

Karowe Diamond Mine: A World-class source of large exceptional diamonds

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Introduction

The Karowe Mine (AK6 kimberlite), owned and operated by Lucara Diamond, located in the Republic of Botswana, achieved commercial diamond production in July 2012 (Figure 1). Between July 2012 and December 2016 over 1.8 million carats have been mined and sold generating in excess of US\$1 billion dollars in revenue. The AK06 kimberlite within the Orapa Kimberlite field is a roughly north-south elongate kimberlite body with a near surface expression of ~3.3 hectares and a maximum area of approximately 7 hectares at approximately 120 m below surface. The body comprises three geologically distinct, coalescing lobes that taper with depth. These are referred to as the North Lobe, Centre Lobe, and South Lobe.

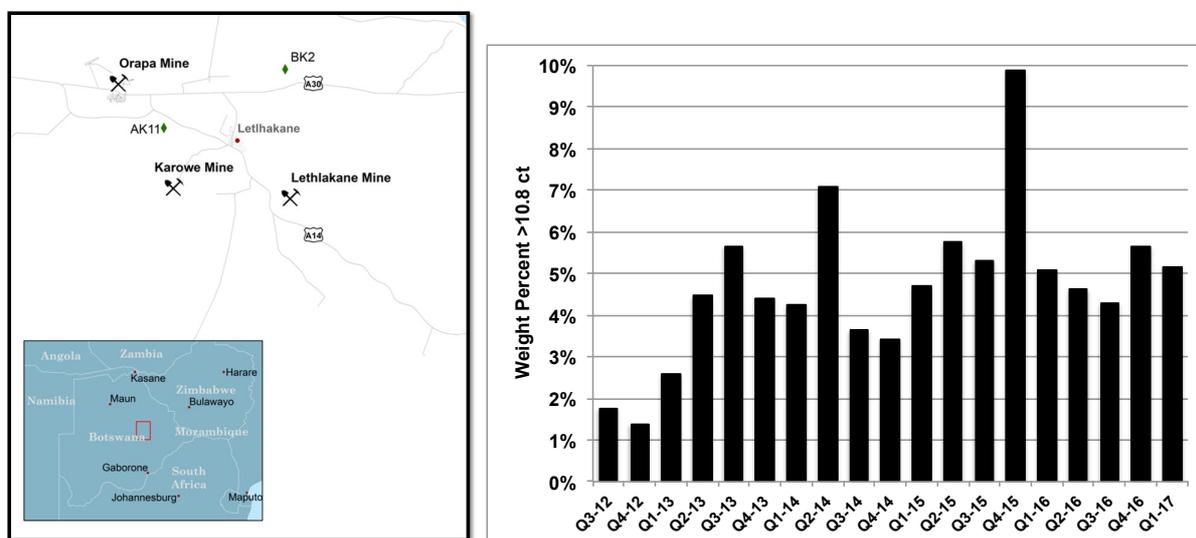


Figure 1 (left). Location of Karowe Mine, AK06 kimberlite, Orapa District Botswana

Figure 2 (right). Weight percent of +10.8 carat diamonds on quarterly carat production Karowe Mine Q3 2012 to end of March 2017.

Kimberlite Geology

The AK6 kimberlite is an opaque-mineral-rich monticellite kimberlite, texturally classified primarily as fragmental volcanoclastic kimberlite with lesser macrocrystic hypabyssal facies kimberlite of the Group 1 variety. The nature of the kimberlite differs between each lobe with distinctions apparent in the textural characteristics. The South Lobe is considered to be distinctly different from the North and Centre Lobes. The North and Centre Lobes exhibit internal textural complexity whereas the bulk of the South Lobe is more massive and internally homogeneous. The South lobe forms the majority of the resource and displays the coarsest diamond size distribution of the three lobes. The proportion of +10.8 carat diamonds increases from approximately 1.8 weight percent in the North Lobe to in excess of 4 weight percent within the South Lobe. Early mining focused on the higher grade North Lobe (Q3 2012 to Q1 2013, Figure 2), as production shifted into the Centre and South Lobes the size distribution became coarser in nature.

The AK6 kimberlite has established a continuing production of large, high value diamonds (Figures 2 and 3). In March 2013 a 239 carat gem quality diamond was recovered which marked the first in a continuing population of large high value Type IIa diamonds recovered from the Centre Lobe and more importantly the South Lobe of the AK6 kimberlite. Recognition of a coarse diamond size

distribution supported through size distribution analysis, breakage studies, and optimization of processing circuits has maintained and enhanced the recovery of large diamonds. Large diamonds >50 carats in size are spatially distributed horizontally and vertically within the South Lobe. Continuity of large diamond recovery is shown for yearly +10.8 carat diamond production normalized to annual total carat production (Figure 3a) and as total volume of +10.8 carat diamonds produced (Figure 3b).

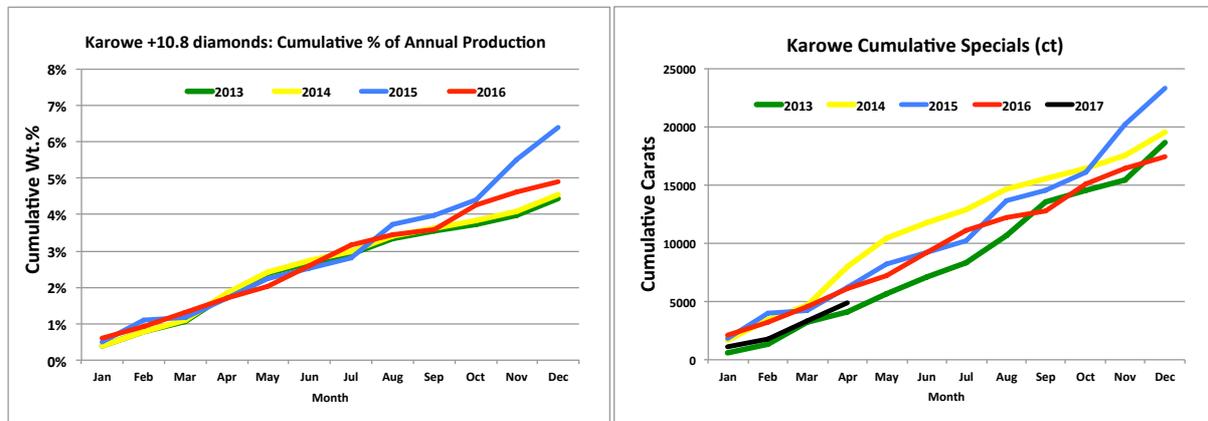


Figure 3a/b. Cumulative +10.8 carat production on a monthly basis normalized to total annual production. Overlap in yearly trends demonstrates stability in large stone recovery. Anomalous uptick noted in November 2015 related to the recovery of above average +10.8 carat production including the 1109 Lesedi La Rona and the 813 carat Constellation. Figure 3b, cumulative +10.8 carat diamond annual production by month for life of mine to end of Q1 2017.

Process plant optimization, including incorporation of sensor-based bulk sorting (X-Ray Transmission), was undertaken to allow treatment of harder, high yielding kimberlite at depth within the South Lobe, and allow the recovery of large diamonds from primary ROM feed pre-concentration. In late 2015 the Karowe Mine recovered an 813 carat stone and the World's second largest gem quality diamond in over 100 years weighing 1,109 carats. Diamonds greater than 10.8ct in weight represent approximately 4.8% by weight of all diamond production over the life of mine to date. Life of Mine average stone size for the +10.8ct production is 28.9 ct/stone.

Log-Log probability plots (carats) of the +10.8 carat recovered diamond population, comprised of in excess of 90,000 carats and over 3200 individual diamonds display evidence for diamond damage/loss in the +100 diamond sizes (Figure 4). Reconstruction of large broken diamonds results in a coarser size distribution model, however, there is still evidence that the diamond population is impacted by the non-recovery of large +100 carat diamonds. This non-recovery of large diamonds may be the result of breakage and/or the host kimberlite has not been processed. Assessment of the size frequency distribution suggests the AK6 kimberlite will continue to produce large and exceptional diamonds.

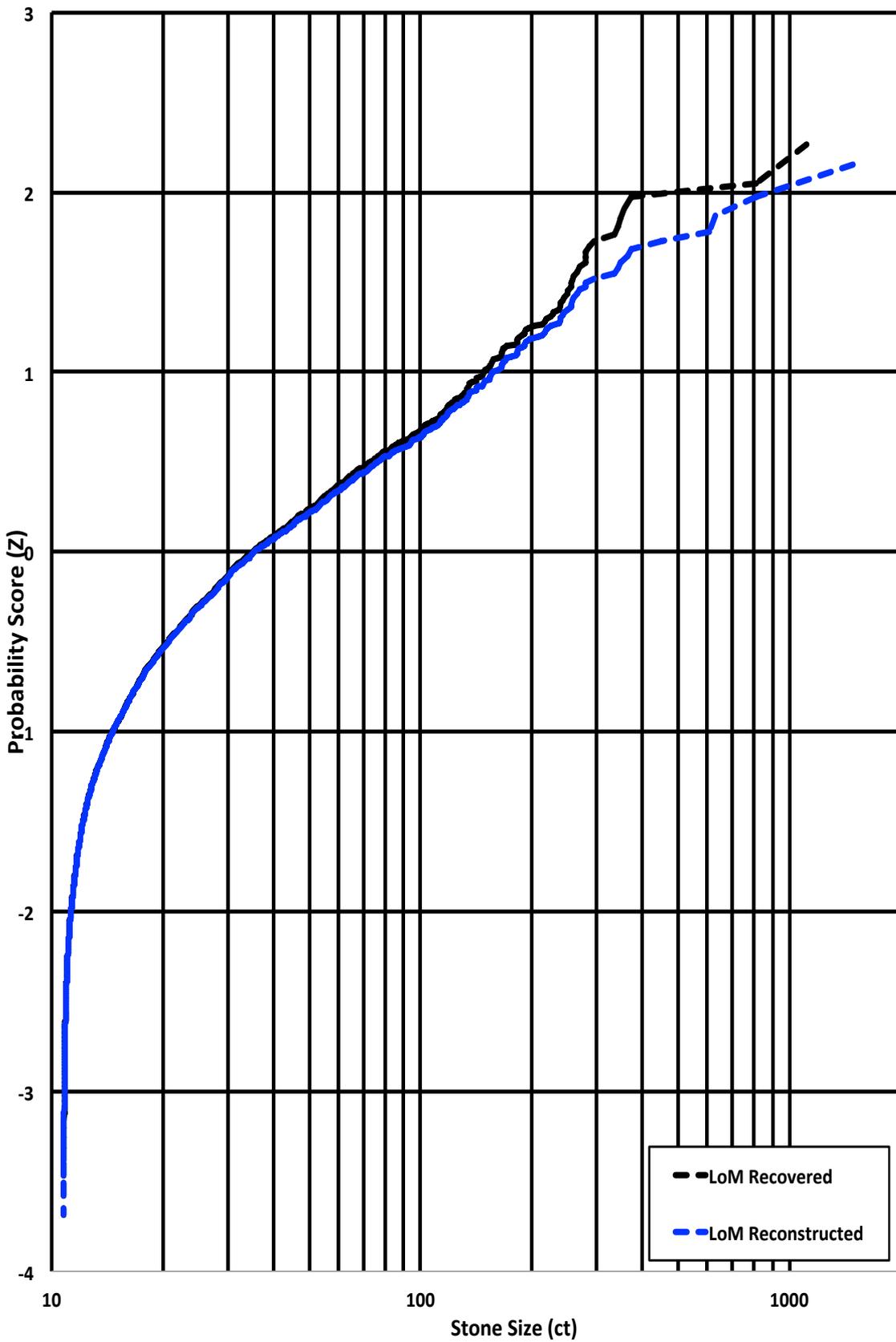


Figure 4. Log-Log Probability diagram for AK6 Life of Mine +10.8 carat diamonds on an as recovered and reconstructed basis.