Preliminary modelling of the data resulted in an estimated revenue of some USD120-220/ct (at1mm bottom cut-off).

Diamond Resource Estimates

No Diamond Resources have been estimated for Thorny River. The number of stones recovered for valuation/sale is considered insufficient to support even an Inferred Resource classification. In addition, the uncertainties around grade estimation also preclude such a classification at this time.

Exploration Targets

Exploration Results include data and information generated by exploration programmes that may be of use to investors. The Exploration Results may or may not be part of a formal declaration of Mineral Resources or Mineral Reserves. However, in Public Reports, that part of Exploration Results' data and information relating to mineralization not classified as a Mineral Resource or Mineral Reserve must be described as an Exploration Target and must contain sufficient information to allow a considered and balanced judgement of the significance of the results. Such reporting must not be presented so as to unreasonably imply that potentially economic mineralization has been discovered. Reporting of isolated values without placing them in perspective is unacceptable. Any such information relating to Exploration Targets must be expressed so that it is not misrepresented or misconstrued as an estimate of Mineral Resources or Mineral Reserves. The term Resource(s) or Reserves(s) must not be used in this context. In the situation where tonnes and grades have been estimated for an exploration property for the purposes of justifying additional exploration, but on insufficient data to define a Mineral Resource, this information must not be presented in Public Reports in such a way that it might be misrepresented or misconstrued as an estimate of a Mineral Resource.

Based on the exploration results to date, exploration targets have been highlighted with the following potential:

- The undiluted raw in-situ grade of the kimberlite dyke sample is estimated between 46-74 cpht (1mm bcos). By contrast, the micro macro models return a range of total content model grade that falls between 54 to 88 cpht at bottom cut off size of +3 DTC diamond sieve (1mm).
- Wide range of modelled diamond values at USD120-220/ct (at 1mm bcos).
- Potential volumes of some 450,000 – 470,000m^3. Using the estimated 2.6g/cm^3 density calculated by Vutomi, this may reflect target tonnages of over some 1.2MT to 100m depth.

In addition to these Exploration Targets (defined as (pre-Resource) Mineralisation) in terms of the 2016 SAMREC Code), there are additional conceptual targets that may exist on the property. This is based on the fact that a drill indicated Resource on the nearby Klipspringer Mine was estimated down to at least 500m. Similar diamond grades and values were estimated for these areas as was being recovered from the mining levels (down to 250m). Extrapolating similar values onto Thorny Rivers would suggest than additional 260,000-270,000m^3 at expected grades and values of 46-74cpht (at 1mm bcos) and USD/120-220ct might be expected to occur between 100-500m depth.

It is important to note that these statements of potential quantity, grade and value are conceptual in nature, that there has been insufficient exploration in these areas to define a Mineral Resource and that it is uncertain if further exploration will result in the targets being delineated as a Mineral Resource.

Material Risks

The specific material risks that have been identified for Thorny River include:

- The Diamond Resource estimated on the property may prove insufficient to support a sustainable operation at the scale envisioned by the parties;
    - Dilution by waste rock may increase with depth or along strike;
    - The fissure sections may pinch out along strike and at depth to decrease potential volume;
    - Diamond values obtained by a larger diamond parcel may prove disappointing;
    - The diamond grade may prove to be inconsistent with depth;
- Diamond breakage may decrease expected values;
- When the expansion to Inferred Resource classification, bulk-sampling/trial-mining and technical studies have been completed, mining conditions and the kimberlite geometry may not be as expected;

- The company may not be able to conclude an agreement to process the kimberlite at a nearby facility and may have to build their own processing plant on-site, which will greatly increase the amount of financing required;
- The operator may not be able to raise sufficient finance to progress the evaluation programme at the right level;
- Power supply and availability of water remain ever-present issues.
- Political risk and the possibility of change in mineral policies is ever-present.

Recommendations

The results achieved at Thorny River are sufficiently encouraging for the CP to recommend that the project proceed to the next phase. Consequently, it is agreed that Vutomi should undertake a high-level techno-economic evaluation (desktop) study of the most appropriate manner in which to complete the next phase of exploration, which should be planned to recover sufficient diamonds to estimate an Inferred Diamond Resource and also to better define the nature of the kimberlite, especially at depth.

This desktop study should include the following issues:

- Additional geophysical surveys;
- Further drilling to resolve fissure thicknesses more accurately;
- Issues that might be encountered during the bulk-sampling/trial-mining phase, based on the experience of the 2017 programme;
- Bulk sampling versus small-scale mining;
- Underground sampling versus surface excavations; and
- Processing plant options:

As this is a Conceptual Study, the assessment should be at a high-level to provides company management with the required information to define the next steps for the project as well as the costs associated with this exercise. Once a corporate decision has been made, then detailed planning on the selected option can take place.

1 INTRODUCTION

1.1 Terms of Reference and Scope of Work

Explorations Unlimited (“EU”) was retained by Vutomi Mining (Pty) Ltd. (“Vutomi” or the “Company”) to prepare a Competent Persons Report (CPR) for the Thorny River Diamond Project (“Thorny River” or “the Property”) in the Polokwane District (Capricorn District Municipality) of the Limpopo Province, South Africa (**Fig. 1.1**). The Thorny River Project comprises portions of the farms Frischgewaagt, Hartebeesfontein and Doornrivier. This CPR comprises background information and exploration results that culminate in the identification of Exploration Targets, compiled in compliance with the SAMREC (2016) Code and associated SAMREC Diamond Guideline document.

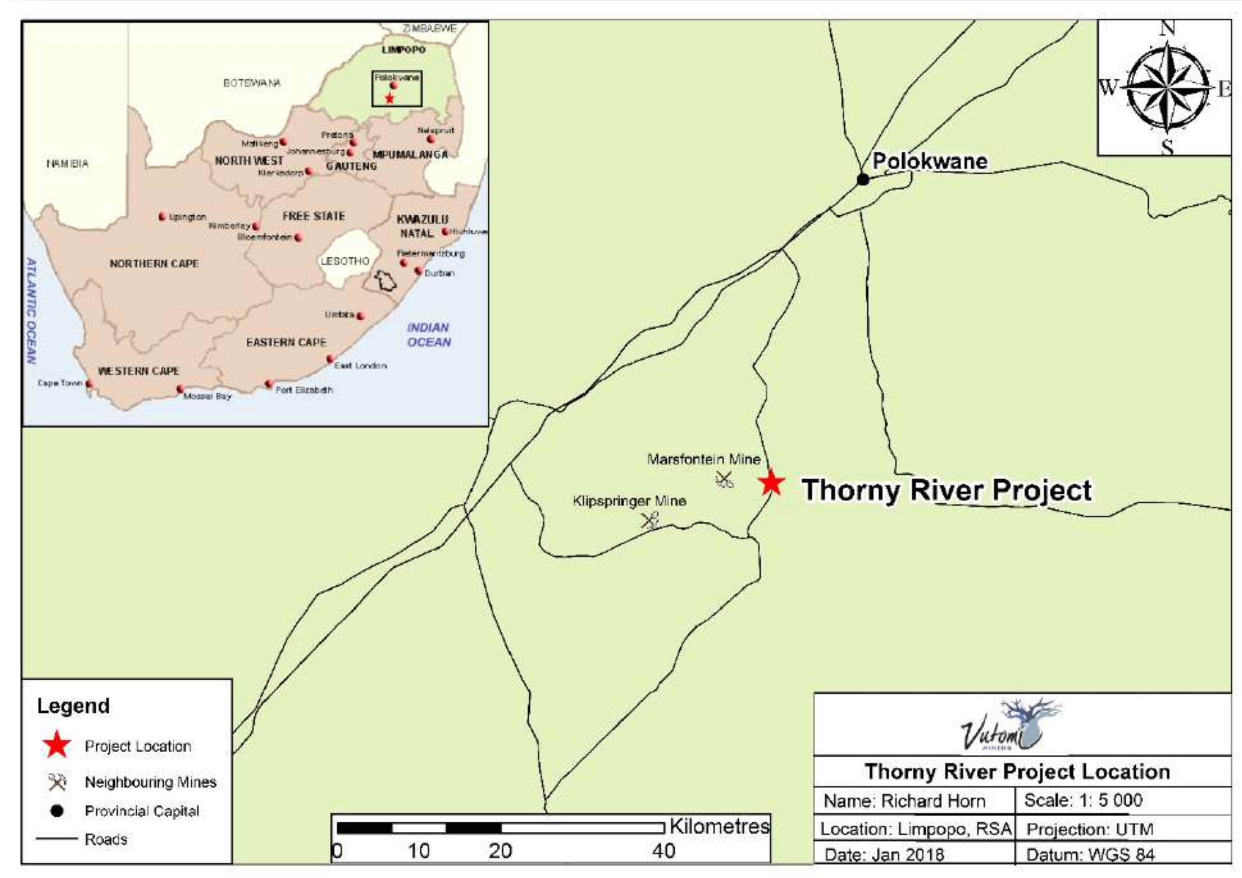


Figure 1.1 Location of the Thorny River Diamond Project

EU is a South African based consultancy owned by Dr Tania R Marshall that has been operating since 1996. EU provides a variety of exploration and prospecting consulting services to the international diamond community. This CPR was prepared, primarily by Dr T.R. Marshall (Pr. Sci. Nat.). Vutomi has accepted that the qualifications, expertise, experience, competence, and professional reputation of Dr Marshall are appropriate and relevant for the preparation of this Report.

Vutomi Mining (Pty) Ltd ("Vutomi Mining") is a private limited liability company incorporated in accordance with the company laws of the RSA under registration number1988/004248/07. Vutomi Mining is the holder of the Prospecting Right over the Hartebeesfontein property.

Razorbill Properties 12 (Pty) Ltd ("Razorbill") is a private limited liability company incorporated in accordance with the company laws of the RSA under registration number 1999/017737/07. Razorbill is the holder of the Prospecting Right over the Doornrivier property. Vutomi Mining and Razorbill have entered into a shareholder's agreement to pursue exploration and mining activities on Prospecting Rights held by both companies.

Vutomi is the name given to the joint venture between Vutomi Mining and Razorbill. This entity has been formed in order to form and develop a kimberlite mining and exploration company by way of pooling of all assets jointly.

Botswana Diamonds PLC ("BOD") is a public limited liability company duly incorporated in accordance with the company laws of England and Wales, registered under company number 07384657, and currently listed on the AIM Stock Exchange. On 6th February 2017, BOD entered into an agreement with Vutomi (See section 2.2.1 for details of this agreement).

1.2 Competent Persons

The Lead Competent Person, ***Dr Tania R Marshall***, has sufficient experience relevant to the style and type of mineral deposit under consideration and to the activity which is being undertaken to qualify as a Competent Person as defined in the SAMREC Code. She confirms that no undue influence has been brought to bear during the compilation of this report. Dr Marshall is the independent Competent Person who is responsible for the compilation of this Competent Persons Report ("CPR").

James A H Campbell confirms that he has sufficient experience relevant to the style and type of mineral deposit under consideration and to the activity which is being undertaken to qualify as a Competent Person as defined in the SAMREC Code. Although a director of Vutomi and BOD, Mr Campbell confirms that no undue influence has been brought to bear during the compilation of this document.

Name	Designation	Registration	Registration Number	Signed
Tania R Marshall	Consultant and Lead Competent Person	SACNASP	400112/96	
James A H Campbell	Director of Vutomi Director of BOD	SACNASP	400082/05	

1.2.1 Technical Specialists

The following technical specialists were involved in the preparation of the Exploration Results and have appropriate experience in their field of expertise with regards to the activity that they are undertaking. Some of them are qualified to act as Competent Persons in their own right. The Lead Competent Person is satisfied that the work carried out by the technical specialists is acceptable and has been signed off by these contributors. The technical specialists consent to the inclusion of the relevant technical information in this report in the form and context in which it appears.

Name	Activity	Designation	Professional Affiliation	Registration Number
Linesh Lutchmansingh	Oversight of exploration programme	Project Geologist	GSSA	964639
Richard Horn	Oversight of day-to-day exploration activities	Site Geologist	SACNASP (Candidate)	114108
Philip Mills	External audit of bulk-sampling programme	Consulting Metallurgist (PMC)	SAIMM	702414
Kurt Petersen	Bulk-sampling (internal) review and grade modelling	Consulting Metallurgist (Metal Dog Minerals)		
Stephen Coward	External audit and grade and value modelling	Independent Consultant (Interlaced Consulting)	AusIMM	992267
Ray Ferraris	External diamond valuation and price modelling	Independent Diamantaire (QTS Kristal Dinamika)		
Busisiwe Ringane	Size Frequency Distribution and diamond assortment modelling	Consultant	SACNASP (Pr. Sci. Nat.)	200037/16
Bjorn Havemann	Volume modelling	Independent Consulting Geophysicist (GeoFocus)	SACNASP (Pr. Sci. Nat)	400295/15

1.3 Sources of Information

The comments and recommendations in this report, specific to the Thorny River project, are based, primarily, on information and technical documents and production data supplied by Vutomi. Other technical/scientific papers and miscellaneous documents referred to are identified within the text or have been referenced in Section 10.

1.4 Units and Currency

All values are metric, unless otherwise stated. Historical grade and tonnage figures are reported in units as originally published. All budget costs are presented in South African Rands (ZAR). Diamond values are expressed in United States Dollars, for which a nominal exchange rate of USD1 = ZAR12 has been used (5 January 2018).

1.5 Site inspection and involvement of Competent Person(s)

Dr Marshall visited the properties comprising the Thorny River project during the week of 11 September 2017. During this visit, all aspects of the project were reviewed, and each drill site and bulk-sampling site was visited. Dr Marshall also visited the processing site of the bulk-sampling on 21 November 2017, where all phases of the sample preparation and processing were investigated.

Mr Campbell was present on the exploration site for two/three days each week and was present for the entire bulk-sampling processing.

1.6 Reliance on Other Experts

1.6.1 Legal Opinion

An opinion regarding the underlying legal contracts, permissions and agreements was provided by Mike Kritzinger, Mining and Corporate Law Consultant. The Opinion, entitled Note on Legal Aspects and Permitting in respect of the farms Frischgewaagt 88 KS, Hartebeesfontein 62 KS and Doornrivier 86 KS, is dated 13 September 2017.

Mike Kritzinger has over 20 years' experience in Africa and internationally with blue-chip mining companies, including Anglo American, De Beers, Gencor, SouthernEra Resources and AngloGold Ashanti. His consultancy, established in 2010, provides legal advice and commercial law services for mining companies; contract management, joint venture agreements, legal due diligence, corporate governance, land tenure, licence applications and maintenance, government liaison, risk management and other legal and company secretarial services.

The author has not independently verified the status of these contracts, permissions and agreements but has accepted that the Legal Opinion represents a materially accurate situation. The author has relied on this opinion for the compilation of Section 2.2.1.2. the Opinion has also been used to compile various portions of section 2.2 and 3.6.

1.6.2 Diamond Valuation

Valuation of the recovered diamonds has been through industry standard practices:

- Putting representative diamond parcels up for sale, either through Flawless Diamonds Tender House ("FDTH") or another legally established and regulated tender house or diamond buyer; and
- Valuation of the bulk-sample diamonds was undertaken by Ray Ferraris, an independent diamond-buyer of over 40 years' experience with, De Beers/DTC, Gem Diamonds Marketing Services and QTS Kristal. Ray consults on all aspects of the rough diamond pipeline including final recovery to export, covering all aspects of valuation and marketing from small prospect samples to large productions. He is known as a Specialist Valuator in large Type IIa diamonds, Fancy Colours and unusual specimens. In addition, he analyses for Diamond Breakage and Damage specializing in Reverse Valuation to calculate actual value loss.

1.6.3 Survey

The volume of the bulk-sample was surveyed by AAM Geomatics (Pty) Ltd ("AAM"). AAM is an international, quality accredited, surveying and aerial mapping company with extensive experience in supplying geospatial services to major projects globally.

The survey methodology used was:

- **X, Y, coordinates for all the Benchmarks were established:**
  - Control was established on site by observing satellite observations for a minimum of 30minutes continuously. The closest Trignet Station or the closest accessible Trig beacon was used to calculate accurate coordinates.
  - The post processing survey method was utilized when surveying the benchmarks.
  - Two Base station GPS Receivers were used when surveying the control points

  - The network was adjusted using the least squares method using the Trignet and/or Trig as a fixed position.
  - Trimble Business Centre software was used to calculate the GPS Network Adjustment
- **Z coordinate for all the Benchmarks will be established in the following manner**
  - Elevations of the beacons calculated using the trig beacon were calculated using the
  - SAGEOID2010 geoid modal.
  - The control beacon is an iron peg positioned in concrete.
  - Trimble Business Centre software was used to calculate the GPS Network Adjustment
- **The topographical survey consisted of the procedure:**
  - Establish a permanent benchmark on site.
  - High resolution Terrestrial Line Scanner (TLS) survey of the trench, prior to excavation.
  - High resolution TLS survey of the trench, post excavation.
  - High resolution topographic and imagery survey using an UAV (Unmanned aerial vehicle) over an area 1 x 1 km centred around the trench.
  - Trimble, 5800, 5700, R4 or R8 GPS, Nikon and Trimble Total stations and Trimble 0.7 Dini Levels (precise), Leica C10 Terrestrial Laser scanner(TLS) were used in the survey

The survey data was signed off by Enslin Gardiner, who is registered with SAGC (registration GPrS LS1407).

1.6.4 Environmental

The Environmental Management Plan ("EMPlan") was completed by Jacques Nienaber, a director of Vutomi Mining. A full Environmental Management Programme and Environmental Impact Assessment is not required for a Prospecting Right – this will be completed during the application of a Mining Right, should the project proceed to the next level of investigation.

1.6.5 Other Expert Reports

During the compilation of this document, the author has relied on various specialist reports. These are referred to in the relevant section and referenced in section 10.

1.7 Use of Data

Neither EU nor family members of the principal of EU have a business relationship with Vutomi or any associated company, or with any other company mentioned in the CPR which is likely to materially influence the impartiality of the Report or create the perception that the credibility of the Report could be compromised or biased in any way. The views expressed herein are genuine and deemed independent of Vutomi. Moreover, neither the Independent CP, nor family members 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 its preparation (which is based upon hourly charge-out rates and reimbursement of expenses). The payment of such fees is not dependent upon the content, or conclusions, of this Report or any consequences of any proposed transaction.

Vutomi has warranted that a full disclosure of all material information in its possession or control has been made to EU, and that it is complete, accurate, true and not misleading. Draft copies of the Report have been reviewed for factual errors by Vutomi. 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 document are given in good faith and in the belief that such statements and opinions are not false and misleading at the date of this Report.

Written consent is provided for the filing of the CPR with any stock exchange and other regulatory authority and also for any publication by them of the CPR for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public. EU reserves the right, but will not be obligated, to revise this CPR and conclusions if additional information becomes known to EU subsequent to the date of this CPR.

2 PROJECT OUTLINE

2.1 Property description and Location

Thorny River is located several kilometres away from the remaining open pit at Marsfontein and Klipspringer Diamond Mines (**Fig. 2.1**) in the N-E of South Africa. The project is at an early exploration stage – having completed a number of geophysical surveys, four drilling (percussion and core) programmes and two bulk-sampling programmes

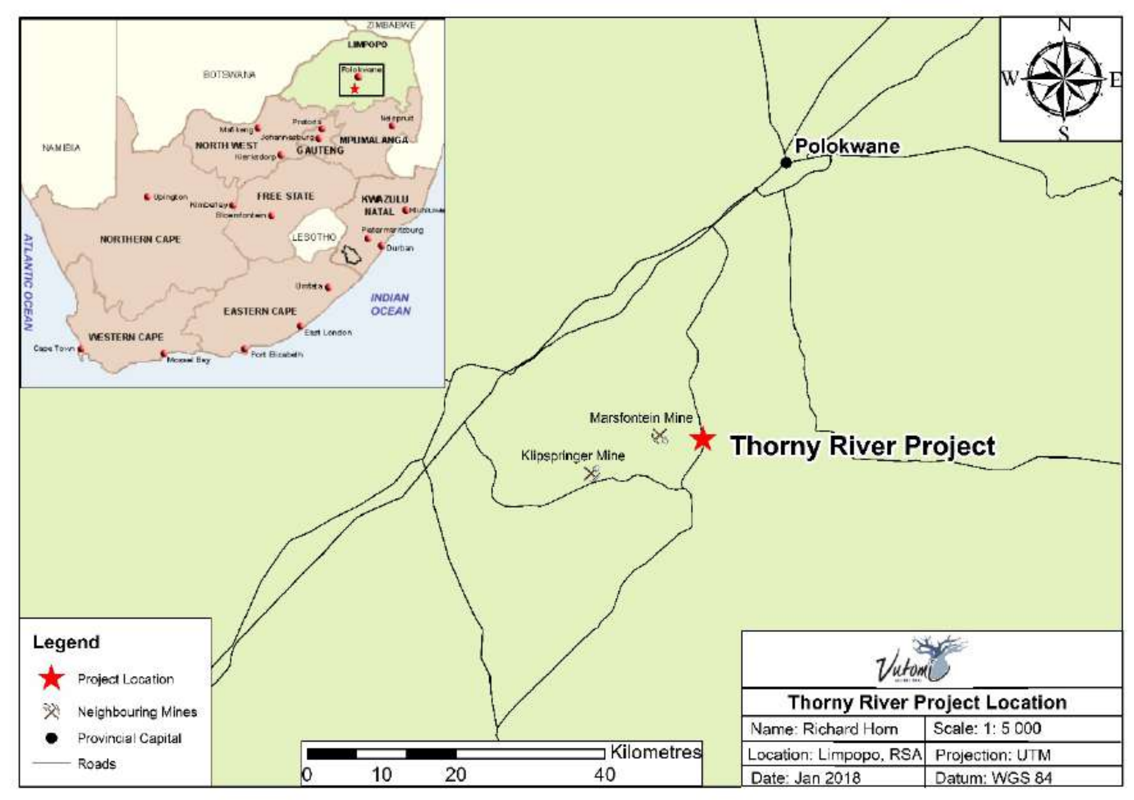


Figure 2.1 Location of the Thorny River Project

Together, the properties comprising Thorny River cover some 2,771ha. The prospecting area is bounded by the co-ordinates identified as A-Y in **Fig. 2.2** and **Table 1.1**. The co-ordinate system used is WGS84 (UTM).

The area currently held under Prospecting Rights includes sufficient space for (current and future) mine offices and out-buildings, processing and final-recovery facilities, as well as for the necessary fines disposal (tailings) ponds, transitory coarse dumps and more permanent water supply dams.

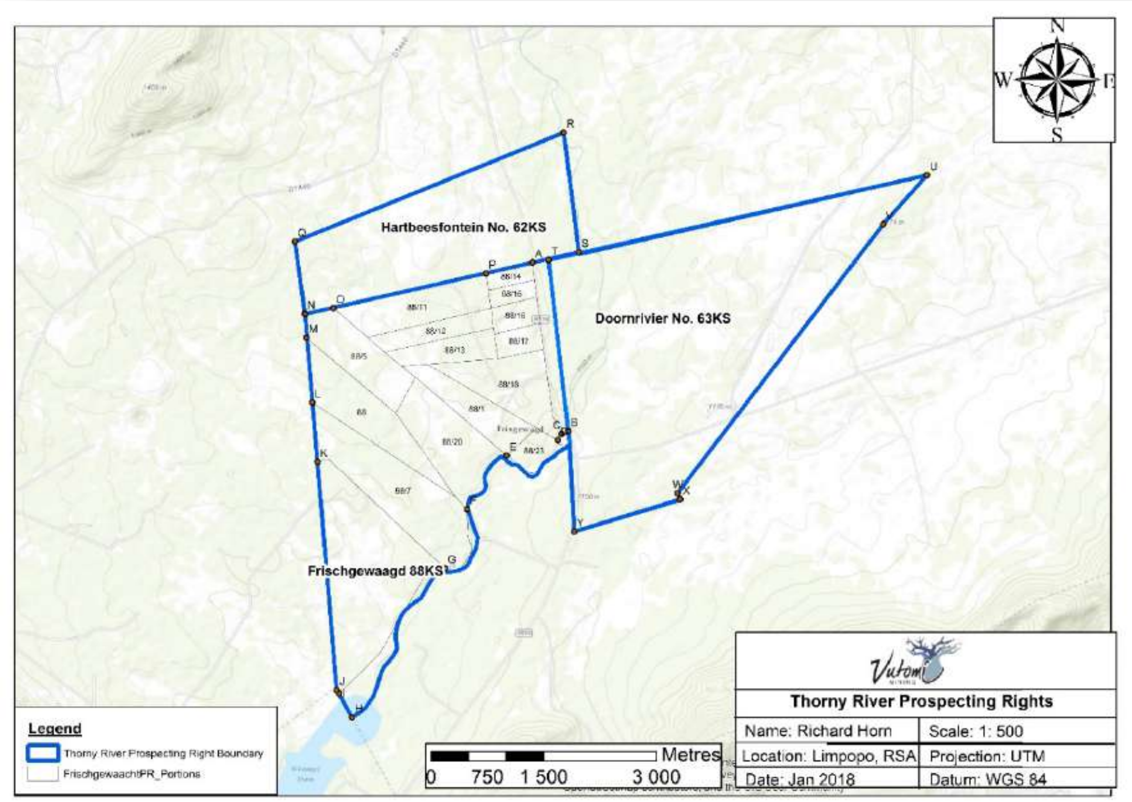


Figure 2.2 Prospecting Rights over Thorny River

Table 2.1 UTM Co-ordinates of the Thorny River project properties

Point	UTM Y	UTM X	Point	UTM Y	UTM X
A	7319150.55	737921.94	**N**	7318464.18	734893.68
B	7316902.62	738398.00	**O**	7318543.21	735272.79
C	7316866.88	738309.01	**P**	7319003.50	737307.21
D	7316784.03	738261.08	**Q**	7319428.72	734762.31
E	7316576.62	737579.90	**R**	7320880.50	738338.29
F	7315862.09	737053.12	**S**	7319288.11	738538.75
G	7315073.39	736759.01	**T**	7319182.73	738136.59
H	7313087.63	735520.67	**U**	7320314.61	743173.86
I	7313407.31	735348.14	**V**	7319661.80	742592.02
J	7313454.93	735316.73	**W**	7316076.46	739851.70
K	7316493.65	735062.47	**X**	7315994.73	739887.50
L	7317285.23	734991.28	**Y**	7315565.32	738478.81
M	7318146.76	734911.28			

2.1.1 ESG Context

The area is situated on the western flank of the Strydpoort Mountains where the elevation rises to 1,700m. Northwards, the landscape is generally gently undulating at an elevation of some 1,100m. The land is covered in bush[1] that becomes dense in patches. The north-facing slope is rocky, with cliffs near the top and narrow kloofs cut the slope, which are less densely wooded than the rest of the property. The southern edge of the property is defined by the Nkumpi River.

Plate 2.1 View across the savanna to the Strydpoort Mountains to the south of the project properties
(Photograph courtesy of J Campbell)

Some of the environmental impacts during the exploration phase include limited dust, noise and blasting (limited to a single blast during the bulk-sampling programme). During this early phase, all waste generated was removed with no impact on the environment.

No villages or settlements occur on/adjacent to the properties that will be directly or indirectly affected by the prospecting operations. Limited employment will be available to the local community at Bergnek during the prospecting phase. One of the directors of Vutomi is in constant communication with the local community to ensure that good relations are maintained.

During the next phase of operations, an Environmental Impact Assessment will need to be done on the properties (as part of the Environmental Management Programme) to assess the potential impact of the project as it progresses to a trial-mining phase.

2.2 Legal aspects and permitting

2.2.1 Permits contracts and agreements

2.2.1.1 Agreements

2.2.1.1.1 Vutomi Mining and Razorbill

The two companies Vutomi Mining and Razorbill share common shareholders and management and are separate vehicles simply to house different mineral rights. Together, the two companies are referred to

[1] The project area falls within a savanna biome and bush encroachment due to overgrazing is a common problem. The properties are used as grazing by the local farmers.

as Vutomi. Subject to the fulfilment of specific suspensive conditions, the parties[2], Charl, Jacques, Dennis, Linesh, John and James, will hold effective interests in Vutomi and Razorbill as follows:

Vutomi Mining:
John 15%
James 15%
Dennis 14% (through Baroville)
Jodo 7%
Linesh 7%
Charl 21% (through Red Sky)
Jacques 21%

Razorbill:
John 16.5%
James 16.5%
Dennis 16.5% (through Kek)
Linesh 16.5%
Charl 16.5% (through Red Sky)
Jacques 16.5%
Balance: 1% (this percentage will be held in trust by Red Sky or its nominee for future allocation to be agreed between the Parties, or for the benefit of an employee share ownership trust.)

2.2.1.1.2 Vutomi and Botswana Diamonds PLC

Vutomi have entered into a relationship with Botswana Diamonds PLC ("BOD"), a public, limited liability company incorporated in the UK (and dual listed on the London AIM Stock Exchange (BOD) and the Botswana Stock Exchange (BOD)). The relationship is in respect of designing, evaluating, funding and carrying out exploration and, if successful, mining activities on the properties/rights held by Vutomi and Razorbill. Pursuant to the terms of the Agreement[3], Botswana Diamonds has agreed to pay Vutomi a total of £942,000 in cash, of which £581,000 will be used to fund exploration activities. In addition, BOD will issue 100 million ordinary shares of 0.25p each ("Ordinary Shares") to Vutomi shareholders. The Agreement will be executed in three Phases after which BOD will own 72% of Vutomi. The remaining 28% will continue to be held by Vutomi's Black Economic Empowerment ('BEE') partners. The three Phases are summarised below:

Exclusivity and Option Fee
Botswana Diamonds will initially pay Vutomi an exclusivity and option fee of £122,000 within a period of 60 days, with £61,000 being paid in cash and £61,000 being paid in the Company's Ordinary Shares at a price of 1.9p. A further announcement regarding the issue of these Ordinary Shares will be made in due course. Upon completion of this initial 60-day period, Phase 1 of the earn-in will commence.

Phase 1
Phase 1 will last for a further 12 months, during which period BOD will, subject to available funding, have the option to pay Vutomi £215,000 to fund exploration activities to earn an additional 15% of Vutomi.

[2] John Harvey Shelton ("John"), James Andrew Hartley Campbell ("James"), Charl Louis Nienaber ("Charl"), Jacques Louis Nienaber ("Jacques"), Linesh Lutchmansingh ("Linesh"), Dennis Kgotli Dikgoro Kekana ("Dennis") Vutomi Mining (Pty) Ltd ("Vutomi Mining"), Razorbill Properties 12 (Pty) Ltd ("Razorbill"), Baroville Trade and Investments 02 (Pty) Ltd ("Baroville"), Red Sky Trust ("Red Sky"), Jodo Minerals (Pty) Ltd ("Jodo") Kek Properties (Pty) Ltd ("Kek"), collectively referred to in this Term Sheet as the "Parties".

[3] BOD Press Release of 6th February 2017

During Phase 1 Vutomi will grant the Company the sole and exclusive right to fund exploration activities in, on and under the Vutomi Prospecting Rights area in order to prepare a conceptual mining and development plan. The required mining permits are in place.

Phase 2
Phase 2 will last for a further 12 months, during which period BOD will, subject to available funding, have the option to pay Vutomi £366,000 to fund exploration activities to earn an additional 25% of Vutomi.

Phase 3
Phase 3 will commence within 90 days of the successful completion of Phase 2. Pursuant to the Agreement, BOD will have the option to issue the outstanding balance of 96.8m Ordinary Shares, priced at VWAP, to Vutomi shareholders and, subject to available funding, settle Vutomi's shareholders loan accounts of approximately £300,000 in cash to earn a further 32% of Vutomi.

Technical Committee
As soon as practicable following the commencement of the Agreement, BOD and Vutomi will establish and constitute a technical committee to oversee the exploration and development activities (the "Technical Committee"). The Technical Committee shall consist of no less than 2 and not more than 4 representatives of both BOD and Vutomi. BOD will initially appoint James Campbell to the Technical Committee.

Termination
At any point the Agreement will lapse if BOD does not exercise its option regarding a specific Phase.

Vutomi is the holder of the Prospecting Right (LP1453PR) over the farms Frischgewaagt (LP657PR incorporated into LP1453PR by granting of 102 application), Hartebeesfontein and Doornrivier; acts as the operator and, through the Technical Committee, is responsible for the exploration activities on Thorny River.

2.2.1.2 Mineral rights (Mining/Prospecting Rights, permits, etc.)

2.2.1.2.1 Frischgewaagt 88 KS and Hartebeesfontein 62 KS: Prospecting Right 1453 PR (New Order Reference 11417 PR)

I. This prospecting right was granted to Vutomi Mining (Pty) Limited for diamonds, in respect of portions 1, 2, 3, 4, 5, 6, 7, 11, 12, 13, 14, 15, 16, 17, 18, 20, 23 and the Remaining Extent of the Farm Frischgewaagt 88 Registration Division KS, Limpopo Province (F**ig. 2.2**).
   i. The commencement date of this Prospecting Right was 5 May 2010 and the right has been registered at the Mineral and Petroleum Titles Registration Office.
   ii. The termination date was 4 May 2013. A renewal application was lodged with the Department of Mineral Resources (DMR) on 26 March 2013. The renewal has not been granted to date, however the right continues to be in force in terms of Section 18 (5) of the Minerals and Petroleum Resources Development Act (MPRDA).

II. A Section 102 application in terms of the MPRDA, (wherein application was made to include Portion 41 of the Farm Hartebeesfontein 62 KS) was lodged with the DMR on 6 April 2011 The Section 102 application was granted by the Department of Mineral Resources on 2 May 2012. Execution is expected to occur with the renewal of PR 1453 and the Section 20 permission once granted.

III. A Section 11 application was lodged with the Department of Mineral Resources on 22 February 2013, in order that the shareholding in Vutomi could be amended to its current status which would not affect the Black Economic Empowerment shareholding. Lodgement was acknowledged by the DMR and approval is still awaited.

IV. Prospecting Fees in respect of the Prospecting Right have been paid to the DMR on a yearly basis and are up to date.

2.2.1.2.2 Doornrivier 86 KS Prospecting Right 11953 PR

I. The DMR has approved the application for a Prospecting Right by Razorbill on 8 June 2017 and the right was granted on 28 June 2017.

II. Prospecting Fees in respect of the Prospecting Right will be payable when they become due.

2.2.1.3 Surface ownership / land use rights

The surface rights for the entire area covered by the Prospecting Right are held by the Republic of South Africa and administered by the Department of Rural Development and Land Reform. On 17 March 2016, this department confirmed that it had no objection to the Prospecting Right application. This followed a meeting between the Department, small scale cattle farmers utilising the surface and Vutomi on 25 March 2015, where no objections to the prospecting operations were received. A formal land use agreement will only be required if it is intended that mining operations will take place on the properties.

2.2.2 BEE Compliance

Vutomi Mining is currently held 28% by BEE shareholders. The shares (Jodo 7%, Linesh Lutchmansingh 7% and Baroville 14%) are fully paid up. All BEE shareholders are fully involved in the management and progress of the project.

2.2.3 Environmental

The Environmental Management Plan (EMPlan) and Prospecting Work Programme ("PWP") in respect of the Prospecting Right on Frischgewaagt/Hartebeesfontein were approved by the DMR on 5 May 2010. An amended EMPlan was submitted on 25 October 2012 after the Section 102 approval. The PWP has since been amended to include provision for bulk sampling and in addition an application was made on 2 February 2013 in terms of Section 20 for permission to remove and dispose of minerals discovered during the prospecting operations.

The EMPlan and PWP in respect of the Prospecting Right on Doornrivier have been submitted to the DMR and approval is awaited. There is no reason to believe that these will not be approved under standard conditions.

Compliance Reports, including an Environmental Performance Audit, have been submitted as required on a yearly basis to the DMR by Vutomi and are up to date. No material issues have been identified to date.

A single grave (Mr Venter, 1928), is located in the north of Frischgewaagt (ref. Fig. 2) but does not fall within the targeted area of interest. A second grave with an internment date of 2013 is located within the area of interest. Even though it is post the granting of the Prospecting Right, it will need to be considered when a Mining Right is applied for.

2.2.3.1 Rehabilitation Guarantees

Vutomi has paid the required Rehabilitation funds for prospecting operations (on Frischgewaagt/Hartebeesfontein) to the DMR as and when requested. The total amount of funds paid to date are ZAR98,300.00 on Frischgewaagt and a further r50'000 on Hartebeesfontein and is up to date with the Department's requirements.

Vutomi has also paid the required Rehabilitation funds for prospecting operations (on Doornrivier) to the DMR. ZAR40,000 was paid on 14 August 2017 and is up to date with the Department's requirements.

2.2.3.2 Unplanned Closure

This initial phase of prospecting has had a limited impact on the properties. The geophysical surveys were non-invasive, and the cut-lines very quickly re-establish themselves. The drilling programmes, likewise, have had a limited footprint due to the fact that the holes are relatively short, and no chemicals were used.

The bulk-sample was limited to a single site – one that had been used previously by an earlier operator. This site was rehabilitated immediately after sample extraction. The sample was processed off-site, at an external facility. Consequently, there is no infrastructure on the property or excavations or underground workings that would have required rehabilitation or ongoing attention should the prospecting programme not continue to the next phase.

2.3 Associated Risks

Land claims exist in respect of Thorny River – these will have to be addressed in advance of a Mining Right being applied for.

Furthermore, general risks associated with prospecting and mining are always present. These issues are discussed more fully in Section 8.2

2.4 Royalties

No royalties are payable during this first-stage exploration programme.

3 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

3.1 Topography, elevation and fauna/flora

There are four significant mountain ranges in the northern reaches of South Africa: the Magaliesberg which runs from Rustenburg in the west to Bronkhorstspruit in the east and forms the southern border of the Bushveld; the Drakensberg escarpment that forms the eastern border of the Bushveld and runs from Tzaneen in the north to Belfast in the south; the Waterberg range that is in the middle of the Bushveld and the Soutpansberg range just north of the town of Louis Trichardt.

The Project is located within the Waterberg geographical region of the Limpopo Province. The Waterberg is a mountainous massif of approximately 14,500km^2 in north Limpopo Province, South Africa. The elevation varies from 500 to 1,400m, with a few peaks rising up to 2,000m above sea level. The ecosystem is typical of a Savanna biome, locally known as the “Bushveld”. Bushveld is a rather loose term and refers to the areas of mixed woodland between 1,000m and 1,500m above sea level (**Plate 3.1**).

Plate 3.1 View of the Waterberg region, with typical Bushveld vegetation

As implied by the region's name, the Bushveld's well-grassed plains are dotted by dense clusters of trees and tall shrubs. The grasses found here are generally tall and turn brown or pale in winter, which is the dry season throughout most of Southern Africa. Vegetative cliff habitats are abundant in the Waterberg due to the extensive historic riverine erosion. The African porcupine uses the protection of these cliffside caves. Some trees cling to the cliff areas, including the paperbark false-thorn, that have flaking bark hanging from their thick trunks. Another common tree in this habitat is the fever tree, thought by Bushmen to have special power to allow communication with the dead. It is found on cliffs above the

Palala River including one site used for prehistoric ceremonies, which is also a location of some intact rock paintings.

The savanna consists of rolling grasslands and a semi-deciduous forest, with trees such as mountain syringa, silver cluster-leaf and lavender tree. The canopy is mostly leafless during the dry winter. Native grasses include signal grass, goose grass and heather-topped grass. Indigenous grasses provide graze to support native species including impala, kudu, klipspringer and blue wildebeest (gnu). Some Pachypodium (succulent, spine-bearing trees and shrubs) habitats are often located in isolated kopje formations. Snakes include the black mamba and spitting cobra. Some birds seen are the black-headed oriole and the white-backed vulture.

As most of the region tends to be dry, the Bushveld is mostly beef cattle and game farming country, with only a few drought-resistant crops such as sorghum and millet being farmed, usually under irrigation.

3.2 Access and Communication

Access to Mokopane or Polokwane (previously Pietersburg), some 34km and 50km distant, respectively) is by high-speed, tarred roads and highways. From there to the property, good tarred roads exist, and the property has sufficient gravel roads to access most areas.

Communication is intermittently available through three cellular telephone networks.

3.3 Surface water and sensitive environments

Annual rainfall in the Waterberg varies from 350mm in the west to 600mm in parts of the northeast.

Riparian zones are associated with various rivers that cut through Waterberg. These surface waters all drain to the Limpopo River which flows easterly to discharge into the Indian Ocean. The river bushwillow is a riparian tree in this habitat. These riparian zones offer habitat for birds, reptiles and mammals that require more water than plateau species. These wet habitats have reduced numbers of water-living insects, and the Waterberg is thus considered an almost malaria-free region.

Small, 6th order, non-perennial streams cross the Project area, as tributaries to the Nkumpi River (**Fig. 3.1**). Due to the general semi-arid nature of the region, the dry river beds are prone to significant erosion (**Plate 3.2**). Although not considered as a sensitive environment, care needs to be taken to prevent excessive erosion in this area.

Figure 3.1 Location of surface water on the Thorny River project properties (tributaries of the Nkumpi River)

Plate 3.2 Erosion typically associated with the non-perennial drainages on the Thorny River project

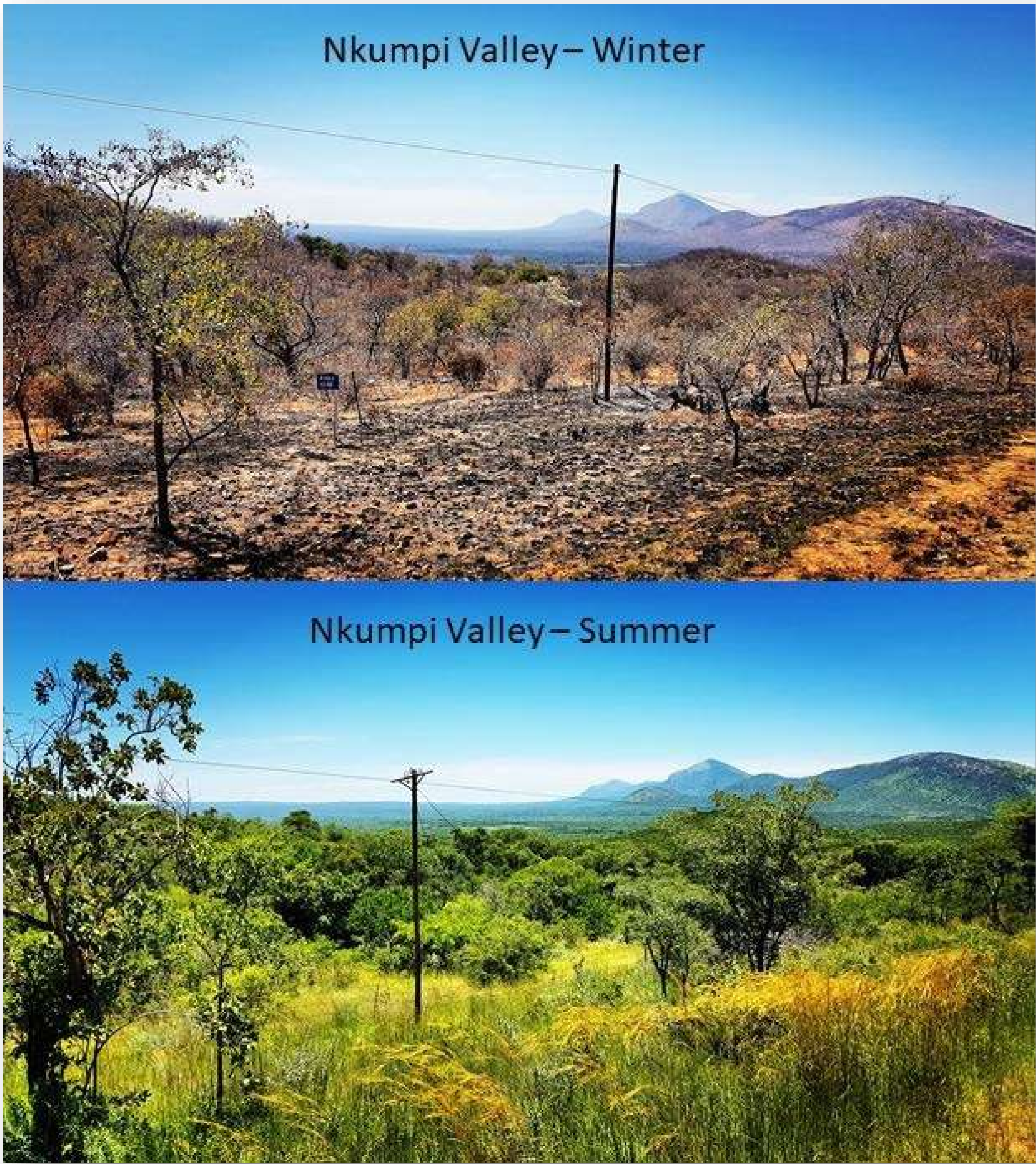


Plate 3.3 Nkumpi Valley on the project properties

3.4 Climate and Weather

Mokopane's climate is a local steppe climate (warm/hot, semi-arid). Despite its position close to the Tropic of Capricorn, the climate is tempered by its position on a plateau 1,230 meters above sea level. The average temperature in Mokopane is 19.3 °C (**Fig. 3.2**). The average annual rainfall is 495 mm. Precipitation is the lowest in July, with an average of 1mm. Most of the precipitation here falls in January, averaging 94 mm. At an average temperature of 23.4 °C, January is the hottest month of the year. June is the coldest month, with temperatures averaging 13.0 °C.

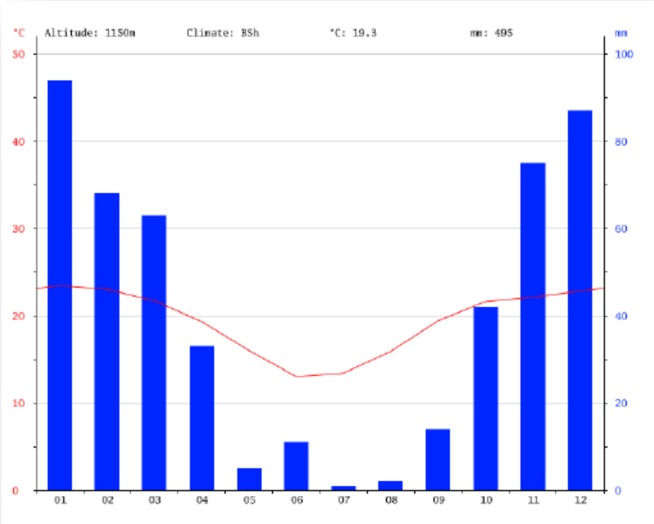


Figure 3.2 Average temperature and precipitation in Mokopane

3.5 Proximity to population centres and nature of transport

The town of Mokopane (previously known as Potgietersrus, some 50km distant from the Project) is located just off the N1 highway in the Limpopo Province of South Africa. The economy of Mokopane was primarily farming, until the advent of platinum mining by Anglo American Platinum and Ivanhoe Mines (namely Mogalakwena and Platreef)). Currently these mines are the biggest contributor to the local economy. Recently there has been interest displayed by other mining companies to start up, but community resistance to mining remains the main reason for the industry’s slow growth in the area. Mokopane is one of South Africa's richest agricultural areas, producing wheat, tobacco, cotton, beef, maize, peanuts and citrus but is also rich in minerals in the form of platinum and granite.

Polokwane is the capital city of Limpopo. Polokwane lies roughly halfway between Gauteng (300 km) and the Zimbabwean border at Messina (200 km) on the N1 highway, which connects Zimbabwe with the major cities of South Africa (inter alia Pretoria, Johannesburg, Bloemfontein and Cape Town). Running east, the R71 connects the city with Tzaneen, Phalaborwa and the Kruger National Park. There are a number of private bus services running in the city and also services connecting Polokwane to other major centers in the country. A public airport, Polokwane International Airport, (IATA: PTG, ICAO: FAPP), is located just North of the city. There are daily flights to Johannesburg.

Thorny River is surrounded by a number of towns and small villages, most notably at Zebedelia (some 15km distant), where a large citrus estate is located.

3.6 General Infrastructure

3.6.1 Power

The nearest ESKOM line is some 1km distant from the project. The initial sampling and evaluation phase is planned to be completed using generators. The feasibility of extending ESKOM services will be considered during the forthcoming Technical Study.

3.6.2 Water

Prospecting activities fall within the definition of "small industrial users" and accordingly Vutomi is authorised to draw underground water on the property, which falls under the Olifants Management Area, for its prospecting operations up to a daily limit set from time to time in the Government Gazette.

Water use licences for the mining operation have not yet been applied for. Once the forthcoming phase of technical study has been completed and the amount of water usage estimated, the water use application will be made.

3.6.3 Staff and Labour

Currently, during the early exploration phase, the limited staff complement is accommodated at a company house at nearby Ngombe Lodge. Visiting management and contractors/consultants are also accommodated at Ngombe. A Geotechnical Assistant and local labour live in their own homes at Bergnek (Polokwane).

3.6.4 Essential Services

All essential services can be obtained from either Mokopane or Polokwane. The 2011 South African census showed the population of Polokwane City of some 130,000 and Mokopane, somewhat smaller at 30,000 inhabitants.

4 History

4.1 Background

The Zebedelia kimberlite cluster comprises a number of *en echelon* dykes trending in a north-easterly to easterly direction. Several blows occur along these dykes and two mines, Klipspringer (currently active) and Marsfontein (mined out) give evidence of the diamondiferous nature of these deposits.

As a result, the Zebedelia area has been prospected by a number of companies over the years. SouthernEra (on their own and with various joint venture partners) were extremely active here during the late 1990's and early 2000's – in 2007, SouthernEra's South African operations were taken over by Mwana Africa PLC (now ASA Resource Group), whose focus has moved to its nickel, copper and gold projects, having recently announced the sale of its Klipspringer Mine to mining exploration company Greenhurst Mining for ZAR23M (Kilian, 2017).

4.2 Previous Ownership

Prospecting licences over the properties comprising the Thorny River diamond project were held by De Beers (RSA Exploration) during 1998-2000. Previously, SouthernEra Diamonds Inc held prospecting rights over Doornrivier. Limited verifiable information is available from these periods.

4.3 Previous Exploration/Development

De Beers conducted extensive sampling on the property during the 1980's and 1990s. Neither the sample data or the results are available.

The kimberlite dykes on Frischgewaagt and Hartebeesfontein were extensively drilled by De Beers during the late 1990's. Indications from personal communication with geologists on site at the time suggest that a total of 110 percussion drill holes with an accumulative depth of 3,597m and 69 core drill holes with accumulative depth of 4,078m were drilled. Further, some 878 kg of kimberlite samples from various localities on both dykes were extracted for microdiamond analyses and approximately 207 (dry) tonnes of kimberlite were extracted during a trenching bulk sampling exercise.

The De Beers project is believed to have been terminated because it did not fit the Corporate profile at the time.

4.4 Previous Resource Estimates

No previous Diamond Resources were ever estimated on the project properties.

5 GEOLOGICAL SETTING, MINERALISATION AND DEPOSIT TYPES

5.1 Geological Setting

The geology of South Africa (**Fig. 5.1**) is extremely varied and spans a period of about 4 billion years (SACS, 1980). The northeast portion of the country is dominated by the granitic rocks and belts of volcanic and sedimentary rocks forming the Archaean Kaapvaal Craton. Much of the rest of the country is covered by Phanerozoic sediments.

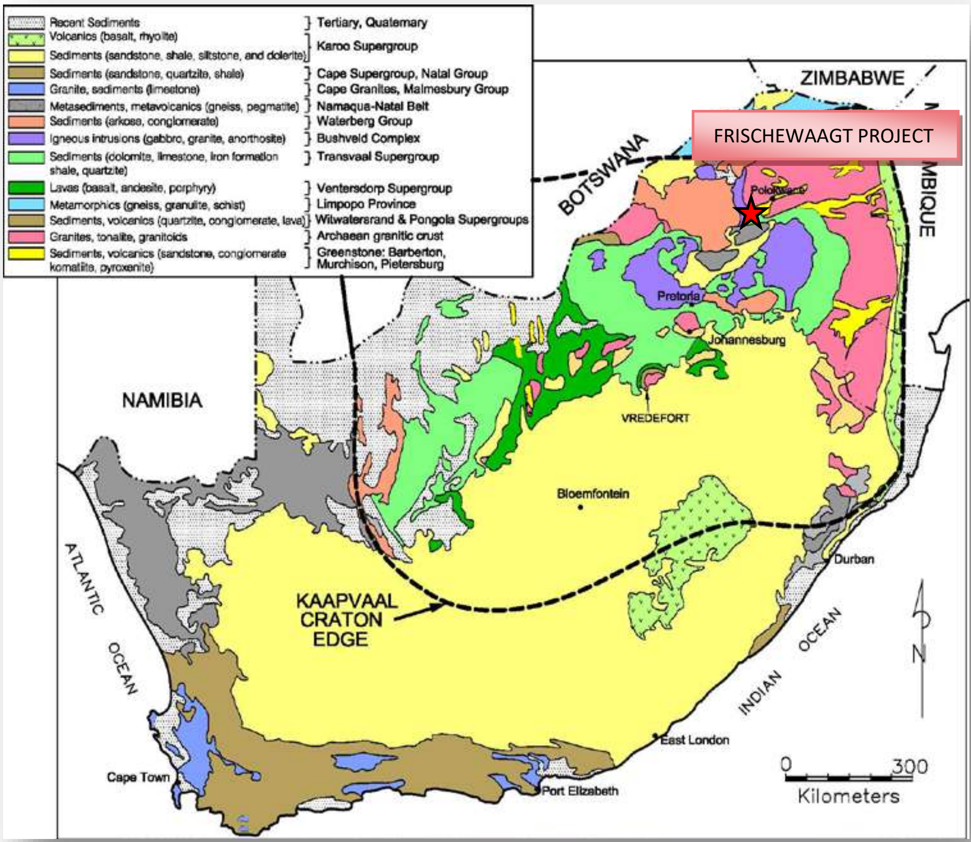


Figure 5.1 The General Geology of South Africa

The earliest clusters of diamondiferous kimberlites intruded into South Africa during the Proterozoic era. The main kimberlitic (both diamondiferous and barren) intrusive event, however, took place in the late Mesozoic. All the kimberlites that host economic deposits occur on the Kalahari Archon (Kaapvaal and Zimbabwe Cratons), while those occurring in the surrounding Proterozoic basement are non-diamondiferous (Gurney, Moore, Otter, Kirkley, Hops, & McCandless, 1991). Over 2,000 kimberlite pipes, blows and fissures have been recorded across South Africa, Lesotho, Swaziland, Botswana and Zimbabwe, spanning emplacement age range of approximately 1,700 – 40 Million years ago ("Ma"), with peaks at 1,700Ma, 1,200Ma, 600-500Ma, 240Ma, and 200-80Ma. Kimberlite emplacement was followed by the liberation and entrainment of diamonds and the subsequent deposition of terraces on the ancient Vaal and Orange Rivers.

5.1.1 Regional Geology

The Zebedelia kimberlite system (**Fig. 1.1**) is located approximately 30km east of Mokopane (formerly Potgietersrus). The Marsfontein kimberlite has been dated at ca. 148Ma (Basson & Viola, 2003)

The region is underlain by the Kaapvaal craton. To the west, in the vicinity of the Klipspringer mine, sediments of the Transvaal Supergroup occur. These comprise the Chuniespoort dolomites, basal Black Reef Formation and the pre-Black Reef units of the Wolkberg Group (possibly Ventersdorp age). In the east, the geology comprises exposed Archaean Turfloop and Meinhardskraal granites and Archaean granite gneisses'. Remnants of ancient Greenstone belts occur to the north east of the region.

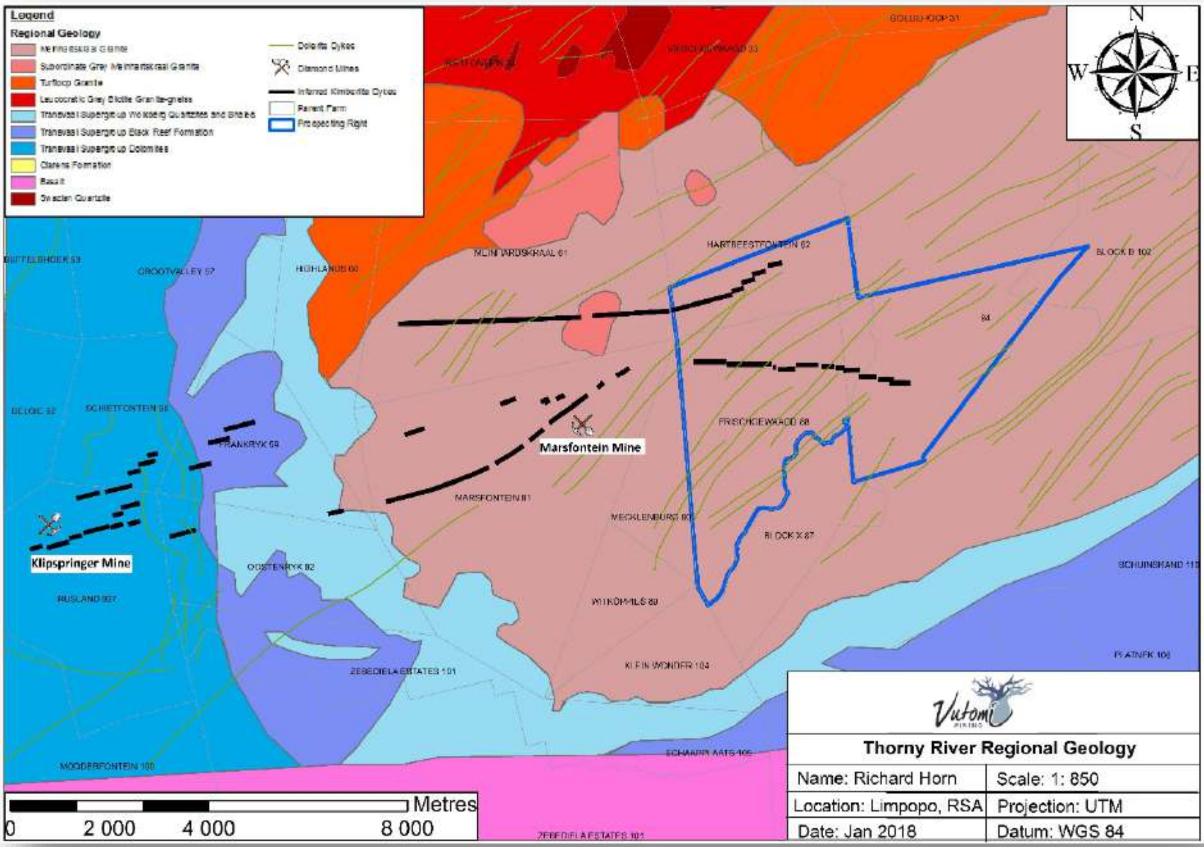


Figure 5.2 Regional Geology (L Lutchmansingh)

A dominant regional unconformity, the Zebedelia Fault, exists to the south and separates the above older Archaean granites and Transvaal Supergroup sediments from the younger upper Karoo basalts and sediments. Dolerite and gabbro dykes and sills were intruded into the Transvaal strata prior to, and during, emplacement of the Bushveld Igneous Complex. Subsequent later (Jurassic) intrusions comprised dolerite and kimberlite. The Zebedelia kimberlites are intrusive into the Archaean Meinhardskraal granites and younger dolerites in the east, and the Transvaal Supergroup sedimentary rocks in the west.

5.1.2 Local Geology

Three rock types are predominant within the Thorny River prospecting right,

- <u>The Meinhardskraal Granite:</u> This is the predominant geology within the property and comprises a number of phases with a leucocratic, pinkish, medium to coarse grained phase being widespread. At shallow depths, the granite is highly weathered but rapidly changes to hard and competent with depth.
- <u>Dolerites:</u> The dolerites are Karoo aged and occur as northeast-southwest trending dykes. The dolerites are usually associated with ground water.
- <u>Kimberlites:</u> These occur as east-west trending *en-echelon* dykes that intersect and disrupt the dolerite.

5.2 Mineralisation

5.2.1 Nature of Mineralisation

Diamond deposits can be classified as primary (kimberlites and lamproites) and secondary (alluvial and marine). Diamonds are known to occur in a variety of rocks, including high-pressure metamorphic rocks such as garnet-biotite gneisses of northern Kazakhstan, alpine-type peridotites, and meteorites. However, the only known economically significant primary sources of diamond are kimberlite and lamproite. No significantly diamondiferous lamproites are known in South Africa where the primary sources mined are kimberlite pipes and dykes. Kimberlite is defined as a volatile-rich, potassic, ultrabasic igneous rock that occurs as small volcanic pipes, dykes and sills. It has an inequigranular texture resulting from the presence of macrocrysts (phenocrysts and xenocrysts) set in a fine-grained matrix. The mineralogy comprises olivine with several of the following: phlogopite, calcite, serpentine, diopside, monticellite, apatite, perovskite, and ilmenite. Kimberlite often contains fragments of upper-mantle derived ultramafic rocks, including xenocrysts such as pyrope garnet, picro-ilmenite, chromian spinel and chrome-diopside. Kimberlite may contain diamond, but as a very rare constituent.

Two distinct types of kimberlite are recognised: Group I, or olivine-rich, monticellite-serpentine-calcite kimberlites and Group II, or micaceous kimberlites. Historically, these were respectively referred to as “basaltic” and “micaceous lamprophyric” kimberlites. These distinctive groups are derived from sources in the earth’s mantle that are either slightly depleted (Group I) or enriched (Group II) with respect to light rare earth elements. This enrichment and depletion is evidence of past metasomatic processes occurring in the mantle (**Fig. 5.3**).

5.3 Geological Model

Thorny River is part of a kimberlite system which starts west of Klipspringer Mine and ends East of Frischgewaagt (the Zebedelia kimberlite cluster). This kimberlite system predominantly is made up of en-echelon kimberlite dykes which are magmatic (hypabyssal) in nature and represent the near root zone (**Fig. 5.3**). However, there are blows (or pipes) which exist in this system where the dykes intersect the regional structure. Both types of kimberlites have tapped the same source in the mantle, so the diamond size frequency distribution would be expected to be similar, though the magmatic could be finer. Marsfontein is an example volcanoclastic diamond size frequency and Klipspringer a magmatic one.

5.3.1 Geological controls of Primary Diamond Deposits

“Clifford’s Rule”, states that diamondiferous kimberlites are almost exclusively found in regions underlain by Archaean craton, that is continental crust older than 2.5 billion years in age. In Africa, Russia and Canada, all of the significantly diamondiferous kimberlites are “on-craton”. The only significant exception to Clifford's Rule is the Argyle lamproite in Australia. It lies "off-craton" in a Proterozoic mobile belt.

The reason for the originally empirical association between Archaean basement and diamondiferous kimberlites has been explained theoretically by consideration of the structure of the cratons (elucidated by geophysics and the study of mantle xenoliths brought to surface by kimberlites), and the temperature/pressure relationship between graphite and diamond. Natural diamonds form and are preserved in a high-pressure environment present in nature at depths of over 120 kilometres. In most parts of the Earth, the temperatures at this depth are too high for diamonds to form. However, Archaean cratons have relatively cool lithospheric roots in which there exists a downward deflection of isotherms and a corresponding upward deflection of the diamond stability field (**Fig. 5.3**).

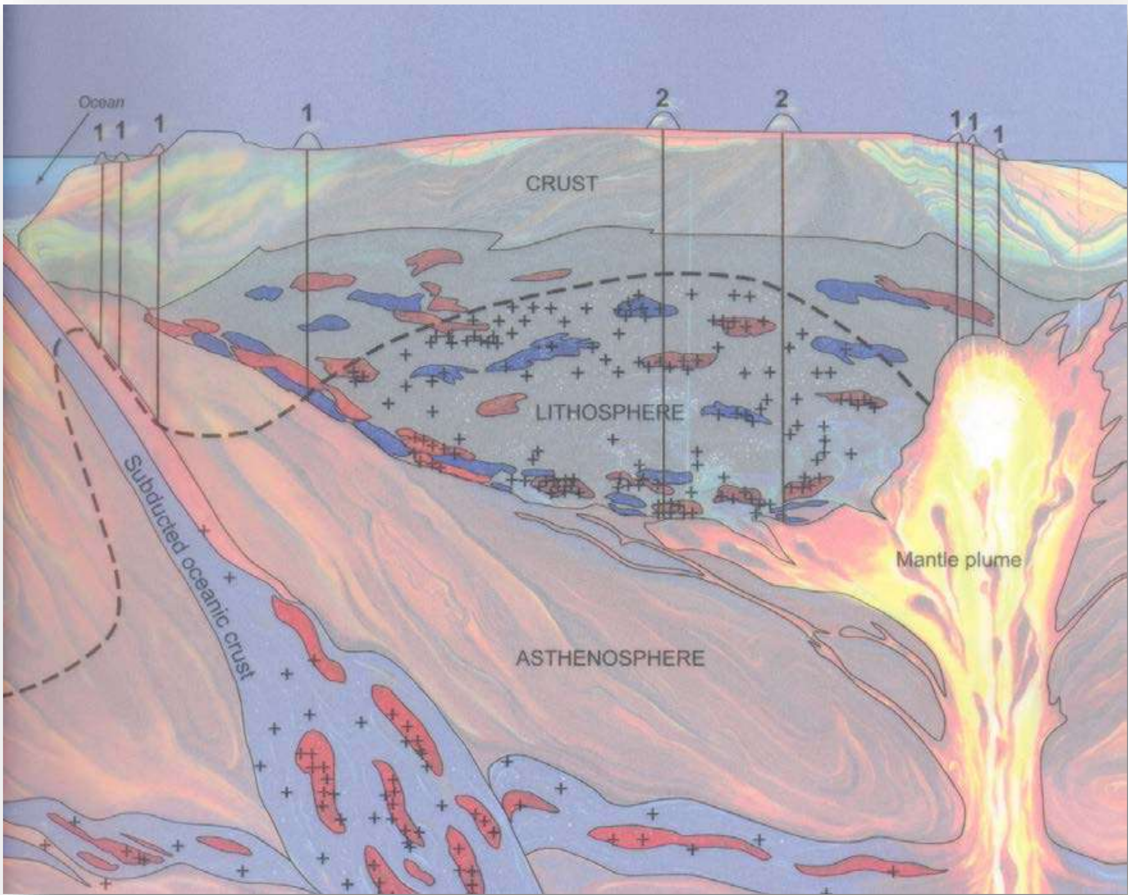


Figure 5.3 Model of a kimberlite pipe (Maggie Newman paintings)

This region of high pressure and relatively low temperature (less than about 1200°C) provides a window in which diamonds can form and be preserved. Kimberlitic magmas are generated at or below these depths (as evidenced by their xenoliths), and may "sample" the lithospheric roots, thus collecting diamonds en route to surface. Kimberlites formed away from the craton do not sample the diamond window, and thus are unlikely to be diamondiferous.

Three broadly distinct vertical zones are recognised in a kimberlite pipe, the crater, diatreme, and root zones (**Fig. 5.4**). The crater represents the uppermost portion of the pipe and is characterised by well-bedded, poorly consolidated sediments with chaotic debris-flow deposits and pyroclastics. The diatreme is volumetrically the most significant and comprises an easily weathered breccia consisting of angular country rock xenoliths and fragments of mantle-derived material set in a fine-grained matrix (previously called tuffisitic kimberlite breccia or TKB). The root zone is composed of magmatic or hypabyssal material usually porphyritic in appearance, containing macrocrysts of olivine and phlogopite set in a fine-grained matrix, often with xenocrystic garnet, ilmenite, spinel and chrome-diopside. Mining difficulties may be experienced in the hypabyssal facies due to the irregular shapes of the intrusion

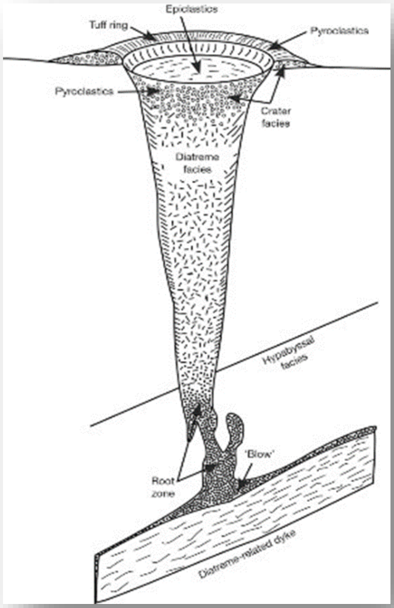


Figure 5.4 Generalised diagram of the Crater, Diatreme and Hypabyssal facies in a kimberlite pipe (Hawthorne, 1975)

The presence and degree of preservation of these zones depends upon the level of erosion, the volatile content of the erupting magma and the stability and nature of the country rock. The large, economically important kimberlites at Orapa and Jwaneng in Botswana have suffered very little erosion, and their crater facies are still preserved. The Kimberley, Jagersfontein, and Koffiefontein pipes are smaller and are eroded down to the diatreme zone.

Group II kimberlite dyke complexes in South Africa have also proved to be viable diamond deposits in certain cases. The study by Gurney and Kirkley (Gurney & Kirkley, 1996), from which excerpts have been taken in the following paragraphs, indicated that dykes typically maintain their size and grade with depth (have been mined to 500-600m below surface, although they persist to greater depths), that dips in general are near vertical, although certain systems have variable dips, strike directions and thicknesses.

Dykes (Ibid) are actually "dyke systems or groups of *en-echelon* to anastomosing, interwoven lenses which pinch and swell along strike" (**Fig. 5.5**). lenses can be separated by zones of branching dykelets or "horse-tails" which can splay out over a distance of 2-3m. Grades can vary quite dramatically as "closely-related dykes and different parts of the same dyke can contain widely differing samples of mantle minerals as well as different diamond grades".

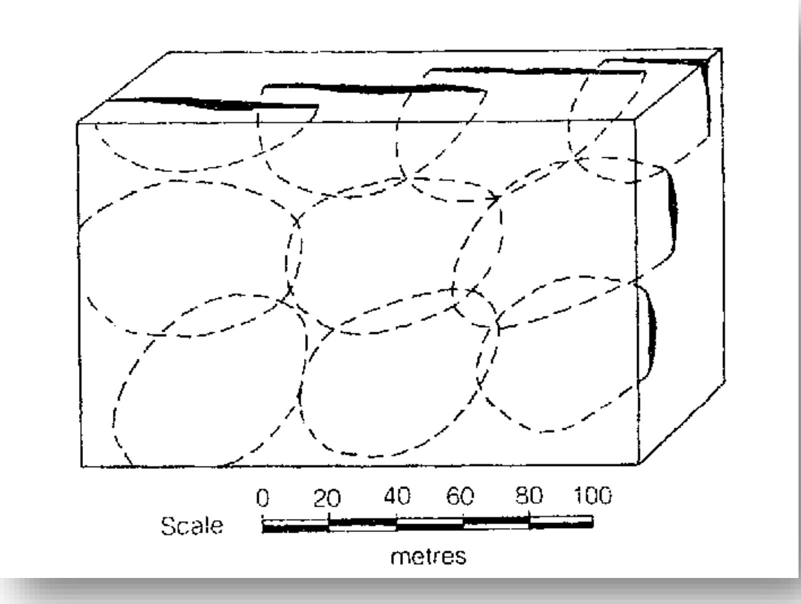


Figure 5.5 Block diagram of an idealised kimberlite dyke (from Clement, et al, 1973 in Gurney & Kirkley, 1996)

5.4 Nature of Deposits on the Property

This kimberlite system on Thorny River is composed primarily of two sets of *en-echelon* dykes (or fissures) which are magmatic (hypabyssal) in nature and represent the near root zone (called the Northern and Southern fissure systems, for ease of reference – **Fig. 5.6**). In addition, there are blows which exist in this system, generally where the dykes intersect the regional structure. Both blows and fissures can be commercially diamondiferous, as evidenced by the Marsfontein (volcanoclastic blow) and Klipspringer (magmatic dyke/fissure) mines.

The kimberlite fissures on Thorny River have a (currently known) combined strike length of some 3.4km. As is typical of most kimberlite fissures, these deposits pinch, swell and split both laterally and vertically, resulting in variable thickness of intersections. The kimberlite fissures range in thickness from a few centimetres to >3m, with the wider areas interpreted as blows along the fissures (**Plate 5.1**).

All kimberlites are Group 2 variety, coherent hypabyssal kimberlites with mineralogies dominated by olivine and phlogopite macrocrysts in a groundmass of apatite monticellite, clinopyroxene and richterite amphibole. Fine grained perovskite and opaques are also present. All kimberlites can be classified as apatite-bearing calcite phlogopite kimberlites (Robey, 2017). Textures vary between macrocrystic and aphanitic – with the aphanitic sections being of limited interest because of their low economic potential. To date, only minor amounts of aphanitic kimberlite has been noted in the logging and trench mapping. Where it has been identified, it is on a metre-scale. Since the grades are estimated on a bulk-sample basis, this “dilution” is factored in.

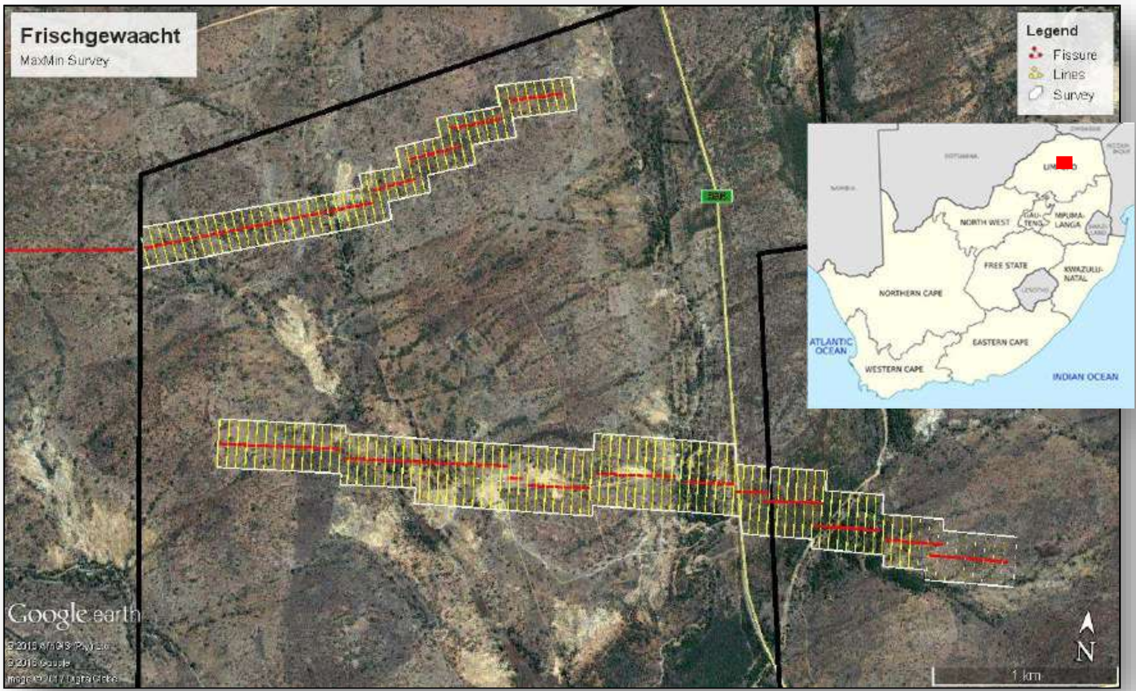


***Figure 5.6 Location of the Northern and Southern fissure systems on the Thorny River Project** (after Havemann, 2018)*

Plate 5.1 The trace of the Thorny River kimberlite fissure on Frischgewaagt showing the average width of 1-2m at surface

6 Exploration Data and Information

Vutomi has conducted exploration on Thorny River over a number of phases, beginning in 2011 and the latest phase ending in November 2017. All of the geophysical surveys were surveyed using either a differential or handheld GPS.

6.1 Geophysics

Vutomi applied a series of geophysical techniques comprising ground magnetics, electrical resistivity, ground penetrating radar, time domain electromagnetic (TDEM) and electro-magnetics using a CMD-4 conductivity meter, EM 34 and Apex MaxMin system.

6.1.1 Ground Magnetics – *August 2011*

Kai Batla MIC was contracted to undertake a high resolution magnetic survey over the kimberlite dyke on Frischgewaacht during 2011. The survey block was located over the linear grain anomaly. During ground checking of the anomaly, a number of old De Beers drill holes were seen and in places pieces of kimberlite were also seen. Given these observations, the author was confident on the positioning of the survey block. The survey block had dimensions of average 0.3km (north south) x 2.0km (east west).

A GEM GSM 19 magnetometer was used to acquire the data and a base station was set up to measure diurnal variations in the earth's magnetic field. The GEM GSM 19 was used in walk mag mode taking readings every 3 seconds. Survey lines were spaced at 50m (**Fig. 6.1**).

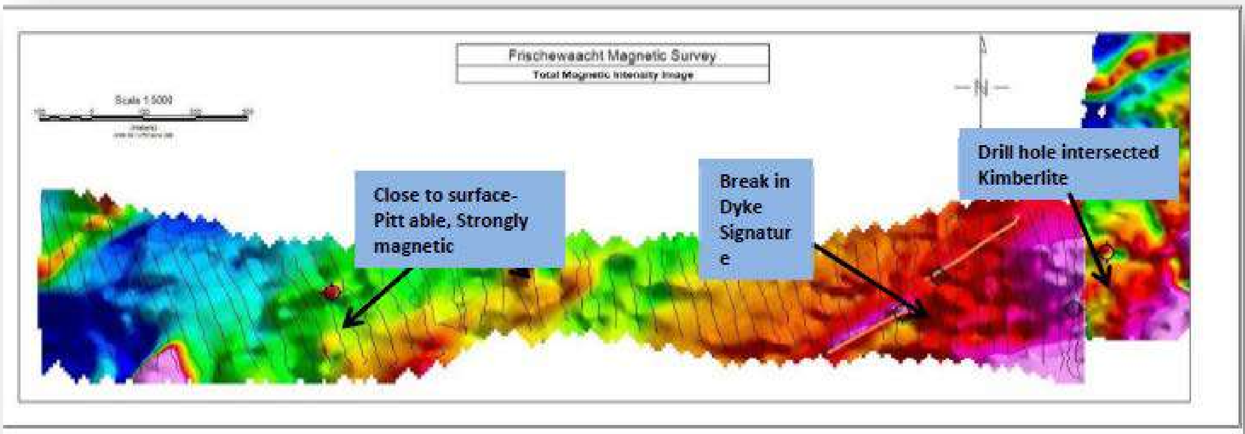


Figure 6.1 Ground Magnetics (Total magnetic intensity)

No east west trending linear magnetic anomaly coincident with the kimberlite dyke was seen. However, a total of five isolated anomalies along an east-west trend are evident. The dolerite dykes trending northeast- southwest are clearly visible. The breaks in the dolerite are interpreted as areas through which the kimberlite intruded. Other dipoles were interpreted as blows on the kimberlite dyke (**Fig. 6.2**).

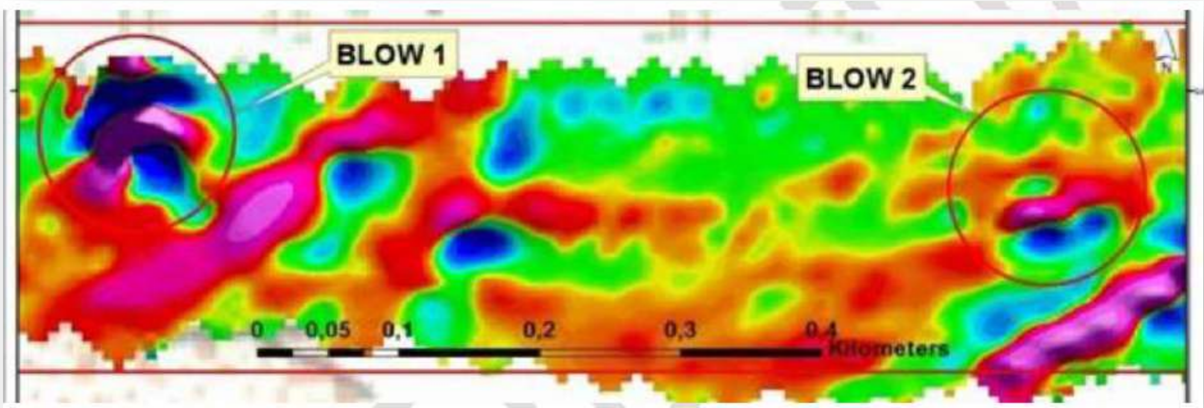


Figure 6.2 Detail of anomalies interpreted as blows on the kimberlite fissure.

6.1.2 Electrical Resistivity, Ground Penetrating Radar and CMD 4 Electro-magnetics – *July 2012*

Given that the ground magnetic survey was inconclusive in delineating the kimberlite dyke, Open Ground Resources (OGR) was contracted during July 2012 to identify a geophysical technique that would be successful. Three techniques were tested namely; electrical resistivity (ER), ground penetrating radar (GPR) and CMD 4 electro-magnetics.

The geophysical results were evaluated on site and the ER technique showed the most promise with prominent conductive anomalies observed in the target areas. The CMD data also showed some weak anomalies (conductors) which appeared to correspond with the known position of the kimberlite dyke. The results, however, were inconclusive and the survey was abandoned.

6.1.3 Time Domain Electromagnetics (TDEM) – *June/July 2014*

The Council for Geoscience was contracted to conduct a TDEM survey and the work was undertaken by Valeriya Zadorozhnaya. Electromagnetic (EM) techniques are used to map conductivity variations within the earth. A time-varying magnetic field is established by passing an electrical current through a closed loop of wire. This primary field generates eddy currents in a conductive medium. These eddy currents in turn generate a secondary EM field which is diagnostic of the electrical characteristics of the conductive medium excited by the primary field. Deep exploration work utilizes a large loop configuration while shallower detailed work utilizes small loops.

A total of 10 profiles, using a 20m x 20m closed loop and 5m stations spacing, were completed. Each profile was located across strike of the inferred position of the kimberlite dyke. This technique was successful in identifying conductive zones within the granite. These zones or breaks/structure in the granite were interpreted as being associated with kimberlite. Some of these targets were, subsequently drilled – see section 6.2 for details.

Although TDEM was successful in identifying the breaks/structure and, by inference, the kimberlite, it is extremely time consuming, laying 20m x 20m closed wire loop in bushveld vegetation and expensive. In addition, the type of TDEM system used is not commercially available and exclusive to the operator. All manuals and software are in Russian. Given these limitations, Vutomi sought a more effective geophysical method that would be able to delineate the kimberlite dyke over an expected strike length of several kilometres.

6.1.4 Frequency Domain Electromagnetics EM34 – *June 2015*

This survey was conducted by an independent contractor in June 2015. The EM34 system consists of two coils: one is the transmitter and the other one is the receiver. The transmitter is energized with an alternating current at a specific frequency. The primary magnetic field generated from the transmitter induces current in the subsurface. These currents generate a secondary magnetic field, which is detected, together with the primary field, by the receiver coil. The two main modes of operation were used: in the first mode (horizontal dipole mode, HDM) both coils, the transmitter and receiver, are located vertically; in the second mode (vertical dipole mode, VDM) the coils laid horizontally, on the surface.

The survey block had dimensions of 350m (north south) x 900m (east west) and was positioned over the kimberlite dyke on Thorny River. Survey lines were spaced at 50m with survey stations being 10m apart. In areas where the instrument picked up anomalous readings, or when close to the kimberlite, station spacing was adjusted to 5m. The location of the dyke was interpreted from the EM data (**Fig. 6.3**) and used to sight boreholes for the next phase of exploration.

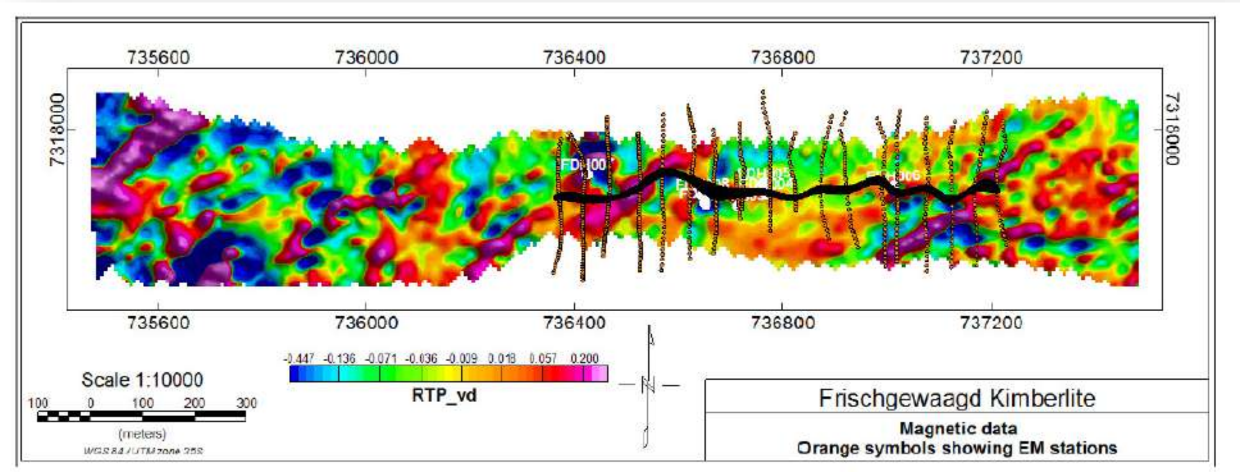


Figure 6.3 Location of the kimberlite dyke, as interpreted from the EM34 survey.

6.1.5 Frequency Domain Electro-magnetics MaxMin (2017)

During May and June 2017, a FDEM survey was undertaken by GeoFocus. The aim of this was to delineate the lateral strike extent of the kimberlite fissure system and identify any potential blows.
Two target areas were identified (**Fig. 6.4**):

- The one target is located in northern extent of the project, on Hartebeesfontein 62 KS, covering a strike length of approximately 2.5km with a north-east strike.
- The second target area extended 4.5km due east across the central portion of Frischgewaagt 88KS, and into the adjacent property, Doornrivier 86 KS.

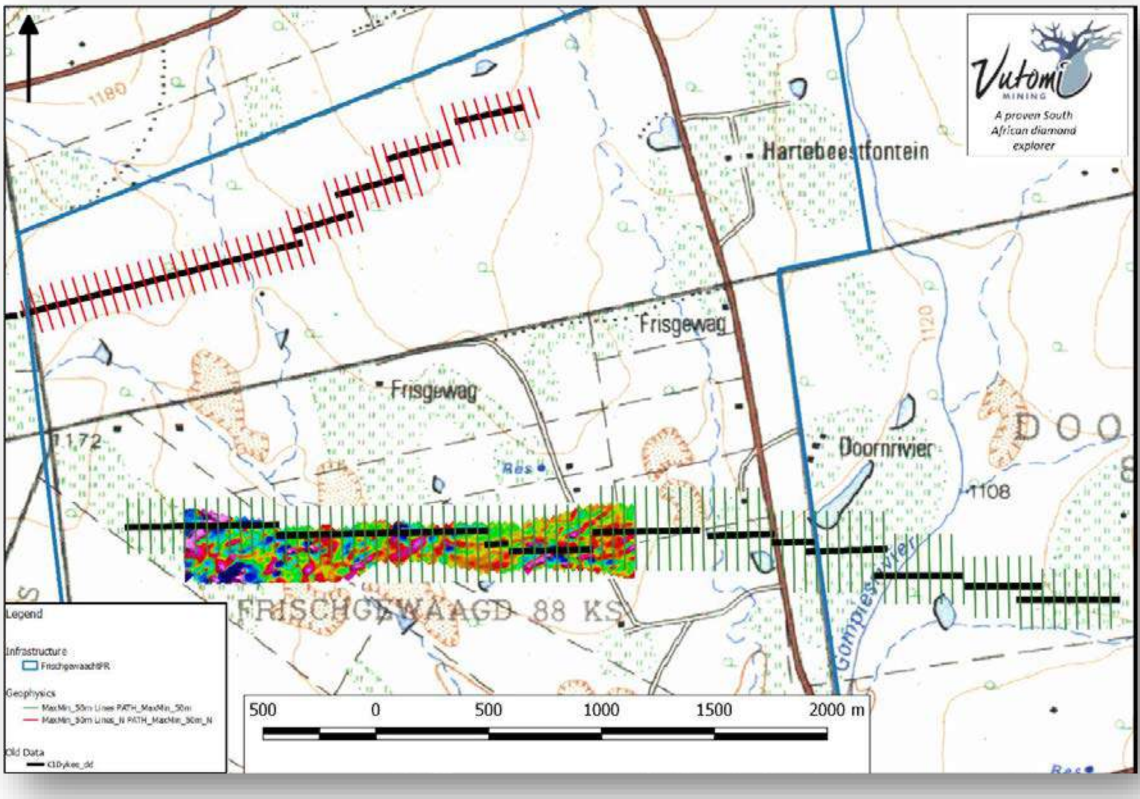


Figure 6.4 Location of the 2017 FDEM survey

Survey parameters were planned at 50m line x 5m station spacing. Surveys were conducted using an Apex MaxMin with a coil spacing of 25m acquiring data over two frequencies (3520Hz and 1760Hz). A 1st pass coverage at 100m line spacing was conducted to ascertain the efficacy of the technique as well as identify areas where an alternative technique or survey configuration would be required, example thick and/or conductive overburden. Ground magnetic data were also acquired, at 50m line spacing, using GEM GSM-19 Overhauser Magnetometers, the latter data were required in support of prioritising FDEM anomalies. **Table 6.1** below summarises the relevant survey statistics.

Table 6.1 Statistics for the 2017 FDEM Survey

Technique	Survey	Line Spacing	Station Spacing	Line-km	Stations	Note
FDEM	Frischgewaagt S	100m	5m	14.56	2,966	Orientation N-S
	Frischgewaagt N	100m	5m	5.42	1,116	Orientation NNW-SSE
			Total	19.98	4,082	
Ground Mag	Frischgewaagt S	50m	~1.5m	32.33	27,446	Orientation N-S
	Frischgewaagt N	50m	~1.5m	11.92	10,804	Orientation NNW-SSE
			Total	44.25	38,250	

FDEM profile (line) data were analysed, together with ground magnetic data, to produce a list of graded targets. These targets were integrated with FDEM and GM contour maps, Google Earth Landsat imagery and mapped data (geology, drainage and structure) to produce final graded anomalies. Anomaly grades (1 = Good / 2 = Moderate / 3 = Poor) were based predominantly on the FDEM profiles, with the known kimberlite fissure signature 'fingerprint' used as baseline. Anomalies were prioritised for drilling providing an estimate of width[4] (less or more than 3m) as well as lateral strike extent.

6.1.6 High Resolution FDEM (Phase 1) and ERT (August 2017)

Following the completion of the reconnaissance phase Max-Min frequency domain electro-magnetic surveys (FDEM) in June 2017, a total of 45 targets (15 over the northern Hartebeesfontein fissure and 30 over the southern Frischgewaagt-Doornrivier fissure) were selected for further follow up by GeoFocus. Through a combination of geological mapping and ground truthing, a total of 14 targets were selected for drilling and 3 for follow up geophysics. 'In-fill' Max-Min surveys were conducted between 7 and 9 August including electrical resistivity tomography (ERT) test surveys conducted between 9 and 11 August.

In-fill FDEM was surveyed at the same coil spacing (25m) and frequencies (3520Hz and 1760Hz) as the original survey over lines spaced 25m apart located in between the original 100m lines. Survey statistics are presented in **Table 6.2** below. The survey was aimed at better defining the fissure over the previously drilled and/or excavated portion of the Frischgewaagt fissure so that an additional drilling programme could be planned.

Table 6.2 Statistics for the 2017 high-resolution FDEM survey

Technique	Survey	Line Spacing	Station Spacing	Line-km	Stations
FDEM	FS05	25m	5m	3.05	638
	FS18	25m	5m	2.67	556
	FS14	25m	5m	1.7	354
			Total	7.42	1,548

In addition, three ERT lines were surveyed over selected targets from the Frischgewaagt and Hartebeesfontein fissures (**Fig. 6.5**). The surveys were aimed at establishing the efficacy of ERT (resistivity) in mapping kimberlite in the following situations: 1) thick and/or conductive overburden, 2) geological complexity and 3) depths of between 30m and 60m.

Based on the results, a total of 15 borehole locations (10 over the southern fissure and 5 over the northern fissure,) were identified roughly 15m away from the anomaly centre. Boreholes were positioned so that the drilling azimuth is perpendicular to the assumed target strike direction. These holes were drilled during the September/October drilling programme and the results will be described below (Section 6.2.3).

[4] Width calculations were complicated by the very narrow nature of the fissures (mostly <3m) which is less than the station spacing and the non-perpendicular orientation of the lines to target in places. Hence width was only presented as likely less than 4m or possibly more.

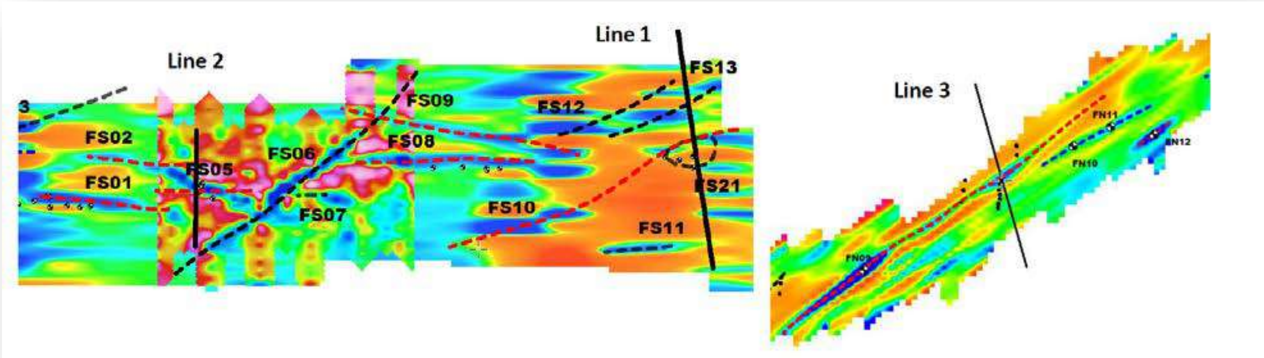


Figure 6.5 Location of the ERT survey lines on Frischgewaagt (1 & 2) and Hartebeesfontein (3)

6.1.7 High resolution FDEM (Phase 2)

Based on the results of the previous geophysical surveys, combined with the initial drilling, GeoFocus was contracted to complete a Phase 2 DEM (Max-Min) survey over two portions of Thorny River (**Fig.6.6**).

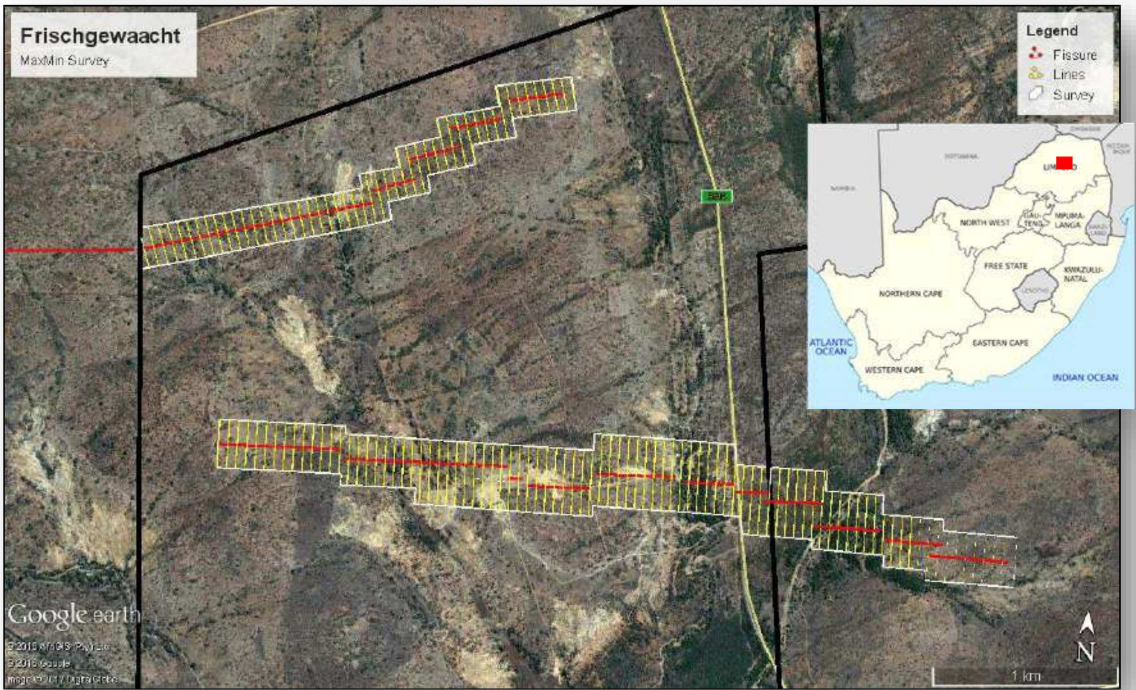


Figure 6.6 Location of the Northern and Southern survey areas on the Thorny River Project

The details of this programme are summarised below from Havemann's report of 1 October 2017. All diagrams and tables are taken from this document.

High resolution FDEM together with GM (ground magnetics) was acquired at 25m line-spacing intervals, spaced between the original 100m line-spacing reconnaissance phase lines (**Fig. 6.7, Fig 6.8 and Table 6.3**). The coil separation was predominantly 25m with a section surveyed at 50m separation; a station spacing of 5m was maintained throughout. Two frequencies, namely 3520 Hz and 1760 Hz, were acquired during the reconnaissance and high-resolution phase-1 with the 3520 Hz frequency dropped in favour of a lower (880 Hz) frequency during phase-2 of the high- resolution surveys.

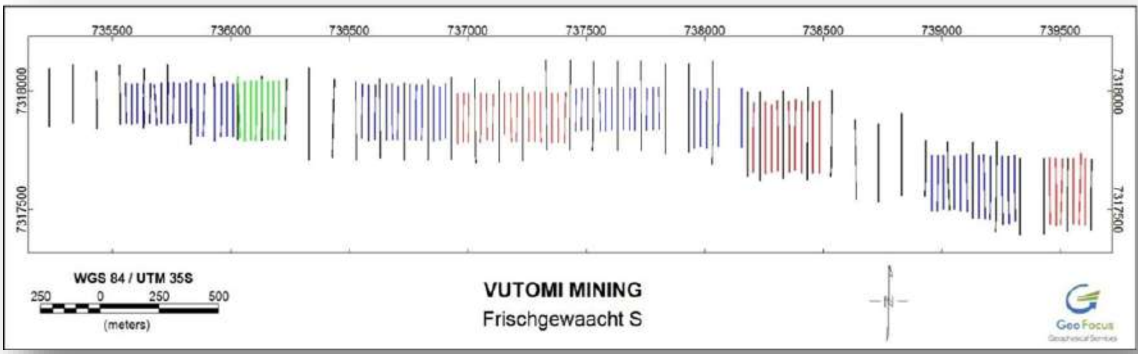


Figure 6.7 Survey lines on the Southern fissure system. Reconnaissance (black), high resolution phase-1 (red) & phase-2 (blue: 25m & green: 50m coil separation)

Table 6.3 Survey statistics for the Phase 2 high resolution FDEM survey

Phase	Coil Separation	Line Spacing	Station Spacing	Line-km	Stations
Reconnaissance	25m	100m	5m	19.98	4,082
High res phase-1	25m	25m	5m	7.42	1,548
High res phase-2	25m	25m	5m	26.23	5,454
High res phase-2	50m	25m	5m	1.99	412
			Total	55.62	11,496

The combined reconnaissance and follow-up MaxMin surveys' results on the southern portion of the fissure system on Frischgewaagt (**Fig. 6.9**) suggest an 'en echelon' kimberlite fissure with a predominantly E-W to ESE-WNW strike, pinching and swelling over a total distance of approximately 3.7km. The combined strike length of the fissure, inferred from drilling and geophysical data, amounts to approximately 2.2km. A reliable estimate of the width of the fissure over the strike length of the body could not be made as it is mostly less than the station spacing of 5m. Other conductors mapped within the study area are associated with the dominant, NE-SW striking, dolerite dykes and to a lesser degree amphibolites and sediments as were intersected.

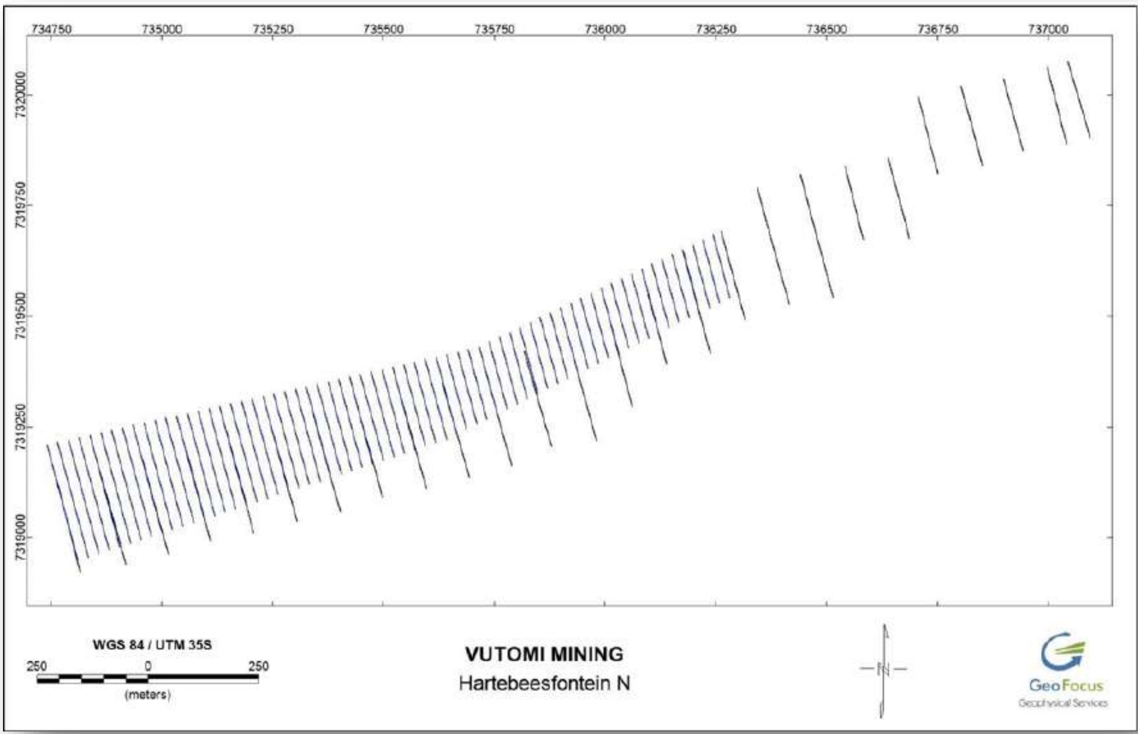


Figure 6.8 Survey lines on the Northern fissure system. Reconnaissance (black), & phase-2 (blue)

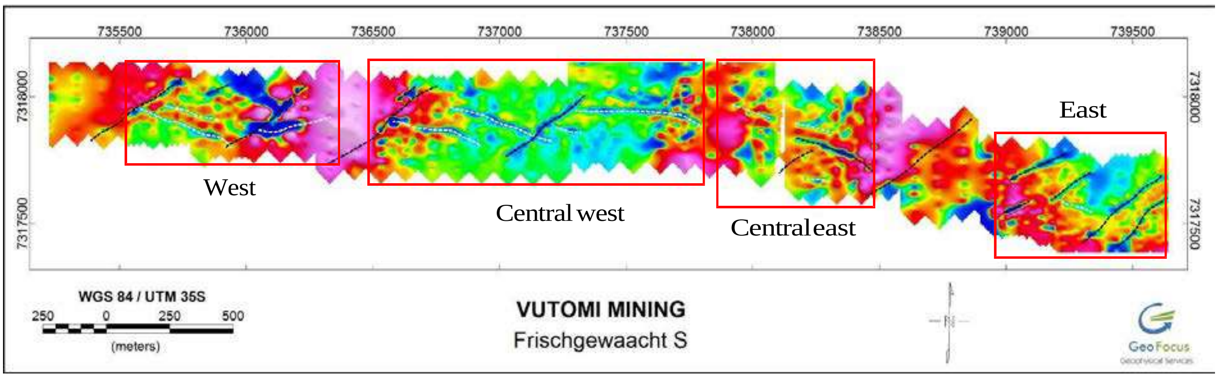


Figure 6.9 Combined FDEM (QP-1760Hz) results for Thorny River (Southern portion) showing inferred kimberlite fissures (white dash) & dolerite (black dash)

Drilling and geophysical results on the Northern section of the fissure system on Hartebeesfontein suggest that the fissure has an E-W strike on the west of the survey changing to a NE-SW strike toward the centre and northeast **(Fig. 6.10**). Dolerites maintain the NE-SW strike observed throughout the study area. The anomalies are observed over a distance of 1.8km with a combined strike length of approximately 1.2km.

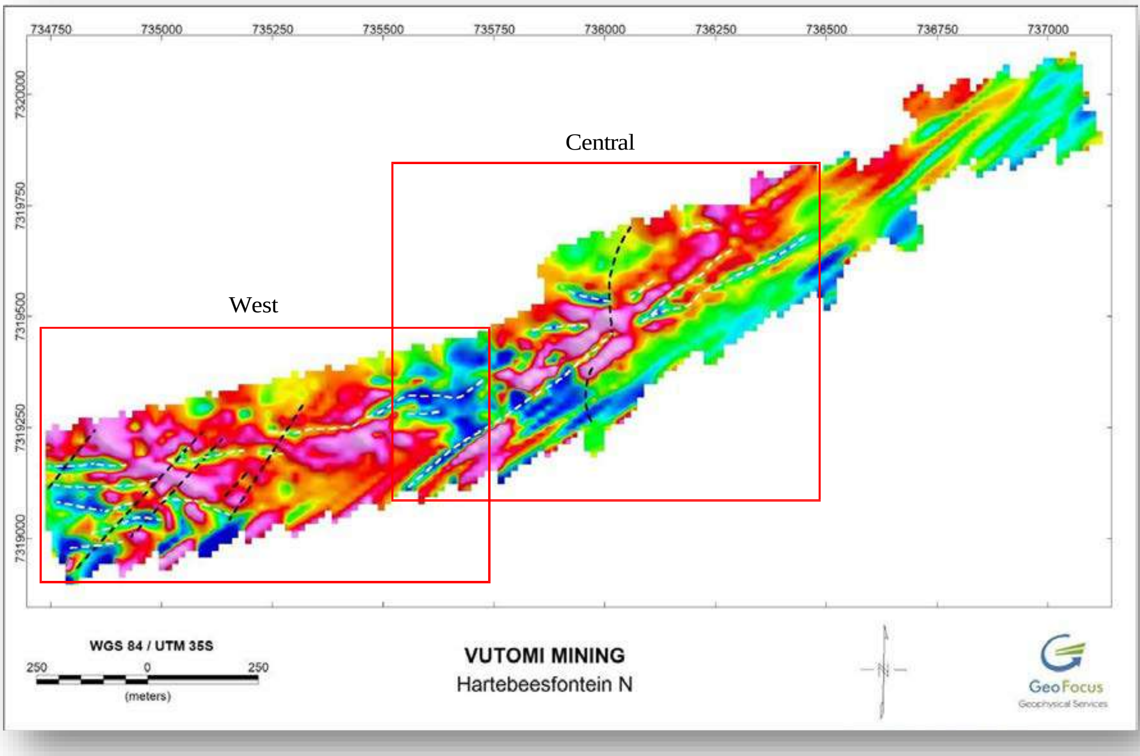


Figure 6.10 Combined FDEM (QP-1760Hz) results for Thorny River (northern portion) showing inferred kimberlite fissures (white dash) & dolerite (black dash)

Ground magnetic data confirmed that all of the kimberlites are largely non-magnetic. The lower 880 Hz frequency corroborated the 1760Hz results indicating continuity, the latter limited to the depth penetration of the system and configuration estimated to be around 30m

6.2 Drilling

Vutomi has conducted a number of drilling[5] programmes on Thorny River (**Fig. 6.11**).

1. Vutomi undertook a limited (percussion) drilling exercise during September 2014 to test a consolidated suite of targets generated by all the geophysical work.
2. A second percussion programme was completed by Vutomi during Jan/Feb of 2017 – this programme was done to delineate the kimberlite extent on the Property. 34 Percussion holes (1,459m) and nine diamond drill (core) holes (482m) were drilled.
3. During March 2017, a core drilling programme was initiated. The objective of this programme was to delineate the extent of the kimberlite and recover sample for petrographic analysis. A total of nine holes were drilled to a total of 412.28m
4. Delineation and deep drilling programme during September/October 2017 was planned to provide additional information relating to the morphology of the kimberlite and to assist in the volume estimation.

[5] Historical drilling by De Beers – since no information is available for this programme, mention is made of it only for completeness.

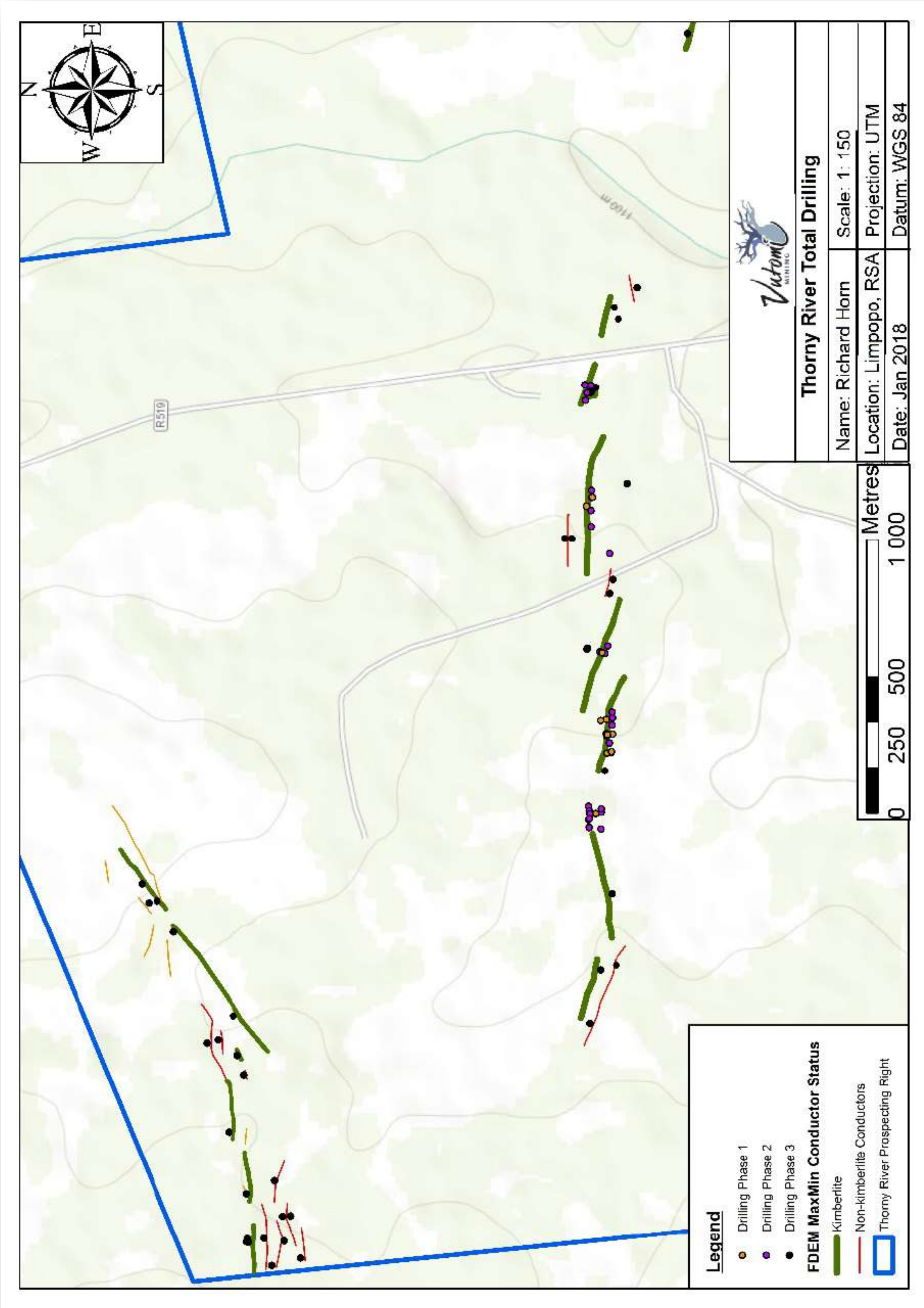


Figure 6.11 Drilling locations on Thorny River

The drilling has all been sited (on the geophysical data) by means of a handheld GPS (Garmin 76C) of which the lateral accuracy can be as low as 10m. However, since the holes were all sited relative to each other, the levels of inaccuracy are within the tolerance for volume estimation of an Exploration Target.

6.2.1 September 2014 drilling programme (Phase 1)

During the September 2014 drilling programme, a total of 10 rotary percussion holes with accumulative depth of 342m were drilled.

A total of 10 rotary percussion holes with accumulative depth of 342m were drilled by C Malan, a local driller. Four holes intersected kimberlite, two of which were coincident with blows identified by the magnetic survey. A 4kg sample comprising -1mm material obtained from kimberlite drill chips were collected and submitted for heavy mineral and mineral chemistry work. Additionally, some 240kg of fresh kimberlite drill chips was collected reserved for microdiamond work.

6.2.2 H1/2017 drilling programme (Phase 2)

During the H1/2017 drilling programme, (January-March) 19 inclined and three vertical percussion holes were drilled, followed by nine cored boreholes.

a. The Percussion drilling was completed by Waterman Drilling & Pumps (Pty) Ltd ("Waterman") using a 6.5inch hammer. Samples were collected every meter, washed in a 2mm and 1mm sieve and bagged into a 50kg sample bag after logging. The different lithological units observed in the holes includes top soil, weathered granite, fresh granite, dolerite, quartz (mostly in the form of veins), weathered kimberlite (green clay) and fresh kimberlite. The logging was qualitative, rather than quantitative and was purposed towards identifying the location and extent of the kimberlite.

b. During March 2017, a core drilling programme was initiated. The objective of this programme was to delineate the extent of the kimberlite and to supplement the available information.

   Drilling was conducted by Waterman using an XY44 Commen Spindle rig that is towed by a tractor and provides a NQ 47.6mm diameter core (**Plate 6.1**). The XY-44A core drill rig utilises diamond bit (yellow synthetic diamonds) or tungsten-carbide-tipped bits and is aligned with a water brake. It is fed with double cylinders that travel much longer. Its oil is supplied in two opposite directions by hydraulic spider disk with a hydraulic lock. It is widely used in mineral exploration, hydrology well drilling and basic pile engineering.

   A total of nine core-boreholes were drilled – seven inclined at 60^{o} and two are vertical (to a total of 412.28m, with some 43.83m of kimberlite intersected). The holes were sited based on the results of the previous percussion programme. All core drilling was completed with diamond drill-bits. All diamonds used in the drill-bits are specified to be yellow synthetic stones to allow for ease of discrimination, should any be lost into the bulk-sample.

   Samples from the core were submitted for petrographic analysis – both macroscopic and microscopic (see section 6.4). The rest of the core has been retained for microdiamond analysis.

Plate 6.1 Drilling rig used by Waterman to provide NQ 47.6mm diameter core on the Thorny River project

Kimberlite intersections (in the 2017 core drilling programme) are shown in **Table 6.4**. It is apparent that the thickness of the kimberlite intersections varies across the dyke system, with kimberlite intersected at shallower depth in the East (approx. 20-30m) and slightly deeper towards the West (+30 to +40m), where it is darker and fresher in the core. Although the holes were drilled at 60°, it is not known what the intersection angle with the kimberlite is. The thicker intersections at FDC008 and FDC009 have been interpreted as two separate blows on the dyke, which may be misleading since both are vertical holes.

All of the core from the drilling programmes is currently stored at a temporary core-shed on site. These will be kept until required or until the project is terminated or progresses to a point, beyond which it no longer requires access to the core. At that stage, the core will be donated to an institution (such as the University of Johannesburg) where it can be used to assist academic research.

Table 6.4 Kimberlite intersections of the core boreholes

Drill hole	Easting	Northing	Elevation	Azimuth	Dip	Depth	Kimberlite thickness[6]
FDC001	29,334	-24,234	1128	360	-60	51,28	2.0
FDC002	29,3341	-24,234	1125	180	-60	28,83	2,78
FDC003	29,3305	-24,234	1117	360	-60	56,23	2,50
FDC004	29,3278	-24,234	1122	180	-60	45,25	0
FDC005	29,3281	-24,234	1120	360	-60	55,7	2,79
FDC006	29,3396	-24,234	1112	360	-60	36,01	1,30
FDC007	29,3437	-24,233	1112	180	-60	55,09	5,35
FDC008	29,3341	-24,234	1121	0	-90	39,02	19,02
FDC009	29,3437	-24,233	1113	0	-90	44,87	8,09

[6] Downhole length, true width not known

6.2.3 H2/2017 Delineation drilling programme (Phase 3)

The delineation drilling programme during September/November 2017 was planned to provide additional information relating to the morphology of the kimberlite and to assist in the volume estimation.

This programme comprised delineation drilling, deep drilling and pilot drilling (**Table 6.5**). Drilling was completed by Waterman using a tracked Thor RC (Reverse Circulation) rig with a 6-inch bit. In the RC method of drilling, drill chips are evacuated from the bottom of the hole by means of compressed air and blown out to surface through the middle of the drill rods into a cyclone where it was collected in sausage type sample bags.

The samples recovered from the drill rig were hand washed through two sieves placed on top of each other. The coarse material was collected in a 2mm sieve, and the fine material was collected in a 1mm sieve which collected the material from beneath the 4mm sieve. Samples were collected at 1m intervals and when close to predetermined kimberlite intersections this interval was reduced to 0.5m.

Table 6.5 Summary of H2/2017 drilling

Drilling Project Summary									
Drilling Programme	Drilling Methodology	Metres Planned	Metres Drilled	Difference (metres)	Number of Holes	Kimberlite Occurance	Causative Bodies Intersected	Comment
Deep Hole Drilling	6" Reverse Circulation	150	168	-18	3	1	N/A	Despite drilling 318 metres, 150 metres drilled does not get totalled in due to abandonment of holes
Delineation Drilling		1600	1453	147	35	15	27	243.5 under budget due to all targets being drilled.
Pilot Drilling		200	85,5	114,5	3	2	N/A	Abandoned due to change in bulk-sampling methodology
Total		1950	1706,5	243,5	41	18	27	

6.2.3.1 Pilot Drilling

A pilot drilling phase commenced as a forerunner to a proposed Large Diameter Drilling phase ("LDD") as a means of bulk-sampling the kimberlite. Only three holes were drilled to a total of 85.5m before inconsistencies with the fissure geometry indicated that LDD would not be a viable bulk-sampling method and the pilot drilling programme was suspended.

6.2.3.2 Delineation Drilling

Holes were sited on geophysical conductors (**Figs. 6.12 and 6.13**). A total of 35 were drilled to a total of 1,453.5m. The drill holes were sampled at 0,5m intervals. The holes typically intersected the causative body at a declined depth of 25 – 35m, which equates to a vertical depth of between 12.5m and 17.5m.

Of the 35 holes drilled, 17 intersected kimberlite. Of the 18 that were negative, only six holes did not identify causative bodies. Non-kimberlite causative bodies intersected included a green slate, dolerite, pegmatite, amphibolite and brown clays without kimberlite indicator minerals.

The kimberlitic intersections averaged some 2m in thickness which, at a 60° declination, translates into an average thickness of approximately 1m assuming that the fissures are perfectly vertical. For comparison, most economic kimberlite dykes in South Africa average 60-80cm in width (Gurney & Kirkley, 1996); this could indicate that the dykes are not perfectly vertical (giving the indication of a thicker dyke than in reality, or the dykes might actually be wider than known elsewhere – a possibility highlighted by the 2m thick outcrop identified in the bulk sample (cf. Fig 6.14).

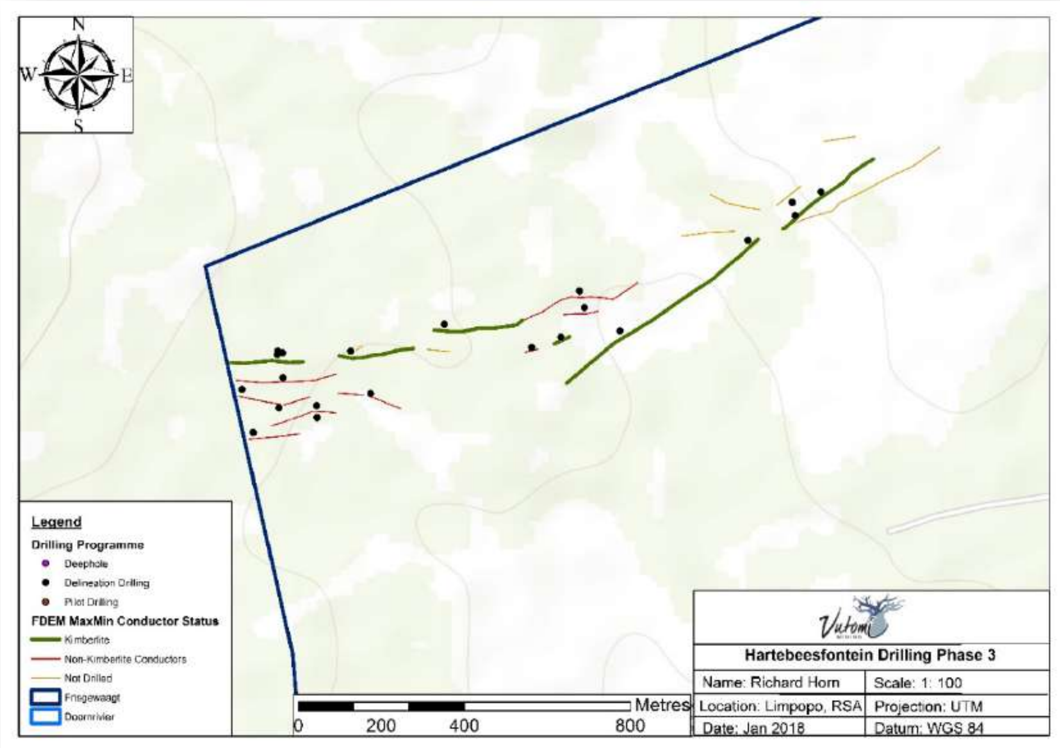


Figure 6.12 Location of 2017 drilling on Hartebeesfontein

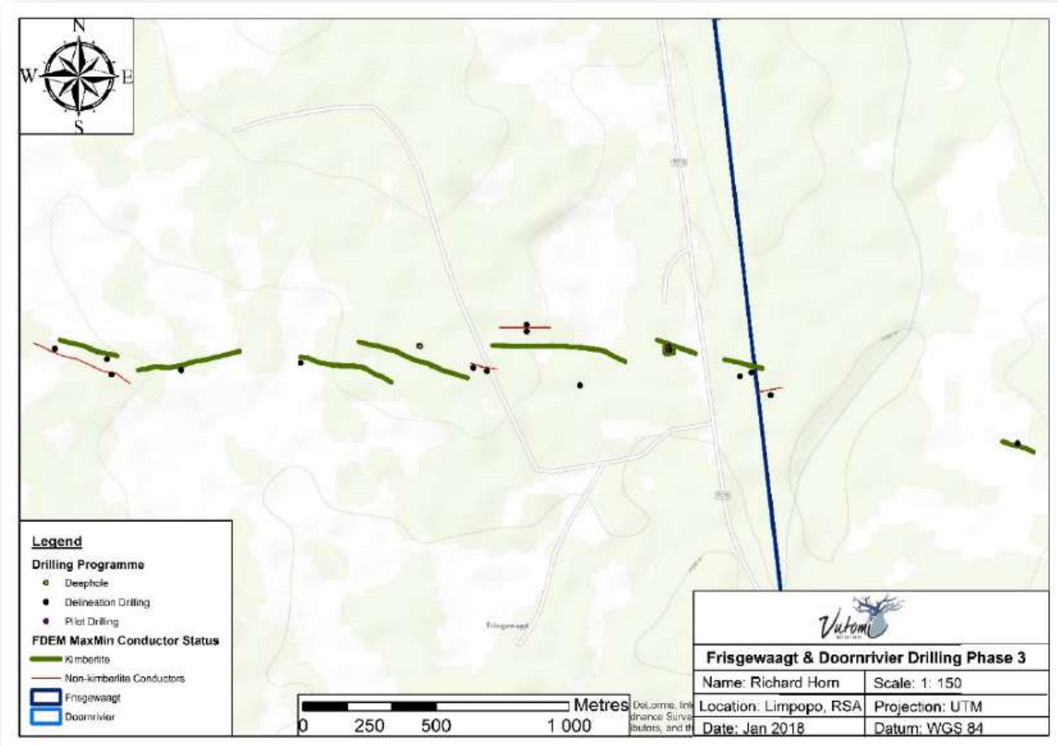


Figure 6.13 Location of 2017 drilling on Frischgewaagt/Doornrivier

The delineation drilling programme identified some 3,410m strike length of kimberlite, comprised a number of segments varying in length from 125-754m. Both small blows and bifurcations are seen to occur in three dimensions.

Geophysical conductors sub-parallel to the known fissures were shown not to be kimberlite – highlighting the importance of extensive drilling so as not to over-estimate the amount of kimberlite in the system.

6.2.3.3 Deep Drilling

Two deep holes were planned to intersect the kimberlite fissure at some 100m, to demonstrate depth continuity. The first deep hole was drilled with percussion in a previous exploration phase. This vertical hole intersected kimberlite multiple times. The hole was stopped in kimberlite at 100 metres depth. The second deep hole intersected kimberlite at 80m.

6.2.4 Drilling Results and Interpretation

Drilling of a kimberlite deposit is, primarily, used to delineate the body, define thicknesses and depths of intersections for volume determination. However, since only RC drilling took place, it has not been possible to estimate the true thicknesses of the kimberlite fissures.

The initial drilling indicated that the dyke is not a single continuous body but comprises of a series of en-echelon segments of varying width and lengths. The mineralogy of the kimberlite is also seen to vary across the dyke segments. The core logging is qualitative in nature and is geared toward petrographic interpretation and is appropriate to the level of Diamond Exploration Target estimation.

6.3 Sampling

In exploration/prospecting of kimberlite deposits, drill samples are taken to separate kimberlitic indicator minerals (“KIM”), especially garnets, for mineral chemistry analysis and microdiamond assessment (**Fig. 6.14**).

- Garnet analysis is used to get a qualitative indication of grade potential prior to initiating a full exploration programme. The results are insufficient to use in Diamond Resource estimation, however, are extremely useful to rank exploration targets and to identify drill targets.
- Microdiamond analysis is a more quantitative method of estimating grade. However, diamond value cannot be obtained from microdiamonds

In all cases, the entire kimberlite intersection sample is taken for KIM or microdiamond analysis – the details of the methods are described below. Percussion (or core) samples are not split or divided in any way. Diamonds are not evenly spread in a kimberlite so, keeping half/quarter samples as a check would not serve any purpose. Additionally, the numbers of individual grains/microdiamonds in the check sample would be too small to be meaningful.

A single 4kg sample comprising -1mm material obtained from kimberlite drill chips (from the 2015 percussion drilling programme) were collected and submitted for heavy mineral and mineral chemistry analysis.

In addition, a sample of 240kg of fresh kimberlite drill chips was collected and stored for microdiamond assessment during October 2017 (**Fig. 6.14**).

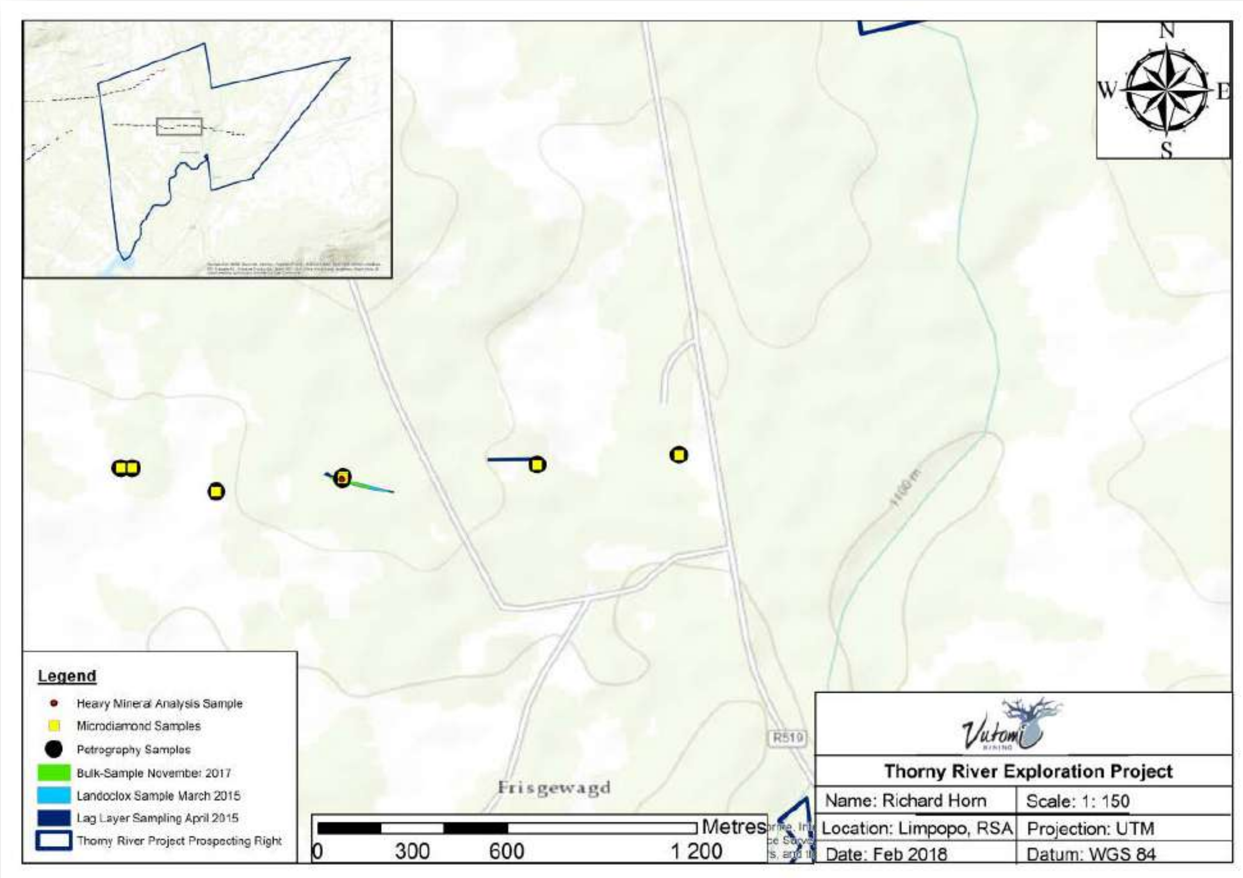


Figure 6.14 Sample localities on the Thorny River Project

6.3.1 Heavy Mineral Sorting ("HMA"), 2014

In 2014, The MSA Group (Pty) Ltd ("MSA") was contracted to undertake the processing of approximately 4kg of screened kimberlite sample (smaller than 1.0mm) for KIM recovery, and analyses of their mineral chemistry by electron microprobe to interpret the diamond potential of the primary source of these indicators (Cronwright, September 2014). MSA is an ISO9001 certified Company and an ISO/IEC 17025 SANAS accredited testing laboratory (#T0544)[7].

The screened drill chip sample with a dry weight of 6.76kg was assigned the MSA internal lab number S2913. The -2.0mm+0.3mm fraction was treated with TBE (tetra bromoethane) and the heavy mineral residue leached by HCl (hydrochloric acid) to produce a 12.8g concentrate which was sorted down to 0.3mm by competent mineral sorters using stereomicroscopes. In total, 404 kimberlitic garnets (mostly mauve, some orange and few cerise), 25 chrome diopsides, 78 high-interest spinels and 79 olivines were recovered. Due to abundance of grains, the residue was not stripped of all minerals.

[7] The Primary author and technical signatory to the report is Hilde Cronwright (Laboratory Manager), who is registered with SACNASP and qualified to act as a Competent Person in this matter.

6.3.1.1 Kimberlite Indicator Mineral ("KIM") Sampling

Two-hundred of the garnet grains from the -1.0 +0.5mm size fraction were selected for microprobe analyses (Cronwright, October 2014) as they appeared to be fresh, whereas the +1mm size fraction garnets appeared to have internal kelyphite (weathering mineral in cracks and fissures) and would not polish well for microprobe analysis.

The number of garnet grains of each colour that were selected for microprobe analyses were selected according to the approximate proportions they were found in the residue: in total, 200 garnets were selected for analysis that comprised 140 mauve and 20 cerise (peridotitic garnets) and 40 orange garnets (eclogitic or megacrystic garnets). No chrome diopsides, ilmenite or spinels were selected for microprobe analysis at this stage, but they are stored on mineral cards at MSA for future examination.

In addition to the 200 grains selected for microprobe analysis, nine (9) extra garnet grains were submitted in case a grain was lost during mounting or polishing of the grain mount. No grains were lost, 209 analyses were done but three (3) mauve garnets analysis did not have acceptable totals and were not reported. Results for grains labelled Gar072, Gar098 and Gar 099 were removed from the dataset when plotting the results.

Based on electron microprobe mineral chemistry analysis (carried out by the Analytical Facility at the University of Johannesburg – an approved service provider to MSA), all garnets are confirmed to be of kimberlitic origin which confirmed the initial visual classification. The garnet results were classified based on their mineral chemistry into different garnet types (G1-G10) based on the system of (Grutter, Gurney, Menzies, & Winter, 2004). The geochemical classification of eclogitic garnet corresponded well to the visual classification. Only one orange garnet (Gar177) was re-classified (based on mineral chemistry of 1.46% Cr_2O_3 wt %) to be of peridotitic rather than eclogitic origin.

Around 54% of garnets fall into the G9/G5 category (garnets that originate from lherzolites and websterites); 19% fall in the G10 field (garnets originating from harzburgites) and 14 garnets (7%) in the G10D (diamond inclusion) field. 42 eclogitic garnets (with Cr_2O_3 less than 2%) fall in the G3 & G4 (eclogitic and megacrystic garnet) fields (**Fig. 6.15**).

The G10D garnets, plotting within the diamond inclusion field, indicate the possibility of peridotitic diamonds sampled by the kimberlite from which this sample has been taken. In addition, there is a population of eclogitic Group 1 garnets (18 out of the 42 eclogitic grains) which suggests the source may also contain diamonds of eclogitic origin (**Fig. 6.16**). Sample S2913 has a significant population of eclogitic Group 1 garnets (18 of the 42 eclogitic grains) which suggests the source has good eclogitic diamond potential. Eclogitic garnet included in diamond are known to commonly have $Na_2O > 0.07$ wt. % (Grutter, Gurney, Menzies, & Winter, 2004). 43% of the eclogitic garnets for sample S2913 plot in the Group I eclogitic field and such garnets are related to diamond from eclogitic sources in the upper mantle. The kimberlite from which these garnets originate from may, therefore, have eclogitic diamond potential.

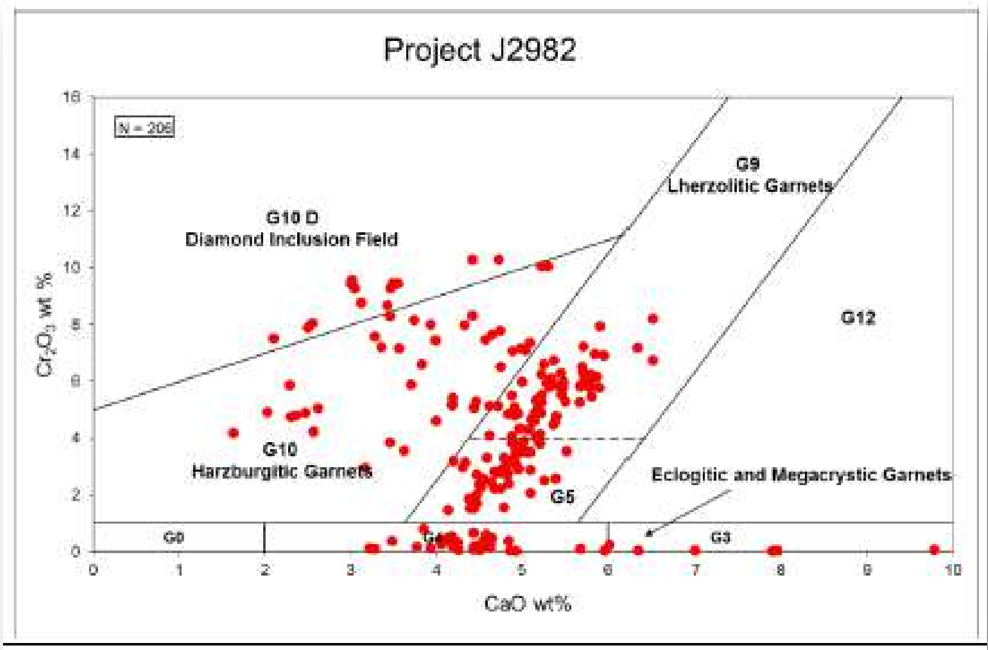


Figure 6.15 Cr2O3 (wt %) vs. CaO (wt %) for garnets from sample S2913.

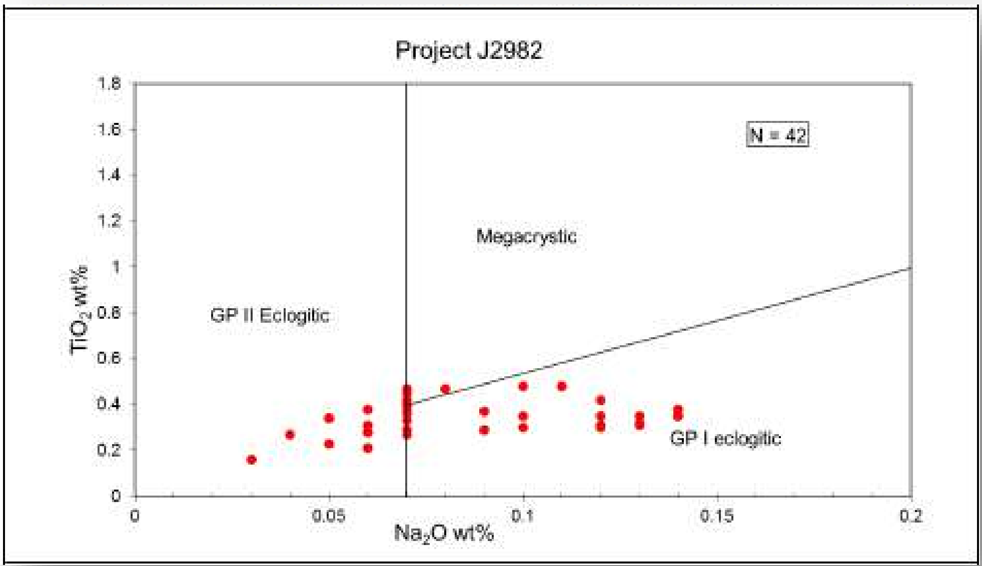


Figure 6.16 TiO2 (wt %) vs. Na2O (wt %) for all garnets with less than 1 wt% Cr2O3 from sample S2913.

6.3.2 Contractor bulk-sampling

In 2015, Vutomi Mining entered into an operations agreement with Landoclox whereby Landoclox would conduct the bulk-sampling activities in four phases:

Phase 1 – Landoclox would extract a total of 250 tonnes of kimberlite from the dyke on Frischgewaagt to determine the diamondiferous nature of the kimberlite and get an indication on stone values. The material was to be trucked through to Wolmaransstad and processed.
Phase 2 – Should the results of Phase 1 prove viable, Landoclox would proceed to Phase 2 which would comprise drilling a few more exploration holes to provide further resolution on locality and morphology.
Phase 3 – Should Phase 2 prove viable, Landoclox would establish a diamond processing plant on-site, at Frischgewaagt.
Phase 4 – This phase would comprise sampling under a bulk-sample permit. This phase would continue until conversion to mining right or to a maximum of 180,000 tonnes.
Phase 1 commenced on 23rd February 2015 and was complete by 4th March 2015. Landoclox used two excavators (a 20T Caterpillar and a 45T Hyundai), to conduct the earth works. Excavations commenced at drill hole FDH006 (ref **Fig.6.14**) where the kimberlite was at its shallowest and known to contain a blow. Weathered kimberlite was encountered at a depth of 4 – 5m.

The contact between the weathered granite and weathered kimberlite was gradational. From approximately 4m, the weathered kimberlite comprised grey green clay occurring interstitially between highly altered but more resistant kimberlite and granite from clast to boulder size. The amount of grey green clay decreased with depth. Although highly altered, much of the kimberlite remained very hard and appeared silicified containing macrocrysts of phlogopite and olivine. The trench reached a maximum depth of 8m and in predominantly weathered kimberlite. At drill hole FDH006 the kimberlite width increased with depth and was at least 2m wide at 8m depth. At this depth both sidewalls were in kimberlite. The trench was advanced 40m to the east and a sample was extracted from between 5m and 8m depth. Typical pinching and swelling of the kimberlite dyke was observed along the 40m strike. A total of approximately 310 tons of kimberlitic material comprising green grey clay, weathered kimberlite, silicified kimberlite and granite were extracted.

The sample was trucked through to Wolmaransstad for processing. The trucks were weighed at a weighbridge along the N1 highway. These weights were used to estimate the total tonnage of 310 tons.

The sample was processed using a scrubber and a 16-foot rotary pan with a bottom cut-off set at 2mm. It should be noted that no crushing was done during the treatment process and therefore a significant amount of material (estimated at some 20T) was returned as oversize and remained untreated. The concentrates produced by the rotary pan was X-ray sorted using a FlowSort, followed by a final hand-sort. A total of 30.42ct (42 stones) were recovered (**Plate 6.2**). The diamonds recovered were valued and sold at the tender house in Wolmaransstad for an average of USD345/ct.

Given the diamond content and quality obtained from the 310T test sample, Landoclox decided to omit Phase 2 drilling and continue directly to Phases 3 and 4.

Phase 3 commenced in April 2015 and included the procurement, mobilisation and commissioning of the diamond processing plant and the mobilisation of all earthmoving vehicles ("EMV"). The processing plant was made up of a head-feed bin, static grizzly, conveyor, scrubber, 2 x 10' rotary pans, dewatering screens and a mechanical jig. A 250KVA generator was used to power the processing plant. Water was piped from a dam located approximately 1km to the south east. No crushing equipment was installed as this was, essentially, an alluvial gravel processing plant.

Plate 6.2 Diamonds recovered from Phase 1 of the sampling programme

Phase 4 commenced in May 2015 and comprised extraction and treatment of kimberlite. The operator assumed the straight-line continuation of the kimberlite dyke from FDH006 to FDH003 and further westwards, a distance of approximately c. 350m. Two sample types were identified (lag (colluvial) gravels and kimberlite dyke material (**Fig. 6.14**):

1. At the identified sample site, the overburden was removed, and the lag deposit extracted and stockpiled for treatment. The lag layer varies in depth from 0.5m to 1.2m and in thickness from 0.1m to 0.5m.

2. Kimberlite dyke material sampled was collected from trenches excavated at drill holes **FDH006** and **FDH001 (Fig. 6.14)**. The trenches at FDH006 and FDH001(**Plate 6.7**) had reached the maximum depth at which the excavators could freely dig without having to blast.

   At **FDH006** the earlier test sample trench was re-opened and enlarged. Sample was extracted at depths varying from 4m to 8m and comprised weathered kimberlite, silicified kimberlite, green clay, weathered and fresh granite. The sample dilution and contamination with host lithologies remained extremely high and in some places up to 90%. Drill logs at FDH006 show undiluted weathered kimberlite being encountered from 9m and getting fresh at 19m. This correlates with the geophysical model of the blow at FDH006 that indicated depth to top of anomaly at 10m. At this locality, the kimberlite dyke strikes at 105° and is oblique to the inferred position. This implies that although the kimberlite dyke zone (dyke array) strikes east –west on Frischgewaagt, segments of the dyke may have variable strike locally. In addition, a zone within the weathered granite comprising kimberlitic veins was identified and sampled.

   At **FDH001** a trace of the kimberlite dyke can been seen from 4m depth. The structured is in-filled with weathered granite and therefore extremely diluted. Sample was extracted from 10m to 12m depth. At this depth, the kimberlite remained weathered but granite contamination within the kimberlite (internal contamination) was low. However, significant contamination with the sidewall occurred during excavation. Kimberlite within the 10m to 12m depth range varied between 1.5m and 0.5m and in places completely pinched out.

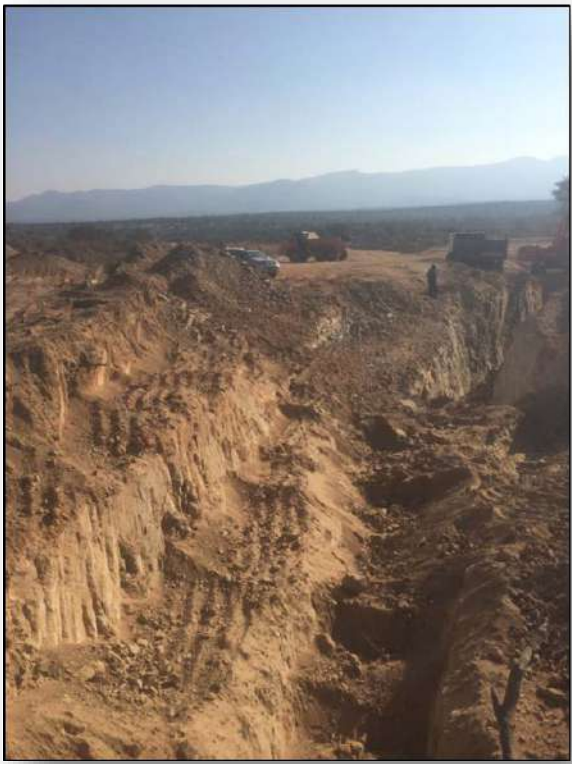
 

Plate 6.3 Trench sampling at FDH006 (left) and FDH001 (right)

Both the lag layer sample and kimberlite from trenches were processed using the rotary pans and diamonds were recovered by mechanically jigging the pan concentrates and hand sorting. Head-feed tonnes were calculated based on number of FEL loads. Diamonds were weighed using a carat scale and were sold on tender at Wolmaransstad.

During this exercise, a total of 236ct (466 stones) were recovered from a total of 3,647 tonnes of material during the bulk sampling[8]. The lag layer component of this work comprised 1,965T yielding 68.6ct (137 stones) giving a grade of 3.5cpht for the lag layer. The weathered kimberlite, silicified kimberlite, green clay, weathered and fresh granite from the trenches, yielded 157ct (313 stones) from 1,580T. These tonnes were, subsequently, adjusted for kimberlite only using visually estimated contamination and dilution – the adjusted weight was estimated at 423T. This figure was further adjusted to around 253T to compensate for losses through scrubber oversize. Using this final value, a sample grade of some 62cpht was calculated.

This process was audited by Gemcore (Mills, June 2015) – the results are discussed in Section 6.7.1.2.1. The results from this bulk-sampling exercise are not considered representative of the Thorny River kimberlite due to the reasons identified above. Further, no sampling protocols were in place and no sample security was present.

[8] Given daily recovery averages of below 10cpht, the operator (Landoclox) decided to withdraw from the project.

6.4 Petrography

6.4.1 Macroscopic/microscopic classification

Ten core samples (from the 2017 drilling programme – ref **Fig 6.14**) were selected for petrographic analysis. Each sample was sliced in half, and a thin section and a polished slab were prepared for macroscopic and microscopic observations. Each sample (**Table 6.6**) was then studied for detail petrographic observation under the stereomicroscope for macroscopic and microscopic observations by Gargi Mishra (GM Geoservices)[9] and Jock Robey[10] (Rockwise Consulting) respectively (Mishra, March 2017) (Robey, 2017).

Table 6.6 Macroscopic/microscopic classifications of core samples.

SAMPLE ID	Drillhole	Depth[11]	Textural Classification	Diamond-bearing potential[12]
B3001	FDC001	26.61-26.74m	Moderately macrocrystic apatite-bearing calcite phlogopite coherent kimberlite of hypabyssal type and Group 2 geochemical variety.	Rock is fine-medium-coarse grained and shows presence of peridotite garnets. Based on abundance of macrocrystic olivine (medium to large size, 5-15mm) and other mantle xenocrysts diamond potential of the rock can be assigned as high to moderate.
B3002	FDC002	23.94-24.00m	Aphanitic phlogopite coherent kimberlite of hypabyssal type and Group 2 variety.	Rock is fine-medium grained and shows presence of peridotite garnets. Based on abundance of macrocrystic olivine (2-7mm) and other mantle xenocrysts diamond potential of the rock can be assigned as low
B3003	FDC003	44.90-45.00m	Macrocrystic, apatite-bearing calcite phlogopite coherent kimberlites of hypabyssal type and Group 2 variety.	Rock is fine-medium-coarse grained. Based on abundance of macrocrystic olivine (medium to large size, 5-15mm) and other mantle xenocrysts diamond potential of the rock can be assigned as high to moderate
B3006	FDC005	43.85-43.95m	Calcite phlogopite coherent kimberlite of hypabyssal type and Group 2 variety.	Rock is fine-medium-coarse grained. Based on abundance of macrocrystic olivine (medium to large size, 5-15mm) and peridotitic garnet abundance, a high diamond potential can be assigned

[9] Gargi Mishra is a consultant who is registered with SACNASP (#400130/09) and is qualified to act as a Competent Person in this respect.

[10] Dr Jock vA Robey has +40years of experience with kimberlite analysis and classification, having been a chief geologist and researcher with De Beers in Kimberley.

[11] This is a downhole depth – true thickness not known

[12] This is simply a qualitative description of theoretical diamond potential as provided by the petrologists, based, typically on abundance and grain size of olivine as a possible proxy for diamond content and may not be used as a resource estimate. Additional investigations are necessary before assigning any degree of confidence to these statements.

B3007	FDC006	28.90-29.00	Macrocrystic apatite-bearing calcite phlogopite coherent kimberlite of hypabyssal type and Group 2 variety	Rock is medium-coarse grained. Based on abundance of macrocrystic olivine (medium to large size, 5-15mm) and peridotitic garnet abundance, a high diamond potential can be assigned
B3010	FDC008	14.96 - 15.02	Macrocrystic calcite phlogopite coherent kimberlite of hypabyssal type and Group 2 variety.	Rock is medium-coarse grained. Based on abundance of macrocrystic olivine (medium to large size, 5-15mm) and peridotitic garnet abundance, a high diamond potential can be assigned
B3011	FDC008	17.06 - 17.09	Macrocrystic calcite phlogopite coherent kimberlite of hypabyssal type and Group 2 variety.	Rock is medium-coarse grained. Based on abundance of macrocrystic olivine (medium) and peridotitic garnet abundance, a medium-high diamond potential can be assigned
B3012	FDC008	18.40 - 18.48	Aphanitic calcite phlogopite coherent kimberlite of hypabyssal type and Group 2 variety.	Rock is fine-medium grained. Based on limited abundance of macrocrystic olivine and other mantle xenocrysts diamond potential of the rock can be assigned as low
B3013	FDC008	22.42 -22.47	Aphanitic phlogopite kimberlite distinguished by not having any olivine	No economic interest
B3014	FDC008	34.12 -34.32	Aphanitic apatite-bearing calcite phlogopite coherent kimberlites of hypabyssal type and Group 2 variety.	Rock is fine-medium grained. Based on limited abundance of macrocrystic olivine and other mantle xenocrysts diamond potential of the rock can be assigned as very low

All kimberlite samples (Robey, 2017) are Group 2 variety, coherent hypabyssal kimberlites with mineralogies dominated by calcite and phlogopite but with accessory apatite and in some samples (B3009 and 10) monticellite, clinopyroxene and richterite amphibole. Fine grained perovskite and opaques are also present. All kimberlite samples can be classified as apatite-bearing calcite phlogopite kimberlites (for comparison, Marsfontein pipe had two kimberlite phases – a monticellite phlogopite phase and a phlogopite monticellite phase). Where the dyke gets wider such as in borehole FDC007, variable mineralogy is seen, with the crystallization of accessory clinopyroxene, amphibole richterite and monticellite. The absence of common monticellite in the Thorny River dyke is not of any concern. Larger kimberlites such as Marsfontein will crystallize monticellite due to slower cooling than in the more rapidly cooled thinner Thorny River dyke.

Samples B3008 to B3014 from boreholes FDC007 and 008 are, in parts, extremely unaltered. The variation in textures between macrocrystic and aphanitic (fine grained, lacking olivine and other macrocrysts) is typical of kimberlite dyes where flow zoning is common as well as multiple phase intrusions. Kimberlite dykes pinch, swell and split both laterally and vertically. This can be seen in the variable thickness of intersections as well as the absence of kimberlite in borehole FDC004.

Aphanitic zones, typically, are of no economic interest, as the amount of macrocrystic olivines are often taken as a proxy for diamond grade (Field, Gernon, Mock, Sparkes, & Jerram, 2009) (Scott-Smith & Smith, 2009). It is, therefore, critical to establish the percentage of the dyke that is aphanitic as opposed to macrocrystic. Since the aphanitic sections are seen in hand-specimen to occur on a centimetre/metre scale only, this will be reflected in the results of the bulk-sampling. However, detailed drilling on close spacing along strike and further petrographic analysis will take place during the forthcoming bulk-sampling/trial-mining and technical studies in an attempt to define specific resource blocks.

Plate 6.4 Photograph showing polished slab of sample B3010 (potentially high interest macrocrystic calcite phlogopite coherent kimberlite of hypabyssal type and Group 2 variety

Plate 6.5 Photograph showing olivine rich fine-medium to coarse grained polished slab for sample B3006. Olivine varies from relatively fresh to highly serpentinised. Rock is poorly sorted (potentially of high diamond interest).

6.5 Microdiamond Analysis

MSA was contracted by Vutomi to process eight (8) kimberlite drill core samples[13] weighing a total of 160.46 kg by caustic fusion and perform microdiamond analysis ("MiDA") to recover microdiamonds down to a minimum size of 75 microns (Cronwright, May 2017). MSA is an ISO9001 certified Company and an ISO/IEC 17025 SANAS accredited testing laboratory (#T0544)[14].

[13] The sample locations for the microdiamond analysis (MiDA) is shown on Fig. 6.14

[14] The Primary author and technical signatory to the report is Hilde Cronwright (Laboratory Manager), who is registered with SACNASP and qualified to act as a Competent Person in this matter.

Prior to the caustic fusion process, synthetic diamonds were added (varying in size from -425 µm to +75 µm in size) and 254 of the 260 spikes added were recovered indicating a 97.7% recovery rate. In total, the 8 samples yielded 223 natural diamonds (weighing 0.0514218 carats) from the combined weight of 160.46 kg kimberlite treated, which corresponds to an average grade of 1.4 stones/kg. The microdiamond population from all 8 samples consists of (in order of decreasing abundance) 36% broken dodecahedra, 15% octahedral crystals, 9% dodecahedral crystals and 9% broken composite crystals. A total of 152 broken crystals (68%) were observed, this includes 40 fragments (18%).

The relatively high proportion of broken stones (68% broken crystals and fragments) is not considered a result of breakage during sample treatment as no crushing of the kimberlite core was done prior to caustic fusion. The breakage of diamonds has therefore most likely occurred as a result of a natural process (possibly during kimberlite emplacement) or during core drilling.

The natural diamonds are predominantly transparent (73%) and lesser translucent (26%). 87% of the stones are white/colourless, 9% brown and 2% each are grey and yellow coloured stones respectively. 36% of the stones displayed frosted surface features and 35% had minor etch features such as ruts and tiny etch pits or trigons. Minute inclusions were observed in 54 of the stones recovered which represents 24% of the total population).

A summary of microdiamond crystal shapes from the 8 samples is shown in **Fig. 6.17.** **Table 6.7** summarises the number of diamonds recovered in each sieve class by sample. Two (2) macrodiamonds (larger than 0.60 mm in size) were recovered from the 8 samples analysed.

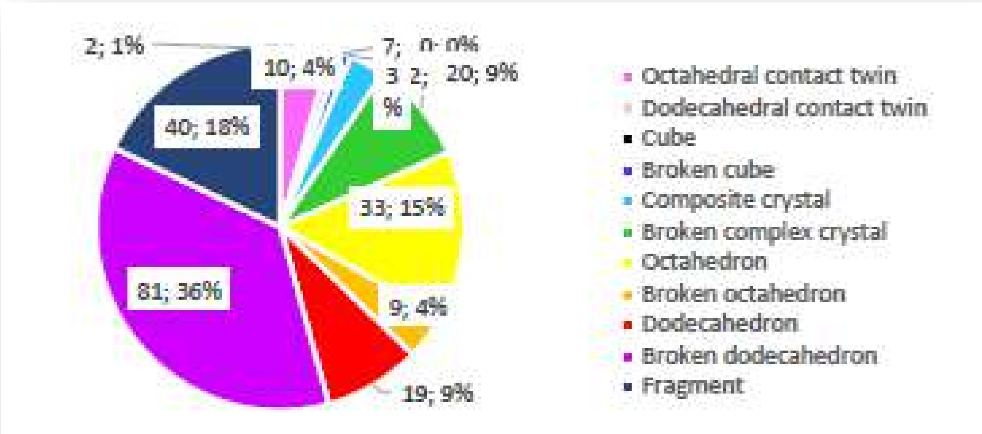


Figure 6.17 Crystal shapes and number of diamonds recovered from the samples from Vutomi

The largest stone recovered is from sample B3015 and is a white transparent broken complex crystal (-1.18mm + 0.85mm in size), weighing 0.01303ct. 351 additional synthetic diamonds and fragments ("client spikes") were recovered from the samples, Notable are samples B3018 (containing 86 client spikes) and sample B3021 (containing249 spikes), possibly derived from diamond-bearing drill bits or cutting blades.

Table 6.7 Crystal shapes and number of diamonds recovered from the 8 samples from Vutomi

Sample ID	Diamond Size Fractions (mm)										Diamonds #
	+1.7	+1.18	+0.85	+0.6	+0.425	+0.3	+0.212	+0.15	+0.106	+0.075	
B3015	0	0	1	0	0	1	0	0	0	2	4
B3016	0	0	0	0	0	0	0	2	0	3	5
B3017	0	0	0	0	0	1	1	1	3	3	9
B3018	0	0	0	0	0	1	1	7	6	5	20
B3019	0	0	0	0	0	0	0	1	1	5	7
B3020	0	0	0	0	2	1	3	1	6	3	16
B3021	0	0	0	0	2	4	3	14	17	19	59
B3022	0	0	0	1	3	2	6	25	34	32	103
Total >0.60 mm	**0**	**0**	**1**	**1**							223

6.6 2017 Bulk-sampling

6.6.1 Location of sample

The 2017 bulk-sample was sited at the location of the previous Landoclox sample at Trench FDH006 (**Fig.6.14**).

6.6.2 Sampling Methodology

In order to access kimberlite, the trench needed to be dewatered and then an access ramp needed to be blasted. The blast created a trench (access pit some 13m wide, thus ensuring that there would be sufficient room for the excavator to swing 360° if in the centre of the trench and to allow an ADT to drive in and reverse out safely (**Fig. 6.18**).

Figure 6.18 Aerial footage (from the drone) of the trench once it was fully sampled. The blow is to the west, the east shows a bifurcation (Green is kimberlite, pink is granite). Trench is 45m in strike length. The thickness of the kimberlite varied from 1-4 metres, with an average thickness of 2m

The waste rock was removed using a Hitachi 330LC and two Bell ADTs (excavation was contracted to Alpha Sands) and placed around the edges of the trench to form a safety berm (**Plate 6.6**). Due to the pinching and swelling nature of fissures, a trench bucket had to be fitted to the excavator in order to be able to extract kimberlite from narrow portions of the trench. The narrow bucket also allowed the excavator operator to extract the inner most portions of the fissure without contaminating the sample with granite. Extraction was particularly difficult where the fissure bifurcated the east, resulting in increased contamination.

As the side walls are unstable, it was not always possible for the excavator to extract uncontaminated material therefore three separate stockpiles were created based on the contamination level of each load.

- Grade A stockpile had less than 30% gangue material[15]. A high proportion of slightly altered with some fresh kimberlite was present. The Grade A stockpile was covered by a tarp in event of rain. Some 85% of the sample that was sent to the bulk-sampling plant comprised material from stockpile A.
- Grade B stockpile had between 50-80% waste material. Contained kimberlite that was highly weathered – slightly altered. Hand-sorters were supplied by Alpha Sand to remove as much gangue material from Grade A and B stockpiles. Stockpile B comprised 15% of the final sample.
- Grade C stockpile was over 80% contaminated, this stockpile contained kimberlitic material in the form of brown clays with indicators, very high waste material content. No material from stockpile C was included in the bulk-sample.

Plate 6.6 Excavating the bulk-sample (J Campbell)

[15] These estimates are simply visual estimates and the precise figures could be more variable.

6.6.3 Bulk-Sample Processing

The kimberlite sample was trucked from the site to the independently staffed and fully-functioning private processing facility by road. The trucks were weighed at a nearby weigh-bridge. This allowed for the accurate estimate of the sample tonnage. The 305.3T[16] bulk sample was processed during 20-24 November 2017. The process was overseen by Messrs. Phillip Mills[17] and James Campbell[18], who were both on-site during the entire programme. The process flowsheet is shown in **Figs. 6.19 and 6.20.** The sample process followed was:

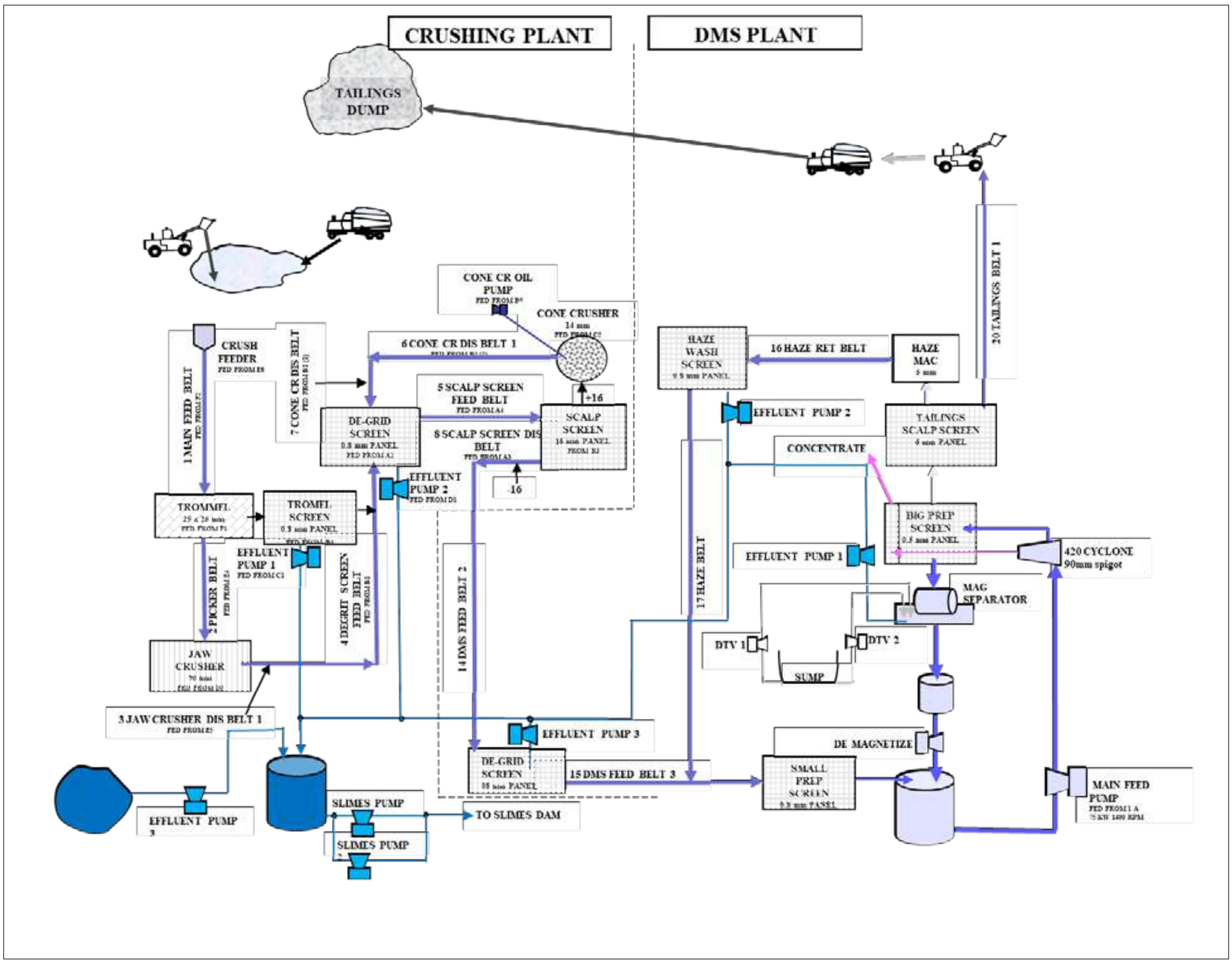


Figure 6.19 Flowsheet of the primary processing through the crushing and DMS plant

- Sample transportation and weighing
  - Tipper truck (Side or back tipper) – 30tonne
  - Weighbridge

[16] The weight of the wet sample was some 342T. with approximately 10% moisture, this resulted in a dry sample mass of 305.3T

[17] Mr. Phillip Mills, a metallurgist, is a director of PMC Consulting and co-owner at Mine-Met Equipment, previously with Gemcore Sampling and De Beers. He is registered as a Member with the Southern African Institute of Mining & Metallurgy (SAIMM) as is qualified to act as a CP in his own right on these matters.

[18] Mr Campbell is the Managing Director of Botswana Diamonds and a geologist of over 30years experience in the exploration and mining of diamonds. He is a Fellow of the SAIMM and of the IMM.

- Sample receipt
  - Plant purged with approx. 5 tonne waste material and washed
    - Checklist signed off once cleaned
  - Sample tipped on cement pad and pushed into receiving bin → 250x250mm grizzly

- Sample Processing – DMS Plant
  - Feed rate: 6-10tph, vibrating feeder onto main feed belt

- Crushing Section
  - 25x25mm Trommel screen - Oversize → Jaw crusher. CSS = 70mm
  - Cone crusher scalp screen (16mm panels) – Oversize → Cone Crusher. CSS = 14mm

- DMS Section
  - 420 Cyclone, 90mm Spigot. Pressure ~ 150kPa, Medium Density ~ 2.70 → Cut point density ~3.05
  - Tailings scalp screen (6mm panels) – Oversize → Hazemac Crusher. CSS = 5mm
  - DMS concentrate → Locked trailer to recovery plant

6.6.3.1 Bulk-sample Process Flow – Recovery Plant

The process at the X-Ray recovery facility was:

- Sample transportation and weighing
  - Plant purged with approx. 0.5 tonne waste material and washed
    - Checklist signed off once cleaned
  - Locked trailer escorted by security to recovery plant → Sample tipped in receiving bin → Weighed by digital pull scale on mono hoist
- Sample Processing – Recovery Plant
  - Feed rate: 200-500 kg/h, gravity feed → classifying screen

- Grease
  - -3mm panel – Feeds onto de-gritting screen → grease tables
  - Grease tailings collected in bins → Manually feed to X-ray as back-up

- X-Ray
  - +3mm panel, -16mm panel → X-ray sorter. Fluorescent tracers inserted prior each run
  - X-ray tailings → Grease as backup
  - +16mm panel → Tailings bin

- Sorting
  - Final Hand sort (and storage of diamonds in Category 5 safe, on-site)

- Reporting by Laboratory Manager and independent consulting metallurgist.
- Diamonds transported to Johannesburg for valuation

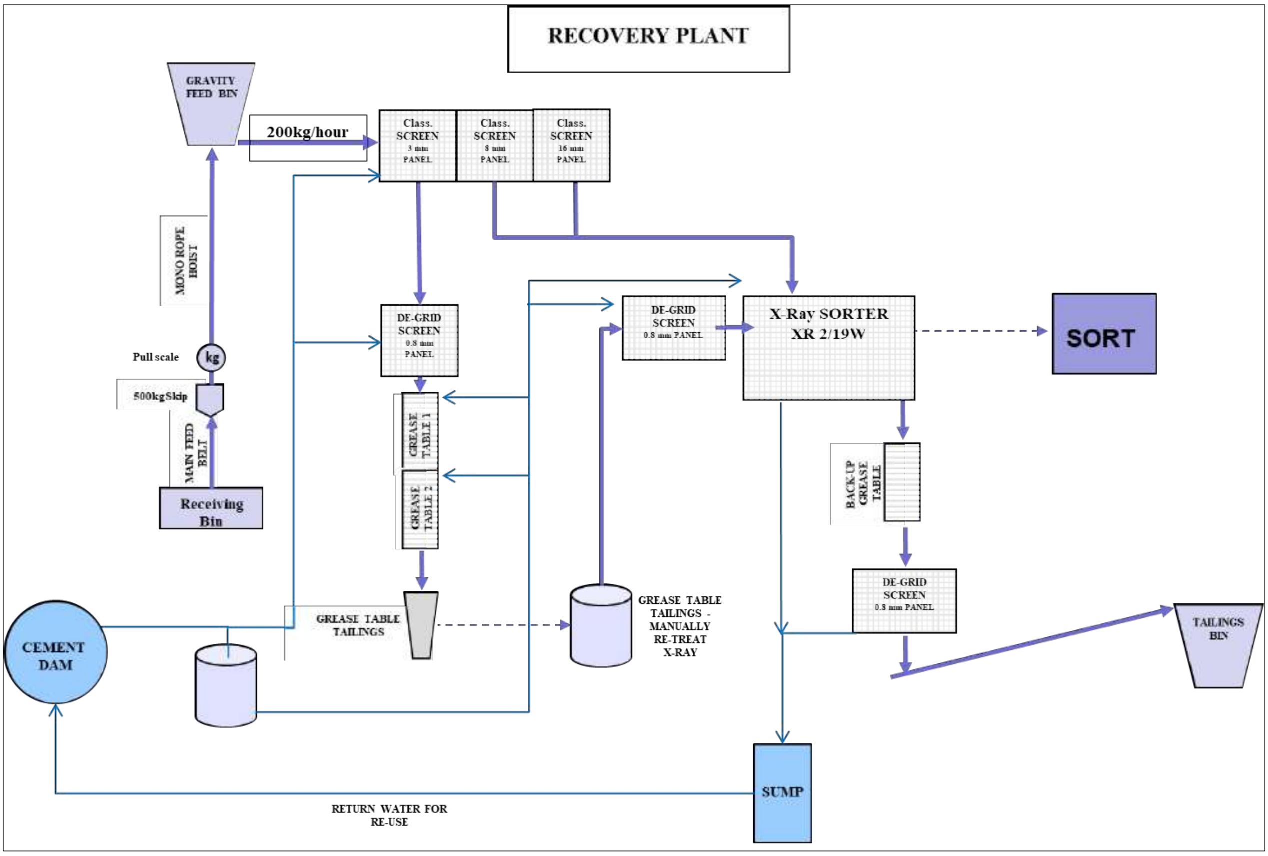


Figure 6.20 Flowsheet of the X-Ray recovery plant

6.6.4 Results

The results from the original sample processing programme delivered disappointing results that did not tally with the estimated average total content, namely a sample grade of some 18.04cpht was recovered in comparison with an estimated total content average of 78cpht. Re-processing of the concentrate increased the recovered grade to 20.69cpht – still way below expected (**Table 6.8**).

Table 6.8 Bulk-sample results (Nov 2017)

Sieve size ds	Sieve size mm	1st Audit Carat Recovery	1st Audit Grade (cpht)	Re-processing Carat Recovery	Total Carats Recovered	Calculated *In-situ* Grade (cpht)
+23	9.28					
+21	7.09					
+19	5.56	3.96	1.30	0.00	3.964	1.30
+17	4.93	5.66	1.86	0.00	5.663	1.86
+15	4.62	4.95	1.63	0.00	4.948	1.63
+13	3.85	3.45	1.13	0.00	3.447	1.13
+12	3.42	5.47	1.80	0.00	5.472	1.80
+11	2.86	7.69	2.53	0.25	7.944	2.61

+9	2.35	7.35	2.42	2.55	9.904	3.26
+7	2.00	4.30	1.41	1.10	5.400	1.78
+6	1.72	5.23	1.72	1.58	6.803	2.24
+5	1.47	3.73	1.23	1.41	5.142	1.69
+3	1.15	2.09	0.69	0.82	2.913	0.96
+2	1.03	0.70	0.23	0.19	0.885	0.29
+1	0.82	0.27	0.09	0.13	0.398	0.13
Total Carats		**54.85**	**18.04**	**8.03**	**62.88**	**20.69**

6.6.4.1 Diamond Size Frequency Distribution

The diamond size frequency distribution (DSF) of the Thorny River samples are shown in **Figs. 6.21 – 6.22.** Vutomi historic data refers to the data derived from the 2015 (Landoclox) sampling and the Vutomi 2017 is the recent (2017) bulk-sampling completed by Vutomi. In both cases, the Thorny River population displays a reasonably fine size distribution with an absence of coarse stones, which is especially notable in the 2017 sample.

With respect to the stone density plot (**Fig. 6.21**), it can be noted that there appears to be some under recovery of stones between 0.1 ct/st and 1 ct/st; that the sieving is in-efficient; or that there were additional coarse stones relative to the rest of the distribution in this sample (Coward, 2018).

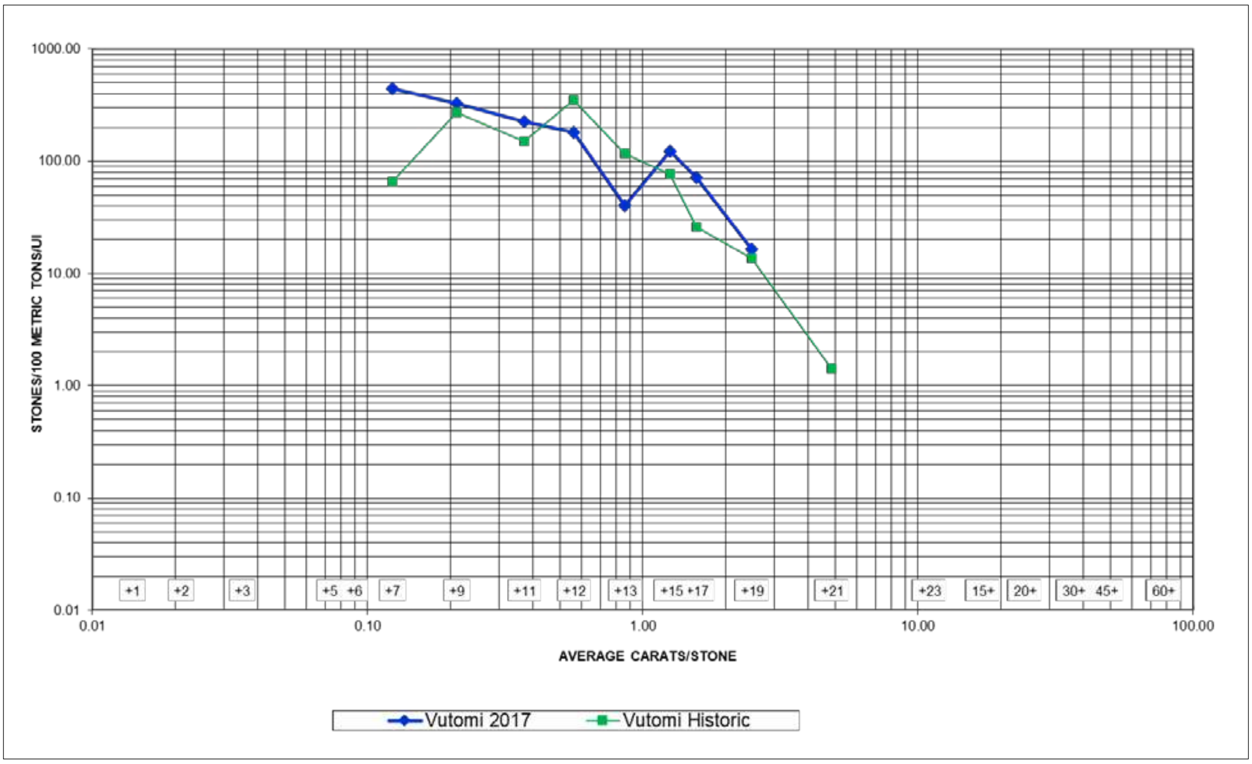


Figure 6.21 Stone grade Log-Log plot of the Thorny River diamond population

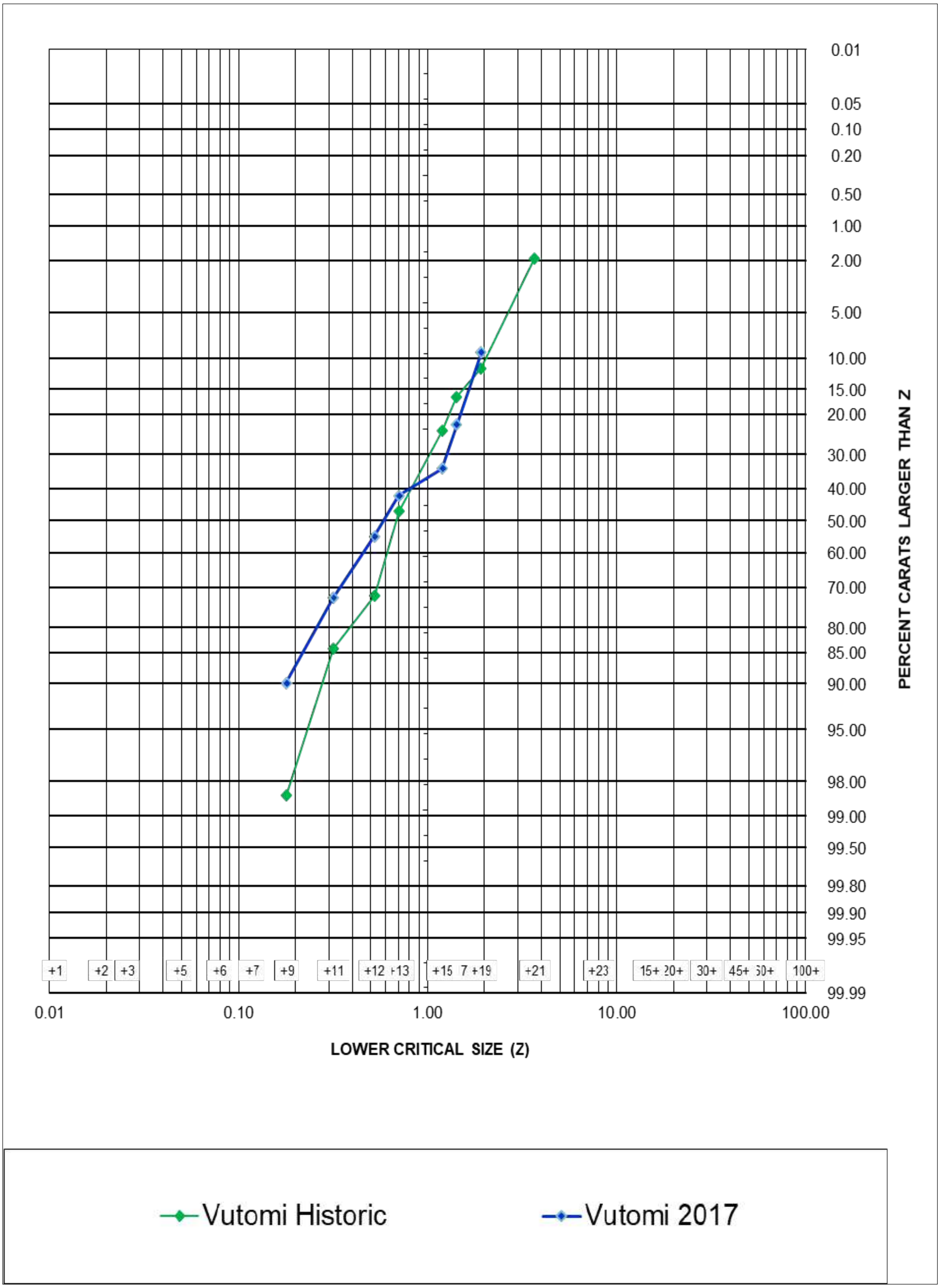


Figure 6.22 SFD of the Thorny River diamond population

In all cases, the coarse component is likely to be underestimated as large stones are unlikely to be recovered in samples with a small support. This can be addressed to some extent by developing an appropriate size grade model that is then extrapolated into both smaller and larger sizes (*Ibid*).

6.6.4.2 Valuation

The valuation (Ferraris & Bouquet, 2017) was undertaken on Friday 1st and Saturday 2nd December 2017 at the secure offices of I. Hennig in the Jewellery Centre in Johannesburg, South Africa by Ray Ferraris (RF) and Robert Bouquet (RB). The diamonds (54.32ct) were transferred from the bulk-sample processing site to the I. Hennig office by Brinks on Friday 1st December and received personally by RB.

The diamonds were sized by sieve[19] (DTC/international standard sieves) and manually weighed using a calibrated Sartorius diamond weighing scale. The parcel was then graded to verify the sales sizes; which comprises the following:

- Caraters - 3 carat and larger
- Grainers – 3 to 8 Grainers (2 carats)
- Sieve Sizes - +11 to +1 (stones weighing less than 0.66 carat to 0.01 carat)

All stones from the +11 and larger sieve sizes were weighed individually by hand and placed in their Grainer sizes and +11. The largest stone is an 8 Grainer light brown gem stone of very high-quality weighing 2.27 carats (**Plate 6.9**). The average stone size of the parcel was 0.134ct/st.

Plate 6.7 The +9 sample with fancy yellow-orange stone ((Ferraris & Bouquet, 2017)

Based on the size of the sample it was noted that “the true size distribution is impossible to ascertain or model from such a small sample” (Ibid). The average value of USD89/ct in the +11 diamond sieve class, however, compares favourably with USD77/ct achieved in the same diamond sieve class from the 2015

[19] Aspects of diamond sieve sizes and correlations are described in Appendix 1

sampling campaign. It is noteworthy that the average published diamond values achieved by Klipspringer were USD130/ct (at a bcos of +1mm)[20].

The final sample valuation is shown in **Fig 6.23.** The valuation of this small sample is estimated at USD89.4/ct.

THORNY RIVER DEC 2017	SAMPLETOTALS		US$ VALUATION	
	CARATS	% CARATS	TOTAL US$	% US$
8gm	8.28	15.30%	$ 2 062.68	42.64%
5gm	1.29	2.38%	$ 77.40	1.60%
4gm	4.10	7.58%	$ 238.00	4.92%
3gm	3.03	5.60%	$ 218.93	4.53%
+11	14.27	26.37%	$ 1 275.21	26.36%
+9	6.86	12.68%	$ 397.40	8.22%
+7	3.81	7.04%	$ 134.23	2.77%
+5	8.57	15.84%	$ 364.09	7.53%
+3	2.70	4.99%	$ 51.24	1.06%
+1	1.20	2.22%	$ 18.25	0.38%
GRAND TOTALS	54.11	100.00%	$ 4 837.43	100.00%

Figure 6.23 Thorny River diamond valuation

The diamond sample was further studied to assess (Ferraris & Bouquet, 2017)

- Shape population
  - Dodecahedral shapes pre-dominate the population.
  - These is a small population of octahedrons which are either White or darker Browns.
  - There is a small population of maccles with very few triangular maccle shapes.
  - No cubes were noted in the sample.
- Colour population
  - White and Brown pre-dominate the parcel. Most of the white diamonds are H or better colour. The Browns have close to a 50:50 split between light Brown and dark Brown.
  - Very few yellow stones are present; while there is a small population of unusual colours which could be seen as near Fancy colours. Obviously, a larger sample would be required to determine this.
- Quality population
  - **Gem** comprises of Sawables, Makeables, Light Brown Gem and Light Gem in the -5 sizes. Gem comprises 26.00% of the carats at 66.22% of the value
  - **Clivage** comprises Brown Gem, White Clivage, Clivage Sawable, Brown Mixed Gem and Dark in the -5 sizes. The Clivage comprises 48.68% of the carats at 30.74% of the value
  - **Rejection** comprises of the non-polishable material and comprise 25.32% of the carats but only 3.04% of the value.

[20] BOD Press Release of 25th January 2018

- Fluorescence
  - The sample contains a range of fluorescence colours with blue being the most prominent. The unusual Yellow-Orange diamonds fluoresce a strong orange colour, indicative of an unusual colour. Other colours noted are white and green; which was noted in a few of the browns and the yellowish green stones
- Breakage
  - Less than 10% of the stones are chipped and are mainly in the smaller sizes from +11 down. None of the 3 Grainer and larger sizes have any chipping or breakage.
  - The only broken stone was noted in the +9; therefore, it can be assumed that breakage has no relevance to the value.

6.7 Density Measurements

Kimberlite core recovered from the 2017 Phase 2 drilling was used to calculate the densities. Sections of the kimberlite core was cut using a diamond cutting disc attached to a hand-held grinder. Four length and diameter measurements of each section of core were taken using a Vernier calliper and recorded and each section of core was weighed using a 5000g electronic scale. The average density of the four samples was calculated at 2.67g/cm^3.

In comparison, density estimations from the Klipspringer Mine (Bartlett, 2012) are 2.45g/cm^3 (above the 5 level) and 2.60g/cm^3 (below the 5 level). The Vutomi density measurements are somewhat higher than the mine measurements and further measurements will be required to reconcile this disparity. However, the author is of the opinion that the measured density (rounded off to 2.6g/cm^3 is of sufficient confidence to be applied to Exploration Results.

6.8 Database Management

Currently, all of the geophysical data is stored and managed by GeoFocus. All of the other exploration data is currently collected on spreadsheets and then transferred into Access. All data is backed-up daily onto Google Drive that only the Project and Site Geologists can modify. Limited analysis and interpretation is done in the open source QGIS.

As the project progresses into the next phase of evaluation, a larger mining software package /GIS will be established.

6.8.1 Data Verification/QAAC, Audits and Reviews

6.8.1.1 Verification of historical data

De Beers conducted extensive sampling on the property during the 1980's and 1990s. Neither the sample data or the results are available. No verification of this data was possible, it was not used in this exploration programme and mention is made of it simply for completeness.

6.8.1.2 Verification of Current data

6.8.1.2.1 Landoclox Bulk-Sample

During 2015, a general audit of the Landoclox bulk-sampling programme was conducted by Gemcore Sampling (Pty) Ltd ("Gemcore"). Gemcore was established in Kimberley, South Africa, in August 2005. The company initially provided bulk sampling services and later ventured into coarse and fine dump mining and processing as well as consulting services.

The audit was conducted to determine if the grade achieved by Landoclox was reliable and if the process efficiency was acceptable (Mills, June 2015). It was found that

- The head feed tons were overstated by 49% due to an incorrect load factor contributing 14% and an incorrect assumption of the total scoops per day, contributing the remainder of the overstatement.
- The daily head feed was overstated as 450 tons per day instead of 230 tons per day. The change in the head feed will influence the grade proportionally, i.e. the grade calculated will increase with 98%.
- The +1mm -2mm material, which can form as much as 30% of the total diamonds by mass of a kimberlite sample, was screened out and pumped to the slimes.
- The recovery efficiency of the two ten-foot rotary pans was found to be 98% for the 4mm tracers which are acceptable. The recovery efficiency for the 2mm tracers was found to be 76%. This is not acceptable.
- The recovery efficiency of the jig is almost 100%.
- It was advised that the sort- and jig tailings be stockpiled if it is required to be re-treated in the future.

6.8.1.2.2 2017 Bulk-Sampling

PMC was contracted to evaluate the processing facility and monitor the bulk-sample to ensure that the sample was treated efficiently and effectively through the plant. The initial report indicated that the plant was operating optimally (apart from bottom cut screen panels, which were changed upon request) and the material was treated effectively to recover the diamonds present in the sample (PMC Audit Checklist 20171231).

Subsequent to the observation being made and the draft report being written the sort results showed gross inefficiencies in the grease and FlowSort treatment of the -3mm fraction. From the sort results it became evident that the inefficiency shift is around 3mm indicating that it is a recovery inefficiency problem and not a DMS or bottom cut screening problem. Inefficiencies in the DMS and the bottom-cut will result in low recoveries closer to 1mm.

The inefficiency in the FlowSort recovery of the -3mm material was attributed to the fact that the FlowSort machine was set up to recover +3mm material and that the operators did not change the settings when treating fine material. Recovery of -3mm diamonds was not optimized in the FlowSort machine.

The inefficiency in the grease recovery of the -3mm material was much more concerning as the grease was the primary recovery process for -3mm material. PMC recommended retreating the recovery and the sort-house tailings through either a different type of x-ray machine and/or over a different type of grease table with different grease and attritioning of the material before treating over grease.

An additional, in-house review by **Metal Dog Consultin**g (Petersen, 2018) noted that:

- "After inspection of the Grease table and X-ray machine facilities, it was found that the X-ray machine was significantly out of specification for this type of processing work. The main offending issues were a detection sensitivity that was too low and water flowrates that transport the material are higher than expected for the size of material to be treated.
- This second audit resulted in an increase of the recoverable in-situ grade from the sample from 18.0 cpht to 20.7 cpht, highlighting that significant quantities of stones had been "missed" during the first audit (114 stones additional to the first audit of 396 stones: ~29% extra).
- It was found that by using the lower envelope of the total content model, a recoverable grade of 32 cpht is estimated, where there is at least the possibility of matching the audit result in terms of order of magnitude. The recoverable model and the audit results diverge as the size reduces below 2.5 mm indicating either the structure of the total content is wrong or that there is still 32-21 = 11 cpht missing. However, the issue still remains that the average total content model with an in-situ grade of 78 cpht is not able to be reduced close to the audited result.
- Within the view that the X-ray machine setup at the sampling site was not appropriate for this size fraction, there is a level of confidence that the audited result of 20.7 cpht should be closer to 32 cpht.
- It was recommended that the entire -3 mm DMS concentrate sample should be retreated through single particle sorter (SPS) technology as a final audit.
- The reality is that the granularity in grade recoveries at sample sizes of 300tonnes cannot provide the same level of consistency that is normally encountered in large kimberlite dykes, where a 300tonne bulk sample would be extremely consistent with recoverable grades from production.
- The original preliminary estimate (Petersen, 5 July 2017) was revisited highlighting that upper and lower Total Carat Count ("TCC") estimates were given along with an average TCC. This study now moves the interpretation into a space where the error estimates of the TCC become more important than the average calculated. The two bulk sample results define boundaries of the level of variability and within error, the original TCC high and low estimates are still sound estimates of the TCC variability. The updated interpretation that is now important is that there is no guidance as to how these upper and lower estimates should be combined in order to produce an average, within the framework that a distinct average cannot be calculated at this present time.
- Based on this updated understanding of the variability of the Frischgewaagt ore body, then the lower estimate of TCC grade in the 2017 study is now a more technically sound estimate of expected grade recovery, where the updated TCC grade (+1mm) is **64-78 cpht** and the updated recoverable grade (+1mm) is expected to be around **55 cpht**.

Interlaced Consulting was approached to review the grade of the 2017 bulk sample (Coward, 2018). A summary of that report is presented below:

Depending on the actual thickness of the dyke, the actual tonnage of pure kimberlite processed could vary from 98-195T, which would have a significant impact on the final recovered grade (from 32-64cpht).

A number of steps were highlighted which would have a material impact on either the estimation of the contained kimberlite or on the lost/missed diamonds that are used to determine the grade range that could have been recovered from the sample (**Table 6.9**)

Table 6.9 List of possible impacts in each process area on diamond recovery and/or loss (Coward, 2018)

Area	Variations to Quantify for RF Estimation	Data to Consider	Other Operation Benchmarks
Geology	Definition of ore and contacts Internal dilution Volume of ore extracted	Face maps Wireframes Geology Samples	Geological loss between 10 to 15%
Mining	External dilution Extraction Loss Sorting Efficiency External ore ingress	Cavity mapping and models Samples of discard and concentrate	Other Dyke mines have reported ~ 23% of mined tonnage is kimberlite
Treatment	Moisture content -> Dry mass Effective bottom cut off Total grind -> Liberation vs lock-up Free loss to DMS tails due to separation efficiency Damage	Delivered moisture content Slurry or grits samples Plant mass balance DMS feed size distribution DMS feed rock type analysis DMS tails density distribution Diamond Size Distribution	Sorting loss~5% ore Liberation ~85 to 95 Recovery efficiencies DMS function of partition effectiveness Samples of size by density of con and tails for free loss calculation
Recovery	Grease efficiency X-ray Losses Hang up Contamination Diamond sieving efficiency Diamond weighing accuracy	Comparison of DSF for each recovery stream Large stones in audit Ct/St vs Average	Expect 95% recovery on first pass X-ray Grease in upper 90% recovery envelope Damage and stress losses~2-3%

It was proposed that, since the wallrock was very friable and unstable, there was a high potential for

- Ingress of external dilution
- Variable internal dilution
- Kimberlite density variation and,
- Remnants of kimberlite left in the sidewall.

All of these features (**Fig. 6.25a and b**) may have contributed to the dilution that resulted in the low grades recovered by the 2017 sampling operation.

The dilution of this sample presents the biggest uncertainty in deriving the adjusted in-situ kimberlite grade. Using a combination of recent and historic data, it is possible to derive a rough approximation for the proportion of kimberlite that was in the recent bulk sample. Accounting for dilution and reasonable range of plausible plant recoveries during sample treatment suggests that the undiluted raw in-situ grade of the kimberlite dyke sample is between 46 and 74 cpht.

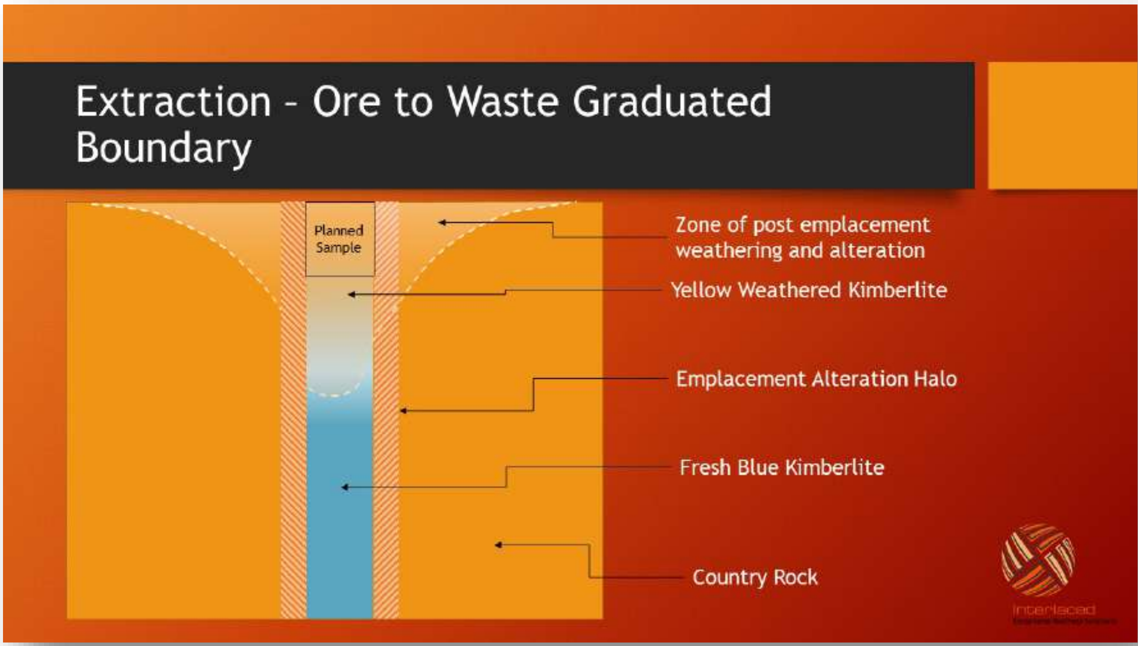
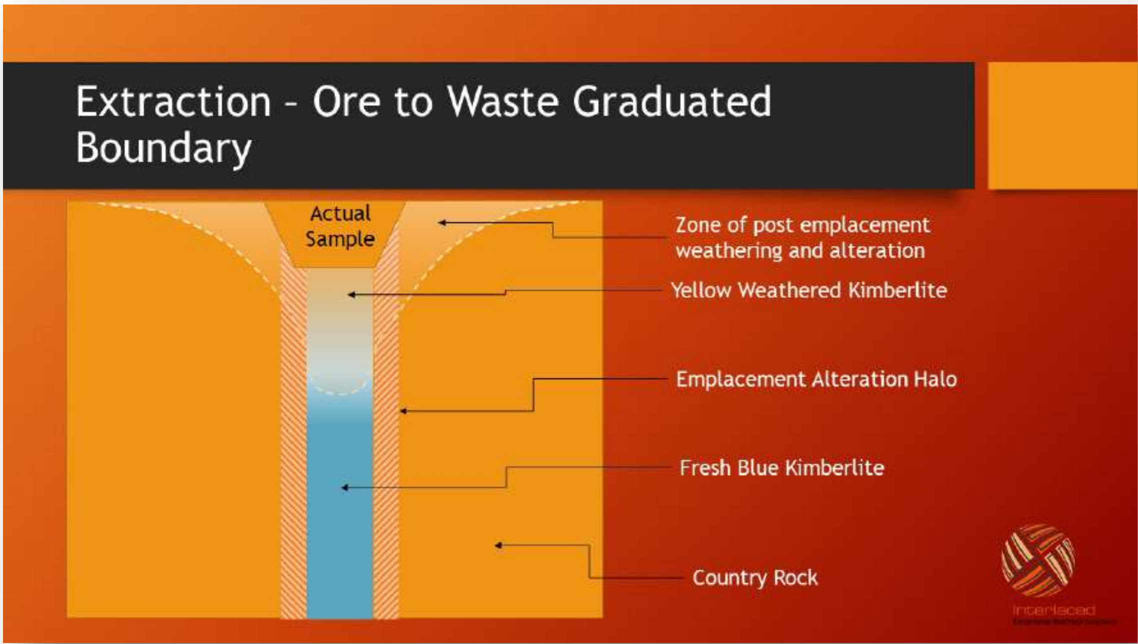


Figure 6.24 Model of the proposed dilution of the planned (above) vs actual (below) sample location (Coward, 2018)



The size frequency distribution of the sample diamonds was reviewed. It appears that the distribution is not smooth, which suggests either a slight loss of middle size stones or an over recovery of fine diamonds. The recovery of coarse stones is not expected to be representative given the relatively small support and geometric extent of this sample.

A micro-macro model was developed to explore the potential in-situ model grade for the sample site. Three different sets of macro diamond inputs were used, a pessimistic, base case and optimistic case to generate a rang for the undiluted in-situ model grade. These models show that, at bottom cut off size of +3 DTC diamond sieve[21], the models return a range of total content model grade that falls between 54 to 88 cpht. Comparatively, at bottom cut-off size of +1 DTC diamond sieve returns a model in-situ grade that ranges between 71 and 113 cpht.

To evaluate the impact of the sample support on size frequency stability, a sample simulation model was developed. A parcel of 500 thousand stones was generated based on a model fitted to an annual production distribution. One hundred samples of 500 stones were extracted from this parcel. The analysis of the distribution of these samples suggest that the sample analysed here contains marginally more fine stones that that which would be expected from the matched Annual Production Parcel.

It was recommended that the additional audits of concentrates and tails continue as planned and that these results be used to confirm the recovery ranges used in this analysis. Comprehensive evaluation of the evidence collected to date should be carried out to enhance the strength of the associations with the adjacent mine. Techniques using various mantle and lithic contents of the kimberlite may provide a way to do this relatively efficiently). Providing definitive evidence would provide a valid basis for using historical data from the klipspringer operation in the future evaluation and development of this project. The same applies for work required to delineate and validate selection and continuity of the of the diamond domains in this deposit.

The range analysis presented here has considered diamond distribution effects in isolation. It is also possible to use various spatial simulation techniques to ascertain the relative impact of spatial variation (Grade, stone size, dilution mining rate etc.) on the results obtained. This approach could use various forms of spatial (e.g. cox process) simulation to produce realistic spatial images of the orebody. Using this approach, it is possible to use each realisation to stress test a range of impacts that spatial variability will have on sampling, mining and processing. The full set of ore body simulations can be used to describe the full range of operating outcomes that could be achieved, in various metrics including financial return.

The micro-macro models used here would benefit substantially from additional micro diamond sampling at unsampled locations of the dyke. Additional core samples will allow improvements to the dyke model as well as the estimation of internal dilution and surrounding country rock competence.

[21] See Appendix 1 for aspects of diamond sieve sizes

7 MINERAL RESOURCE ESTIMATES

No Diamond Resources have been estimated for the Thorny River Project. The number of stones recovered for valuation/sale is considered insufficient to support even an Inferred Resource classification. In addition, the uncertainties around grade estimation also preclude such a classification at this time.

8 Other Relevant Data and Information

8.1 Exploration Targets

Exploration Results include data and information generated by exploration programmes that may be of use to investors. The Exploration Results may or may not be part of a formal declaration of Mineral/Diamond Resources or Mineral/Diamond Reserves. However, in Public Reports, that part of Exploration Results' data and information relating to mineralization not classified as a Mineral/Diamond Resource or Mineral/Diamond Reserve must be described as an Exploration Target and must contain sufficient information to allow a considered and balanced judgement of the significance of the results. Such reporting must not be presented so as to unreasonably imply that potentially economic mineralization has been discovered. Reporting of isolated values without placing them in perspective is unacceptable. Any such information relating to Exploration Targets must be expressed so that it not misrepresented or misconstrued as an estimate of Mineral/Diamond Resources or Mineral/Diamond Reserves. The term Resource(s) or Reserves(s) must not be used in this context. In the situation where tonnes and grades have been estimated for an exploration property for the purposes of justifying additional exploration, but on insufficient data to define a Mineral/Diamond Resource, this information must not be presented in Public Reports in such a way that it might be misrepresented or misconstrued as an estimate of a Mineral/Diamond Resource.

8.1.1 Estimation and Modelling Techniques

8.1.1.1 Grade Estimation

The average grade at Thorny River has been estimated using a variety of techniques, including microdiamond modelling and bulk-sampling.

8.1.1.1.1 Bulk-Sampling (Landoclox)

The mini bulk-sampling programme has been discussed in section 6.3.3 above and will not be repeated here. During this exercise, a total of 236ct (466 stones) were recovered during the bulk sampling, which had a bcos of 2mm. The diamonds were recovered from an estimated volume of 3,657T processed (adjusted down from 7,151T post the Gemcore audit, 49% decrease in the original estimate; a grade of 12.77cpht was estimated.

The salient points of this programme are:

- The lag layer component of this work comprised 1,965T yielding 68.6ct (137 stones) giving a grade of 3.5cpht for the lag layer.
- The weathered kimberlite, silicified kimberlite, green clay, weathered and fresh granite from the trenches, yielded 157ct (313 stones) from 1,580T. These tonnes were, subsequently, adjusted for kimberlite only using visually estimated contamination and dilution – the adjusted weight was estimated at 423T. This figure was further adjusted to around 253T to compensate for losses through scrubber oversize. Using this final value, a sample grade of some 62cpht was calculated.
- The sample extracted from the grain anomaly yielded 16 stones with accumulative weight of 10ct.

A number of problems were identified on this programme; consequently, these results are not viewed as representative of the kimberlite. They are presented here for completion.

- Focus was placed on mining the lag layer within the weathered zone. This layer was assumed to be enriched but, when treated, resulted in very low grades.

- The process did not contain a crushing circuit and all kimberlite +30mm, was discarded as oversize. Visual estimations suggest that at least 40% of all kimberlite extracted was in the +30mm fraction
- The plant was set up for treating gravels and had a 2mm bcos. Typically, kimberlites tend to recover up to 30% of their diamonds within the +1mm -2mm size fraction.
- Rotary pan efficiency on the 2mm tracers was only 76%.
- Tapping of pan concentrates was not continuous.
- Contamination and dilution of the kimberlite dyke at the trenched depths was very high.
- Poor understanding of the deposit.

8.1.1.1.2 Microdiamond Assessment (MSA)

The size frequency distribution ("SFD") of the 223 microdiamonds recovered from 160.46 kg of core (2017 drilling programme) was modelled, by MSA (**Dr JJ Ferreira**[22]), to estimate a diamond grade of the kimberlite sampled (Ferriria, June 2017). MSA is an ISO9001 certified Company and an ISO/IEC 17025 SANAS accredited testing laboratory (#T0544).

MiDA data from the eight samples were used in the assessment of diamond potential based on stone weights, sample stone counts and sample weight. In total 223 diamonds were recovered from 160.46 kg of kimberlite treated. Sampling material came from three localities described as "Central blow" and "Second Blow" (adjacent to the road) with a combined weight of 133 kg and from the "Dyke proper" which had a relatively low weight of only 27 kg. The combined sample from each locality i.e. "Central Section", "Dyke Proper" and "Second Blow" is therefore used to obtain a provisional estimate of diamond content.

Additional information for 410 macrodiamonds (207.3ct) recovered from a 250T bulk sample[23] was supplied by Vutomi and used for comparison purposes only, specifically for the size distribution modelling (**Table 8.1**).

Recoverable diamond content is estimated between 20 cpht and 270 cpht for the combined blow samples at +0.6 mm recovery based on assumed bottom cut-off modifying factors. Grade estimates were based on a size distribution model and an associated stone density in stones per 20 kg per locality and for the three localities combined. The two entities define diamond content, which is expressed in the form of a grade size model representing total diamond content above the bottom sieve size used for microdiamond recovery, and above a higher cut-off size that might be required for economic diamond recovery. Modifying factors were applied to reflect diamond recovery as expected from normal production procedures at +0.6 mm. Recoverable diamond content is estimated between 20 cpht and 270 cpht for the combined blow samples at +0.6 mm recovery based on assumed bottom cut-off modifying factors. Grade estimates fall in a wide range due to the nature of the distribution of stones in the size classes. Two size classes above 0.6 mm contain one stone each with a destabilising effect on modelling, consequently estimates are provided with the size classes included and excluded and based on two different modelling approaches.

[22] Dr Ferreira is a renowned expert in the area of Total Content Model development. His extensive experience has been honed over three decades specifically in the model development of major De Beers mines.

[23] These are the diamonds that were recovered from the 2015 Landoclox bulk-sample. Contractor records indicate the recovery of 207.30cts (410 stones), however the Brokers note shows 236.15ct (466 stones) sold. The author has been unable to reconcile this inconsistency.

Table 8.1 Summary of macro-diamond recovery from the (Landoclox) 250T bulk sample, subdivided on diamond sieve classes in carat

Diamond Sieve	Lower critical size	Average size	Carats	Stones
+15ct	14.8000	17.1180	0	0
+23	8.0360	10.9060	0.00	0
+21	3.6910	4.8500	3.99	1
+19	1.9180	2.4800	19.80	8
+17	1.4230	1.5700	10.55	7
+15	1.1950	1.2600	14.98	12
+13	0.7030	0.8600	48.15	56
+12	0.5230	0.5610	52.11	93
+11	0.3170	0.3710	25.13	68
+9	0.1790	0.2110	29.46	140
+7	0.1170	0.1230	3.13	25
Total			**207.30**	**410**

The diamond size distribution curves in **Fig. 8.1** show that the "Dyke Proper" sample has a finer size distribution compared with the samples from the central and second blows. In view of low stone counts, this should be used only as an indication of the actual nature of the size distributions. More material will have to be analysed to confirm this preliminary finding.

The low stone-counts allows limited options for grade estimation. Therefore, the samples from the two blows were combined to reflect the size distribution for the two blows and the total combined sample. The dyke sample reflects grade potential based on a finer size distribution and was excluded from the analysis.

There is an indication that diamonds from the "Central Section" might have a slightly coarser size distribution. In view of the slight difference the data from the two blows were combined to compensate for low stone counts from each of the two blow sections. The combined samples per locality were considered too small for a definite grade and size assessment but the results provide a reasonable indication of the diamond grade. Combined sampling results are analysed to give an indication of the diamond grade from the overall deposit.

The curves in **Fig.8.2** represent the distribution of diamond size based on two different bottom cut-off screen sizes (model at +0.6 mm and +104 mm). The two curves on the left in the figure depict microdiamonds from the sample and corresponding recovery based on a model fitted to the sample. Both sets of data are shown at +0.075 mm, with recovery in the +0.075 - 0.150 mm size class in the model assumed at 40% of total diamond content. The curves on the right in **Fig. 8.2** represent the model and bulk sample at efficiency level achieved in the bulk sample. For this purpose, diamond recovery in the model was assumed at 5%, 50% and 80% in size classes +7, +9 and +11. The resulting overlap of the two curves suggests that the microdiamond model might still be too coarse, compared with the bulk sample.

However, no further action was taken in view of issues that are obvious with respect to the recovery achieved in the bulk sample.

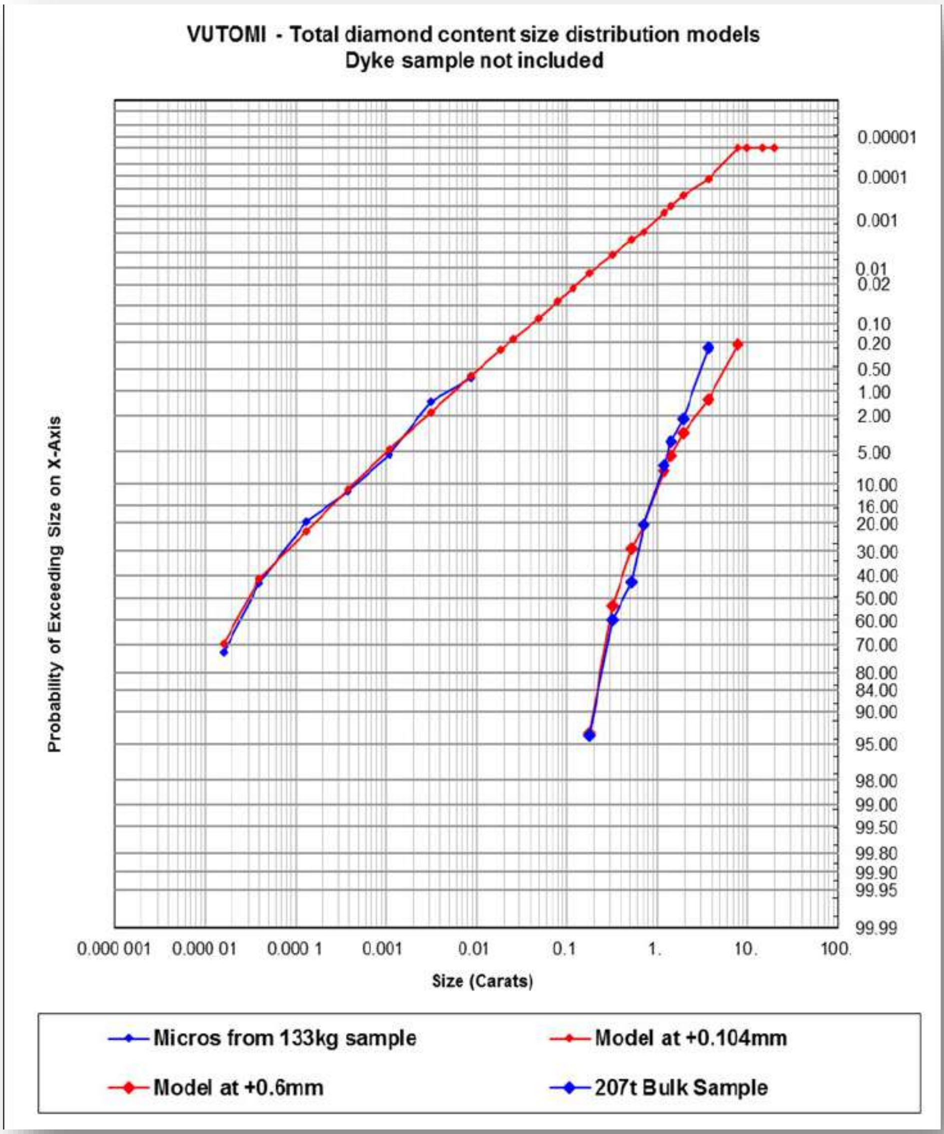


Figure 8.1 ***Diamond Size Distribution Model based on micro diamonds from "Central" and "Second Blow". Dyke sample not included***

The more optimistic upper diamond content model denoted as the 'Maximum MiDA Model' is based on the individual microdiamond points shown in the graph. The model assumes the microdiamonds in the size classes to be reflecting diamond content on their own, regardless of the underlying size distribution. In the case of a sufficiently large sample parcel of diamonds the two models normally coincide.

Furthermore, in this case the sample is obviously too small and the last two microdiamond points on the graph (for size classes above 0.6mm) have excessive influence on the model, each point representing a single stone in the size class. To give an adequate weight to the smaller size classes the two size classes were subsequently removed, resulting in an optimistic model. Elimination of the last two (largest) size classes does not affect the size distribution model to this extent, except that the smaller number of points available for modelling becomes much more restrictive. The situation illustrates the high level of uncertainty due to small sample size and low stone counts. The models were used to provide diamond content estimates ranging from 20 cpht to 270 cpht, clearly requiring more diamonds before higher levels of confidence can be achieved.

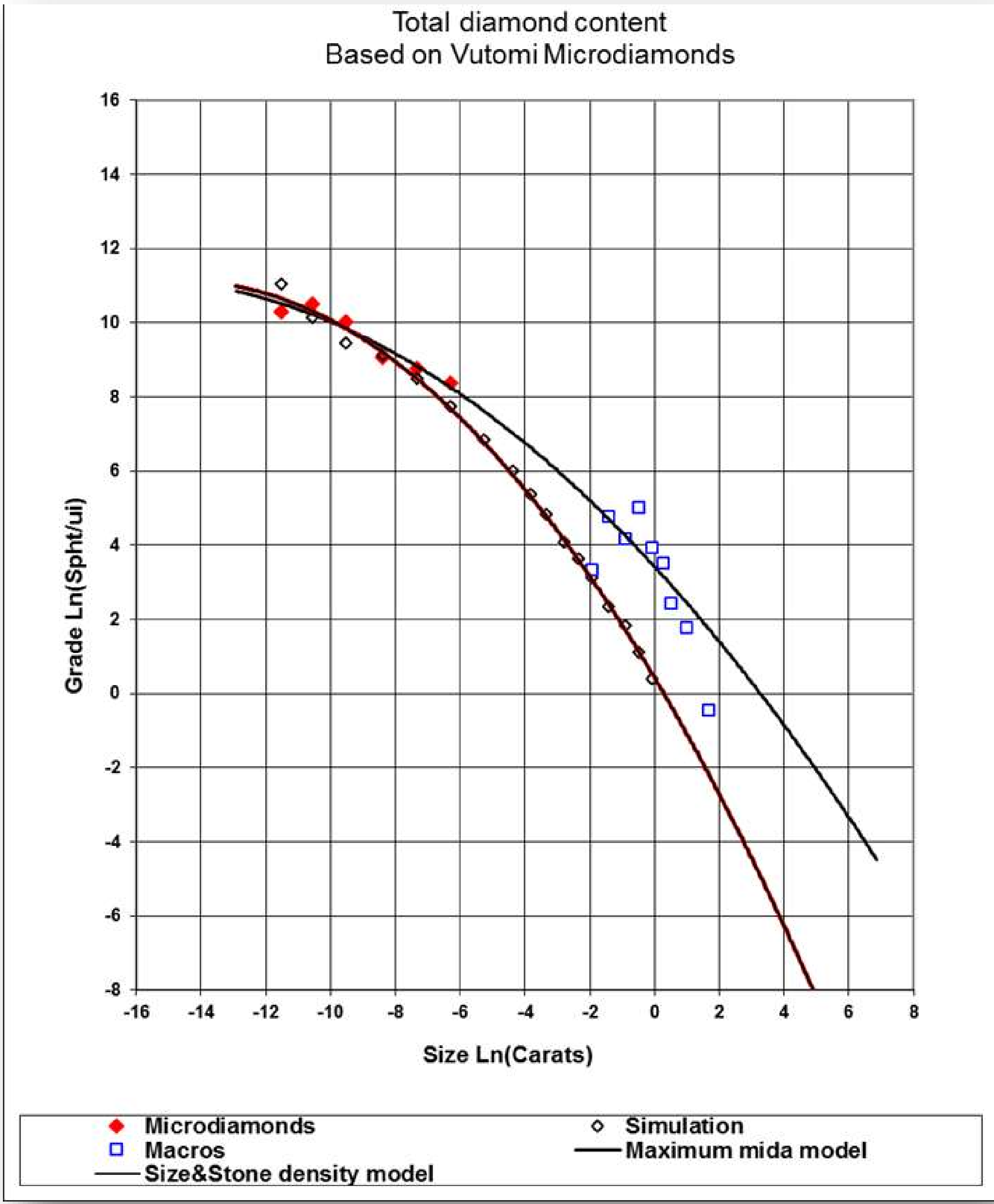


Figure 8.2 Total diamond content model based on reduced sample (remove two largest microdiamond size classes)

Ferreira's grade estimates for this data is between

- 20 cpht, and
- 270 cpht.
- with 70 cpht as a most probable result.

These estimates assume recovery in the +0.6-0.85 mm and +0.85-1.18 mm size classes to be 30% and 80% efficient. It is to be noted that the planned bcos for the program is 1mm, so the diamond grades modelled in these size fractions will have to be discounted in the final estimation.

Further, sampling does not provide information about the kimberlite dilution by country rock or other crustal fragments which only affects the sample stone density. Grade could, and should, therefore be factorised when dilution information becomes available.

8.1.1.1.2.1 QA/QC

During the MiDA process (Cronwright, May 2017), MSA regularly add synthetic diamonds to monitor the process efficiency for each sample in the size fractions: -425 µm to +300 µm, -300 µm to +212 µm, -212 µm to +150 µm, -150 µm to +106 µm and -106 µm to +75 µm. These spikes are added prior to the caustic fusion process. Both natural and synthetic diamonds are recovered from the +75 µm residue using 60X magnification with a binocular microscope. The residue is examined a minimum of two times to ensure the total recovery of diamonds. If any additional stones are recovered during second sort, a re-checking of the residue is undertaken a third time to ensure the recovery of all diamonds from the sample.

The recovery rate of the spikes (synthetic diamonds) is reported and the recovered spikes are stored on sample cards. Synthetic diamonds, either client spikes or released into the sample from diamond drilling, are identified, stored on sample cards and reported.

Of the 260 spikes added to the Vutomi samples, 254 were recovered, indicating a 97.7% recovery rate.

8.1.1.1.3 Microdiamond Assessment (Metal Dog Minerals)

In July 2017, **Dr Kurt Petersen**[24] was contracted to do a preliminary TCC grade estimate (+1 mm or +3DTC)[25] for the Thorny River prospecting site to further refine the grade estimate (Petersen, 5 July 2017). Micro-diamond data from a 164kg sample and macro-diamond data from an estimated 250T bulk sample[26] were provided as the main datasets to develop this TTC model. The subsequent total content model estimated an average grade of 78cpht (at 1mm bcos). The resulting SFD calculated for the average grade of 78 cpht is shown below in **Fig8.3**, which is positioned in relation to the micro- (red data) and macro- (blue data) distributions. The average TCC grade was calculated as 78 cpht and one (1) standard deviation away from this (on the lower side) was 64 cpht. The lower boundary has a grade of 38 cpht (at 1mm bcos).

The areas of concern in producing this total content result were;

- Macro diamond results are not well understood in terms of controls around sample taking, crushing extent or other concentration and recovery details.
- The macro- diamond results lacked definition in the +1-3 mm size range, which would have helped to bridge the micro- to macro- distributions.
- The fitted total content model was essentially an *a priori* process based on historical total content models rather than incorporating empirical evidence.
- Well proven total content model development techniques employed by practitioners such as the MSA study (Ferriria, June 2017) proved to be inconclusive due to the absence of definition in the 1 mm size range

[24] Dr Petersen holds an MSc in Engineering Science from the University of Queensland (Australia) and a PhD in Metallurgy from Stellenbosch University (South Africa). With over 15 years' experience in process modelling and simulation (10 years specifically in the Diamond industry), Dr Petersen is highly experienced in the optimisation of recovery performance.

[25] Aspects of diamond sieve sizes and correlations are described in Appendix 1

[26] This is the same dataset as interpreted by MSA, above

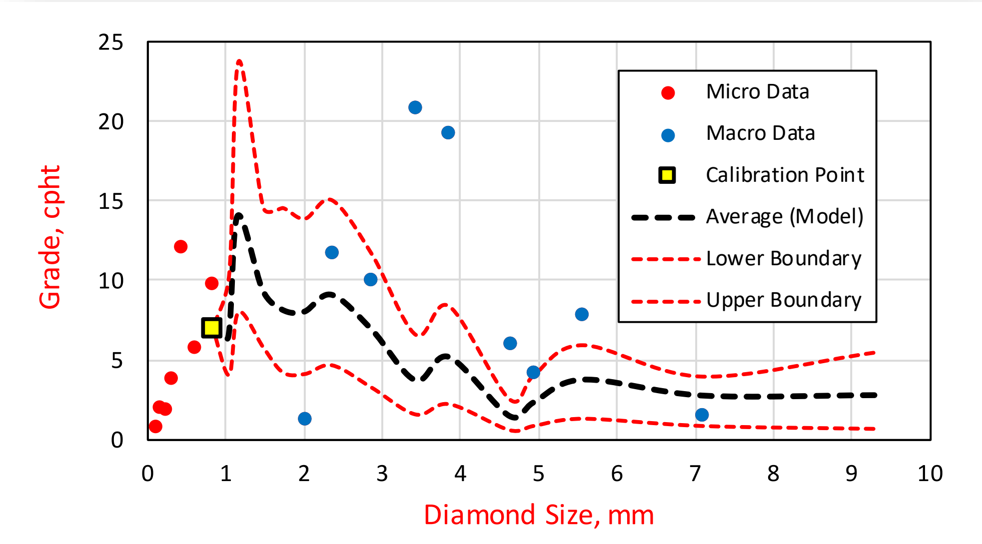


Figure 8.3 ***Estimated total content*** (Petersen, 5 July 2017)

8.1.1.1.4 Bulk-Sampling

The 2017 bulk-sampling programme recovered a total of 54.85cts from 304T of kimberlite for a sample grade of 21cpht. These results are considerably short of the estimated total content of 78cpht. Although it is realistic to assume that there will be considerable lateral grade variations along a kimberlite fissure and that the sample size is small, it is still a concern that both of the bulk sample results are so different from the modelled microdiamond results and estimated TCC model above.

In order to provide a meaningful integration of the above data, Interlaced Consulting (Coward, 2018) reviewed the available data and noted the following points:

- *The size frequency distribution of the sample diamonds has been reviewed. It appears that the distribution is not smooth, which suggests either a slight loss of middle size stones or an over recovery of fine diamonds. The recovery of coarse stones is not expected to be representative given the relatively small support and geometric extent of this sample.*
- *Using a pessimistic, base and optimistic case for the undiluted in-situ raw grade, a macro-micro model was developed to explore the potential in-situ model grade for the sample site. These models return a range of model grade that ranges between 54 to 88 cpht at a bottom cut off size of +3 DTC diamond sieve and 71 to 113 cpht at a bottom cut off size of +1 DTC diamond sieve.*[27]
- *To evaluate the impact of the sample support on size frequency stability, a sample simulation model was developed. A sample simulation model was developed using a parcel of 500 thousand stones, generated based on a model fitted to an annual production distribution. One hundred samples of 500 stones were extracted from this parcel. The analysis of the distribution of these samples suggest that the sample analysed contains marginally more fine stones that that which would be expected from the matched Annual Production Parcel. The simulated sampling model was used also to evaluate how sample support might impact on the shape of the recovered diamond size frequency. The analysis*

[27] +1DTC sieve is equivalent to 1.092mm round aperture, which equates roughly to a 0.82mm square aperture. A +3DTC sieve has round apertures of 1.473mm, which equates to a square aperture of ±1.15mm. See Appendix 1 for further details.

of the distribution of these samples suggest that the sample analysed here contains marginally more fine stones that that which would be expected from the model distribution. This finding may be a result of lower recoveries in the mid-size stone range.

- *The dilution of this sample presents the biggest uncertainty in deriving the adjusted in-situ kimberlite grade. Using a combination of recent and historic data, it is possible to derive a rough approximation for the proportion of kimberlite that was in the recent bulk sample. Accounting for dilution and reasonable range of plausible plant recoveries during sample treatment suggests that the undiluted raw in-situ grade of the kimberlite dyke sample is between 46 and 74 cpht.*

Prior to the acquisition of the bulk sample a total content model was developed, the parameters used to fit the curve were plausibly oscillated to provide a grade range of between 10 and 270 cpht. Using the raw 'as recovered' bulk sample diamonds the range changes to between 20 and 41 cpht at a bottom cut of at +1 DTC. This model is shown using a second order polynomial as developed by Ferreira (2013).

*The adjusted undiluted results were then used to produce a base case total content relationship (**Fig. 6.23**). The model fit is based only on one combined set of micro and macro diamonds. Therefore, the model fit is vulnerable to mixing of different populations of grades should it be found that the dyke is made up of more than one domain*

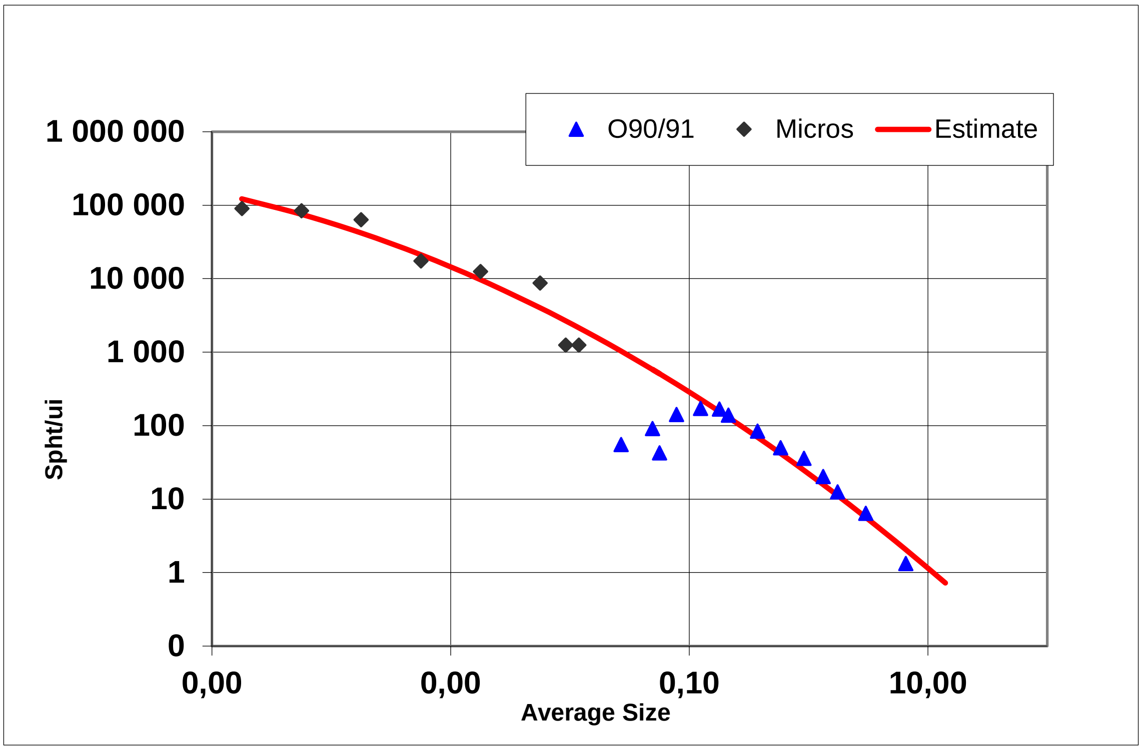


Figure 6.4 Grade estimation using 2017 Thorny River micro-macro distribution model

8.1.1.2 Diamond Value

The revenue model (Ringane, 2018) was based on a number of available datasets (**Table 8.2**).[28]

- The 2015 historic bulk sampling recovery where 272ct were recovered at 2mm bcos. The bulk-sampling revenue information is a combination of both sale and valuation. A total of 396 stones were through the National Diamond Marketing between March of 2015 – June 2015 at an average revenue per carat of USD201/ct. The remaining sample was sent through to FDTH in September for valuation, where 123 stones were valued at USD147/ct.

  The 2015 diamond valuation and sales data were assessed for internal consistency. The following concerns were raised with respect to the 2015 grade/value estimation. The tonnage figure has a very low confidence, being an estimate of an estimate. Not all of the diamond parcels have J registers – raising concerns over the completeness of the information provided. Moreover, the variation in the pre-sales valuation and the actual sales figures (from one of the diamond bourses) is significant.

  The diamonds are from different locations within the prospecting area and variations in the revenue per carat and grade between the different geological units is expected. However, since the estimated revenue is global, this is not a significant problem at this stage. The preliminary revenue is a modelled value (at2mm bcos) and is based on a very, small sample size, thus affecting the level of confidence in the diamond value;

Table 8.2 Datasets used for the diamond revenue model

Sales/valuation companies	Carats	Stones	Revenue (USD)	USD/ct
National Diamond Marketing	25.96	52	2,271	87.5
	30.40	42	10,513	345.8
	65.74	148	10,293	156.6
	80.48	154	17,648	219.3
	202.58	396	40,725	201.0
Flawless Diamonds (Pty) Ltd	70.41	123	10,368	147.3

As expected there are differences in valuation and final sale numbers. Hence the final sale number for the valuation parcel might significantly vary from the cited numbers. An example of the variation is for the 80.48ct parcel where the actual (13/06/2015) sale is 7% higher than the valuation (15/06/2015). In some instances, the variation per size class is significant (**Table 8.3**).

A total of 317ct is available for valuation/revenue estimation. The available data does not reflect the various lithological differences, nor does it reflect the variation in assortment within the parcel. This is especially concerning with the poor recovery from the 2017 sampling exercise, where only 63ct were recovered from some 300T. The poor recovery, coupled with the lack of stones above 4mm in the parcel,

[28] It is important to note that the parcels were valued by different valuation houses (National Diamond Marketing and Flawless in the case of the 2015 parcels and QTS Kristal Dinamika in the case of the 2017 parcel). Moreover, the data represents parcels at different bcos, with the 2015 parcels only representing diamonds greater than 2mm.

cannot be confirmed as representative of the larger distribution and assortment of the diamond population.

Table 8.3 Variation in valuation per size class for the 2015 data

Sieve Size	Approximate mm scale	Actual Sales value	Valuation value	% Var
+19	5.56	1,036	1,030	1
+17	4.93	500	500	-
+13	3.85	185	140	32
+12	3.42	90	90	- 0
+11	2.86	72	45	59
+9	2.35	84	74	14

- The 2017 sampling with 63ct from 305T. Of those, 54ct were valued by Ferraris & Bouquet (QTS Kristal Dinamika) at USD89/ct (at 1.5mm bcos). The equivalent value at 2mm bcos (42ct) is USD106/ct,

Combining the various datasets has its own challenges as there are parcels which reflects valuation figures and the other sales figures (**Fig. 8.4**). The confidence in the sales number is slightly higher as all sale data represent sales within a short time frame and using the same sort house. The 2015 sales data value is higher than the valuation done by Flawless, especially for the larger size classes. This mostly influenced by the good quality stones recovered and sold during the March – June Sales in the +19 and +21 fractions.

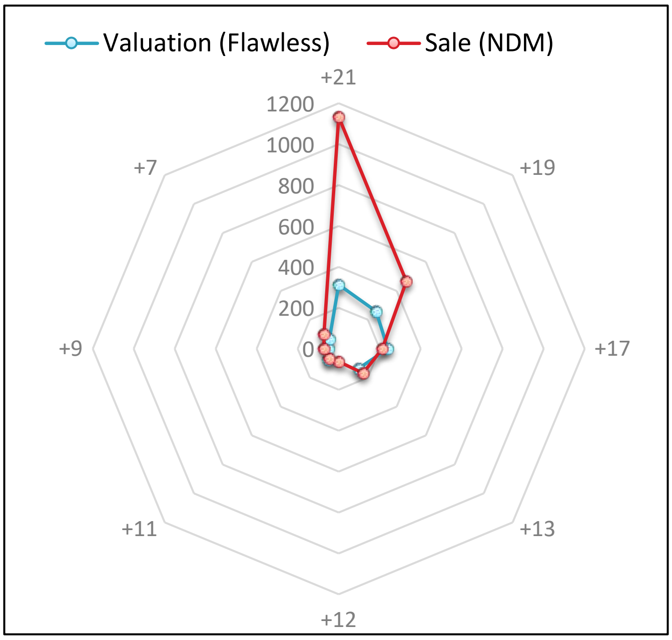


Figure 8.5 Modelled Valuation and Sale data for the 2015 revenue estimation

The average revenue-per-carat for the 2015 and 2017 periods are shown below (**Fig. 8.5**). The distinct variation is the absence of finer stones in the 2015 as a result of a different bcos and the high revenue per carat attained for the 2mm stones for the 2015 data. Due to the lack of data, uncertain confidence in the data and lower certainty in geological continuity a zonal dollar per carat has been estimated for the entire dyke fissure based on the total carat recovered. The lower size fractions revenue per carat have been modelled entirely on the 2017 data, whereas results for the larger size class were influenced by the 2015 data where data was more representative (**Fig. 8.6**).

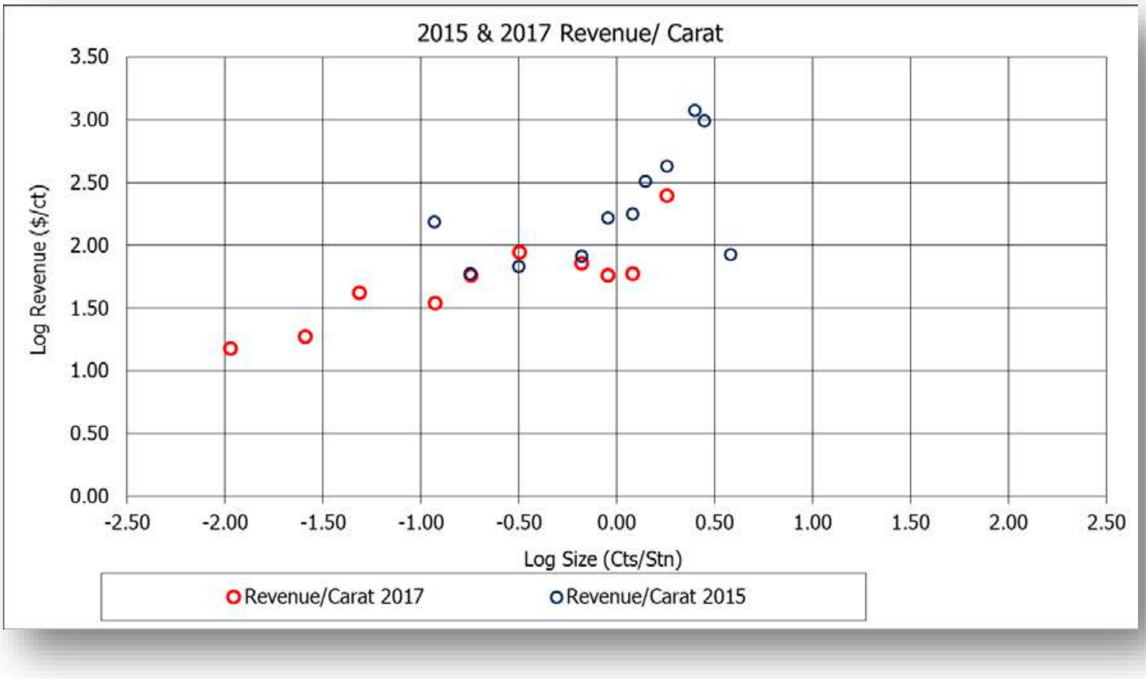


Figure 8.6 Average revenue data for the 2015 and 2017 parcels

Applying the expected total distribution to the modelled combined 2017 and 2015 revenue per carat, an estimated revenue of USD120-220/ct is expected at 1mm bcos (**Fig.8.6 and Table 8.4**).

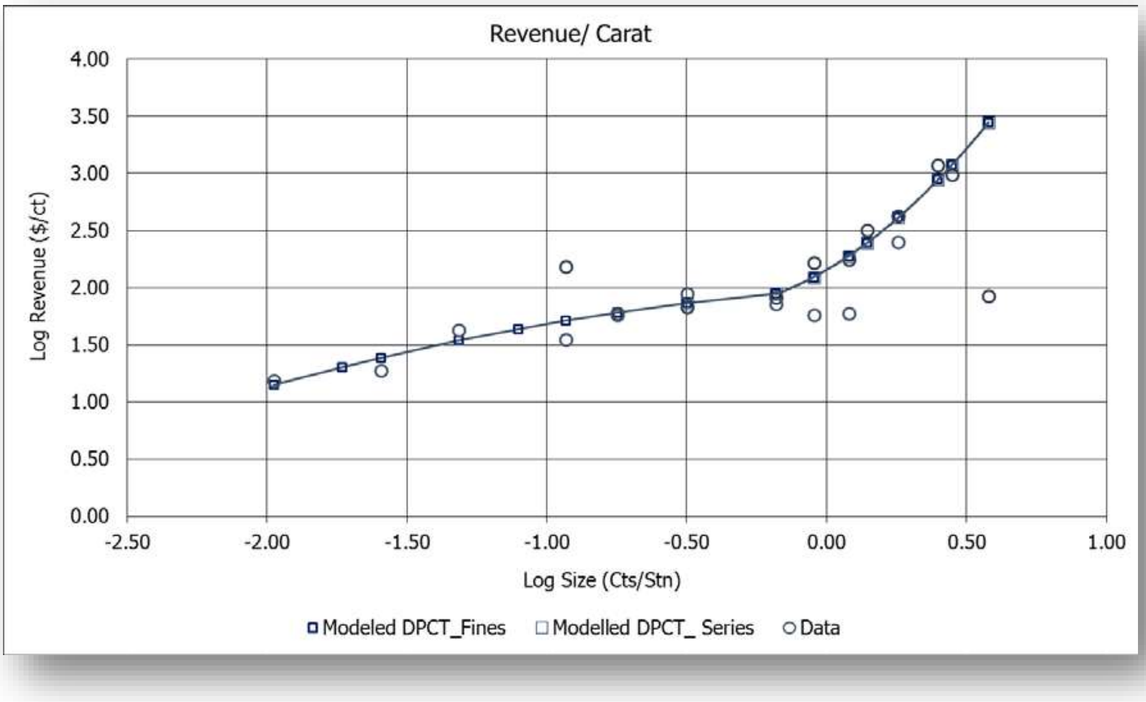


Figure 8.7 Revenue modelling for the 2015-2017 diamond data

Table 8.4 Revenue modelling

Diamond Size	% Sieve	USD/ct value
Coarse (8mm)	5%	800 - 1100
Medium	80& - 75%	160 - 220
Fine (-7mm)	15% - 20%	<35

The large range is due to the fact that there is significant variation in the +11-8gr size classes (**Table 8.5**), which increases the uncertainty in the expected revenue per carat in these size classes. In addition, poor recovery on the coarse size class results in a wider range being given for the coarse and medium size class.

Table 8.5 Variation of diamond values within size fractions

Size	2017 Parcel (USD/ct)	2015 Parcel (USD/ct)
8gr	249.12	426.49
6gr	0.00	321.45
5gr	60.00	178.02
4gr	58.05	165.03
3gr	72.25	81.93
+11	89.36	67.70
+9	57.93	59.30

8.1.1.3 Volume Estimation

Only limited information exists with respect to estimation of size and volume of the kimberlite. However, inferences have been made based on this data. At least two circular anomalies were identified from a ground magnetic survey along a portion of the fissure. Single drill holes into each of the anomalies intersected kimberlite, which have been interpreted as blows along the fissure. The anomalies have a combined geophysical size of 0.2 ha (cf. Marsfontein with an aerial extent of only 0.4 ha).

Limited core drilling along the fissure showed fissure widths in excess of 1m. A single vertical drill hole indicates that the kimberlite fissure may extend to a depth of at least 104m below surface (a second borehole intersected the fissure at a vertical depth of some 80m).

The Exploration Target volume thus identified at Thorny River (as at February 2018) is approximately 450,000 – 470,000m^3 (**Table 8.6**). Using the estimated 2.6g/cm^3 density calculated by Vutomi, this may reflect target tonnages of over some 1.2MT to 100m depth.

The economic kimberlite dykes in South Africa typically maintain their size and grade to depth, in contrast to diatremes (Gurney & Kirkley, 1996). If the same holds true at Thorny River then an additional 260,000-270,000m^3 of kimberlite may be expected to exist to depths of 500m, the depth to which Indicated Diamond Resources have been identified at the nearby Klipspringer.

Table 8.6 Exploration Results (potential volumes modelled from geophysical results)

Location (Farm)	Dyke Units	Length (m)	Width (m)	Depth (m)	Volume (m^3)
Frischgewaagt / Doornrivier	**TR-F01**	215	1.00	100	21,500
	TR-F02	260	1.00	100	26,000
	TR-F03	360	1.25	100	45,000
	TR-F04	355	1.00	100	35,500
	TR-F05	460	0.65	100	29,900
	TR-F06	410	1.71	100	70,200
	TR-F07	125	0.25	100	3,000
Hartebeesfontein	**TR-H01**	745	1.50	100	111,750
	TR-H02	480	2.25	100	108,000

8.2 Risk Assessment

Underlying strategic risks for prospecting and mining companies do not vary significantly over time. However, the acuteness, and hence the priority of these risks, changes depending on the economic environment (PWC, 2011). Deloitte (2017) has identified the most significant strategic business risks for the mining and metals sector, for 2018, as:

i. Switch to growth

A clear understanding of growth options available to companies — whether to build or buy — is essential. This requires ongoing awareness of the market (capital markets, global supply and demand, geopolitical developments and customer behaviour) and the competition.

ii. Productivity improvement

The need for sustainable and enduring productivity improvements remains vital for survival and prosperity and, even though some work has been done on it, there is still sizeable scope for improvement.

iii. Capital access

The cyclical downturn has created challenging fundraising conditions for the mining and metals industry. While producers are largely focused on restoring balance sheets and improving profitability through asset sales and capex reductions, mid-tier and junior companies are grappling with the challenge of risk-averse equity markets and highly selective lenders. These market conditions have facilitated the rise of alternative sources of finance, but such sources often bring increased complexity, costs and risks.

iv. Resource nationalism

Resource nationalism activity continues in the form of mandated beneficiation and increased taxes, albeit at a slower rate. This activity is being driven by the perception that mining and metals companies are still not paying their "fair share" to host nations. It is this sentiment and a drive to combat corruption that has resulted in new transparency laws being enacted that will require companies to start reporting taxes and other government payments. Mining and metals companies will need to ensure they are ready for these new reporting requirements.

v. Social licence to operate (SLTO)

Maintaining a SLTO is an increasingly multi-faceted and multi-stakeholder risk with a complex array of relationships to negotiate. In recent years, this risk has broadened in the face of tougher global economic conditions. As miners consider closing projects, they must balance the potential reputational damage of withdrawing from a community and the impact on local economies that it may have.

vi. Price and currency volatility

A clear legacy of the super-cycle for mining and metals is a "super correction," with markets ultimately self-correcting via the price mechanism — the greater price stimulus both in scale and duration, the greater the correction and the greater the volatility as markets seek to correct.

vii. Capital projects

The productivity of invested capital is a key issue for CEOs across the global mining and metals sector as falling commodity prices and rising supply surplus have ushered in a period of restraint in capital project investment. Scarce capital is driving a strong focus on capital productivity or "value for money," and with that numerous high-profile projects have been scrapped, shelved or sent back for re-planning. Yet, despite many mining and metals companies enhancing the process maturity of engineering design, projects continue to experience significant project cost and schedule overruns.

viii. Access to energy

While falling oil prices have brought some relief to mining and metals companies, the current slump in oil prices is the result of oversupply and the imbalance could be reversed through supplier discipline. This becomes even more critical as mining and metals companies expand operations to remote areas with under-developed energy infrastructure, while reducing their emissions and energy footprint becomes an imperative.

ix. Cybersecurity

Cyber-hacking has become more widespread and sophisticated, with cyber-attacks being a common issue across the mining and metals sector regardless of size or scale.

x. **Innovation**

The sector is currently operating in a low-price environment. Therefore, many mining and metals companies may need to innovate to survive, while others may look to maximize revenues and gain first-mover advantage when the market returns to growth. The benefits of innovation are clear: those businesses that encourage innovation can improve their position on the cost curve relative to their peers.

Other incipient risks highlighted by this study are infrastructure, access to water, pipeline shrinkage, fraud and corruption, climate change, geopolitical uncertainty and increasing regulatory requirements.

8.2.1.1 In South Africa

"Over the past decade, commodity prices reached both historic highs and historic lows, mining companies engaged in both significant acquisitions and consolidations and operational realities shifted irrevocably in the face of a digital revolution………. The next 10 years will see the continuation of rapid changes in the industry against a backdrop of declining orebody grades, decreasing availability of tier one assets and continued focus on shareholder returns. To thrive amid this volatility, companies must rethink the traditional mining model. Change is coming and mining companies must find ways to remain relevant" (Deloitte Touch Tohmatsu Limited, 2018).

The Allianz Risk Barometer 2018 report (BusinessTech, 2018) reveals that cyber incidents remain a top threat with 38% of responses for a third year in a row for South African businesses. Business interruption

(BI) ranked second at 34%, and changes in legislation and regulation is in third place at 29%. This is up from fifth place in 2017, as policy uncertainty and sluggishness in the market has had a negative impact on business confidence over the past year. The report, further, revealed two new business threats that have emerged in South Africa as part of the top 10 list, namely climate change/ increasing volatility of weather and loss of reputation or brand value, both at 16%. Market developments as a threat has slightly declined to fourth place at 23% from third in 2017 regardless of prevailing political uncertainly and a difficult business environment. Fires and explosions and new technologies – tied in in sixth place – are both at 19% proving this is still a concern as South Africa was plagued with incidents of large fires at Durban Harbour, Braampark and Knysna. Macroeconomic developments (13% of responses) slid seven places to 10th on the list.

South Africa has been classified as a country with potentially only medium security risk combined with a medium risk of political interference (with high security issues in deprived urban areas (Control Risks). The only risks in South Africa are thought likely to be supply chain vulnerability and civil unrest in the form of strikes, riot, civil commotion, malicious damage and terrorism (Aon).

In spite of an apparent reduction in political risks, the sovereign credit rating still remains under threat of further downgrades (FPM Risk & Wealth Management, 2018). This in itself adds a touch of uncertainty over confidence levels (business and consumer) and as a result could prevent a positive departure from lacklustre economic conditions

Annual analysis by the Stern School of Business shows that, in January 2017, country risk premiums range from 0% to +19% ((Damodaran, 2017) with risk premiums for South Africa at around 3.06%. This compares with 0.00% for North America, 2.23% for Western Europe, North America and 5.43% for Central/South America. The total risk premium is obtained by adding to this basic figure, the historical risk premium for a mature equity market (estimated from US historical data), putting South Africa at 8.75% (for comparison, the US and Canada would be at 5.69%, Brazil at 9.64%, Russia at 8.25%, India at 7.39%, China at 7.25% and Greece, Mozambique and Ukraine at 19.9%).

An alternative indication of country risk is the SABOR rate. Traditionally SABOR (the South African Bank Offered Rate) has been defined as the rate at which a prime commercial bank is offered deposits by other banks. The SABOR is the equivalent of the American Federal Funds Rate and the LIBOR (London Interbank Offered Rate) and is used as a benchmark for other short-term interest rates. Indications from SABOR put the current risk for South Africa (November 2017) around 6.7% (www.resbank.co.za).

8.2.1.2 Specific Risks

In addition to the general risks described above, the following mining-specific issues may also affect the Mineral Resource and/or Reserve estimate materially. One should note that most of these issues are very similar to gold and copper bulk tonnage mining as well.:

- Varying kimberlite composition may result in plant recovery issues (both in bulk-sampling and later in production mining). For example, limited variations will occur over time and space and cannot be identified during testing.
- Diamond breakage may decrease expected values.
- The regulatory authorities may introduce new legislation regarding new permits, rehabilitation requirements, additional BEE ownership or even (partial or total) resource nationalism.
- South Africa's electricity supply situation will continue to remain a risk owing to instability of the distribution network. Potential shortages of power, localised power outages and increases in power prices will need to be considered when planning and budgeting mine expansion.
- The sufficiency of water is not to be underestimated.

- The operator may not be able to raise sufficient finance to progress the evaluation programme at the right level.
- With further exploration, reasonable prospects for eventual economic extraction ("RPEEE") may prevent a Diamond Resource from being classified on the property. Included among the possible risks are:
  - Dilution by waste rock may increase with depth or along strike;
  - The fissure sections may pinch out along strike and at depth to decrease potential volume;
  - Diamond values obtained by a larger diamond parcel may prove disappointing;
  - The diamond grade may prove to be inconsistent with depth;
  - Diamond breakage may decrease expected values;
- When the expansion to Inferred Resource classification, trial-mining and relevant technical studies have been completed, mining conditions and the kimberlite geometry may not be as expected;
- The company may not be able to conclude an agreement to process the kimberlite at a nearby facility and may have to build their own processing plant on-site, which will greatly increase the amount of capital required;

8.3 Adjacent Properties

A number of pipes/blows and fissures are known to exist in the immediate vicinity of Thorny River (**Fig. 8.7**). Perhaps the best known are the Klipspringer and Marsfontein mines.

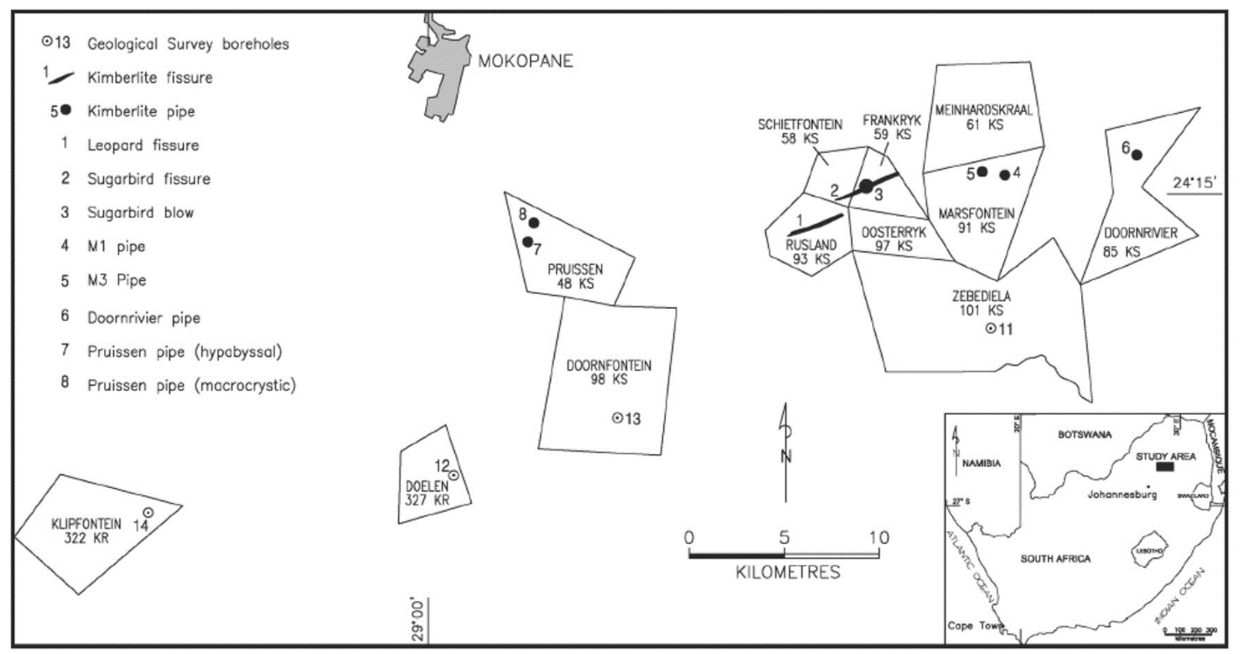


Figure 8.8 ***Location of the Klipspringer and Marsfontein occurrences in the vicinity of the Thorny River project*** (Mc Carthy & Allan, 2007)

Although the author has visited both the Klipspringer and Marsfontein properties, she has not independently verified the information as presented in this section, which information is all in the public domain. In addition, the reported grade and value characteristics of the Klipspringer and Marsfontein deposits may not necessarily reflect those expected on Thorny River.

8.3.1 Klipspringer

The Klipspringer Diamond Mine (**Plate 8.1**) in South Africa is located 250 km north of Johannesburg and 35 km south of Polokwane, the provincial capital of the Limpopo Province. It comprises Group-2 kimberlite dykes and blows, of which the Leopard and Kudu fissure (dykes) and Sugarbird and Kudu blows, are diamondiferous. There is no published information on mantle-xenoliths, diamond- inclusions or the nature of the diamonds from these dykes and mines (Field & et., al, 2008)

The mine, currently[29] owned by Asa Mining PLC, is on care and maintenance since 2011 (as a result of severe weather which flooded the shaft, bottom and lower level of the Leopard fissure), and has an Inferred Resource of 3.4M tonnes and an Indicated Resource of 0.7M tonnes, both with a grade of 49cpht and diamond value of USD130/ct (bcos of 1mm) (Bartlett, 2012).

The Klipspringer mine was operated by SouthernEra. The 2006 bulk-sampling yielded a recovered grade of 62.06cpht from 11,343T, compared to the 2003 trial mining of 38.54cpht from 193,712T. A total of 4,007ct was sold for an average price of USD/ct100, giving as approximated *in-situ* revenue of some USD62/T. These results were very encouraging when compared to historical results achieved at the mine.

Plate 8.1 ***Klipspringer Mine*** (Asa Resource Group website)

The mine consists of several *en-echelon* kimberlite fissures and blows trending in a northeast orientation, and includes the Leopard Fissure, the Sugarbird Fissure, the Sugarbird Blow, the Kudu Fissure, and the Kudu Blow, amongst others. The mined fissure widths range from 0.5-2.14m (average of 0.8m). Total content modelled grades of 83cpht were reported with 50cpht mined (recovered) grades. The average width of the fissure was noted as 0.8m, with ranges from 0.5-2.14m. Mining expected some 40% dilution at the rate of 50k tonnes per annum (Ibid).

[29] The mine is in the process of disposal to SLA Capital on behalf of Greenhurst Mining.

8.3.2 Marsfontein

Marsfontein (**Plate 8.2**) consists of a small kimberlite pipe, or blow (M1), located on or associated with a Group-2 kimberlite dyke (Field & et., al, 2008). The kimberlite has been dated at 155.1±0.8 Ma (Ibid)). The kimberlite intruded the Archaean Meinhardskraal granite and a dolerite dyke of unknown age.

Plate 8.2 Photograph of the Marsfontein open pit (above) with a fissure widening into the blow (below)

Mining of the 0.4-hectare pipe commenced on 31 August 1998 (Scott & Jennings, 2003). In the first two days of mining the 15-metre thick eluvial gravels overlying the pipe, some 40,000 carats were produced at a grade of 1,433 carats per hundred tons (cpht). In the first month, 24,781 tons were treated to produce 165,251 carats (grade 667 cpht). This material was worth USD934 per ton. The value of the first month's production was USD 23.14 million, payback of capital being achieved in 3.4 working days.

M1 formed the entire mining reserve, whilst the dyke (termed M8) proved to be sub-economic. The M1 pipe was sub-divided into four varieties by Machin, 1999 (quoted in Field, et al., 2008). Three of these were classified as hypabyssal-facies, macrocrystic kimberlite, and the fourth as diatreme-facies TKB). The latter was found to be insignificant in size.

The weathered kimberlite grade (Scott & Jennings, 2003) was 509cpht. The unweathered kimberlite grade started at 355cpht and ended at 81cpht. This latter grade was assumed to be the result of higher dilution as the pipe decreased in size with depth and dilution increased. Kimberlite from the mine was treated from September 1998, to the end of 2000, when the economic limit of mining was reached in the 150m deep pit. In total 970,347 tons were mined and treated to produce 1,826,031 carats for an overall grade of 188.18 cpht. Further low-grade stock piles from gravels around the pipe and from a stockwork of kimberlite veinlets in diabase were processed in 2001 and produced an additional 94,534 carats.

The grade recovered from the pit varied with depth with recoveries from the shallow portions running at up to 1,400 cpht dropping of to 80 cpht at the pit limit of 150 metres depth. Total revenue from M1 was USD246,300,000 from the 1,920,565 carats produced, an average ofUSD128 per carat.

8.4 Country Profile

8.4.1 South African Economy

Given the shift in South Africa's political environment, there are expectations of a new direction for the local economy (FPM Risk & Wealth Management, 2018). GDP growth rates are expected to improve over the next few years, but not yet to inspiring levels. Although the World Bank's expectations for growth in the South African economy is just 1.1% for 2018 ((Cronje, 2018), other economists are more positive, stating that *"With emerging assets still well bid as we enter 2018, investors are looking for 'the next big emerging market story' akin to Brazil in 2016 and Mexico in early 2017. South Africa is at the top of the list of potential candidates, given the market-friendly ANC leadership ... outcome"* (Brown, 2018)

The rand is expected to sustain a mild strengthening bias this year, with support from improving local fundamentals; however, into 2019, the rand could come under pressure again as the pace of global growth starts to decelerate and the current account starts to widen again (FPM Risk & Wealth Management, 2018).

The current key economic indicators are given in **Table 8.7**.

Table 8.7 Economic indicators for South Africa (February 2018) www.tradingeconomics.com

Interest Rate	GDP Growth Rate (YoY)	Unemployment Rate	Core Inflation Rate
6.75%	0.80%	26.7%	4.70%

8.4.2 The Mining Industry

Economic activity in modern-day South Africa has been centred on mining activities, their ancillary services and supplies. The country's stock exchange in Johannesburg was established in 1887, a decade after the first diamonds were discovered on the banks of the Orange River, and almost simultaneously with the gold rush on the world-famous Witwatersrand.

In many ways South Africa's political, social and economic landscape has been dominated by mining, given that, for so many years the sector has been the mainstay of the South African economy. Although gold, diamonds, platinum and coal are the most well-known amongst the minerals and metals mined, South Africa also hosts chrome, vanadium, titanium and a number of other lesser minerals. While mining is 8% of GDP on a direct basis, it can account for almost double that on an indirect basis and importantly, represents over 40% of exports which bring in needed foreign currency (CNBC Africa, 2018).

Latest statistics show mining production in South Africa for November 2017 increased by 6.5% year-on-year, with the largest contributors being PGMs (12.3% and contributing 2.8 percentage points); iron ore (20.7% and contributing 2.5 percentage points); and coal (8.5% and contributing 2.1 percentage points) (CNBC Africa, 2018).

8.4.3 South Africa's Mineral Legislative Environment

8.4.3.1 Mineral Policy

South Africa has, generally, endorsed the principles of private enterprise within a free-market system, offering equal opportunities for all the people. The state's influence within the mineral industry has, thus far, been confined to the goal of orderly regulation and the promotion of equal opportunity for all citizens. The Minerals and Petroleum Resources Development Act (MPRDA Act 28 of 2002) was introduced to legislate the official policy concerning the exploitation of the country's minerals. Previously, South African mineral rights were owned by either the State or the private sector. This dual ownership system represented an entry barrier to potential new investors. The new MPRDA was introduced with the objective for all mineral rights to be vested in the State, with due regard to constitutional ownership rights and security of tenure.

The current socio-economic crisis in SA is on a national scale. High unemployment, income inequality, slow land reform and poor service delivery are motivations for widespread protests and continued unrest in the country. The general consensus among South African mining experts is that the sector is in for yet another bumpy ride as a range of challenges have aligned to create what has been described as a 'perfect storm' through which local mining companies will have to persevere. At the heart of this perfect storm is the lack of mineral policy certainty, an issue that has been troubling South Africa's mining sector since 2013.

8.4.3.2 Mineral and Petroleum Resource Development Act 28 of 2002 ("MPRDA")

The Mineral and Petroleum Resources Development Act (MPRDA), 2002 aims to:

- Recognise that mineral resources are the common heritage of all South Africans
- Promote the beneficiation of minerals
- Guarantee security of tenure for existing prospecting and mining operations
- Ensure that historically disadvantaged individuals participate more meaningfully
- Promote junior and small-scale mining.

A draft version of the amended Mineral and Petroleum Resources Development Act (MPRDA) was made available to the public after it was approved by cabinet on 27 December 2012. The draft Minerals & Petroleum Resources Development Act (MPRDA Bill) has been in limbo since President Jacob Zuma sent it back to Parliament in January 2015, citing constitutional concerns and lack of consultation with communities at provincial level.

At the last round of public hearings, a number of legal experts from among others the Chamber of Mines, the Institute of Race Relations (IRR), law firm Webber Wentzel and the Legal Resource Centre argued that the Bill as it currently stands is still in contravention of the Constitution (Peyper, 2017). In in its submission, the Chamber of Mines said that a clause included in the MPRDA that would elevate the Mining Charter to law would not pass constitutional muster as it offends the separation of powers between the legislature and the minister.

The Chamber also objected to the beneficiation clause in the amended legislation, which would give the Minister of Mineral Resources unfettered powers to restrict the quantity of minerals available for exports. This clause, it argued, is also inconsistent with South Africa's international trade obligations and would furthermore amount to an expropriation of the mining company's income, which was the mine's property – a contravention of the Constitution.

Also in question at the public hearings were the 57 amendments proposed by the Department of Mineral Resources (DMR), which go beyond the Constitutional. To a large extent, the DMR's amendments were suggested to accommodate the petroleum and gas industry. Most notably, the DMR agreed to reconsider the free carried interest in the MPRDA, which would allow government to levy 20% interest on all new exploration and production rights as well as further participation interest.

The stakeholders present at the public hearing agreed on one matter: that the MPRDA impasse has been going on for too long and that the delay in ratifying the legislation is to the detriment of the mining industry, which has suffered severe blows in the past five years as a result of weakening commodity prices, legislative uncertainty and relentless demands from government.

8.4.3.3 Broad Based Black Economic Empowerment (BBBEE) and the Mining Charter

On 15 June 2017, the Minister of Mineral Resources (the Minister) published the revised Broad-based Black Economic Empowerment Charter for the South African Mining and Minerals Industry (the Mining Charter III), purportedly under section 100(2) of the Mineral and Petroleum Resources Development Act, 2002 (the MPRDA) and section 9 of the Constitution of the Republic of South Africa, 1996 (Webber Wentzel, 2017). Mining Charter III contains far reaching changes and introduces more onerous and stringent compliance obligations to those currently stipulated in the Broad-based Black Economic Empowerment Charter for the South African Mining and Minerals Industry, (the 2010 Mining Charter).

Mining Charter III has been criticised by all quarters (Leon & Leyden, 2017). However, many believe that the implementation of Mining Charter III, in some form or another, is inevitable (Dylan, 2017). Even if the charter was amended, it would bear similarities to that of the current version and would, therefore, still require all mining operations to adapt to comply with new compliance criteria within an expected 12month period.

However, with the change in political leadership, there exists a possibility that the controversial Charter could be scrapped in its entirety (Groenewald, 2018), even as it is due to be challenged in court at the end of February 2018.

8.4.3.4 The Minerals and Petroleum Resources Royalty Bill

The royalty bill was introduced on May 1, 2009. In terms of the currently applicable formulae, the applicable royalty rates will vary according to the profitability of the mining company, subject to a minimum rate of 0.5% and maximum rate 9.0% for diamonds (unrefined minerals). The profitability parameter in the formulae is EBIT and it also allows for 100% capital expensing which is an acknowledgement of the high capital costs associated with mining.

$$Y(u) = 0.5 + \{EBIT / (Gross\ sales \times 9)\}$$

Where:
Y (u) = Royalty percentage rate;
EBIT = Earnings before interest and taxes (but EBIT can never go below zero).

The formula contains four parameters: (1) an intercept term, 0.5, (2) EBIT, (3) gross sales and (4) 9 as a constant:

- The 0.5 essentially acts as a minimum royalty percentage rate (0.5%) in order to ensure that Government (as custodian) always receives some level of royalty payments for the permanent loss of non-renewable resources.
- EBIT essentially measures an extractor's net operating mining profits in relation to recovered mineral resources to be eventually transferred. Taxes and other Government charges, such as the royalty, are excluded because EBIT is part of the royalty determination. The exclusion of interest effectively neutralises how key methods of financing (i.e. debt or equity) mineral operations are undertaken. EBIT for mineral resources transferred is conceptually viewed as the aggregate amount of:
  (1) Gross sales for all transferred mineral resources;
  PLUS
  (2) Recoupment in respect of the disposal of assets used to develop mineral resources to the extent the depreciation on those assets offset EBIT;
  LESS
  (2) Operating expenditure incurred (and depreciation allowances applicable to capital expenditure) relating to the extraction and development of mineral resources to the extent those expenditures are both: (i) deductible under the Income Tax Act, and (ii) bring those minerals to a Schedule 1 or Schedule 2 condition (as applicable).

8.4.3.5 The Diamond Amendment Bill

The 2005 amendments to the Diamonds Act, viz., Diamonds Amendment Act, 2005 and the Diamonds Second Amendment Act, 2005 as well as the 2007 amendment to Regulations under the Diamonds Act took effect on 1 July 2007. These Regulations were also, subsequently, amended on 4 April 2008. The object of the Regulator (SADPMR) in terms of the Diamonds Act, 1986 (as amended) is to ensure equitable and regular supply of rough diamonds to local beneficiators. It makes provision for the establishment of the State Diamond Trader ("SDT") who would facilitate the supply of rough diamonds equitably and a Precious Metals and Diamonds Regulator to promote equitable access to rough diamonds to licensees. The objects of the amendments are to:

- Promote a culture of value addition of minerals by maximising the value of economic benefit of South Africa's mineral wealth;
- Recognise the fact that beneficiating our minerals locally contributes to South Africa's economy;
- Prevent and abolish restrictive and unfair practices with regard to accessibility and availability of minerals and access to markets; and
- Create an internationally competitive and efficient administrative and regulatory regime by means of national licensing system.

In this regard, the regulators functions include the implementing, administering and controlling all matters relating to the purchase, sale, beneficiation, import and export of diamonds; and establishing diamond exchange and export centres, which shall facilitate the buying, selling, export and import of diamonds and matters connected therewith.

The Act, which was introduced against strong opposition by diamond miners, appears to have failed to achieve its objectives (Mathews, 2013). Although South Africa has been exporting diamonds for more than 100 years, it had not been able to develop a local cutting and polishing jewellery industry – in fact, over the last few years the number of jobs in local diamond beneficiation has dwindled, not increased.

8.4.3.6 Diamond Export Levy Bill 2007

The Diamond Export Levy Bill was required to give effect to certain provisions of the Diamonds Act, 1986, as amended. The Diamond Export Levy Bill's main objective is to support the local beneficiation of rough diamonds. The beneficiation of rough diamonds is seen as important to encourage the development of the local economy, skills and employment creation. The Bill proposes a 5% export levy on rough diamonds that should contribute towards local beneficiation but is low enough so as not to unduly encourage smuggling. The 5% levy applies to all rough (natural unpolished) diamonds that are exported, while synthetic diamonds are exempted. The levy amount will be equal to 5% of the value of a rough diamond exported, as specified on a return described in Section 61 of the Diamonds Act, 1986 or of the value as assessed by the Diamond and Precious Metals Regulator described in section 65 of the Diamonds Act, 1986.

The Bill contains relief measures that may offset the 5% levy in full or in part. A producer is entitled to receive a credit for imported rough diamonds. This credit will offset (in full or in part) a producer's export duty liabilities. The Minister of Minerals and Energy may also exempt a producer from the 5% export levy if a producer's activities are supportive of local diamond beneficiation, or the producer has an annual turnover of less than ZAR10 million, and such a producer has offered his or her rough diamonds for sale at the Diamond Exchange and Export Centre but there were no local buyers. However, the diamonds must subsequently be sold for an amount at least equal to the reserve price at which such diamonds were offered at the centre. These conditions preserve South African's "right of first refusal" with respect to bidding on any rough diamond intended for export.

8.4.3.7 Precious Metals Bill and the Beneficiation Strategy

The Precious Metals Bill amends Chapter XVI of the Mining Rights Act, No 20 of 1967, so as to eliminate the barriers to local beneficiation of precious metals and to rationalise the regulation of matters pertaining to the downstream development of precious metals. The objects of the Bill include:

- To allow for the acquisition and possession of precious metals for the local beneficiation;
- To regulate the precious metal industry;
- To repeal the legislations that create barriers to beneficiation; and
- To amend the over-regulation of the industry by centralising the issuing of jewellers' permits within the Department of Minerals and Energy.

In order to implement beneficiation strategies, mining licences may, in future, be granted with attached conditions, to ensure a supply of raw material for local industries seeking to further refine, or beneficiate, the extracted minerals (SAPA, 2011). However, for South Africa to succeed in its endeavours, it needs to create the necessary skilled labour force and to establish the necessary industrial development zones with attractive tax advantages and low tariff regimes. Customs systems would also have to be streamlined and harbours decongested to facilitate efficient trading conditions.

8.4.3.8 Kimberley Process

The Kimberley Process ("KP") is a joint governments, industry and civil society initiative to stem the flow of conflict diamonds – rough diamonds used by rebel movements to finance wars against legitimate governments. The trade in these illicit stones has fuelled decades of devastating conflicts in countries such as Angola, Cote d'Ivoire, the Democratic Republic of the Congo and Sierra Leone. The Kimberley Process Certification Scheme ("KPCS") imposes extensive requirements on its members to enable them to certify shipments of rough diamonds as 'conflict-free'. The core mandate of the KPSC is to guarantee consumers that the organisation is aware of the origin of the diamonds that the consumers buy.

In essence, the participants in the KPSC have agreed that they will only allow for the import and export of rough diamonds if those rough diamonds come from or are being exported to another Kimberley Process participant. The KPSC requires that each shipment of rough diamonds being exported and crossing an international border be transported in a tamper-resistant container and accompanied by a government-validated KP Certificate. Each certificate should be resistant to forgery, uniquely numbered and include data describing the shipment's content. The shipment can only be exported to a co-participant country in the Kimberley Process. No uncertified shipments of rough diamonds will be permitted to enter a participant's country. Once a certified shipment has entered its country of destination it may be traded – in whole or part – and mixed with other parcels of rough diamonds as long as all subsequent transactions are accompanied by the necessary warranties. Failure to adhere to these procedures can lead to confiscation or rejection of parcels and/or criminal sanctions. Any rough diamonds being re-exported will also require KP Certificates, which will be issued in the exporting country. These re-exports can comprise any combination of rough diamonds that have been previously imported through the KP Certification Scheme.

In order to strengthen the credibility of the KP agreement, as well as to provide the means by which consumers might more effectively be assured of the origin of their diamonds, the World Diamond Council proposed that the industry create and implement a System of Warranties for diamonds. Trade in rough diamonds is permitted between Participants of KPSC only on the basis of authentic KP certificates. Under this system, which has been endorsed by all KP participants, all buyers and sellers of both rough and polished diamonds must warrant that, for each parcel of diamonds "*The diamonds herein invoiced have been purchased from legitimate sources not involved in funding conflict and in compliance with United Nations resolutions. The seller hereby guarantees that these diamonds are conflict free, based on personal knowledge and/or written guarantees provided by the supplier of these diamonds.*"

In addition, each company trading in rough and polished diamonds is obliged to keep records of the warranty invoices received and the warranty invoices issued when buying or selling diamonds. This flow of warranties in and warranties out must be audited and reconciled on an annual basis by the company's own auditors. Failure to abide by the aforementioned principles exposes the member to expulsion from industry organizations.

The KPCS is open to all countries that are willing and able to implement its requirements. The KPCS currently has 54 participants, representing 81 countries (with the European Union, and its 28 Member States counting as a single participant, represented by the European Commission). Another seven countries have applied to join the KPCS but have yet to meet the minimum requirements. KPCS members account for approximately 99.8% of the global production of rough diamonds.

The term Observers refers to Industry and Civil Society groups that play an active role in monitoring the effectiveness of the certification scheme and who provide technical and administrative expertise to the Secretariat, Working Groups, Applicants and Participants.

- African Diamonds Producers Association (ADPA)
- Civil Society Coalition

- Diamond Development Initiative (DDI)
- World Diamond Council (WDC)

The Central African Republic was temporarily suspended from the KP in 2013. However, in May 2016, a partial suspension of the diamond export ban has revived the local trade in specific “green-zones”. Admission of the latest applicant, Gabon, is conditional upon meeting the requirements set out in the relevant Administrative Decision (December 2017). Moçambique is on the list of current candidates who have expressed an interest in joining the KP.

9 Conclusions and Recommendations

The Thorny River kimberlite fissure complex is well located in the Limpopo Province of South Africa, being along strike from the remaining open pit at Marsfontein and Klipspringer Diamond Mines. Marsfontein has the singular distinction of attaining capital payback of USD23.14M in under four working days! The Klipspringer Mine is currently on Care & Maintenance due to flooding in 2011 and is undergoing change of ownership.

Geophysical surveys (frequency domain electromagnetics, ground magnetics and electrical resistivity tomography) have been extremely useful in delineating the location and extent of kimberlite fissures at Thorny River. However, several linear conductors displaying a similar strike and signature to the known fissures remain unresolved.

Macroscopic and microscopic classification of core samples to identify, *inter alia*, the relative abundance and size of olivine crystals has proved useful as a qualitative descriptor of theoretical diamond abundance. Conversely, aphanitic zones, typically, are of no economic interest, as the amount of macrocrystic olivines are often taken as a proxy for diamond grade (Field, Gernon, Mock, Sparkes, & Jerram, 2009) (Scott-Smith & Smith, 2009). Continued petrographic work should continue to build up a library of textures which can be used to identify higher priority targets early on in the on-going exploration programme.

The microdiamond results, to date, have provided large grade ranges, based on very small-size samples. Additional samples of larger number of stones are expected to provide better resolution, especially when combined with a relatively large parcel of macrodiamonds.

The drilling to date has proved useful in identifying the nature (kimberlitic vs non-kimberlitic) of the geophysical anomalies as well as provide significant information in determining the average thickness of the fissures. Drilling should continue with the objective of further defining the shape and true thickness of the fissure sections in order to further refine the volume model.

The challenging nature of fissure sampling both at surface and underground suggests that accurate collection of data throughout the sample collection and treatment processes is required. Due diligence in this area will improve the probability of being able to use the information acquired to produce a valid resource estimate. Various comments have been made with respect to issues identified surrounding grade range analysis (Coward, 2018):

- *Comprehensive evaluation of the evidence collected to date should be carried out to enhance the strength of the associations with the adjacent mine. Techniques using various mantle and lithic contents of the kimberlite may provide a way to do this relatively efficiently. Providing definitive evidence would provide a valid basis for using historical data from the klipspringer operation in the future evaluation and development of this project. The same applies for work required to delineate and validate selection and continuity of the of the diamond domains in this deposit.*
- *The range analysis has considered diamond distribution effects in isolation. It is also possible to use various spatial simulation techniques to ascertain the relative impact of spatial variation (Grade, stone size, dilution mining rate etc.) on the results obtained. This approach could use of various forms of spatial (e.g. cox process) simulation to produce realistic spatial images of the orebody. Using this approach, it is possible to use each realisation to stress test a range of impacts that spatial variability will have on sampling, mining and processing. The full set of ore body simulations can be used to describe the full range of operating outcomes that could be achieved, in various metrics including financial return.*
- *The micro-macro models used here would benefit substantially form additional micro diamond sampling at unsampled locations of the dyke. Additional core samples will allow improvements to*

the dyke model as well as the estimation of internal dilution and surrounding country rock competence.

Data obtained from the 2015 bulk-sampling programme lacked the rigours required of a structured and systematic operation designed for Resource estimation. Minor (and major) inconsistencies have been identified in volume estimates, grade control and valuation protocols, resulting in a lack of confidence in the data. Due to the professional management now in place and the fact that the prospecting is carried out (and/or strict oversight is maintained) by Vutomi personnel, it is believed that these problems will be obviated going forward.

9.1 Recommendations

The results at Thorny River are sufficiently encouraging for the CP to recommend that the project proceed to the next phase. Consequently, it is agreed that Vutomi should undertake a high level techno-economic (desktop) study of the most appropriate manner in which to complete the next phase of exploration, which should be planned to define reasonable prospects for eventual economic extraction, to recover sufficient diamonds to estimate an Inferred Diamond Resource and also to better define the nature of the kimberlite, especially at depth.

This desktop study should include the following issues:

- Additional geophysical surveys;
- Further drilling to resolve fissure thicknesses more accurately;
- Issues that might be encountered during the bulk-sampling/trial-mining phase, based on the experience of the 2017 programme;
- Bulk sampling versus small-scale mining;
- Underground sampling versus surface excavations; and
- Processing plant options:

Factors which need to be evaluated include

1. Capex and fund raising;
2. Opex;
3. Licensing requirements;
4. Risk; and
6. Timing.

As this is a Conceptual Study, the assessment should be at a high-level to provides company management with the required information to define the next steps for the project. Once a decision has been made, then detailed planning on the selected option can take place.

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11 Date And Signature Page

Respectfully Submitted

Tania R Marshall (Dr)

Geological Consultant (Pr. Sci. Nat)
SACNASP registration number 400112/96

33 Olympia Street,
Sunnyridge, Germiston
Republic of South Africa
1401
Tel/Fax: +2711 828-2989
E-mail: marshall.tania@gmail.com

James A H Campbell

Managing Director of Botswana Diamonds plc
SACNASP registration number 400082/05

162 Clontarf Road,
Dublin 3
Republic of Ireland
D03 F6Y0
T: +353 1 833 2833 / F: +353 1 833 3505
E-mail: james@botswanadiamonds.co.uk

Date of Signature **15 February 2018**

Effective Date **15 February 2018**

12 CERTIFICATE OF AUTHORS

12.1 Tania Ruth Marshall

I, Tania Ruth Marshall (Pr. Sci. Nat.) do hereby certify that:

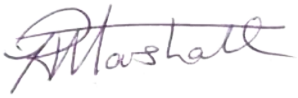
- I am a Geological Consultant with:
  Explorations Unlimited
  33 Olympia Street,
  Sunnyridge, Germiston
  1401
  South Africa

- I graduated with a degree in Bachelor of Science from the University of Witwatersrand in 1982. In addition, I have obtained a Bachelor of Science (Honours) in Geology in 1984, a Master of Science in Geology in 1987 and a Doctor of Philosophy (Geology) in 1990.
- I am a Fellow of the Geological Society of South Africa (#38829), a Member of the Southern African Institute for Mining and Metallurgy (#709224) and am registered with the South African Council for Natural Scientific Professions (SACNASP) as a Geological Scientist since 1996 (#400112/96).
- I have worked as a geologist continuously since my graduation from university in 1987. During this period, I have been involved in the exploration and exploitation of diamond deposits throughout Africa, including the evaluation and valuation of a number of such deposits for both private and public companies.
- My experience on diamond deposits is both as operator and as consultant, during which I have prepared costing estimates for mining and processing operations. In addition, as consultant, I have seen and reviewed operations and their various cost centres.
- I sit on the South African Mineral Resource Committee (SAMREC) and South African Mineral Asset Valuation Committee (SAMVAL) Working Groups (since 2010 and 2013 respectively) as well as the SAMREC Diamond Resource/Reserve Working Group Sub-committee (since 2005).
- I have read the definition of "Competent Person" set out in SAMREC 2016 and certify that, by reason of my education, affiliation with a professional association (as defined in SAMREC) and past relevant work experience, I fulfil the requirements to be an independent "Competent Person" for the purposes of this document.
- I am responsible for the preparation of this Competent Persons Report entitled COMPETENT PERSONS REPORT (CPR) ON THE THORNY RIVER KIMBERLITE PROJECT, (POLOKWANE DISTRICT, LIMPOPO PROVINCE) RSA FOR VUTOMI MINING (PTY) LTD] (effective date 15 February 2018),
- I have visited the Thorny River properties during the week 12-14 September 2017 and the bulk-sampling processing on 21 November 2017.
- I am independent of the issuer and any associated company(ies).
- I have read SAMREC 2016 and the SAMREC Diamond Guidelines and the Competent Person's Report has been prepared in compliance with both documents.
- At the date of signature, to the best of my knowledge, information and belief the CPR contains all the scientific and technical information that is required to be disclosed so as to make the technical report not misleading.

- I consent to the filing of the CPR with any stock exchange and other regulatory authority and any publication of the CPR by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public.

Dated this 15 February 2018

Signed



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Tania R Marshall (Dr)

Geological Consultant (Pr. Sci. Nat.)
SACNASP registration number 400112/96

33 Olympia Street,
Sunnyridge, Germiston
1401
Republic of South Africa
Tel/Fax: +2711 828-2989
E-mail: marshall.tania@gmail.com

12.2 James Andrew Hartley Campbell

As the co-author of the report entitled Competent Persons Report (CPR) on the Thorny River Kimberlite Project (Polokwane District, Limpopo Province) RSA for Vutomi Mining (Pty) Ltd], I hereby state:

- My name is James Andrew Hartley Campbell and I am the Managing Director of Botswana Diamonds plc (a London AIM listed company) of 162 Clontarf Road, Dublin.
- I am registered as aa Pr. Sci Nat (registration 400082/05) and a FSAIMM (registration 706292), FIMMM (registration IOM/112/000172) and F.Inst.D C.Eng C (registration 426090).
- My qualifications are: B.Sc (Hons); ARSM Dipl Datm (UNISA).
- I have worked in the diamond exploration, development and mining areas since October 1985 and have specifically specialised in diamond resource (both kimberlite and alluvial) development.
- I am a 'Competent Person' as defined in the SAMREC (2016) Code.
- I have supervised the field, analytical and interpretative work contained in this report.
- I have been to the area under investigation at least twice a month for a minimum of two days apiece during the exploration and resource development of Thorny River.
- I am responsible for the r estimation of Exploration Targets section of this Competent Persons Report entitled COMPETENT PERSONS REPORT (CPR) ON THE THORNY RIVER KIMBERLITE PROJECT, (POLOKWANE DISTRICT, LIMPOPO PROVINCE) RSA FOR VUTOMI MINING (PTY) LTD] (effective date 15 February 2018),
- I am not aware of any material fact or material change with respect to the subject matter of the Report that is not reflected in the Report, the omission of which would make the Report misleading.
- I declare that this Report appropriately reflects the Competent Person's view.
- I am not independent of the Thorny River project, as I am CEO and a shareholder in Vutomi Mining Pty Ltd and MD of (and a shareholder in) Botswana Diamonds plc.
- I have read the SAMREC Code (2016) and confirm that the Report has been prepared in accordance with the guidelines of the SAMREC Code and the SAMREC Diamond Guidelines.
- At the effective date of the Report, to the best of my knowledge, information and belief, the Report contains all scientific and technical information that is required to be disclosed to make the Report not misleading.
- I consent to the filing of the CPR with any stock exchange and other regulatory authority and any publication of the CPR by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public.

Dated at Centurion on15 February 2018

James Andrew Hartley Campbell
Managing Director of Botswana Diamonds plc
SACNASP registration number 400082/05
162 Clontarf Road,
Dublin 3
Republic of Ireland
D03 F6Y0
T: +353 1 833 2833 / F: +353 1 833 3505
E-mail: james@botswanadiamonds.co.uk

13 APPENDIX 1 DIAMOND SIEVE SIZES

The standard measure of diamond weight is the carat (1ct is equal to 200mg or 0.2g). Diamond size, by contrast, refers to the dimensions of the stone. Diamond size frequency distributions and values are, typically, done with references to diamond sieve sizes (i.e., the size aperture through which a diamond will pass). Unfortunately, there is no universal sieve size classification in use – in this document, the author has produced the size measurements in the original units and has not attempted to convert to a common nomenclature.

The more common systems in use are the DTC, Rubin/Antwerp, Christensen, grainers, nominal square aperture, Tyler mesh, etc. There is often no direct relationship between all of these systems. The table below attempts to show basic correlations (based on the Kimberley pool distribution) – please note that these figures are approximations and that the reader should consult specific tables for detailed correlations.

Diamond Sieve (DTC screen name)	Round Aperture size (mm)	Average diamond size (ct)	Average square aperture (mm)	Grainers
+23	10.312	10.9060	9.2	Above 2ct, grainers equal the carat weight.
+22			8	
+21	7.925	4.8500		
+19	6.35	2.4800	5.56	
+17	5.74	1.5700		6
+15	5.41	1.2600		5
+14	4.75		4.00	
+13	4.521	0.8600		4
+12	4.089	0.5610	3.42	3
+11	3.454	0.3710	2.8	Below 0.66ct, grainers are measured in terms of square mesh sieves
+10	3.277			
+9	2.847	0.2110	2.35	
+8	2.515			
+7	2.464	0.1230	2.00	
+6	2.159	0.090		
+5	1.829	0.073	1.47	
+4	1.753			
+3	1.473	0.035	1.15	
+2	1.321	0.022		
+1	1.092	0.014	0.82	

SIEVE CHARACTERISTICS AND SIZE COMPARISONS FOR ROUGH DIAMONDS

QTS - KRISTAL DINAMIKA
Rough Diamond Services

SALES RANGES	DIAMOND SIEVE	SORTING SIZES	WEIGHT RANGE	MM SIEVE	SQUARE APERTURE MM	LOWER CRITICAL SIZE	AVERAGE CRITICAL SIZE
SPECIAL LARGE	100+ CTS	100+ CTS	+99.80 Carats to ∞			90.800	100.000
	60+ CTS	60+ CTS	+59.80 - 99.79 Carats			59.800	73.687
	40+ CTS	45+ CTS	+44.80 - 59.79 Carats			44.800	51.759
+10.8 Caraters (SPECIALS)	30+ CTS	30+ CTS	+29.80 - 44.79 Carats			29.800	36.538
	20+ CTS	20+ CTS	+19.80 - 29.79 Carats			19.800	24.291
	15+ CTS	15+ CTS	+14.80 - 19.79 Carats			14.800	17.118
	+10.8 CTS	14-15 Cts	+13.80 - 14.79 Carats	13.20	13.200	21.043	
		12-13 Cts	+11.80 - 13.79 Carats	11.20	11.200	13.380	
		11 Cts	+10.80 - 11.79 Carats	9.50	9.500	8.500	
5-10 Caraters	23	8-10 Cts	+7.80 - 10.79 Carats		9.280	8.036	10.906
		5-7 Cts	+4.80 - 7.79 Carats	8.00	8.000	5.293	
2-4 Caraters	21	4 Cts	+3.80 - 4.79 Carats		7.090	3.691	4.850
		3 Cts	+2.80 - 3.79 Carats	6.70	6.700	3.247	
		10 Grainer	+2.50 - 2.79 Carats		6.350	2.801	
	19	8 Grainer	+1.80 - 2.49 Carats		5.560	1.918	2.480
Grainers	17	6 Grainer	+1.40 - 1.79 Carats		4.930	1.423	1.570
				4.75	4.750	1.258	
					4.699	1.221	
	15	5 Grainer	+1.20 - 1.39 Carats		4.620	1.195	1.260
				4.00	4.000	0.784	
	13	4 Grainer	+0.90 - 1.19 Carats		3.850	0.703	0.860
	12	3 Grainer	+0.66 - 0.89 Carats		3.420	0.523	0.561
				3.35	3.350	0.481	
Smalls					3.327	0.472	
	11	+11	+11 Sieve to 0.65 Carats		2.860	0.317	0.371
					2.830	0.302	
				2.80	2.800	0.293	
					2.362	0.184	
					2.360	0.183	
	9	+9	Average 0.25 Carats	2.35	2.350	0.179	0.211
Fines	7	+7	Average 0.15 Carats	2.00	2.000	0.117	0.123
	6	+6	Average 0.10 Carats		1.720	0.079	0.090
					1.651	0.068	
	5	+5	Average 0.08 Carats		1.470	0.049	0.073
					1.410	0.044	
				1.40	1.400	0.043	
					1.190	0.028	
	3	+3	Average 0.04 Carats		1.150	0.026	0.035
Ultra Fine Diamonds	2	+2	Average 0.03 Carats		1.130	0.019	0.022
	(FD)			1.00	1.000	0.017	
					0.840	0.011	
	1	+1	Average 0.02 Carats		0.820	0.011	0.014
SIEVE DETAILS	DIAMOND SIEVE	SORTING SIZES	WEIGHT RANGE	MM SIEVE	SQUARE APERTURE MM	LOWER CRITICAL SIZE	AVERAGE CRITICAL SIZE

ALLUVIAL DIAMONDS
AVERAGE AND CRITICAL SIZES

DIAMOND SIEVE	TYLER MESH SIEVES	MM SIEVES	ROUND APERTURE (mm)	SQUARE APERTURE (mm)	CRITICAL SIZE CTS/STN	AVE SIZE DIAM SVE CTS/STN
		13.2		13.20	#24.167	
		11.2		11.20	#15.078	
		9.5		9.50	#9.399	
+23			10.312	9.30	9.090	
		8		8.00	5.739	
+21			7.925	7.13	4.191	4.75
		6.7		6.70	3.449	
	0.25"			6.35	2.957	
+19			6.350	5.70	2.185	2.50
+17			5.74	5.15	1.624	1.75
		4.75		4.75	1.285	
	4			4.699	1.246	
+15			5.410	4.85	1.380	
+13			4.521	4.04	0.805	0.97
		4.0		4.00	0.784	
+12			4.089	3.65	0.599	0.68
		3.35		3.35	0.471	
	6			3.27	0.462	
+11			3.454	3.07	0.365	0.48
	7			2.83	0.290	
		2.80		2.80	0.282	
+9			2.845	2.52	0.206	0.31
	8			2.362	0.173	
		2.36		2.36	0.172	
+7			2.464	2.18	#0.135	
	9	2.00		2.00	#0.107	
+6			2.159	1.90	#0.0916	
	10			1.651	#0.0618	
+5			1.829	1.60	#0.0562	0.12
	12			1.41	#0.0393	
		1.40		1.40	#0.0385	
	14			1.19	#0.0241	
+3			1.473	1.28	#0.0298	*0.041
+2			1.321	1.14	#0.0216	*0.025
	16			1.00	#0.0147	
+1			1.092	0.93	#0.0123	*0.016
	20			0.84	#0.0089	
		0.71		0.71	#0.00548	
	28			0.59	#0.00322	
		0.50		0.50	#0.00200	
	35			0.42	#0.00121	
	48			0.30	#0.00046	

= EXTRAPOLATED VALUE

* = LOGARITHMIC MIDPOINT