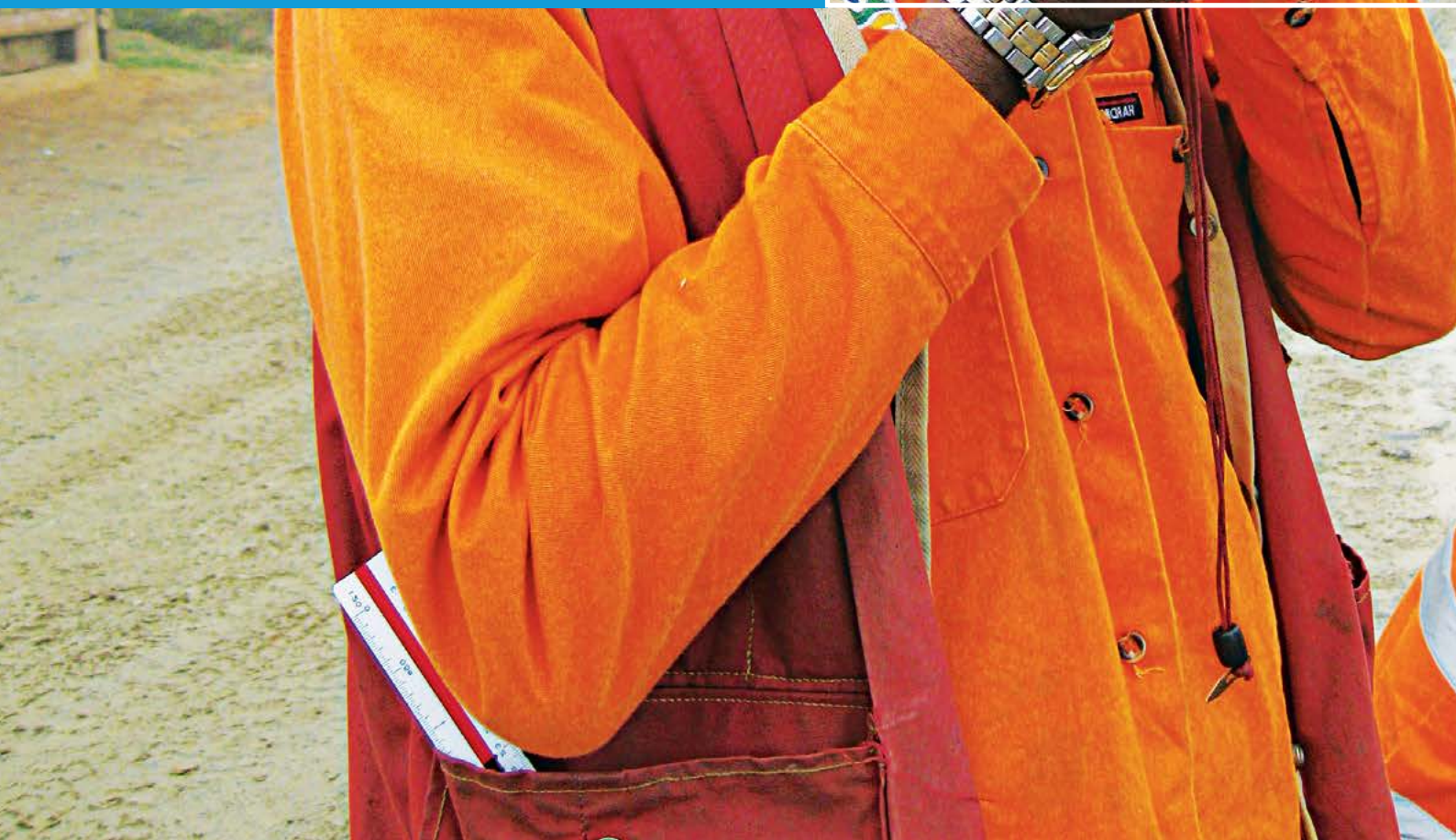
HARMONY™

MINERAL RESOURCES AND MINERAL RESERVES

Supplement to the Integrated Annual Report 30 June 2019

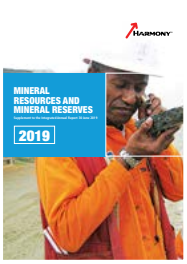
2019



Target North

Our 2019 set of reports includes:

INTEGRATED ANNUAL REPORT 2019



MINERAL RESOURCES AND MINERAL RESERVES 2019

ESG REPORT 2019

FINANCIAL REPORT 2019

REPORT TO SHAREHOLDERS 2019

These reports together with other supporting documents are available online at www.har.co.za. Other additional information can be found at www.harmony.co.za.

HARMONY™

OTHER REPORTS

Form 20-F

Annual report filed with the United States Securities and Exchange Commission, in compliance with the listing requirements of the New York Stock Exchange

Global Reporting Initiative Scorecard

An index of the indicators reported in terms of the Global Reporting Initiative

Operations 2019

Detailed information on each operation

Tshepong Operations

OUR REPORTS ONLINE

Harmony's full set of 2019 reports and supporting documents are available at *www.har.co.za.*

The electronic reports are interactive pdfs, with links to sections within the document and to external websites. The interactive links are indicated by text in red italics.

CONTENTS

CORPORATE PROFILE

WHO WE ARE

Harmony, a gold mining and exploration company, conducts its activities in South Africa and in Papua New Guinea, one of the world's premier new gold-copper regions. With 69 years of experience, Harmony is currently South Africa's largest gold producer.

Headquartered in Randfontein, South Africa, Harmony is listed on the Johannesburg Stock Exchange, our primary listing, and on the New York Stock Exchange, on which our shares are quoted as American Depositary Receipts. At 30 June 2019, our market capitalisation was R17.1 billion (US$1.2 billion) (30 June 2018): R10.6 billion; US$769 million).

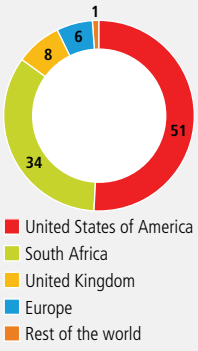
OUR IMPACT

At Harmony, we understand the impact that our company has on the lives of the people we employ, the communities that surround our mines and the environment, as well as the economic contribution that we make to the countries in which we operate.

SHAREHOLDERS

Our largest shareholder is African Rainbow Minerals Limited (ARM) which has a stake of 13.83% in the company. The remainder of our shareholders, which are geographically diverse, include some of the largest fund managers globally.

Geographic distribution of shareholders (%)
as at 30 June 2019



WHAT WE DO

Exploration and acquisitions

Exploring for and evaluating economically viable gold-bearing orebodies and/or value-accretive acquisitions

Mining and processing

Establishing, developing and operating mines and related processing infrastructure. Ore mined is milled and processed by our gold plants to produce gold doré bars

Sales and financial management

Generating revenue through the sale of gold produced and optimising efficiencies to maximise financial returns

Stewardship and mine closure

Restoring mining impacted land for alternative economic use post-mining, having in place approved mine closure commitments and empowering communities and employees

WHAT WE ACHIEVED IN FY19

- **17% increase** in production to **1.44Moz** of gold, contributed to a **23% increase** in production profit
- **2% increase** in underground recovered grade to 5.59g/t at South African mines
- **Operating free cash flow boosted** by Moab Khotsong and Hidden Valley
- **Hedging** strategy contributed to improved cash flow margins
- **19% increase** in headline earnings per share to 204 SA cents – 8% increase to 14 US cents
- **Included in** Bloomberg Gender-Equality Index 2019, and FTSE4Good Index
- **CDP Climate Change and Water** reports scored A- and B respectively

CORPORATE PROFILE CONTINUED

WHERE WE OPERATE

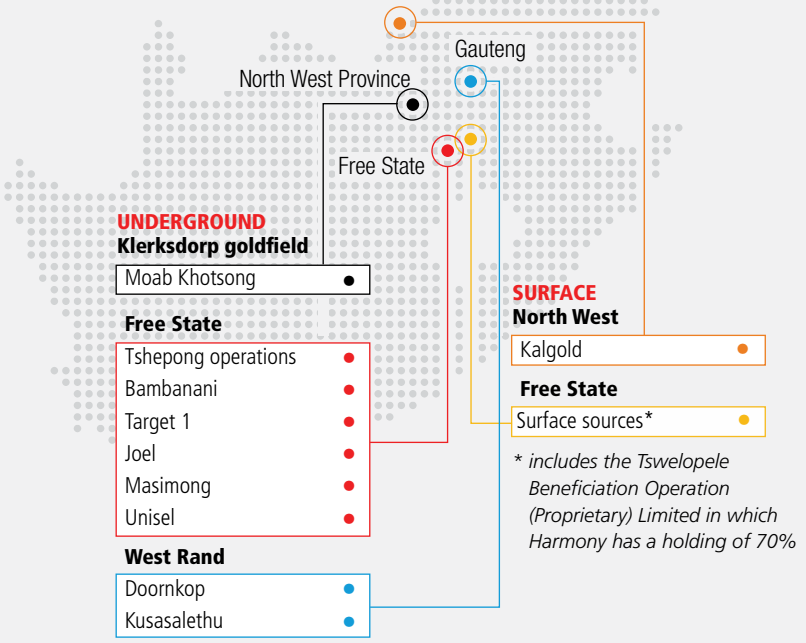
In South Africa, our nine underground operations are located within the world-renowned Witwatersrand Basin – one in the Klerksdorp goldfield, two in the West Rand and six in the Free State, in the southern portion of the Witwatersrand Basin.

In addition, we have an open-pit mine on the Kraaipan Greenstone Belt as well as several surface treatment operations.

In Papua New Guinea, Hidden Valley is an open-pit gold and silver mine.

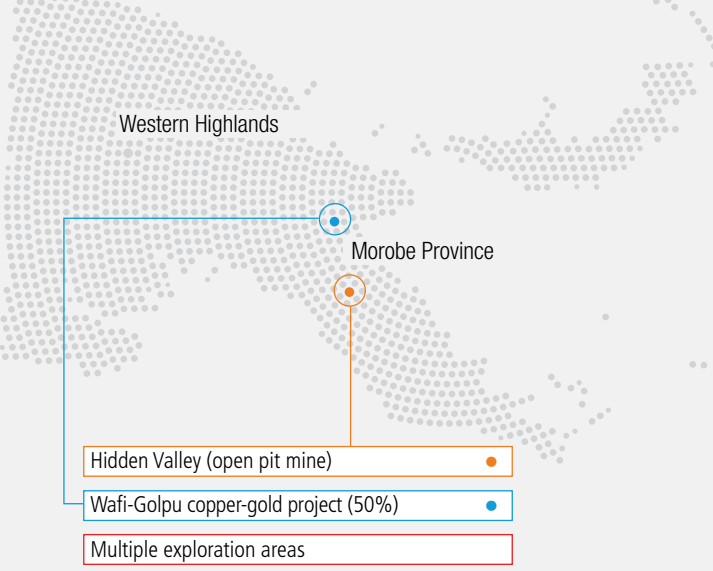
Our significant gold-copper portfolio includes a 50% stake in the Wafi-Golpu project in the Morobe Province, through a 50:50 joint venture with Newcrest Mining Limited (Newcrest).

SOUTH AFRICA



* *includes the Tswelopele Beneficiation Operation (Proprietary) Limited in which Harmony has a holding of 70%*

PAPUA NEW GUINEA



Harmony's equity interest 100% unless otherwise indicated

OUR VALUES

SAFETY
No matter the circumstances, safety is our main priority

ACCOUNTABLE
We are all accountable for delivering on our commitments

ACHIEVEMENT
Achievement is core to our success

CONNECTED
We are all connected as one team

HONESTY
We uphold honesty in all our business dealings and communicate openly with stakeholders

COMPLIANCE AND SUMMARY

AS AT 30 JUNE 2019

ABOUT THIS REPORT

This statement of Harmony's mineral resources and mineral reserves as at 30 June 2019 is produced in accordance with the South African Code for the Reporting of Mineral Resources and Mineral Reserves (SAMREC) and section 12.11 of the JSE Listings Requirements (as updated from time to time).

Harmony now declares all its mineral resources and mineral reserves in accordance and in compliance with the SAMREC code. This is a change from 2018 when Papua New Guinea resources and reserves were declared compliant with the JORC code. This change is to align Harmony's corporate reporting.

In our reporting, certain terms are used such as 'measured', 'indicated' and 'inferred' resources, which the United States' Securities and Exchange Commission guidelines strictly prohibit US-registered companies from including in their filings. United States investors are urged to consider the disclosure in this regard in our Form 20-F which is available on our website at *www.harmony.co.za/investors/reporting/20f*

Note that unless otherwise stated Harmony's equity interest is 100%.

REPORTING CODE AND COMPLIANCE

The SAMREC code was developed and established in 1998 by the South African Institute of Mining and Metallurgy and is the recommended guideline for mineral resource and mineral reserve reporting for companies listed on the JSE.

The first version of the SAMREC Code was issued in March 2000 and adopted by the JSE in its Listings Requirements later that year; this was similarly the basis for the JSE Ongoing Reporting Requirements promulgated in 2005. The SAMREC Code was reviewed in 2004, updated in 2007 and amended in July 2009. The latest update of the SAMREC Code was launched on 19 May 2016 with this version superseding previous versions. In addition, Section 12.11 of the JSE Listings Requirements was subsequently updated with the revised SAMREC and SAMVAL Codes that came into effect on 1 January 2017.

The latest edition of the SAMREC Code includes an updated Table 1 template, which provides an extended list of the main criteria to be considered and reported when reporting on exploration results, mineral resources and mineral reserves. In complying with the principles of the code, comments relating to the items in the relevant sections of Table 1 must be provided on an 'if not, why not' basis within the competent person's report. Guidelines for the compilation of Table 1 are for (i) the first-time declaration of exploration results, a mineral resource or a mineral reserve, and (ii) instances where this information has changed materially since last publicly reported for significant projects.

Reporting on an 'if not, why not' basis ensures that it is clear to an investor or other stakeholders whether items have been considered and deemed of low consequence or are not yet addressed or resolved. Harmony has adopted the compilation and updating of Table 1 as a standard to complement internal reports.

Harmony has written confirmation from the lead competent person that the information disclosed in this report is compliant with the SAMREC Code and, where applicable, with the relevant JSE Section 12 and SAMREC Table 1 requirements, and that it may be published in the form, format and context in which it was intended.

In reporting mineral reserves, distinct cognisance has also been taken of Industry Guide 7 of the United States' Securities and Exchange Commission.

OUR STRATEGY

Maintaining and growing our margins efficiently is essential to sustaining our business and meeting our strategic objectives. This includes delivering safely on our operational plans, reducing costs, improving productivity and maximising revenue. We are devoted to improving the company's operational performance.

Our values are entrenched in everything we do – safety, accountability, achievement, being connected and honest – and they inform our decisions and our actions. Realistic planning supports our strategy to optimise assets – our orebodies, our infrastructure and our people. This will ensure safer, more profitable production. Our life-of-mine plans are prepared in line with this approach.

ASSUMPTIONS

In converting mineral resources to mineral reserves, the following commodity prices and exchange rates were applied:

- A gold price of US$1 290/oz
- An exchange rate of R/US$14.11
- The above parameters resulted in a rand gold price of R585 000/kg for the South African assets
- The Hidden Valley mine and the Wafi-Golpu project used commodity prices of US$1 290/oz Au, US$17.00/oz Ag, US$9.00/lb Mo and US$3.00/lb Cu at an exchange rate of A$1.36 per US$
- Gold equivalent ounces are calculated assuming US$1 290/oz Au, US$3.00/lb Cu and US$17.00/oz Ag, and 100% recovery for all metals

Note:
***Au** = gold* ***Cu** = copper*
***Ag** = silver* ***Mo** = molybdenum*

For more information on Harmony's reporting code, our SAMREC compliance and the definitions used, refer to the section, Harmony standard for SAMREC compliant reporting.

PERMITTING FOR THE WAFI-GOLPU PROJECT

Laws governing mineral rights affect our business and could impose significant costs and burdens. Mineral rights in the countries in which we operate could be altered, suspended or cancelled for a variety of reasons, including breaches in obligations in relation to these mining rights.

The delay in the permitting for the Wafi-Golpu joint venture project and changes to the mining legislation in Papua New Guinea may impact our resource and reserve estimates. For further details on this, see *page 40* in Exploration and projects.

COMPLIANCE AND SUMMARY CONTINUED

AS AT 30 JUNE 2019

MINERAL RESOURCES AND MINERAL RESERVES – SUMMARY

Harmony's total attributable gold equivalent mineral resource of 117.3Moz was declared as at 30 June 2019, a 0.4% decrease year on year from the 117.8Moz declared on 30 June 2018. Gold contained in the mineral resources at the South African operations represented 61% of Harmony's total, with the Papua New Guinea assets representing 39% of total gold and gold equivalent mineral resources as at 30 June 2019.

Harmony's total attributable gold and gold equivalent mineral reserves amounted to 36.5Moz of gold, a 0.8% decrease on the 36.8Moz declared at 30 June 2018. Gold reserve ounces at our South African operations accounted for 47% while the Papua New Guinea gold and gold equivalent ounces represented 53% of Harmony's total mineral reserves as at 30 June 2019.

South Africa

Underground operations

Harmony's mineral resources at the South African underground operations as at 30 June 2019 totalled 60.6Moz (210.4Mt at 8.96g/t), a decrease of 1.1% year on year from the 61.3Moz (216.7Mt at 8.79g/t) declared as at 30 June 2018.

Mineral reserves at the South African underground operations as at 30 June 2019 totalled 10.6Moz (56.7Mt at 5.83g/t), an increase of 4.9% year on year from the 10.1Moz (52.4Mt at 6.02g/t) declared as at 30 June 2018. The increase is mainly due to the mineral reserves added from Moab Khotsong, Tshepong and Doornkop.

Surface operations (including Kalgold)

Mineral resources at Harmony's South African surface operations as at 30 June 2019 were 10.8Moz (1 109.5Mt at 0.30g/t). The 14.6% increase was mainly due to exploration drilling at Kalgold.

Mineral reserves at the South African surface operations as at 30 June 2019 were 6.6Moz (808.8Mt at 0.26g/t), a decrease of 2.0% due to depletion.

Papua New Guinea

Operations

Attributable gold and gold equivalent mineral resources at our Papua New Guinea operations as at 30 June 2019 were 45.9Moz, a decrease of 2.5% year on year from the 47.1Moz declared as at 30 June 2018. This decrease is mainly due to the new resource model applied at Hidden Valley, changes in the metal price and depletion.

Attributable gold and gold equivalent mineral reserves as at 30 June 2019 are 19.3Moz, a decrease of 3.4% year on year from the 19.9Moz declared as at 30 June 2018.

Doornkop

COMPLIANCE AND SUMMARY CONTINUED

AS AT 30 JUNE 2019

EXPLORATION

Our exploration strategy is to pursue brownfields exploration targets close to existing infrastructure. This will drive short to medium term organic ore reserve replacement and growth to support our current strategy of increasing quality ounces and to mitigate the risk of a depleting ore reserve base. Key work streams underpinning the FY19 exploration programme included:

- Brownfield exploration at Hidden Valley and Kalgold to optimise existing open pit operations and extend mine life
- Brownfield exploration at our underground operations in South Africa
- Greenfield exploration at Target North

South Africa

Tshepong Operations – B-Reef

B Reef exploration at Tshepong Operations continued during FY19. A new block of ground was identified at the Phakisa section where development towards the B Reef will begin in FY20.

Kalgold

A total of 26 790 metres of drilling was completed in FY19, bringing the total to date to 48 610 metres (210 boreholes) completed on the Kalgold near-mine exploration programme. Drill results have been very encouraging and a mineral resource update and prefeasibility study to optimise the Kalgold operation based on the results of the exploration drilling is underway.

An airborne electro-magnetic survey was undertaken in FY19 to provide a method for rapidly assessing the regional potential of the Kalgold prospecting rights and initial interpretation has identified numerous potential targets. Further detailed interpretation and field work to put anomalies in context with geology is planned for the first quarter of FY20.

Moab Khotsong – 101 level

Underground exploration drilling is underway in two specific blocks above infrastructure in the project area with the aim to identify opportunities for early access and mining of these blocks of ground. Drilling will continue in FY20.

Joel

145 level exploration: Exploration is aimed at upgrading the current resource to the indicated level and to determine the economic mining limit to the north and northeast below current mining infrastructure to ensure the 145 level decline project remains economically viable. Exploration drilling began in August 2019 and is due to be completed in June 2020. Three long inclined boreholes will be drilled in all. The first hole is currently at 220m and we expect to intersect reef at 300m.

High-grade Beatrix Reef extension (Klippan): Exploration is planned to upgrade the resource to the indicated level and determine the economic mining limit in the north and north east areas originally classified as non-depositional zones. Opening up this area will greatly reduce the risks of the initial development-constrained mining areas in the 137 project area. Exploration is scheduled to start in November 2019 and it due to end in April 2020. Three boreholes will also be drilled in this area.

Target North

Drilling of the first borehole from surface began towards the end of FY19 with a total of 1 542 metres being drilled. Drilling of three initial exploration boreholes is planned to confirm the geological model and test the Ventersdorp Contact Reef, as well as the sub-cropping Dreyerskuil and Eldorado (EA) Reefs. Drilling will continue in FY20.

Papua New Guinea

Hidden Valley District (Harmony 100%)

Near mine exploration targeting potential high-grade satellite epithermal gold deposits progressed in FY19. Target development and regional exploration of the Webiak is currently underway. Mapping, trenching and surface sampling continued as part of drill target development (1 799 soil, 531 rockchip samples). Drill programme planning is in progress, targeting commencement in the first quarter of FY20.

INDEPENDENT REVIEW

Harmony's South African mineral resources and reserves at Doornkop as well as the group SAMREC statement were independently reviewed by The Mineral Corporation for compliance to SAMREC. Moab Khotsong's and the Wafi-Golpu Joint Venture's mineral reserves and resources were reviewed by SRK Consulting and Hidden Valley's mineral reserves and resources were reviewed by Derisk Geomining Consultant.

Kalgold Plant

COMPLIANCE AND SUMMARY CONTINUED

AS AT 30 JUNE 2019

COMPETENT PERSON'S DECLARATION

In South Africa, an ore reserve manager is appointed at each operation to take responsibility for the compilation and reporting of their operations' mineral resources and mineral reserves. In Papua New Guinea, competent persons are appointed for the mineral resources and mineral reserves for specific projects and operations.

The mineral resources and mineral reserves reported are based on information compiled by the following competent persons, as at 30 June 2019.

Mineral resources and mineral reserves of South Africa:

Jaco Boshoff
BSc (Hons), MSc, MBA
Who has 24 years' relevant experience and is registered with the South African Council for Natural Scientific Professions (SACNASP), is a member of the South African Institute of Mining and Metallurgy (SAIMM) and of the Geological Society of South Africa (GSSA).

Mr Boshoff is Harmony's Lead Competent Person.

Physical address:
Randfontein Office Park
Corner Main Reef Road and Ward Avenue
Randfontein
South Africa

Postal address:
PO Box 2
Randfontein
1760
South Africa

Mineral resources and mineral reserves of Papua New Guinea:

Gregory Job
BSc, MSc
Who has 31 years' relevant experience and is a member of the Australian Institute of Mining and Metallurgy (AusIMM).

Physical address:
Level 2
189 Coronation Drive
Milton, Queensland 4064
Australia

Postal address:
PO Box 1562
Milton, Queensland 4064
Australia

Both these competent persons, who are full-time employees of Harmony, consent to the inclusion in this report of the information in the form and context in which it appears.

Administrative information for professional organisations

Australasian Institute of Mining and Metallurgy (AusIMM)

Postal address: PO Box 660, Carlton South, Vic 3053, Australia
Telephone: +61 3 9658 6100
Facsimile: +61 3 9662 3662
Website: *www.ausimm.com.au*

South African Council for Natural Scientific Professions (SACNASP)

Postal address: Private Bag X540, Silverton, 0127, Gauteng, South Africa
Telephone: +27 12 841 1075
Facsimile: +27 86 206 0427
Website: *www.sacnasp.org.za*

Southern African Institute of Mining and Metallurgy (SAIMM)

Postal address: PO Box 61127, Marshalltown, 2107, Gauteng, South Africa
Telephone: +27 11 834 1273/7
Facsimile: +27 11 838 5923/8156
Website: *www.saimm.co.za*

Geological Society of South Africa (GSSA)

CSIR Miningtek
Carlow and Rustenburg roads
Melville, Johannesburg
South Africa
Website: *www.gssa.org.za*

Details of the professional registrations of our competent persons can be obtained from the company secretary at:
companysecretariat@harmony.co.za

LEGAL ENTITLEMENT TO MINERALS REPORTED

Harmony's South African operations operate under new order mining rights in terms of the Minerals and Petroleum Resources Development of Act (MPRDA) of 2002 (Act No. 28, of 2002).

In Papua New Guinea, Harmony operates under the Independent State of Papua New Guinea Mining Act 1992. All required operating permits have been obtained and are in good standing. The legal tenure of each operation and project has been verified to the satisfaction of the accountable competent person.

ENVIRONMENTAL MANAGEMENT AND FUNDING

Harmony's environmental strategy aims to optimise our environmental performance by managing our environmental impacts, focusing on effective risk controls, reducing environmental liabilities, ensuring responsible stewardship of our products within our scope of influence, complying with environmental legislation and regulations.

For further information regarding Harmony's approach to sustainability and environmental performance refer to the Integrated Annual Report 2019, which is available at *www.har.co.za*.

Details relating to the provision for environmental rehabilitation and funding can be found in note 25 in Harmony's audited annual financial statements that are presented in a separate report, the Financial Report 2019. This is also available online at *www.har.co.za*.

Bio energy and rehabilitation project – Free State

HARMONY STANDARD
FOR SAMREC COMPLIANCE REPORTING

DEFINITIONS AS PER THE SAMREC CODE 2017

Exploration results include data and information generated by mineral exploration programmes that might be of use to investors but which do not form part of a declaration of mineral resources or mineral reserves.

An exploration target is a statement or estimate of the exploration potential of a mineral deposit in a defined geological setting where the statement or estimate, quoted as a range of tonnes and a range of grade or quality, relates to mineralisation for which there has been insufficient exploration to estimate Mineral Resources.

Mineral resources

A **'mineral resource'** is a concentration or occurrence of solid material of economic interest in or on the Earth's crust in such form, grade or quality and quantity that there are reasonable prospects for eventual economic extraction. The location, quantity, grade, continuity and other geological characteristics of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge, including sampling.

An **inferred mineral resource** is that part of a mineral resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade or quality continuity. An Inferred Resource has a lower level of confidence than that applying to an indicated mineral resource and must not be converted to a mineral reserve. It is reasonably expected that the majority of inferred mineral resources could be upgraded to indicated mineral resources with continued exploration.

An **indicated mineral resource** is that part of a mineral resource for which quantity, grade or quality, densities, shape and physical characteristics are estimated with sufficient confidence to allow the application of modifying factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit.

Geological evidence is derived from adequately detailed and reliable exploration, sampling and testing and is sufficient to assume geological and grade or quality continuity between points of observation.

A **measured mineral resource** is that part of a mineral resource for which quantity, grade or quality, densities, shape, and physical characteristics are estimated with confidence sufficient to allow the application of modifying factors to support detailed mine planning and final evaluation of the economic viability of the deposit.

Geological evidence is derived from detailed and reliable exploration, sampling and testing and is sufficient to confirm geological and grade or quality continuity between points of observation. A measured mineral resource has a higher level of confidence than that applying to either an indicated mineral resource or an inferred mineral resource. It may be converted to a proved mineral reserve or to a probable mineral reserve.

Mineral reserves

Modifying factors are considerations used to convert mineral resources to mineral reserves. These include, but are not restricted to, mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social and governmental factors.

A **mineral reserve** is the economically mineable part of a measured and/or indicated mineral resource. It includes diluting materials and allowances for losses, which may occur when the material is mined or extracted and is defined by studies at prefeasibility or feasibility level as appropriate that include application of modifying factors. Such studies demonstrate that, at the time of reporting, extraction could reasonably be justified. The reference point at which mineral reserves are defined, usually the point where the ore is delivered to the processing plant, must be stated. It is important that, in all situations where the reference point is different, such as for a saleable product, a clarifying statement is included to ensure that the reader is fully informed as to what is being reported.

A **probable mineral reserve** is the economically mineable part of an indicated, and in some circumstances, a measured mineral resource. The confidence in the modifying factors applying to a probable mineral reserve is lower than that applying to a proved mineral reserve.

A **proved mineral reserve** is the economically mineable part of a measured mineral resource a proved mineral reserve implies a high degree of confidence in the modifying factors.

A **scoping study** is an order of magnitude technical and economic study of the potential viability of mineral resources that includes appropriate assessments of realistically assumed modifying factors together with any other relevant operational factors that are necessary to demonstrate at the time of reporting that progress to a prefeasibility study can be reasonably justified.

A **prefeasibility study** is a comprehensive study of a range of options for the technical and economic viability of a mineral project that has advanced to a stage where a preferred mining method, in the case of underground mining, or the pit configuration, in the case of an open pit, is established and an effective method of mineral processing is determined it includes a financial analysis based on reasonable assumptions on the modifying factors and the evaluation of any other relevant factors which are sufficient for a competent person, acting reasonably, to determine if all or part of the mineral resource may be converted to a mineral reserve at the time of reporting. A prefeasibility study is at a lower confidence level than a feasibility study.

A **feasibility study** is a comprehensive technical and economic study of the selected development option for a mineral project that includes appropriately detailed assessments of applicable modifying factors together with any other relevant operational factors and detailed financial analysis that are necessary to demonstrate at the time of reporting that extraction is reasonably justified (economically mineable). The results of the study may reasonably serve as the basis for a final decision by a proponent or financial institution to proceed with, or finance, the development of the project. The confidence level of the study will be higher than that of a prefeasibility study.

ESTIMATION

To meet SAMREC's requirements that this solid material reported as a mineral resource should have 'reasonable and realistic prospects for eventual economic extraction', Harmony has determined an appropriate cut-off grade which has been applied to the quantified mineralised body according to a process incorporating a long-term view on future economic modifying factors. In applying this process, Harmony uses a gold price of R690 000/kg to derive a cut-off

HARMONY STANDARD FOR SAMREC COMPLIANCE REPORTING CONTINUED

grade to determine the mineral resources at each of its South African underground operations.

Mineral resources have been estimated on the basis of geoscientific knowledge, and borehole and sampling data, with input from the company's ore reserve managers, geologists and geostatistical staff. Each mine's mineral resources are categorised, blocked-out and ascribed an estimated value. At all our mines, computerised geostatistical estimation processes are used.

To define that portion of a measured and indicated mineral resource that can be converted to a proved and probable mineral reserve, Harmony applies the concept of a cut-off grade. At our underground South African mines, this is done by defining the optimal cut-off as the lowest grade at which an orebody can be mined such that the total profits, under a specified set of mining parameters, are maximised.

The cut-off grade is determined using the company's Optimiser software, which requires the following as input:

- the database of measured and indicated resource blocks (per shaft section)
- an assumed gold price which, for this mineral reserve statement, was taken as R585 000/kg
- planned production rates
- the mine recovery factor which is equivalent to the mine call factor multiplied by the plant recovery factor
- planned cash operating costs (rand per tonne)

Rand per tonne cash operating costs are historically based but take cognisance of distinct changes in the cost environment such as restructuring, right-sizing, and other cost-reduction initiatives, and for below-infrastructure ounces, an estimate of capital expenditure.

The block cave reserve at Golpu in Papua New Guinea uses proprietary block cave optimisation software to define the optimal mine plan and sequencing. The open-pit reserve at Hidden Valley in Papua New Guinea is using the Whittle optimisation programme to guide the most efficient mine design given the commodity prices and cost inputs assumed.

The mineral reserves represent that portion of the measured and indicated resources above the cut-off grade in the life-of-mine plan and have been estimated after consideration of the factors affecting extraction, including mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors.

A range of disciplines, including geology, survey, planning, mining engineering, rock engineering, metallurgy, financial management, human resources management and environmental management, have been involved at each mine in the life-of-mine planning process and the conversion of resources into reserves.

The modifying factors related to the ore flow that are used to convert the mineral resources to mineral reserves through the life-of-mine planning process are stated for each shaft. For these factors, historical information is used, except if there is a valid reason to do otherwise. As a result of the depth at which mining occurs and the resulting rock engineering requirements at our South African underground mines, some shafts include stope support pillars into the design of their mining layouts which accounts for discounts of 7% to 10%. A further 15% discount is applied as a life-of-mine factor to provide for unpay and off-reef mining. In general, life-of-mine plan extraction factors do not exceed 85% and are reflected in the mineral reserves.

For further detail on the sampling procedures used by Harmony, see *pages 140 and 141*

Tshepong

INDEPENDENT AUDIT OPINION

THE MINERAL CORPORATION

Mr A J Boshoff
Executive: Mineral Resources and Reserves
Harmony Gold Mining Company Limited
Randfontein Office Park
Corner Main Reef Road and Ward Avenue
Randfontein

02 September 2019

Dear Mr Boshoff

INDEPENDENT AUDIT OF 2019 MINERAL RESOURCES AND MINERAL RESERVES

The Mineral Corporation has completed an audit (the Audit) of Harmony Gold Mining Company Limited's (Harmony or the Group) Mineral Resource and Mineral Reserve Statement for 2019. The objectives of the Audit were to provide assurance that Harmony's policies and procedures, if followed, would result in the reporting of Mineral Resources and Mineral Reserves in terms of the SAMREC Code (2016), and to provide assurance that the Mineral Resource and Mineral Reserve estimates have been compiled in accordance with Harmony's policies.

The Audit included all of Harmony's operations except for the Moab Khotsong Operation and the South East Asia Operations. The Doornkop Operation was identified to test whether Harmony's policies and procedures were being followed. Site visits and detailed technical audits were undertaken at this operation, while desktop audits of the Life of Mine (LoM) plans were undertaken for the remaining operations.

The Mineral Corporation has found that the Group's policies and procedures are well established and managed. Appropriate levels of scrutiny and sign-off of the geological data are sought by the Group from its operations. A sound methodology for undertaking statistical and geostatistical analysis is in place. In addition, the methodology for assessing geological losses, the methodology for Mineral Resource classification and the determination of reasonable prospects for eventual economic extraction are sound. The Mineral Corporation reviewed Harmony's planning process, which was found to align with industry best practice.

The Modifying Factors and planning parameters developed for Doornkop were reviewed and were found to align with the Harmony planning procedures and are supported by historical performance. No material issues were identified with the implementation of the planning process and the Life of Mine (LoM) plans comply with the requirements of the SAMREC Code (2016).

No material issues were identified with the process of converting the LoM plans into the primary Mineral Reserve Statements, and then into the Consolidated Mineral Reserve Statements. The Mineral Corporation is satisfied that the technical inputs contained in the Group financial model can be reconciled. In addition, the Mineral Reserves have been demonstrated to be economically viable.

The Mineral Corporation concludes that Harmony's policies and procedures for Mineral Resource and Mineral Reserve estimation would result in the reporting of Mineral Resources and Mineral Reserves in terms of the SAMREC Code (2016). Based on the detailed audits undertaken, The Mineral Corporation concludes that the Harmony procedures are generally being followed. We note that this opinion does not imply that The Mineral Corporation has accepted the role of Competent Person for the Mineral Resources and Mineral Reserves estimation. Such role resides with the nominated personnel of Harmony.

Yours faithfully

STEWART NUPEN
Director
BSc (Honours), MBA, Pr.Sci.Nat. (400174/07), FGSSA

DIRECTORS: JE Murphy (Managing), GK Wilson, AH Hart, RA Heins (British), C Madamombe (Zimbabwean), SRQ Nupen

Mineral Corporation Consultancy (Pty) Ltd
Reg. No. 1995/000999/07
Trading as: The Mineral Corporation

Homestead Office Park
65 Homestead Avenue
Bryanston 2021 South Africa

P O Box 1346
Cramerview
2060 South Africa

Tel: +27 11 463 4867
Fax: +27 11 706 8616
email: business@mineralcorp.co.za

www.mineralcorp.co.za

> ADVISORS TO THE MINERAL BUSINESS

RELATIONSHIP BETWEEN HARMONY'S MINERAL RESOURCES AND MINERAL RESERVES

SOUTH AFRICA – UNDERGROUND

Increasing level of geoscientific knowledge and confidence

Mineral resources (total)

Tonnes		Gold	
Mt	g/t	000kg	000oz
210.4	8.96	1 885	60 590

Reported as *in situ* mineralisation estimates

Mineral reserves (total)

Tonnes		Gold	
Mt	g/t	000kg	000oz
56.7	5.83	331	10 636

Reported as mineable production estimates

Inferred

Tonnes		Gold	
Mt	g/t	000kg	000oz
72.5	9.05	657	21 111

Indicated

Tonnes		Gold	
Mt	g/t	000kg	000oz
69.2	9.20	636	20 454

Probable

Tonnes		Gold	
Mt	g/t	000kg	000oz
16.2	5.75	93	2 987

Measured

Tonnes		Gold	
Mt	g/t	000kg	000oz
68.7	8.61	592	19 024

Proved

Tonnes		Gold	
Mt	g/t	000kg	000oz
40.6	5.86	238	7 649

Considerations used to convert mineral resources to mineral reserves. These include, but are not restricted to, mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social and governmental factors (the modifying factors)

SOUTH AFRICA – SURFACE (INCLUDING KALGOLD)

Increasing level of geoscientific knowledge and confidence

Mineral resources (total)

Tonnes		Gold	
Mt	g/t	000kg	000oz
1 109.5	0.30	335	10 784

Reported as *in situ* mineralisation estimates

Mineral reserves (total)

Tonnes		Gold	
Mt	g/t	000kg	000oz
808.8	0.26	207	6 641

Reported as mineable production estimates

Inferred

Tonnes		Gold	
Mt	g/t	000kg	000oz
65.1	0.39	26	824

Indicated

Tonnes		Gold	
Mt	g/t	000kg	000oz
771.6	0.30	229	7 371

Probable

Tonnes		Gold	
Mt	g/t	000kg	000oz
634.9	0.24	154	4 952

Measured

Tonnes		Gold	
Mt	g/t	000kg	000oz
272.8	0.30	81	2 589

Proved

Tonnes		Gold	
Mt	g/t	000kg	000oz
173.8	0.30	53	1 689

Considerations used to convert mineral resources to mineral reserves. These include, but are not restricted to, mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social and governmental factors (the modifying factors)

RELATIONSHIP BETWEEN HARMONY'S MINERAL RESOURCES AND MINERAL RESERVES CONTINUED

SOUTH AFRICA – TOTAL

Increasing level of geoscientific knowledge and confidence

Mineral resources (total)

Tonnes	Gold	
Mt	000kg	000oz
1 319.9	2 220	71 374

Reported as *in situ* mineralisation estimates

Mineral reserves (total)

Tonnes	Gold	
Mt	000kg	000oz
865.5	537	17 277

Reported as mineable production estimates

Inferred

Tonnes	Gold	
Mt	000kg	000oz
137.6	682	21 935

Indicated

Tonnes	Gold	
Mt	000kg	000oz
840.8	865	27 825

Probable

Tonnes	Gold	
Mt	000kg	000oz
651.1	247	7 939

Measured

Tonnes	Gold	
Mt	000kg	000oz
341.5	672	21 614

Proved

Tonnes	Gold	
Mt	000kg	000oz
214.4	290	9 338

Considerations used to convert mineral resources to mineral reserves. These include, but are not restricted to, mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social and governmental factors (the modifying factors)

PAPUA NEW GUINEA – ATTRIBUTABLE GOLD

Increasing level of geoscientific knowledge and confidence

Mineral resources (total)

Tonnes		Gold	
Mt	g/t	000kg	000oz
812.0	0.72	582	18 750

Reported as *in situ* mineralisation estimates

Mineral reserves (total)

Tonnes		Gold	
Mt	g/t	000kg	000oz
216.7	0.93	201	6 439

Reported as mineable production estimates

Inferred

Tonnes		Gold	
Mt	g/t	000kg	000oz
348.7	0.41	144	4 573

Indicated

Tonnes		Gold	
Mt	g/t	000kg	000oz
465.5	0.94	436	14 091

Probable

Tonnes		Gold	
Mt	g/t	000kg	000oz
213.9	0.93	198	6 354

Measured

Tonnes		Gold	
Mt	g/t	000kg	000oz
2.8	0.97	3	86

Proved

Tonnes		Gold	
Mt	g/t	000kg	000oz
2.8	0.97	3	86

Considerations used to convert mineral resources to mineral reserves. These include, but are not restricted to, mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social and governmental factors (the modifying factors)

RELATIONSHIP BETWEEN HARMONY'S MINERAL RESOURCES AND MINERAL RESERVES CONTINUED

TOTAL ATTRIBUTABLE GOLD – HARMONY UNDERGROUND AND SURFACE

Increasing level of geoscientific knowledge and confidence

Mineral resources (total)

Tonnes	Gold	
Mt	000kg	000oz
2 131.9	2 802	90 124

Reported as *in situ* mineralisation estimates

Mineral reserves (total)

Tonnes	Gold	
Mt	000kg	000oz
1 082.2	738	23 716

Reported as mineable production estimates

Inferred

Tonnes	Gold	
Mt	000kg	000oz
486.3	826	26 509

Indicated

Tonnes	Gold	
Mt	000kg	000oz
1 306.3	1 302	41 916

Probable

Tonnes	Gold	
Mt	000kg	000oz
865.0	445	14 293

Measured

Tonnes	Gold	
Mt	000kg	000oz
344.3	675	21 699

Proved

Tonnes	Gold	
Mt	000kg	000oz
217.1	293	9 424

Considerations used to convert mineral resources to mineral reserves. These include, but are not restricted to, mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social and governmental factors (the modifying factors)

TOTAL ATTRIBUTABLE GOLD AND GOLD EQUIVALENTS – HARMONY UNDERGROUND AND SURFACE

Increasing level of geoscientific knowledge and confidence

Mineral resources (total)

Tonnes	Gold Equivalents	
Mt	000kg	000oz
2 131.9	3 649	117 335

Reported as *in situ* mineralisation estimates

Mineral reserves (total)

Tonnes	Gold Equivalents	
Mt	000kg	000oz
1 082.2	1 134	36 454

Reported as mineable production estimates

Inferred

Tonnes	Gold	
Mt	000kg	000oz
486.3	1 054	33 833

Indicated

Tonnes	Gold Equivalents	
Mt	000kg	000oz
1 306.3	1 920	61 779

Probable

Tonnes	Gold Equivalents	
Mt	000kg	000oz
865.0	840	27 006

Measured

Tonnes	Gold Equivalents	
Mt	000kg	000oz
344.3	676	21 724

Proved

Tonnes	Gold Equivalents	
Mt	000kg	000oz
217.1	294	9 448

Considerations used to convert mineral resources to mineral reserves. These include, but are not restricted to, mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social and governmental factors (the modifying factors)

MINERAL RESOURCES STATEMENT (METRIC)

Estimates at 30 June 2019

Operations	Measured resources			Indicated resources			Inferred resources			Total mineral resources		
Gold	Tonnes (Mt)	Grade (g/t)	Gold (000kg)	Tonnes (Mt)	Grade (g/t)	Gold (000kg)	Tonnes (Mt)	Grade (g/t)	Gold (000kg)	Tonnes (Mt)	Grade (g/t)	Gold (000kg)
SOUTH AFRICA UNDERGROUND												
Free State												
Tshepong Operations	24.2	11.19	271	12.7	10.39	132	36.2	10.13	367	73.1	10.53	770
Bambanani	0.6	15.96	10	–	–	–	–	–	–	0.6	15.96	10
Unisel	0.6	8.22	5	0.2	8.62	2	–	–	–	0.8	8.32	6
Joel	4.1	7.69	32	3.9	8.29	32	7.1	5.18	37	15.2	6.66	101
Masimong	2.4	8.55	21	0.3	7.86	3	–	–	–	2.7	8.47	23
Target 1	7.2	7.69	55	4.8	6.83	33	3.9	6.00	23	15.9	7.02	112
Target 3	0.6	9.19	6	2.9	10.17	30	1.2	8.66	11	4.8	9.66	46
Total	**39.8**	**10.03**	**399**	**24.9**	**9.30**	**231**	**48.5**	**9.03**	**438**	**113.1**	**9.44**	**1 068**
West Rand												
Doornkop South Reef	4.5	8.00	36	4.7	7.67	36	4.2	7.89	33	13.4	7.85	105
Doornkop Main Reef	0.1	5.38	0.4	0.05	5.51	0.3	0.02	5.32	0.1	0.1	5.41	1
Doornkop Kimberley Reef	18.1	3.36	61	12.1	3.15	38	10.1	3.28	33	40.3	3.28	132
Kusasalethu	2.8	11.40	32	15.6	8.73	136	3.8	8.70	33	22.2	9.07	201
Total	**25.5**	**5.07**	**129**	**32.4**	**6.49**	**210**	**18.1**	**5.48**	**99**	**76.0**	**5.77**	**439**
Klerksdorp goldfield												
Moab Khotsong	3.5	18.29	63	11.9	16.40	195	5.9	20.15	119	21.3	17.75	377
Total	**3.5**	**18.29**	**63**	**11.9**	**16.40**	**195**	**5.9**	**20.15**	**119**	**21.3**	**17.75**	**377**
South Africa underground – total	**68.7**	**8.61**	**592**	**69.2**	**9.20**	**636**	**72.5**	**9.05**	**657**	**210.4**	**8.96**	**1 885**
SOUTH AFRICA SURFACE												
Kraaipan Greenstone Belt												
Kalgold open pit	14.6	0.79	12	66.5	0.92	61	8.7	1.05	9	89.8	0.91	82
Kalgold tailings dam	–	–	–	–	–	–	23.8	0.26	6	23.8	0.26	6
Total	**14.6**		**12**	**66.5**		**61**	**32.5**		**15**	**113.6**		**88**
Free State surface												
Phoenix	55.8	0.27	15	–	–	–	–	–	–	55.8	0.27	15
St Helena	191.3	0.27	52	–	–	–	–	–	–	191.3	0.27	52
Central Plant	–	–	–	60.5	0.27	16	–	–	–	60.5	0.27	16
Other:												
– Waste rock dumps	–	–	–	3.9	0.51	2	17.2	0.43	7	21.1	0.44	9
– Tailings	–	–	–	561.6	0.22	125	15.5	0.19	3	577.1	0.22	128
Total	**247.2**	**0.27**	**67**	**626.0**	**0.23**	**143**	**32.6**	**0.31**	**10**	**905.8**	**0.24**	**220**
Klerksdorp goldfield												
Mispah	–	–	–	73.3	0.30	22	–	–	–	73.3	0.30	22
Kop Paydam	11.0	0.20	2	–	–	–	–	–	–	11.0	0.20	2
Moab MOD	–	–	–	5.9	0..41	2	–	–	–	5.9	0.41	2
Total	**11.0**	**0.20**	**2**	**79.1**	**0.31**	**24**	**–**	**–**	**–**	**90.1**	**0.30**	**27**
South Africa surface – total	**272.8**	**0.30**	**81**	**771.6**	**0.30**	**229**	**65.1**	**0.39**	**26**	**1 109.5**	**0.30**	**335**
SOUTH AFRICA – TOTAL (underground and surface)	**341.5**		**672**	**840.8**		**865**	**137.6**		**682**	**1 319.9**		**2 220**
PAPUA NEW GUINEA												
Hidden Valley	2.7	0.96	3	64.5	1.53	99	1.5	1.06	2	68.8	1.50	103
Hamata	0.01	2.25	0.02	2.0	1.90	4	0.2	1.52	0.3	2.2	1.86	4
Wafi [1]	–	–	–	54.0	1.65	89	20.0	1.28	26	74.0	1.55	114
Golpu [1]	–	–	–	345.0	0.71	245	70.0	0.63	44	410.0	0.71	289
Nambonga [1]	–	–	–	–	–	–	20.0	0.82	16	20.0	0.82	16
Kili Teke	–	–	–	–	–	–	237.0	0.24	56	237.0	0.24	56
PAPUA NEW GUINEA – TOTAL	**2.8**	**0.97**	**3**	**465.5**	**0.94**	**436**	**348.7**	**0.41**	**144**	**812.0**	**0.71**	**582**
HARMONY – TOTAL	**344.3**		**675**	**1 306.3**		**1 302**	**486.3**		**827**	**2 131.9**		**2 802**

MINERAL RESOURCES STATEMENT (METRIC) CONTINUED

Estimates at 30 June 2019

Operations	Measured resources		Indicated resources		Inferred resources		Total mineral resources	
Gold equivalents [2]	Tonnes (Mt)	Au eq (000kg)	Tonnes (Mt)	Au eq (000kg)	Tonnes (Mt)	Au eq (000kg)	Tonnes (Mt)	Au eq (000kg)
Silver								
Hidden Valley	2.7	1	64.5	22	1.5	1	68.8	23
Copper								
Golpu [1]	–	–	345.0	596	70.0	92	410.0	688
Nambonga [1]	–	–	–	–	20.0	7	20.0	7
Kili Teke	–	–	–	–	237.0	128	237.0	128
Total	**–**	**–**	**345.0**	**596**	**327.0**	**227**	**667.0**	**823**
Silver and copper – total	**2.7**	**1**	**409.5**	**618**	**328.5**	**228**	**735.7**	**847**
PAPUA NEW GUINEA – TOTAL (including gold equivalents)	**2.8**	**3**	**465.5**	**1 055**	**348.7**	**372**	**812.0**	**1 429**
HARMONY – TOTAL (including gold equivalents)	**344.3**	**676**	**1 306.3**	**1 920**	**486.3**	**1 054**	**2 131.9**	**3 650**

Other metals

PAPUA NEW GUINEA

Silver	Tonnes (Mt)	Grade (g/t)	Ag (000kg)	Tonnes (Mt)	Grade (g/t)	Ag (000kg)	Tonnes (Mt)	Grade (g/t)	Ag (000kg)	Tonnes (Mt)	Grade (g/t)	Ag (000kg)
Hidden Valley	2.7	21.13	58	64.5	26.12	1 684	1.5	25.21	39	68.8	25.90	1 781
Golpu [1]	–	–	–	345.0	1.29	449	70.0	1.06	77	410.0	1.25	526
Total	**2.7**	**21.13**	**58**	**409.5**	**5.21**	**2 133**	**71.5**	**1.62**	**116**	**478.8**	**4.82**	**2 307**

Copper	Tonnes (Mt)	Grade (%)	Cu (000t)	Tonnes (Mt)	Grade (%)	Cu (000t)	Tonnes (Mt)	Grade (%)	Cu (000t)	Tonnes (Mt)	Grade (%)	Cu (000t)
Golpu [1]	–	–	–	345.0	1.00	3 750	70.0	0.85	600	410.0	1.00	4 300
Nambonga [1]	–	–	–	–	–	–	20.0	0.20	40	20.0	0.20	40
Kili Teke	–	–	–	–	–	–	237.0	0.34	802	237.0	0.34	802
Total	**–**	**–**	**–**	**345.0**	**1.00**	**3 750**	**327.0**	**0.44**	**1 442**	**667.0**	**0.77**	**5 142**

Molybdenum	Tonnes (Mt)	Grade (lb/t)	Mo (Mlb)	Tonnes (Mt)	Grade (lb/t)	Mo (Mlb)	Tonnes (Mt)	Grade (lb/t)	Mo (Mlb)	Tonnes (Mt)	Grade (lb/t)	Mo (Mlb)
Golpu [1]	–	–	–	345.0	94	33	70.0	72	5	410.0	90	37
Kili Teke	–	–	–	–	–	–	237.0	168	40	237.0	168	40
Total	**–**	**–**	**–**	**345.0**	**94**	**33**	**307.0**	**146**	**45**	**647.0**	**119**	**77**

SOUTH AFRICA

Uranium	Tonnes (Mt)	Grade (kg/t)	U_3O_8 (Mkg)	Tonnes (Mt)	Grade (kg/t)	U_3O_8 (Mkg)	Tonnes (Mt)	Grade (kg/t)	U_3O_8 (Mkg)	Tonnes (Mt)	Grade (kg/t)	U_3O_8 (Mkg)
Free State surface	–	–	–	184.7	0.10	18	–	–	–	184.7	0.10	18
Klerksdorp goldfield surface	–	–	–	84.3	0.12	10	–	–	–	84.3	0.12	10
Moab Khotsong underground	–	–	–	15.3	0.83	13	5.9	0.72	4	21.3	0.80	17
Total	**–**	**–**	**–**	**284.2**	**0.15**	**42**	**5.9**	**0.72**	**4**	**290.2**	**0.16**	**46**

[1] *Harmony's 50% attributable portion*

[2] *Gold equivalent ounces are calculated assuming a US$1 290/oz Au, US$3.00/lb Cu and US$17.00/oz Ag with 100% recovery for all metals*

Rounding of numbers may result in slight computational discrepancies

Note: 1 tonne = 1 000kg = 2 204lb

1 troy ounce = 31.10348 grams

MINERAL RESERVES STATEMENT (METRIC)

Estimates at 30 June 2019

Operations	Proved reserves			Probable reserves			Total mineral reserves		
Gold	Tonnes (Mt)	Grade (g/t)	Gold (000kg)	Tonnes (Mt)	Grade (g/t)	Gold (000kg)	Tonnes (Mt)	Grade (g/t)	Gold (000kg)
SOUTH AFRICA UNDERGROUND									
Free State									
Tshepong operations	20.0	5.87	117	3.8	4.70	18	23.8	5.68	135
Bambanani	0.7	11.69	9	–	–	–	0.7	11.69	9
Unisel	0.2	4.81	1	0.1	4.13	0.2	0.2	4.65	1
Joel	2.9	4.95	15	1.4	4.87	7	4.4	4.93	22
Masimong	0.6	4.37	3	0.04	3.53	0.1	0.7	4.33	3
Target 1	3.2	4.38	14	1.5	4.66	7	4.6	4.47	21
Total	**27.6**	**5.72**	**158**	**6.8**	**4.72**	**32**	**34.5**	**5.52**	**190**
West Rand									
Doornkop South Reef	5.3	4.92	26	5.6	4.86	27	10.9	4.89	53
Kusasalethu	3.6	6.79	24	0.9	6.67	6	4.5	6.76	30
Total	**8.9**	**5.67**	**51**	**6.5**	**5.11**	**33**	**15.4**	**5.43**	**84**
Klerksdorp goldfield									
Moab Khotsong	4.0	7.29	29	2.8	9.70	28	6.9	8.28	57
Total	**4.0**	**7.29**	**29**	**2.8**	**9.70**	**28**	**6.9**	**8.28**	**57**
South Africa underground – total	**40.6**	**5.86**	**238**	**16.2**	**5.75**	**93**	**56.7**	**5.83**	**331**
SOUTH AFRICA SURFACE									
Kraaipan Greenstone Belt									
Kalgold	9.4	0.87	8	8.9	1.18	11	18.4	1.02	19
Free State surface									
Free State (Phoenix)	55.8	0.27	15	–	–	–	55.8	0.27	15
Free State (St Helena)	108.6	0.27	29	–	–	–	108.6	0.27	29
Free State (Central Plant)	–	–	–	60.5	0.27	16	60.5	0.27	16
Free State (other):									
– Waste rock dumps	–	–	–	3.9	0.51	2	3.9	0.51	2
– Tailings	–	–	–	561.6	0.22	125	561.6	0.22	125
Free State surface	**164.4**	**0.27**	**44**	**626.0**	**0.23**	**143**	**790.4**	**0.24**	**188**
South Africa surface – total	**173.8**	**0.30**	**53**	**634.9**	**0.24**	**154**	**808.8**	**0.26**	**207**
SOUTH AFRICA – TOTAL (underground and surface)	**214.4**		**290**	**651.1**		**247**	**865.5**		**537**
PAPUA NEW GUINEA									
Hidden Valley	2.7	0.96	3	13.6	1.91	26	16.3	1.75	29
Hamata	0.01	2.25	0.02	0.4	1.74	1	0.4	1.75	1
Golpu [1]	–	–	–	200.0	0.86	171	200.0	0.86	171
PAPUA NEW GUINEA – TOTAL	**2.8**	**0.97**	**3**	**213.9**	**0.93**	**198**	**216.7**	**0.93**	**201**
HARMONY – TOTAL	**217.1**		**293**	**865.0**		**445**	**1 082.2**		**738**

MINERAL RESERVES STATEMENT (METRIC) CONTINUED

Estimates at 30 June 2019

Operations	Proved reserves		Probable reserves		Total mineral reserves	
Gold equivalents [2]	Tonnes (Mt)	Au eq (000kg)	Tonnes (Mt)	Au eq (000kg)	Tonnes (Mt)	Au eq (000kg)
Silver						
Hidden Valley	2.7	1	13.6	5	16.3	6
Copper [1]						
Golpu	–	–	200.0	390	200.0	390
Silver and copper – total as gold equivalents	**2.7**	**1**	**213.6**	**395**	**216.3**	**396**
PAPUA NEW GUINEA – TOTAL (including gold equivalents)	**2.8**	**3**	**213.9**	**593**	**216.7**	**597**
HARMONY – TOTAL (including gold equivalents)	**217.1**	**294**	**865.0**	**840**	**1 082.2**	**1 134**

Other metals

PAPUA NEW GUINEA

	Tonnes	Grade	Ag	Tonnes	Grade	Ag	Tonnes	Grade	Ag
Silver	(Mt)	(g/t)	(000kg)	(Mt)	(g/t)	(000kg)	(Mt)	(g/t)	(000kg)
Hidden Valley	2.7	21.13	58	13.6	30.41	413	16.3	28.85	471
	Tonnes	Grade	Cu	Tonnes	Grade	Cu	Tonnes	Grade	Cu
Copper	(Mt)	(%)	(000t)	(Mt)	(%)	(000t)	(Mt)	(%)	(000t)
Golpu [1]	–	–	–	200.0	1.20	2 450	200.0	1.20	2 450
	Tonnes	Grade	U_3O_8	Tonnes	Grade	U_3O_8	Tonnes	Grade	U_3O_8
Uranium	(Mt)	(kg/t)	(Mkg)	(Mt)	(kg/t)	(Mkg)	(Mt)	(kg/t)	(Mkg)
Moab Khotsong	–	–	–	6.9	0.22	1	6.9	0.22	1

[1] *Harmony's 50% attributable portion*

[2] *Gold equivalent ounces are calculated assuming a US$1 290/oz Au, US$3.00/lb Cu and US$17.00/oz Ag with 100% recovery for all metals*
Metal figures are fully inclusive of all mining dilutions and gold losses, and are reported as mill delivered tonnes and head grades
Metallurgical recovery factors have not been applied to the reserve figures

Rounding of numbers may result in slight computational discrepancies

Note: 1 tonne = 1 000kg = 2 204lb
1 troy ounce = 31.10348 grams

MINERAL RESOURCES STATEMENT (IMPERIAL)

Estimates at 30 June 2019

Operations	Measured resources			Indicated resources			Inferred resources			Total mineral reserves		
Gold	Tons (Mt)	Grade (oz/t)	Gold (000oz)	Tons (Mt)	Grade (oz/t)	Gold (000oz)	Tons (Mt)	Grade (oz/t)	Gold (000oz)	Tons (Mt)	Grade (oz/t)	Gold (000oz)
SOUTH AFRICA UNDERGROUND												
Free State												
Tshepong operations	26.7	0.326	8 716	14.0	0.303	4 236	39.9	0.295	11 797	80.6	0.307	24 749
Bambanani	0.7	0.485	318	–	–	–	–	–	–	0.7	0.465	318
Unisel	0.6	0.240	156	0.2	0.251	53	–	–	–	0.9	0.243	209
Joel	4.5	0.224	1 019	4.3	0.242	1 040	7.9	0.151	1 190	16.7	0.194	3 249
Masimong	2.6	0.249	659	0.4	0.229	84	–	–	–	3.0	0.247	743
Target 1	8.0	0.224	1 783	5.3	0.199	1 059	4.3	0.175	750	17.5	0.205	3 592
Target 3	0.7	0.268	178	3.3	0.297	965	1.3	0.253	340	5.3	0.282	1 483
Total	**43.8**	**0.293**	**12 829**	**27.4**	**0.271**	**7 436**	**53.4**	**0.263**	**14 077**	**124.7**	**0.275**	**34 342**
West Rand												
Doornkop South Reef	4.9	0.233	1 150	5.1	0.224	1 148	4.7	0.230	1 074	14.7	0.229	3 373
Doornkop Main Reef	0.1	0.157	14	0.1	0.161	8	0.02	0.155	3	0.2	0.158	25
Doornkop Kimberley Reef	20.0	0.098	1 957	13.4	0.092	1 226	11.1	0.096	1 066	44.5	0.096	4 249
Kusasalethu	3.1	0.333	1 037	17.2	0.255	4 379	4.1	0.254	1 051	24.4	0.265	6 467
Total	**28.1**	**0.148**	**4 158**	**35.7**	**0.189**	**6 762**	**20.0**	**0.160**	**3 194**	**83.8**	**0.168**	**14 133**
Klerksdorp goldfield												
Moab Khotsong	3.8	0.534	2 037	13.1	0.478	6 257	6.5	0.588	3 840	23.4	0.518	12 134
South Africa underground – total	**75.8**	**0.251**	**19 024**	**76.2**	**0.268**	**20 454**	**79.9**	**0.264**	**21 111**	**231.9**	**0.261**	**60 590**
SOUTH AFRICA SURFACE												
Kraaipan Greenstone Belt												
Kalgold	16.1	0.023	371	73.3	0.027	1 971	9.5	0.031	293	99.0	0.027	2 636
Kalgold tailings dam	–	–	–	–	–	–	26.2	0.008	201	26.2	0.008	201
Total	**16.1**		**371**	**73.3**		**1 971**	**35.8**		**494**	**125.2**		**2 837**
Free State – surface												
Phoenix	61.5	0.008	490	–	–	–	–	–	–	61.5	0.008	490
St Helena	210.9	0.008	1 656	–	–	–	–	–	–	210.9	0.008	1 656
Central Plant	–	–	–	66.7	0.008	517	–	–	–	66.7	0.008	517
Other:												
– Waste rock dumps	–	–	–	4.3	0.015	64	18.9	0.012	235	23.2	0.013	299
– Tailings	–	–	–	619.1	0.007	4 032	17.0	0.006	94	636.1	0.006	4 126
Total	**272.5**	**0.008**	**2 147**	**690.1**	**0.007**	**4 613**	**36.0**	**0.009**	**329**	**998.5**	**0.007**	**7 089**
Klerksdorp goldfield surface												
Mispah	–	–	–	80.8	0.009	710	–	–	–	80.8	0.009	710
Kop Paydam	12.1	0.006	72	–	–	–	–	–	–	12.1	0.006	72
Moab MOD	–	–	–	6.5	0.012	77	–	–	–	6.5	0.012	77
Total	**12.1**	**0.006**	**72**	**87.2**	**0.009**	**787**	**–**	**–**	**–**	**99.3**	**0.009**	**859**
South Africa surface – total	**300.7**	**0.009**	**2 589**	**850.6**	**0.009**	**7 371**	**71.7**	**0.011**	**824**	**1 223.0**	**0.009**	**10 784**
SOUTH AFRICA – TOTAL (underground and surface)	**376.5**		**21 614**	**926.8**		**27 825**	**151.7**		**21 935**	**1 455.0**		**71 374**
PAPUA NEW GUINEA												
Hidden Valley	3.0	0.028	85	71.1	0.045	3 169	1.7	0.031	53	75.8	0.044	3 307
Hamata	0.01	0.066	1	2.2	0.055	122	0.2	0.044	10	2.4	0.054	133
Wafi [1]	–	–	–	59.5	0.047	2 800	22.0	0.036	800	81.6	0.044	3 600
Golpu [1]	–	–	–	380.3	0.021	8 000	77.2	0.018	1 400	451.9	0.021	9 400
Nambonga [1]	–	–	–	–	–	–	22.0	0.023	500	22.0	0.023	500
Kili Teke	–	–	–	–	–	–	261.2	0.007	1 810	261.2	0.007	1 810
PAPUA NEW GUINEA – TOTAL	**3.0**	**0.028**	**86**	**513.1**	**0.027**	**14 091**	**384.4**	**0.012**	**4 575**	**895.0**	**0.021**	**18 750**
HARMONY – TOTAL	**379.5**		**21 699**	**1 439.9**		**41 918**	**536.1**		**26 509**	**2 350.0**		**90 124**

MINERAL RESOURCES STATEMENT (IMPERIAL) CONTINUED

Estimates at 30 June 2019

Operations	Measured resources		Indicated resources		Inferred resources		Total mineral resources	
Gold equivalents [2]	Tons (Mt)	Au eq (000oz)	Tons (Mt)	Au eq (000oz)	Tons (Mt)	Au eq (000oz)	Tons (Mt)	Au eq (000oz)
Silver								
Hidden Valley	3.0	24	71.1	713	1.7	16	75.8	753
Copper								
Golpu [1]	–	–	380.3	19 150	77.2	2 960	451.9	22 110
Nambonga [1]	–	–	–	–	22.0	240	22.0	240
Kili Teke	–	–	–	–	261.2	4 108	261.2	4 108
Total	**–**	**–**	**380.3**	**19 150**	**360.4**	**7 308**	**735.2**	**26 458**
Silver and copper – total as gold equivalents	**3.0**	**24**	**451.4**	**19 863**	**362.1**	**7 324**	**811.0**	**27 211**
PAPUA NEW GUINEA – TOTAL (including gold equivalents)	**3.0**	**110**	**513.1**	**33 954**	**384.4**	**11 897**	**895.0**	**45 595**
HARMONY – TOTAL (including gold equivalents)	**379.5**	**21 724**	**1 439.9**	**61 779**	**536.1**	**33 833**	**2 350.0**	**117 335**

Other metals

PAPUA NEW GUINEA

Silver	Tons (Mt)	Grade (oz/t)	Ag (000oz)	Tons (Mt)	Grade (oz/t)	Ag (000oz)	Tons (Mt)	Grade (oz/t)	Ag (000oz)	Tons (Mt)	Grade (oz/t)	Ag (000oz)
Hidden Valley	3.0	0.616	1 863	71.1	0.762	54 151	1.7	0.735	1 256	75.8	0.755	57 270
Golpu [1]	–	–	–	380.3	0.037	14 000	77.2	0.030	2 300	451.9	0.037	16 500
Total	**3.0**	**0.616**	**1 863**	**451.4**	**0.151**	**68 151**	**78.9**	**0.045**	**3 556**	**527.8**	**0.140**	**73 770**

Copper	Tons (Mt)	Grade (%)	Cu (Mlb)	Tons (Mt)	Grade (%)	Cu (Mlb)	Tons (Mt)	Grade (%)	Cu (Mlb)	Tons (Mt)	Grade (%)	Cu (Mlb)
Golpu [1]	–	–	–	380.3	0.986	8 250	77.2	0.778	1 250	451.9	0.963	9 500
Nambonga [1]	–	–	–	–	–	–	22.0	0.181	88	22.0	0.181	88
Kili Teke	–	–	–	–	–	–	261.2	0.307	1 767	261.2	0.307	1 767
Total	**–**	**–**	**–**	**380.3**	**0.986**	**8 250**	**360.4**	**0.400**	**3 105**	**735.2**	**0.597**	**11 355**

Molybedenum	Tonnes (Mt)	Grade (lb/t)	Mo (Mlb)	Tonnes (Mt)	Grade (lb/t)	Mo (Mlb)	Tonnes (Mt)	Grade (lb/t)	Mo (Mlb)	Tonnes (Mt)	Grade (lb/t)	Mo (Mlb)
Golpu 1	–	–	–	380.3	0.189	72	77.2	0.143	11	451.9	0.184	83
Kili Teke	–	–	–	–	–	–	261.2	0.335	88	261.2	0.335	88
Total	**–**	**–**	**–**	**380.3**	**0.189**	**72**	**338.4**	**0.291**	**99**	**713.2**	**0.239**	**171**

SOUTH AFRICA

Uranium	Tons (Mt)	Grade (lb/t)	U_3O_8 (Mlb)	Tons (Mt)	Grade (lb/t)	U_3O_8 (Mlb)	Tons (Mt)	Grade (lb/t)	U_3O_8 (Mlb)	Tons (Mt)	Grade (lb/t)	U_3O_8 (Mlb)
Free State surface	–	–	–	203.6	0.200	41	–	–	–	203.6	0.200	41
Klerksdorp goldfield surface	–	–	–	92.9	0.246	23	–	–	–	92.9	0.246	23
Moab Khotsong underground	–	–	–	16.9	1.669	28	6.5	1.449	9	23.4	1.608	38
	–	–	–	313.3	0.293	92	6.5	1.449	9	319.9	0.316	101

[1] *Harmony's 50% attributable portion*

[2] *Gold equivalent ounces are calculated assuming a US$1 290/oz Au, US$3.00/lb Cu and US$17.00/oz Ag with 100% recovery for all metals*

Rounding of numbers may result in slight computational discrepancies

Note: 1 tonne = 907kg = 2 000lb

1 troy ounce = 31.10348 grams

MINERAL RESERVES STATEMENT (IMPERIAL)

Estimates at 30 June 2019

Operations	Proved reserves			Probable reserves			Total mineral reserves		
Gold	Tons (Mt)	Grade (oz/t)	Gold (000oz)	Tons (Mt)	Grade (oz/t)	Gold (000oz)	Tons (Mt)	Grade (oz/t)	Gold (000oz)
SOUTH AFRICA UNDERGROUND									
Free State									
Tshepong operations	22.0	0.171	3 774	4.2	0.137	576	26.2	0.166	4 350
Bambanani	0.8	0.341	278	–	–	–	0.8	0.341	278
Unisel	0.2	0.140	29	0.1	0.121	7	0.3	0.136	36
Joel	3.2	0.144	468	1.6	0.142	225	4.8	0.144	693
Masimong	0.7	0.127	88	0.04	0.103	4	0.7	0.126	93
Target 1	3.5	0.128	444	1.6	0.136	221	5.1	0.130	665
Total	**30.5**	**0.167**	**5 080**	**7.5**	**0.138**	**1 034**	**38.0**	**0.161**	**6 114**
West Rand									
Doornkop South Reef	5.9	0.144	845	6.2	0.142	872	12.0	0.143	1 718
Kusasalethu	3.9	0.198	779	1.0	0.194	194	4.9	0.197	972
Total	**9.8**	**0.165**	**1 624**	**7.2**	**0.149**	**1 066**	**17.0**	**0.158**	**2 690**
Klerksdorp goldfield									
Moab Khotsong	4.4	0.213	945	3.1	0.283	887	7.6	0.242	1 832
Total	**4.4**	**0.213**	**945**	**3.1**	**0.283**	**887**	**7.6**	**0.242**	**1 832**
South Africa underground – total	**44.7**	**0.171**	**7 649**	**17.8**	**0.168**	**2 987**	**62.5**	**0.170**	**10 636**
SOUTH AFRICA SURFACE									
Kraaipan Greenstone Belt									
Kalgold	10.4	0.026	265	9.8	0.034	339	20.2	0.030	605
Free State – surface									
Phoenix	61.5	0.008	490	–	–	–	61.5	0.008	490
St Helena	119.7	0.008	933	–	–	–	119.7	0.008	933
Central Plant	–	–	–	66.7	0.008	517	66.7	0.008	517
Other:									
– Waste rock dumps	–	–	–	4.3	0.015	64	4.3	0.015	64
– Tailings	–	–	–	619.1	0.007	4 032	619.1	0.007	4 032
Total	**181.2**	**0.008**	**1 424**	**690.1**	**0.007**	**4 613**	**871.3**	**0.007**	**6 036**
South Africa surface – total	**191.6**	**0.009**	**1 689**	**699.9**	**0.007**	**4 952**	**891.5**	**0.007**	**6 641**
SOUTH AFRICA – TOTAL (underground and surface)	**236.3**		**9 338**	**717.7**		**7 939**	**954.0**		**17 277**
PAPUA NEW GUINEA									
Hidden Valley	3.0	0.028	85	15.0	0.056	833	18.0	0.051	918
Hamata	0.01	0.066	1	0.4	0.051	20	0.4	0.051	21
Golpu [1]	–	–	–	220.5	0.025	5 500	220.5	0.025	5 500
PAPUA NEW GUINEA – TOTAL	**3.0**	**0.028**	**86**	**235.8**	**0.027**	**6 354**	**238.9**	**0.027**	**6 439**
HARMONY – TOTAL	**239.3**		**9 424**	**953.5**		**14 293**	**1 192.9**		**23 716**

MINERAL RESERVES STATEMENT (IMPERIAL) CONTINUED

Estimates at 30 June 2019

Operations	Proved reserves		Probable reserves		Total mineral reserves	
Gold equivalents [2]	Tons (Mt)	Au eq (000oz)	Tons (Mt)	Au eq (000oz)	Tons (Mt)	Au eq (000oz)
Silver						
Hidden Valley	3.0	25	15.0	175	18.0	199
Copper						
Golpu [1]	–	–	220.5	12 538	220.5	12 538
Silver and copper – total as gold equivalents	**3.0**	**25**	**235.4**	**12 713**	**238.4**	**12 738**
PAPUA NEW GUINEA – TOTAL (including gold equivalents)	**3.0**	**110**	**235.8**	**19 067**	**238.9**	**19 177**
HARMONY – TOTAL (including gold equivalents)	**239.3**	**9 448**	**953.5**	**27 006**	**1 192.8**	**36 454**

Other metals

PAPUA NEW GUINEA

Silver	Tons (Mt)	Grade (oz/t)	Ag (000oz)	Tons (Mt)	Grade (oz/t)	Ag (000oz)	Tons (Mt)	Grade (oz/t)	Ag (000oz)
Hidden Valley	3.0	0.616	1 863	15.0	0.887	13 271	18.0	0.842	15 134

Copper	Tons (Mt)	Grade (%)	Cu (Mlb)	Tons (Mt)	Grade (%)	Cu (Mlb)	Tons (Mt)	Grade (%)	Cu (Mlb)
Golpu [1]	–	–	–	220.5	1.111	5 400	220.5	1.111	5 400

SOUTH AFRICA

Uranium	Tons (Mt)	Grade (lb/t)	U_3O_8 (Mlb)	Tons (Mt)	Grade (lb/t)	U_3O_8 (Mlb)	Tons (Mt)	Grade (lb/t)	U_3O_8 (Mlb)
Moab Khotsong	–	–	–	7.6	0.435	3	7.6	0.435	3

[1] *Harmony's 50% attributable portion*

[2] *Gold equivalent ounces are calculated assuming a US$1 290/oz Au, US$3.00/lb Cu and US$17.00/oz Ag with 100% recovery for all metals*
Metal figures are fully inclusive of all mining dilutions and gold losses, and are reported as mill delivered tonnes and head grades
Metallurgical recovery factors have not been applied to the reserve figures

Rounding of numbers may result in slight computational discrepancies

Note: 1 tonne = 907kg = 2 000lb
1 troy ounce = 31.10348 grams

RESOURCE AND RESERVE RECONCILIATION

MINERAL RESOURCES

As at 30 June 2019, attributable gold equivalent mineral resources were 117.3Moz, down from 117.8Moz in June 2018. The following tables show the year on year reconciliation of the mineral resources.

Mineral resource reconciliation – gold and gold equivalents

	kg (000)	Moz
June 2018 – Gold and gold equivalents	3 664	117.8
Changes during FY19:		
Mined	(62)	2.0
Additions at Kalgold, Tshepong, Joel and Target	65	2.1
Gold equivalents	(19)	(0.6)
June 2019 – Gold and gold equivalents	**3 649**	**117.3**

Mineral resource comparison by operation – FY18 vs FY19

				Net of depletion variance		
Gold	**FY18 (Moz)**	**FY19 (Moz)**	**Depletion (Moz)**	**(Moz)**	**(%)**	**Comments**
SOUTH AFRICA UNDERGROUND						
Free State						
Tshepong operations	23.674	**24.749**	0.370	1.445	6.1	Gold ounces increased year on year mainly due to the increase in grade as well as structural changes in both the Basal and B Reef horizons
Bambanani	0.457	**0.318**	0.096	(0.043)	(9.4)	Increase in remnant pillars to protect shaft infrastructure at 69 level
Unisel	0.118	**0.209**	0.066	0.157	133.3	Life of mine boundaries extended, new blocks added to the resources
Joel	2.064	**3.249**	0.068	1.253	60.7	Additional resources identified through drilling and exploration. Lower resource cut-off year-on-year resulted in additional resources
Masimong	0.761	**0.743**	0.130	0.112	14.7	Improvement in block values made more blocks available above cut off at better values
Target 1	2.996	**3.592**	0.096	0.692	23.1	Resources added due to underground exploration and drilling
Target 3	1.483	**1.483**	0	0	0	
Free State – total	**31.553**	**34.342**	**0.826**	**3.615**	**11.5**	
West Rand						
Doornkop	7.521	**7.647**	0.156	0.281	3.7	Revised geological model
Kusasalethu	7.861	**6.467**	0.208	(1.186)	(15.1)	Changes to valuation methodology and lower grades in certain blocks
West Rand – total	**15.382**	**14.113**	**0.364**	**(0.905)**	**(5.9)**	
Klerksdorp goldfield						
Moab Khotsong	14.331	12.134	0.388	(1.808)	(12.6)	Increased in the resource cut-off grade
South Africa underground – total	**61.265**	**60.590**	**1.578**	**0.903**	**1.5**	

RESOURCE AND RESERVE RECONCILIATION CONTINUED

Gold	FY18 (Moz)	FY19 (Moz)	Depletion (Moz)	Net of depletion variance (Moz)	Net of depletion variance (%)	Comments
SOUTH AFRICA SURFACE						
Kraaipan Greenstone Belt						
Kalgold – pit	1.164	2.636	0.046	1.518	130.4	Changes due to improved confidence and understanding of the resource base following the exploration programme
Kalgold tailings dam	0.201	0.201	0	0	0	
Total	**1.365**	**2.837**	**0.046**	**1.518**	**111.2**	
Free State – Surface						
Phoenix	0.575	0.490	0.061	(0.024)	(4.1)	
St Helena	1.656	1.656	0	0	0	
Central Plant	0.552	0.517	0.039	0.004	0.7	Depletion offset by increase in MRF
Waste rock dumps	0.329	0.299	0.013	(0.017)	(5.2)	Rehabilitation and re-mining
Tailings	4.065	4.126	0	0.061	1.5	
Total	**7.177**	**7.089**	**0.113**	**0.024**	**0.3**	
Klerksdorp goldfield – Surface						
Mispah	0.708	0.710	0	0.002	0.3	Deposition
Kop Paydam	0.072	0.072	0	0	0	
Moab MOD	0.089	0.077	0.017	(0.005)	5.9	Depletion offset by higher value
Total	**0.868**	**0.859**	**0.017**	**(0.007)**	**(0.9)**	
South Africa surface – total	**9.411**	**10.784**	**0.159**	**1.549**	**16.5**	
SOUTH AFRICA – total (underground, surface, Kalgold)	**70.676**	**71.374**	**1.754**	**2.452**	**3.5**	
PAPUA NEW GUINEA						
Hidden Valley/Kaveroi	3.948	3.307	0.253	(0.389)	(9.8)	Depletion and new resource model with change to fixed cut off
Hamata	0.157	0.133	0	(0.025)	(15.6)	Depletion and movement to fixed cut off
Wafi	3.621	3.600	0	(0.021)	(0.6)	New resource model with updated geological model
Golpu	9.282	9.400	0	0.118	1.3	
Nambonga	0.507	0.500	0	(0.007)	(1.4)	New resource model with updated geological model
Kili Teke	1.810	1.810	0	0	0.0	
PAPUA NEW GUINEA – total	**19.326**	**18.750**	**0.253**	**(0.323)**	**(1.7)**	
GOLD TOTAL	**90.002**	**90.124**	**2.006**	**2.128**	**2.4**	

RESOURCE AND RESERVE RECONCILIATION

Gold	FY18 (Moz)	FY19 (Moz)	Depletion (Moz)	Net of depletion variance (Moz)	Net of depletion variance (%)	Comments
Gold equivalents						
Silver – equivalent gold ounces						
Hidden Valley	1.072	0.753	0	(0.319)	(29.7)	Depletion and new resource model with change to fixed cut off
Copper – equivalent gold ounces						
Golpu	22.358	22.110	0	(0.248)	(1.1)	Change in metal price assumptions
Nambonga	0.220	0.240	0	0.020	8.8	Change in metal price assumptions and new model
Kili Teke	4.157	4.108	0	(0.049)	(1.2)	Change in metal price assumptions
Copper gold equivalent – total	**26.735**	**26.458**	**0**	**(0.277)**	**(1.0)**	
Papua New Guinea – total equivalent gold ounces	**27.807**	**27.211**	**0**	**(0.596)**	**(2.1)**	
Papua New Guinea – total gold and equivalent gold ounces	**47.133**	**45.961**	**0.253**	**(0.919)**	**(2.0)**	
GOLD TOTAL (excluding equivalents)	**90.002**	**90.124**	**2.006**	**2.128**	**2.4**	
GOLD TOTAL (including equivalents)	**117.809**	**117.335**	**2.006**	**1.532**	**1.3**	

RESOURCE AND RESERVE RECONCILIATION CONTINUED

MINERAL RESERVES

As at 30 June 2019, Harmony's attributable gold equivalent mineral reserves were 36.5Moz, down from 36.8Moz. The year on year mineral reserve reconciliation is shown below.

Mineral reserve reconciliation – gold and gold equivalents

	kg (000)	Moz
June 2018 – Gold and gold equivalents	1 146	36.8
Changes during FY19		
Mined	(48)	(1.5)
Additions at Tshepong, Moab Khotsong and Doornkop	47	1.5
Gold equivalents	(9)	(0.3)
June 2019 – Gold and gold equivalents	**1 136**	**36.5**

Mineral reserve comparison by operation – FY18 vs FY19

Gold	FY18 (Moz)	FY19 (Moz)	Depletion (Moz)	Net of depletion variance (Moz)	Net of depletion variance (%)	Comments
SOUTH AFRICA UNDERGROUND						
Free State						
Tshepong operations	4.343	4.350	0.268	0.275	6.3	Gold ounces increased year on year due to the increase in grade as well as structural changes in both the Basal and B Reef horizon
Bambanani	0.386	0.278	0.085	(0.023)	(6.1)	Increase in remnant pillars to protect the shaft infrastructure at 69 level
Unisel	0.053	0.036	0.041	0.024	45.8	Life of mine boundaries extended new blocks added to the reserves
Joel	0.686	0.693	0.053	0.060	8.8	The additional resources identified converted to reserves
Masimong	0.246	0.093	0.078	(0.076)	(31.0)	Life of mine reduced from 36 to 15 months
Target 1	0.724	0.665	0.090	0.030	4.2	
Free State – Total	**6.437**	**6.114**	**0.613**	**0.289**	**4.5**	
West Rand						
Doornkop South Reef	1.129	1.718	0.110	0.700	62.0	Due to incorporation of seismic survey, additional borehole information and development into new ground on 192, 197 and 202 levels
Kusasalethu	0.959	0.972	0.173	0.187	19.5	Positively affected by good values in Geozone 9 that increased end of LOM value. Depletion was offset by adding a year to the LOM by developing extra raises into this geozone
West Rand – Total	**2.087**	**2.690**	**0.284**	**0.887**	**42.5**	

RESOURCE AND RESERVE RECONCILIATION

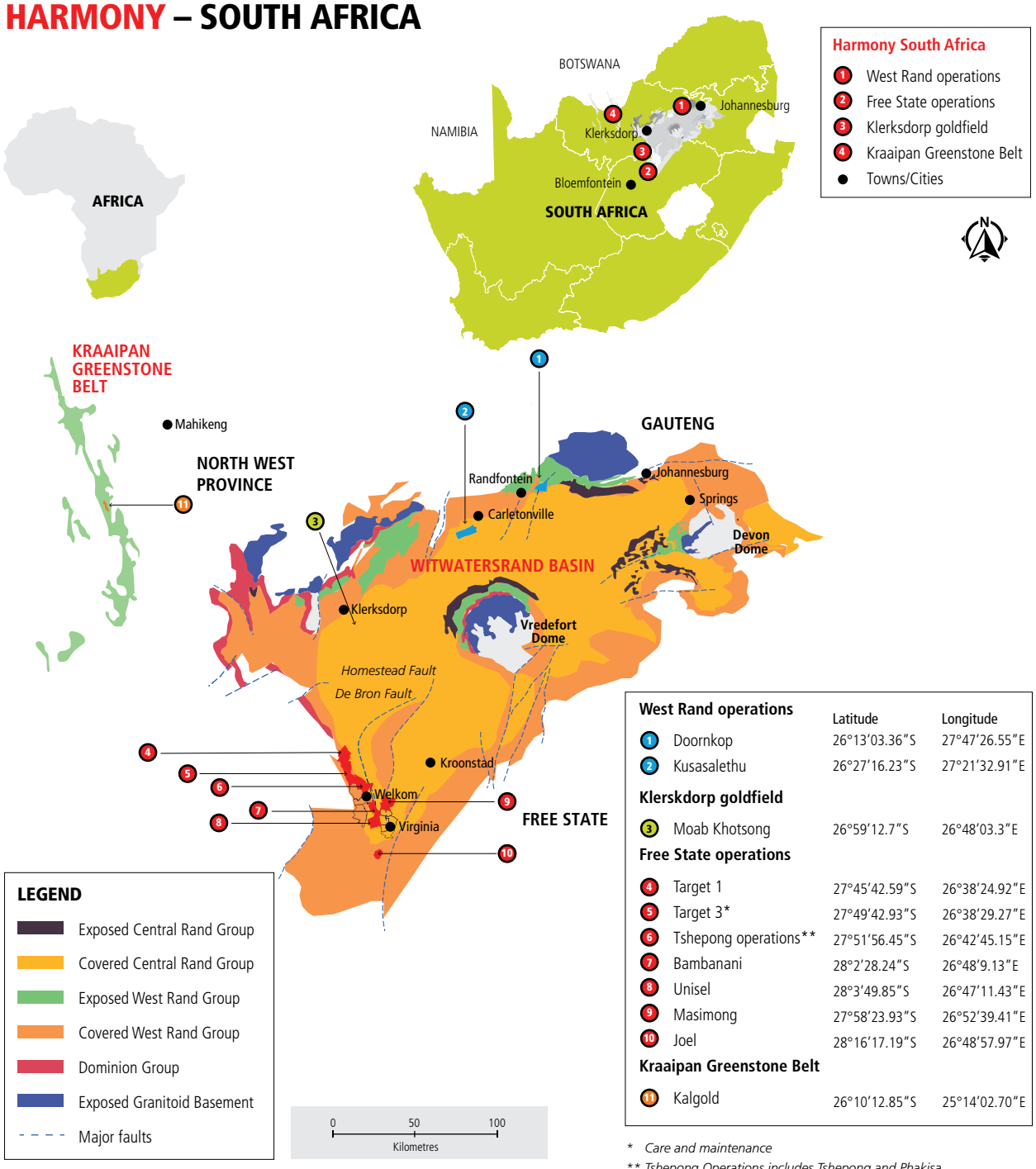
Gold	FY18 (Moz)	FY19 (Moz)	Depletion (Moz)	Net of depletion variance (Moz)	Net of depletion variance (%)	Comments
Klerksdorp goldfield						
Moab Khotsong	1.615	1.832	0.264	0.481	29.8	The shaft pillar was included adding 0.106Moz. Isolated blocks of ground in Top Mine were investigated and found to be feasible, adding 0.170Moz. Middle Mine gained 0.042Moz due to exploration and design optimisation
South Africa underground – Total	**10.139**	**10.636**	**1.161**	**1.657**	**16.3**	
SOUTH AFRICA SURFACE						
Kraaipan Greenstone Belt						
Kalgold	0.683	0.605	0.046	(0.033)	(4.8)	New model and planning parameters used for pit optimisation
Free State Surface						
Phoenix	0.575	0.490	0.061	(0.024)	(4.1)	Depletion
St Helena	0.933	0.933	0	0	0	
Central Plant	0.552	0.517	0.039	0.004	0.7	Depletion offset by increase in MRF
Waste rock dumps	0.064	0.064	0	0	0	
Tailings	3.971	4.032	0	0.061	1.5	Deposition
Total	**6.095**	**6.036**	**0.100**	**0.041**	**0.7**	
South Africa surface – Total	**6.779**	**6.641**	**0.146**	**0.008**	**0.1**	
SOUTH AFRICA – Total	**16.918**	**17.277**	**1.307**	**1.666**	**9.8**	
PAPUA NEW GUINEA						
Hidden Valley/Kaveroi	1.271	0.918	0.227	(0.125)	(9.9)	Depletion and new resource model with change to fixed cut off
Hamata	0.035	0.021	0	(0.014)	(40.6)	Depletion and movement to fixed cut off
Golpu	5.573	5.500	0	(0.073)	(1.3)	Metal price shifts
PAPUA NEW GUINEA – Total	**6.880**	**6.439**	**0.227**	**(0.213)**	**(3.1)**	
HARMONY – Total	**23.798**	**23.716**	**1.534**	**1.453**	**6.1**	
Gold equivalents						
Silver						
Hidden Valley	0.357	0.199	0	(0.157)	(44.1)	Depletion and new resource model with change to fixed cut off
Copper						
Golpu	12.686	12.538	0	(0.148)	(1.2)	
Equivalent gold ounces – total	**13.043**	**12.738**	**0**	**(0.305)**	**(2.3)**	
Papua New Guinea – total gold and equivalent gold ounces	**19.923**	**19.177**	**0**	**(0.745)**	**(3.7)**	
GOLD TOTAL (excluding equivalents)	**23.798**	**23.716**	**1.534**	**1.543**	**6.1**	
GOLD TOTAL (including equivalents)	**36.840**	**36.454**	**1.534**	**1.148**	**3.1**	

** Gold depletion only*

Doornkop

LOCATION AND GEOLOGY OF OPERATIONS, PROJECTS AND EXPLORATION

HARMONY – SOUTH AFRICA



Projection: UTM Zone 36, Southern Hemisphere (WGS 84)

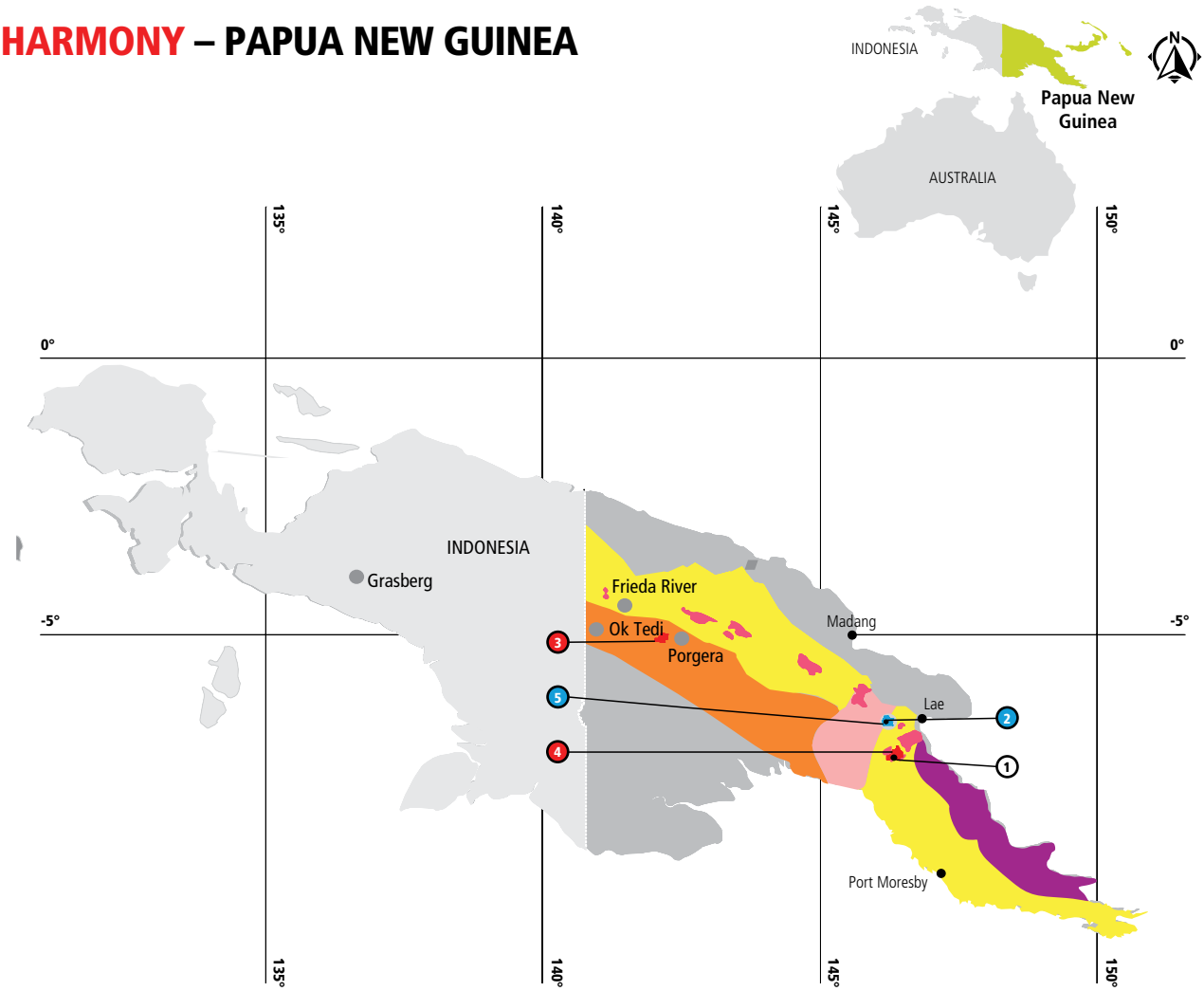
	Latitude	Longitude
West Rand operations		
1 Doornkop	26°13'03.36"S	27°47'26.55"E
2 Kusasalethu	26°27'16.23"S	27°21'32.91"E
Klerskdorp goldfield		
3 Moab Khotsong	26°59'12.7"S	26°48'03.3"E
Free State operations		
4 Target 1	27°45'42.59"S	26°38'24.92"E
5 Target 3*	27°49'42.93"S	26°38'29.27"E
6 Tshepong operations**	27°51'56.45"S	26°42'45.15"E
7 Bambanani	28°2'28.24"S	26°48'9.13"E
8 Unisel	28°3'49.85"S	26°47'11.43"E
9 Masimong	27°58'23.93"S	26°52'39.41"E
10 Joel	28°16'17.19"S	26°48'57.97"E
Kraaipan Greenstone Belt		
11 Kalgold	26°10'12.85"S	25°14'02.70"E

* *Care and maintenance*

** *Tshepong Operations includes Tshepong and Phakisa sections combined*

LOCATION AND GEOLOGY OF OPERATIONS, PROJECTS AND EXPLORATION CONTINUED

HARMONY – PAPUA NEW GUINEA



Projection: UTM Zone 54, Southern Hemisphere (WGS 84)

Legend

- New Guinea Mobile Belt / Papuan Fold Belt } Niugini Mobile Belt
- Papuan Ultramafic Belt
- Aure Trough
- Other mining operations
- Towns/Cities

Operations and projects

1. Hidden Valley
2. Wafi-Golpu project (Harmony 50%)

Exploration projects

3. Kili Teki
4. Hidden Valley district
5. Morobe Exploration Joint Venture (Harmony 50%)

Harmony equity interest 100% unless otherwise indicated

EXPLORATION AND PROJECTS

EXPLORATION HIGHLIGHTS AND MILESTONES

Kalgold brownfield exploration programme:

- Prefeasibility study underway to optimise Kalgold operation
- 27 368m drilled with excellent results
- An updated, audited, SAMREC-compliant mineral resource estimate was completed.
- As at 30 June 2019, Kalgold's open-pit mineral resource contained:
  - 89.8Mt @ 0.92g/t Au for 2.636Moz Au

Wafi-Golpu

PROJECT HIGHLIGHTS AND MILESTONES

Advancement of the Wafi-Golpu joint venture project:

- Supporting documents for the special mining lease (SML) application were submitted in March 2018 and the environmental impact statement in June 2018
- The Wafi-Golpu joint venture entered into a Memorandum of Understanding (MOU) with the State in December 2018, targeting an SML grant by June 2019
- Since the signing of the memorandum of understanding, a legal matter between the provincial and national government of project benefits has interrupted the permitting process and continues to do so. The joint venture remains ready to engage with the Government of Papua New Guinea and the regulators. However, at this stage the permitting timeline and roadmap are still to be redefined
- In parallel with permitting, the joint venture progressed detailed design and the tendering of select scopes of work associated with advancing the Nambonga Exploration Decline, and the Northern Access Road. The joint venture was well placed to award the contract early in 2019. However, permitting delays resulted in the joint venture holding off on contract awards until the project is fully permitted

EXPLORATION AND PROJECTS

EXPLORATION

PAPUA NEW GUINEA – EXPLORATION SUMMARY

Brownfield focus around Hidden Valley:

- Exploration programmes focused on near-mine brownfield targets on the contiguous tenement package surrounding the Hidden Valley mining lease which comprises 502km^2 of tenure
- Prefeasibility studies on the down-dip extensions of the Hidden Valley orebody to extend mine life continued
- Generative work for high-grade satellite gold deposits has developed new drill targets at the Webiak Prospect:
  - Located approximately 7km north of the Hidden Valley mine
  - Low sulphidation epithermal gold-silver vein mineralisation
  - Drill testing planned for the first quarter of FY20

Greenfield exploration and tenement rationalisation:

- Reduction in regional greenfield exploration programmes and tenement holding in favour of near-mine brownfield exploration continued
- Harmony (100%) tenement holding reduced to 711.8km^2 (FY18: 963.75km^2)
- Joint venture (Harmony 50%) tenement holding reduced to 182.3km^2 (FY18: 325.3km^2):
  - Harmony continues to manage exploration on the portfolio tenement package on behalf of the exploration portfolio joint venture participants (ultimate parent companies: Newcrest 50%; Harmony 50%)

PAPUA NEW GUINEA

Key geological features

Papua New Guinea is one of the world's most prospective yet under-explored terrains for porphyry copper-gold and epithermal gold mineralisation. The New Guinea mobile belt which spans the core of the Irian Jaya-Papua New Guinea mainland, is host to a number of world-class porphyry copper-gold and gold deposits including Golpu (Cu-Au), Ok Tedi (Cu-Au), Grasberg (Cu-Au), and Porgera (Au).

The central belt of rocks that makes up the highland spine of Papua New Guinea formed as a result of subduction related interaction between the Pacific plate (in the north), converging with the Australian plate (in the south). Deposits typical of subduction related arc settings include:

- Epithermal gold deposits which form at shallow depths, relatively close to the earth's surface, examples of which include Hidden Valley, Hamata, Kerimenge, Wau and Wafi
- Porphyry copper-gold systems which form at deeper levels in the crust are associated with the emplacement of intrusive stocks and dykes. These systems are among the largest sources of copper ore in the world, and can also contain significant amounts of gold, molybdenum and silver as by-products. Golpu is a high-grade porphyry copper-gold system

Key legal and regulatory features

Papua New Guinea has a sophisticated legislative, regulatory and fiscal regime.

Mining in Papua New Guinea is governed by the Mining Act of 1992. Minerals are owned by the State, which administers mining tenements through the offices of the Mineral Resources Authority. The types of tenements issued include: exploration licence; mining lease; special mining lease; alluvial mining lease; lease for mining purpose; and mining easement. Exploration licences are issued for a term not exceeding two years, and are renewable for further two-year terms subject to compliance with expenditure and other conditions. Each licence contains a condition conferring on the State the right, exercisable at any time prior to the start of mining, to make a single purchase of up to 30% equitable interest in any mineral discovery under the licence at a price pro rata to the accumulated exploration expenditure.

If (pursuant to a feasibility study approved by the board of directors) a decision is made to develop a mine on a resource, a permitting process must be followed, including:

- Applying to the Mineral Resources Authority for a mining lease (or, at the discretion of the Minister for Mines, a special mining lease). This includes our entering into a memorandum of agreement with local, provincial and national governments and landowners regarding the allocation to those parties of the royalties payable by the Company to the State, and, in the case of a special mining lease, a mining development contract with the State setting out the applicable project implementation, fiscal and other arrangements, including social performance obligations in respect of the proposed mining operation. Other relevant agreements include a Fiscal Stabilisation Agreement and a State Equity Acquisition Agreement
- Applying to the Conservation and Environmental Protection Authority for a Level 3 environmental permit. This includes undertaking an environmental impact study

The permitting process can be very time consuming (18-24 months, or longer in some cases).

Over the past two to three years, the state has undertaken a mining legislative and tax regime review, which is still underway. The subject of the review includes the Mining Act 1992, the Mining Safety Act 1997, the Income Tax Act 1959 and the Environment Act 2000, and applicable regulations. In addition, the review has addressed mineral policy generally, and mining-specific sector policies including offshore mining policy, sustainable development policy, involuntary relocation policy and mine closure policy. Mining companies must pay royalties to the state based on production (currently 2%), and the quantum of this royalty has also been under review.

The review has also considered the provisions of the state purchase option reservation, including possible changes to the percentage interest "cap", the consideration payable for the interest and the allocation of ownership of the acquired interest between the nominee of the state,

EXPLORATION AND PROJECTS

EXPLORATION CONTINUED

Wafi-Golpu

the relevant provincial government and affected landowners.

The Chamber of Mines and Petroleum of Papua New Guinea, as the representative mining industry body, has engaged with the State as part of the response to the government's proposed legislative amendments, certain of which industry considers to be adverse (eg increased royalty rate; reduced state option strike price, prohibition of fly-in, fly-out, among others). Since 2017, when the Chamber tabled its position, there has only been limited engagement with the State.

Pursuant to the tax regime review and notwithstanding industry objections, certain adverse changes to the fiscal regime were introduced with effect from 1 January 2017. The main changes were the introduction of an additional profit tax, the cessation of the double deduction allowance for exploration expenditure, and an increase in the rates of interest withholding and dividend withholding taxes.

In May 2019, Hon. James Marape was appointed as Prime Minister pursuant to a vote of no confidence in the previous Government. He has committed his Government to a review and restructuring of resource laws, which could presage the introduction of a new Mining Act and associated mining and related policies.

Harmony began actively exploring in Papua New Guinea in 2003. Since then, we have developed a high-quality project portfolio, both in established mineral provinces and in emerging gold and copper districts.

Harmony has advanced several gold and copper-gold prospects which are at various stages of exploration and evaluation across Harmony's lease areas. These include the Kili Teke prospect.

In line with the company's strategy and growth targets, capital allocated to exploration projects for organic growth in FY19 has been focused on near-mine, brownfield targets. Although greenfield exploration activities have been scaled back, as part of a balanced approach Harmony continued to maintain its greenfield tenement interests for exposure to major new gold and copper gold discoveries in highly prospective underexplored terranes and mining districts throughout Papua New Guinea.

Exploration FY19

Key work streams underpinning the FY19 exploration programme included:

- The Wafi-Golpu copper-gold deposit permitting process and progressing the special mining lease application
- Near-mine exploration and projects in support of extending mine life at Hidden Valley
- Maintenance of a greenfield exploration portfolio to enhance Harmony's world-class copper-gold footprint in Papua New Guinea
- In FY19, we spent R467.9 million (US$33 million) on exploration in Papua New Guinea which was largely driven by Golpu project related activities (FY18: R407.4 million; US$37 million). Expenditure of R278.5 million (US$20) planned for FY20

The case for exploration investment in Papua New Guinea remains strong if the current or proposed legislative environment remains supportive of exploration activities. Harmony closely monitors the environment for new opportunities to enhance our project portfolio, in line with core operating capabilities. The country is hugely prospective and under-explored. In addition, Harmony has an established track record of discovery and adding value through cost-effective exploration:

- Since 2003, resource growth from Harmony-held tenements, both those held in joint venture (Harmony's 50% equity share) and by Harmony alone (100%-held), amounts to 12.7Moz of gold and 5.1Mt of copper
- Discovery cost on a per ounce gold equivalent basis of less than US$10 is among the best in the world

Tenements held in joint venture

(Wafi-Golpu Joint Venture and Exploration Portfolio Joint Venture) (Harmony 50%)

Harmony is in a 50:50 joint venture with Newcrest Mining over a number of tenements in Morobe Province.

These tenements encompass the Wafi-Golpu project and span the Wafi Transfer zone and its strike extensions, and are prospective for epithermal gold and porphyry style copper-gold deposits. The exploration strategy

EXPLORATION AND PROJECTS

EXPLORATION CONTINUED

is to discover bulk tonnage (~1Moz) or high-margin gold or copper-gold deposits to provide new resource options that can leverage infrastructure or complement the Wafi-Golpu project.

In line with the focus on brownfields exploration, the regional joint venture tenure was reduced to several tenements contiguous with the Wafi-Golpu project. The aggregate tenement package in Morobe Province, held in the 50:50 joint venture between Newcrest and Harmony, now stands at 182.3km^2 (FY18: 325.3km^2).

During FY19, total Harmony expenditure (50%) on the joint venture tenements in Morobe Province was R3.3 million (US$0.23 million), compared to R1.8 million (US$0.2 million) in FY18. Generative work focused on establishing the geophysical footprint and developing near mine drill targets within the Wafi-Golpu project area is planned to continue in FY20.

Exclusively held tenements

(Morobe Consolidated Goldfields Limited and Harmony Gold (PNG) Exploration Limited) (Harmony 100%)

Rationalisation of regional greenfield tenure within Harmony's 100%-owned tenement portfolio in Papua New Guinea continued. The tenement portfolio comprised 711.8 km^2 as at 30 June 2019, compared with FY18: 963.8km^2 (a 26% decrease year-on-year).

A total of R32.4 million (US$2.3 million) was spent on 100% Harmony-owned projects in FY19 (FY18: R71.2 million/US$5.5 million).

Work programme expenditure focused on development of brownfield gold targets within a 10km radius of the Hamata processing plant at Hidden Valley. This includes study work on the depth extension of the Hidden Valley deposit.

The FY19 resource for Kili Teke remains at 782 000t of copper, and 1.8Moz of gold. The deposit is open at depth and along strike to the southeast. Drill spacing remains broad and potential to increase the resource base remains high. For further details on Kili Teke and its mineral resource, see *pages 136 to 138*.

Papua New Guinea – overview of joint venture exploration (Harmony 50%)

Objectives	Progress in FY19	Targets/plans for FY20
Exploration portfolio tenements (Wafi-Golpu district)		
Wafi transfer zone – grassroots exploration targeting discovery of additional resources to expand Wafi-Golpu into a mineral district.	Technical work planned to advance orebody knowledge and understanding of the geophysical footprint of Golpu includes: • Processing of the merged regional ZTEM dataset and integration with 3D deposit models (geology, surface and downhole geochemistry and geophysics) • Surface geophysics to refine drill targets at depth and elsewhere within the Wafi-Golpu system. Follow up mapping and surface sampling on ranked targets along the Wafi-Transfer structure	Follow up mapping and surface sampling on ranked targets along the Wafi-Transfer structure

Hidden Valley

EXPLORATION AND PROJECTS

EXPLORATION CONTINUED

Papua New Guinea – overview of brownfield exploration activity and greenfield tenement portfolio (Harmony 100%)

Objectives	Progress in FY19	Targets/plans for FY20
Kili Teke Project – EL2310		
Targeting copper-gold porphyry.	Engagement with local communities and stakeholders continued during FY19, although fieldwork was postponed with general unrest occurring in the in the Highlands during the period. The Wardens Hearing for the extension of term application was completed on June 5 2019.	Work scheduled for FY20 includes: • Community engagement and social mapping • Airborne geophysics and processing to identify "blind" targets masked by limestone cover and for improving drill targeting at depth
Hidden Valley District Project – EL497, EL677, EL2313, ML151		
Brownfields exploration within a 10km radius of the Hidden Valley plant to develop replacement resources and support mine-life extension.	Mining studies to investigate options to extend mine life on down dip extension of the Hidden Valley orebody continued. Exploration work focused on the Webiak Prospect located approximately 7.5km north of Hidden Valley. Over 2 330 surface samples were collected during the year. Grid-based surface soil sampling ongoing. Results outlined high level epithermal pathfinder anomalies which indicate potential for concealed epithermal precious metal zone(s) at depth. The geochemical footprint suggests the system has potential to extend over several kilometres below cover rocks of the Bulolo Volcanics.	• Complete mining studies to prefeasibility level including mine optimisation, geometallurgical model, geotechnical studies, and tailings deposition • Drill testing of the Webiak target areas is scheduled for first quarter FY20, with surface sampling and mapping over the broader prospect area ongoing • Target identification and development on the northern margin of the Wau epithermal domefield, including extension of surface sampling and mapping at the Kobiak prospect
Project generation		
Develop a project pipeline capable of delivering additional quality resources to sustain growth.	Data consolidation and follow-up work continued. Surface sampling at Moa/Udat creek comprised (302 samples) with detailed mapping over 4km^2. Results highlighted potential for small scale structurally hosted, high-grade gold lodes. However, size potential appeared limited and prospectivity was downgraded. Tenement monitoring for new opportunities continued.	• Prospect indentification and development in the Wau mining district • Follow-up of historic gold stream sediment anomalies at Mt Kuluron located on EL677 immediately south of Hidden Valley mine for follow-up work

EXPLORATION AND PROJECTS

EXPLORATION CONTINUED

SOUTH AFRICA

All our underground mines are located within the Witwatersrand Supergroup. Most are situated in the south-western corner of the Witwatersrand Basin or Free State goldfields, and comprise sedimentary rocks extend laterally for hundreds of kilometres into the West Rand goldfields and East Rand Basin. Our mining assets include an open-pit operation on the Kraaipan Greenstone Belt to the north-west of the Witwatersrand Basin. Additional information on the geology is provided by operation in this report.

Exploration FY19

In FY19, Harmony spent R58 million on exploration in South Africa. Expenditure of R96 million is planned for FY20.

Underground exploration

A total of 73 118 metres (FY18: 62 961 metres) was drilled across Harmony's underground operations in South Africa.

Using a method known as continuous coring, underground exploration drilling is conducted as per required intervals from existing underground excavations (haulages and cross cuts). This drilling provides information to determine the elevation and grade of the targeted reef horizon as well as geological features in the immediate surrounding lithology. It assists in structural geological interpretation and evaluation of specific areas as well as compilation of regional structural geological and evaluation models. Mine geologists and planners use drilling information to determine a mine's development strategy and eventually its economic viability.

Kalgold brownfield exploration programme

The Kalgold operation is 100% owned by Harmony and located approximately 276km west of Johannesburg, in North West Province, South Africa. Harmony holds 448 square kilometres of highly prospective tenure over the Kraaipan Greenstone Belt, which includes the Kalahari Goldridge mining right (Kalgold), its associated open-pit gold mines and several adjacent prospecting rights. The titles provide an ideal mix of near-mine and new mine opportunities that can leverage existing infrastructure and can be fast-tracked into production with aggressive exploration.

The brownfield infill drill campaign carried out in FY19 focused along the main line of lode and potential satellite targets. Intercepts returned over the course of the programme confirmed an expanded, robust mineralised system with over 2.1 kilometres of strike, extending to more than 300 metres below surface (a full list of drill intercepts is included with the SAMREC Table 1 report at *www.harmony.co.za*).

The expanded resource base underpins the Kalgold expansion prefeasibility study currently under way.

Kalgold

EXPLORATION AND PROJECTS

EXPLORATION CONTINUED

South Africa – summary of brownfields exploration

Objectives	Progress in FY19	Targets/plans for FY20
Kalgold Operation		
Advance prefeasibility studies in support of an expansion of the Kalgold open-pit mining operation: • Additional resource growth to underpin expansion studies and improve operational flexibility • New high-grade satellite resources • Extensions to known deposits	124 holes totalling 27 368 metres were drilled during the year. An updated mineral resource estimate for Kalgold was completed in January 2019, comprising 90.8Mt at 0.92g/t Au for 2.675Moz of gold [1]. Infill drilling resulted in an upgrade of a significant portion of the resource into an indicated category to support the pre-feasibility study.	The Kalgold prefeasibility study will be concluded and the best options for Kalgold expansion will be evaluated.
Kalgold prospecting rights		
Understand the potential to develop the Kraaipan Greenstone Belt into a new mineralised province with multiple mining centres.	The mineralisation style encountered at Kalgold is extremely conductive, and amenable to detection under cover via geophysical survey techniques. The airborne electromagnetic survey was carried out over the entire Kalgold prospecting rights area. Survey results are highly encouraging and indicate the presence of numerous anomalies.	Planned regional exploration includes follow-up geological investigations/ground truthing of identified geophysical targets, including mapping and surface geochemistry.
Tshepong Operations: Tshepong section, B Reef		
At the Tshepong section, exploration continues to maintain current levels of B Reef mining. Drilling is being conducted to identify areas of economic value in the projected extensions of the current B Reef channels being mined.	21 exploration holes were completed during the year. Drilling assisted in the testing of the current payshoot model and in delineating more detailed channels that were extrapolated from existing payshoots.	Exploration drilling was completed by the end of June 2018. Currently, B Reef exploration is being conducted only in the decline section by means of on-reef development.
Tshepong Operations: Phakisa section, B Reef		
Currently, there is no mining of the B Reef at the Phakisa section. Exploration drilling is being undertaken to identify areas of economic value in the down-dip extensions of those channels being mined in the neighbouring Tshepong section. Limited drilling is taking place on the south side of the Phakisa shaft pillar. Significant potential may exist to mine the B Reef in the Phakisa section.	Drill results, combined with historic regional information, have improved understanding of the B Reef's boundaries. This has allowed enhanced definition of the EV10 pay shoot which is currently being explored by drill holes. The potential of the existence of the pay shoot is being extrapolated from current mining across the Dagbreek fault as well as from two surface boreholes in the extrapolated pay shoot.	An additional four holes, from 69 to 73 levels, will be drilled. This will involve one machine drilling on the north side of the shaft. Development into this block (EV10) is planned to commence in FY20.
Doornkop South Reef		
Drilling of long-incline boreholes is being conducted to confirm the South Reef on levels 192 and 197 to build confidence in the geological model.	Drilling will begin in October 2019 once the drilling sites have been equipped.	The project will be completed and new target drill areas identified to further increase geological confidence and to grow the resource base.

[1] *Complete assay results and resource details are tabulated in the technical annexure available at www.harmony.co.za: SAMREC Table 1 Report – Kalgold operation, North West Province, Republic of South Africa*

EXPLORATION AND PROJECTS

EXPLORATION CONTINUED

South Africa – summary of brownfields exploration continued

Objectives	Progress in FY19	Targets/plans for FY20
Harmony-White Rivers Exploration joint venture		
The main aim of this exploration joint venture is to explore and develop potential gold resources at White Rivers Exploration (Pty) Ltd's Beisa Project and abutting exploration areas within Harmony's adjacent Target complex.	The prefeasibility study has been concluded and reviewed.	Underground exploration drilling in the southern portion of the project area is planned. The drilling programme aims to convert inferred resources in the initial mining area into indicated category to facilitate future mining studies.
Target North		
The aim of the current exploration programme is to confirm the geological model, which was created on the completion of the Target North study work. The model defined a potential block of well-mineralised Ventersdorp Contact Reef where it overlies the alluvial fans of the upper Elsburg and Dreyerskuil reefs. Two fans have been interpreted in the Target North area of the Dreyerskuil and Mariasdal fans. Further resource definition drilling will be planned, pending the results of the current exploration programme.	The surface exploration drilling programme began and borehole MAL21 was advanced to 1 542 metres and is continuing.	Three surface boreholes will be drilled in the postulated Mariasdal fan area in order to test the Ventersdorp Contact Reef as well as the sub-cropping Elsburg and Dreyerskuil reefs. Drilling is expected to take about two years. The geological model will be updated once the drilling programme has been completed.
Joel – high-grade Beatrix Reef extension (Klippan)		
Exploration is planned to upgrade the Resource to the indicated level and determine the economic mining limit in the north and north east areas originally classified as non-depositional zones. Opening up this area will greatly reduce the risks of the initial development-constrained mining areas in the 137 project area.		Exploration is scheduled to start in November 2019 and it due to end in April 2020. Three boreholes will also be drilled in this area.

Target North

EXPLORATION AND PROJECTS

EXPLORATION CONTINUED

South Africa – summary of brownfields exploration continued

Objectives	Progress in FY19	Targets/plans for FY20
Joel – 145 level exploration		
Exploration here is aimed at upgrading the current resource to the indicated level and to determine the economic mining limit to the north and northeast below current mining infrastructure to ensure the 145 level decline project remains economically viable.		Exploration drilling began in August 2019 and is due to be completed in June 2020. Three long inclined boreholes will be drilled in all. The first hole is currently at 220m and we expect to intersect reef at 300m. Two more holes will be drilled as soon as the first hole is completed.
Moab Khotsong – 101 level		
The drilling programme here focuses on possible target blocks caught up within the Jersey fault loss area based on seismic data interpretation and surface drilling. Drilling is planned to continue as development opens up new drill sites with a specific focus on these target blocks.	Two electro-hydraulic machines have been deployed and have drilled 5 903 metres, with eight intersections of the Vaal Reef within the structurally complex area.	Drilling is planned to continue into three target block areas, using the two electro-hydraulic machines together with an LM90 LIB machine towards the end of FY20.

Kalgold

EXPLORATION AND PROJECTS

PROJECTS – PAPUA NEW GUINEA

Wafi-Golpu key statistics:

- Resource contains 18.6Moz gold and 8.6Mt copper

- Estimated life of mine of more than 28 years

- Steady-state production estimated at 161 000t of copper, 266 000oz of gold (more than 1.4Moz of gold equivalents ounces annually)

- Above average grades:
  - Gold – 0.90g/t
  - Copper – 1.27%

- Costs of US$0.26/lb are in the lowest decile for copper production
  - expressed in terms of gold production, an all-in sustaining cost of minus US$2 128/oz is estimated

Permitting

Permitting of the Wafi-Golpu project has been delayed. The Wafi-Golpu joint venture entered into a Memorandum of Understanding (MOU) with the government of Papua New Guinea in December 2018, targeting a special mining lease grant by June 2019. Since the signing of the MOU in December 2018, a legal matter between the provincial and national government has interrupted the permitting process, and continues to do so. The Wafi-Golpu joint venture remains ready to engage with the Government of Papua New Guinea and the regulators. At this stage, the permitting timeline and roadmap are still to be redefined.

The Papua New Guinea government has commissioned a review of the mining regime. Any change to the Papua New Guinea mining regime may result in the imposition of additional restrictions, obligations, operational costs, taxes or royalty payments and could have a material adverse effect on Harmony's business, operating results and financial condition.

The Chamber of Mines and Petroleum of Papua New Guinea, as the representative industry body, has been collating information from industry participants and engaging with the Papua New Guinea government as part of the industry's response to the review proposals.

Wafi-Golpu joint-venture

(Harmony 50%)

The Wafi-Golpu project is owned by the Wafi-Golpu joint venture, a 50:50 unincorporated joint venture between subsidiaries of Harmony and Newcrest Mining Limited respectively.

The Wafi-Golpu joint venture participants hold exploration licences EL440 and EL1105, which are located approximately 65km southwest of Lae, in Morobe Province. The joint venture has applied for a special mining lease (SML 10) to undertake the construction, operation and ultimately, closure of a greenfield block cave copper-gold mine.

The proposed mine site is situated at an elevation of approximately 400m above sea level in moderately hilly terrain. It is near the Watut River, approximately 30km upstream from its confluence with the Markham River. Lae, the second largest city in Papua New Guinea, will host the project's import and concentrate export facilities.

The 2018 feasibility study remains the basis for the business case based on block caving the Golpu Resource.

The project is a viable development of a high-quality resource, capitalising on the high-grade nature of the copper-gold Golpu orebody, optimised capital expenditure profile and the ability to optimise the production rate and cash flow by preferentially (in time) targeting higher-grade sections of the ore reserve.

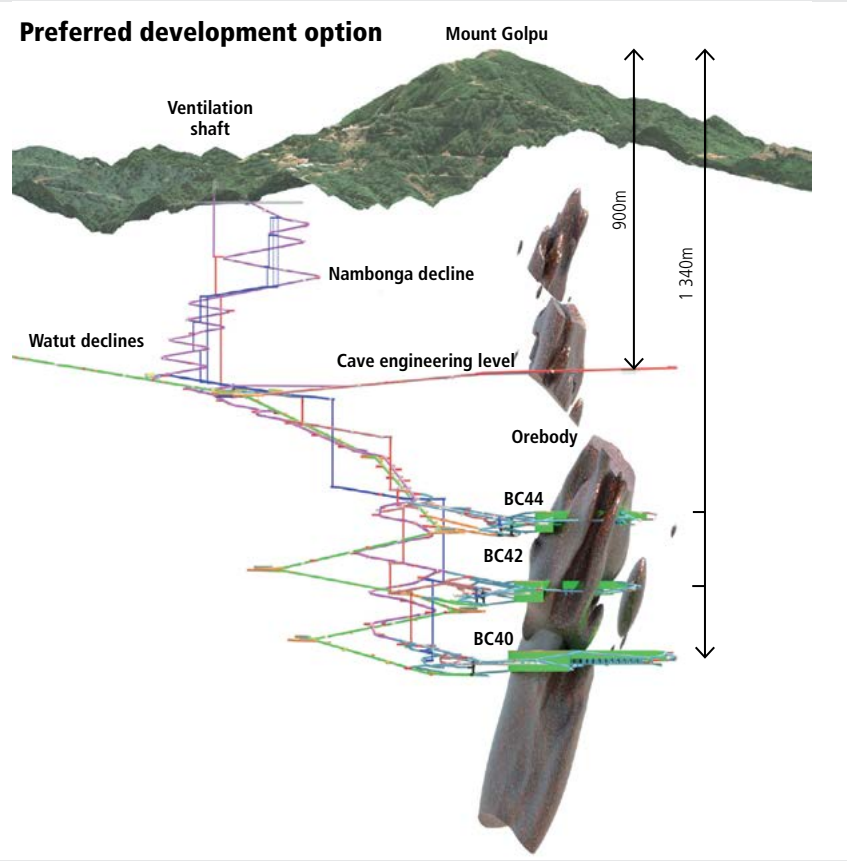
The primary project deliverable is the commissioning of a mining operation to produce at nameplate capacity of 16.84Mtpa a high-quality copper and gold concentrate with ore sourced from three block caves, namely BC44 and BC42 and BC40.

The special mining lease 10 (SML 10) application was submitted to the Papua New Guinea Mineral Resources Authority in August 2016 and was amended in March 2018, when an updated feasibility study was tabled, including deep sea tailings placement as the preferred tainings solution. The Environment Impact Statement was submitted in June 2018.

The joint venture participants entered into a MOU with the State in December 2018,

EXPLORATION AND PROJECTS

PROJECTS – PAPUA NEW GUINEA CONTINUED



The diagram alongside illustrates the preferred development option. Evaluation of this preferred development option in the feasibility study update is based on:

- Mining 155Mt (approximately 40%) of the current known ore reserve in two block cave levels being block cave 44 (BC44, 65Mt) at 4400mRL and block cave 42 (BC42, 90Mt) at 4200mRL, both at a feasibility level of confidence
- Mining and processing the remaining ore reserve (210Mt), currently at a prefeasibility level of confidence, in a third block cave level, block cave 40 (BC40) at 4000mRL
- Total ore mined of 376Mt over 28 years (26 years post commercial production), including 11Mt of development ore

Note that when development tonnages are allocated to the block caves levels, the volumes per cave are 68Mt (BC40), 93Mt (BC42) and 215Mt (BC44). The values (tonnages and durations) per block cave level refer to production from the drawpoints, not development.

targeting an SML grant by June 2019. However, delays in discussions with the State, and litigation between the State and the Morobe Province concerning the MOU prevented this target from being achieved. The permitting process may be further delayed due to ongoing mining and fiscal regime reviews. This includes delays associated with discussions between the national government and the Morobe Provincial government regarding the project, which is currently the subject of legal proceedings between them.

When these matters are resolved, Wafi-Golpu joint venture is well placed to resume discussion with the Papua New Guinea Government based on the constructive progress already made on the various agreements required for completion of the permitting process and the grant of a special mining lease. The Wafi-Golpu project will progress to execution once:

- SML 10, the environmental impact statement and all other necessary tenements and permits required in support of project development have been granted
- All required agreements with the State and landowners have been signed
- All necessary approvals have been received from the boards of directors of the ultimate holding companies of the partners in the joint venture, namely Harmony and Newcrest

Initial activities post granting of the SML will focus on development of site access roads and bridges, and the construction of the Nambonga and Watut declines.

For further details of the mineral resources and reserves at Wafi-Golpu and Nambonga, see *page 132*.

Wafi-Golpu

EXPLORATION AND PROJECTS

PROJECTS – SOUTH AFRICA

South Africa – summary of projects underway in FY19

Objectives	Progress in FY19	Targets/plans for FY20
Kalgold expansion project		
Kalgold currently treats approximately 130 000tpm. Following on from the current exploration drilling programme, the project is looking at optimising/increasing production.	A prefeasibility study started in June 2018 to investigate various plant throughput options. The second phase of the exploration drilling programme was completed in December and the resource estimate from this work is used in the study.	The prefeasibility study will be completed and future options will be evaluated once technical and economic criteria have been met.
Joel North		
In order to access the orebody from 137 level, two declines were developed at 12° from 129 level – a chairlift decline and a conveyor belt decline. Primary footwall development is currently taking place on 137 level to intersect the reef.	The permanent conveyor has been commissioned. Construction of the box fronts on 137 level is ongoing. Work on the 137 level east haulage was started. The 137 E5 cross cut is being developed and work has also begun on the raise.	The entire project, including all construction and equipping, to access the reef horizon and start stoping, will be completed.
Tailings retreatment expansion		
Retreatment of additional tailings in the Free State (Saints project).	No further work has been carried out on phase 2.	The project is on hold.
Central Plant tailings reclamation "plus"		
Expansion of the existing Central Plant reclamation project will increase tailings retreatment by up to 200 000tpm. Additional reclamation and deposition sites will be required and the Central Plant will need expanded treatment facilities.	The competent person's report and the feasibility study passed and met our technical and economic criteria. This project is now in the design phase.	Implementation awaits capital allocation.
Joel tailings reclamation		
Increase tailings reclamation capacity by using the Joel plant and tailings storage facility (TSF) which have become available following the transfer of the Joel run-of-mine ore to Harmony One plant for processing there.	A prefeasibility study is in progress to investigate the potential benefits of recovering gold from the reclamation of tailings at the Joel plant and depositing the retreated tailings onto the Joel TSF.	Complete the prefeasibility study
Target 3 shaft		
Target 3 shaft was placed on care and maintenance in FY15. This project investigates the possibility of re-opening the shaft to mine the higher-grade Basal Reef.	The 2017 feasibility study was updated during the year after the geological model was updated with additional information. Study outcomes remained essentially unchanged. Rehabilitation of the main shaft brattice wall continued throughout the year as did pumping of water.	As Target 3 shaft is a main pumping shaft, certain rehabilitation work will take place during pumping operations. Rehabilitation of the main shaft brattice wall will continue. This work is aimed at improving project economics by reducing project capital requirements and the time to produce first gold.
Moab Khotsong – Mispah tailings dam retreatment project		
The Mispah tailings reclamation project entails the reclamation of gold from the Mispah 1 TSF. The tailings are treated at the Noligwa plant and the residue deposited onto the Mispah 3 extension of the Mispah TSF complex.	The prefeasibility study indicated an 11-year project life with the production of 7 922kg of gold from the reclamation of 66.3Mt of tailings at a monthly rate of 510 000 tonnes from the Mispah 1 tailings storage facility.	The results of the risk-based study on installing a lining under the Mispah 3 TSF, will be presented to the Department of Water and Sanitation. The outcome of this engagement with the department will guide the timing and scope of the feasibility study, which is currently on hold.

EXPLORATION AND PROJECTS

PROJECTS – SOUTH AFRICA CONTINUED

South Africa – summary of projects underway in FY19 continued

Objectives	Progress in FY19	Targets/plans for FY20
Moab Khotsong – Great Noligwa shaft pillar extraction		
The Great Noligwa shaft pillar project was approved by the technical and investment committees for implementation in FY20. The chosen option is based on partial extraction of reef blocks with a central stabilising pillar to maintain the integrity of both shaft barrels.	The feasibility study was concluded in January 2019 and approved by the technical and investment committees. Execution began in July 2019. The project will extend Moab Khotsong's life of mine to 2028.	Project implementation will be in line with safety guidelines and with the project schedule's critical path for the reopening, rehabilitation, development and infrastructure upgrades. Capital expenditure will be as per the project's scope for cash flow and project management.
Moab Khotsong – Zaaiplaats project		
A prefeasibility study will assess various options for the Zaaiplaats project and establish the potential to extend Moab Khotsong's life of mine.	A business case was concluded that identified various access options for Zaaiplaats. The prefeasibility study has begun.	The prefeasibility study will be concluded and the potential to progress Zaaiplaats to further levels of study will be evaluated.

Target

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA

Tshepong

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – WEST RAND

CONTRIBUTION TO GOLD MINERAL RESOURCES (Including gold equivalents)

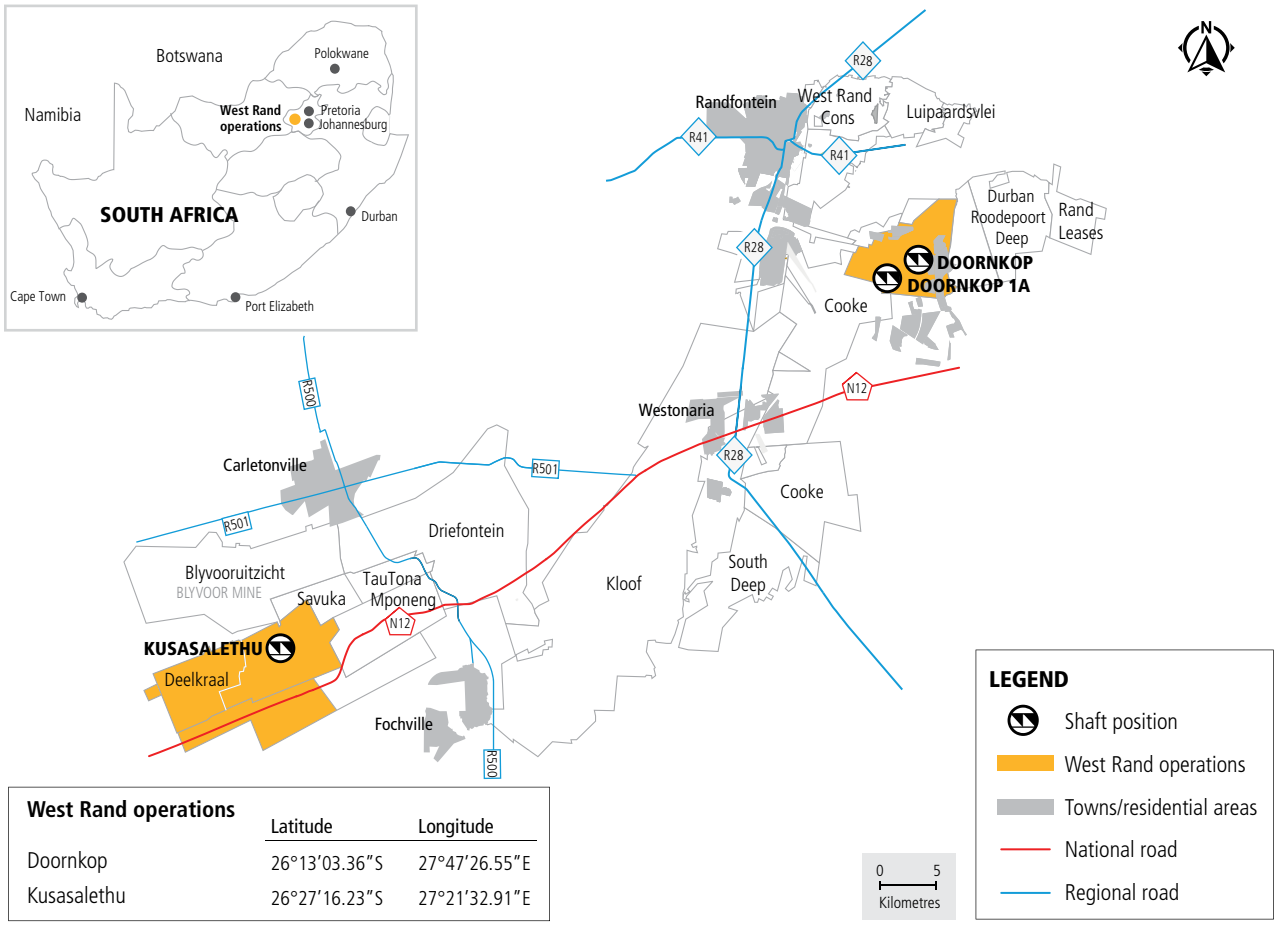
WEST RAND OPERATIONS **12%**

CONTRIBUTION TO GOLD MINERAL RESERVES (Including gold equivalents)

WEST RAND OPERATIONS **7%**

As at 30 June 2019, Harmony's West Rand operations, Doornkop and Kusasalethu, had combined mineral reserves of **2.7Moz** which are included in mineral resources of **14.1Moz**.

West Rand operations – locality



West Rand operations	Latitude	Longitude
Doornkop	26°13'03.36"S	27°47'26.55"E
Kusasalethu	26°27'16.23"S	27°21'32.91"E

Kusasalethu

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – WEST RAND

LOCATION

Harmony has two underground mining operations – Doornkop and Kusasalethu – on the north and northwestern rim of the Witwatersrand Basin.

The Doornkop shaft complex is located south of Krugersdorp, 30km west of Johannesburg, in the province of Gauteng. The property lies between Cooke 1 shaft, belonging to Sibanye–Stillwater, and Durban Roodepoort Deep Mines.

Kusasalethu is situated on the West Wits Line, adjacent to the Savuka and Mponeng mines (AngloGold Ashanti Limited) to the east and the dormant Deelkraal to the west. Kusasalethu is situated 14km south of Carletonville and 90km southwest of Johannesburg.

REGIONAL GEOLOGY

Refer to the geological descriptions under each operation.

WEST RAND STRATIGRAPHIC COLUMN

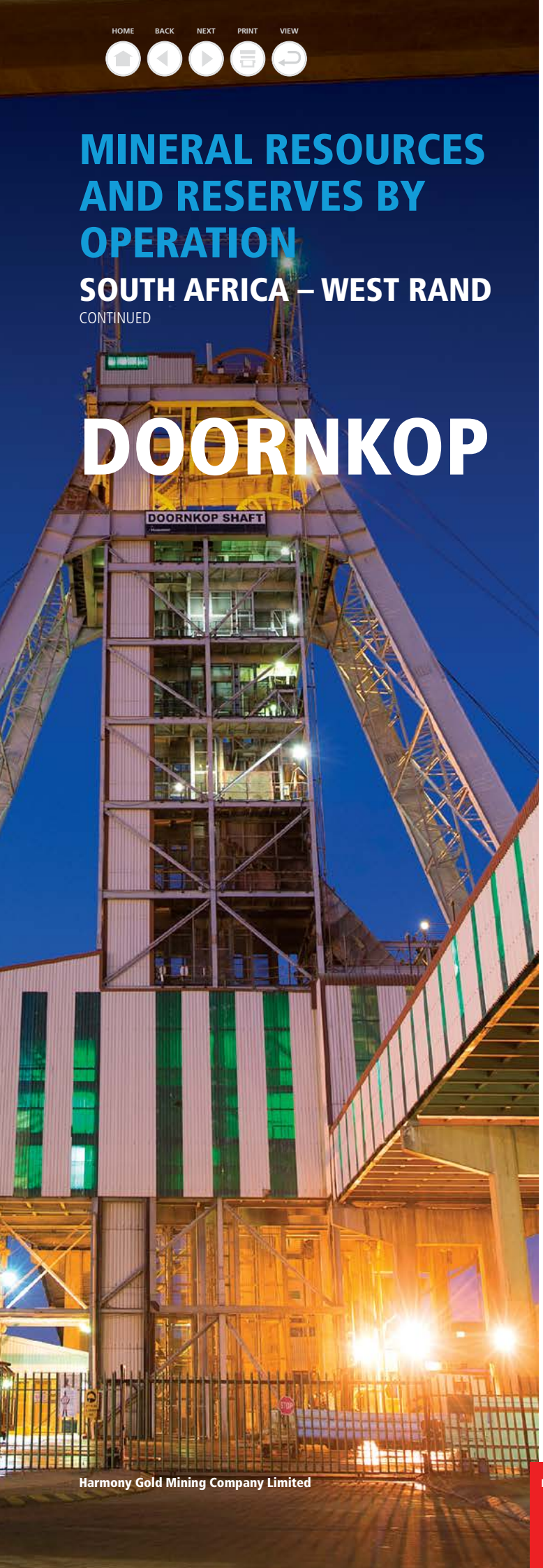
Group	Sub-group	Formation	Informal unit and reefs	Member
Klipriviersberg		Westonaria	Klipriviersberg/ Ventersdorp lava	
		Venterspost	Ventersdorp Contact Reef	
Central Rand Group	Turffontein	Mondeor	Elsburg massives and individuals	Modderfontein Waterpan
		Elsburg	Quartzites and conglomerates	Gemsbokfontein
				Planvlakte
				Gemspost
				Vlakfontein
		Kimberley	Shale	Kimberley Reefs
	Johannesburg	Booysens shale	Upper transitional Shale Lower transitional	Kimberley shale
		Krugersdorp	Bird amygdaliod Bird reefs White reef	Bird
			Luipaardsvlei quartzite	Luipaardsvlei
		Livingstone conglomerate	Livingstone Reef	Livingstone Reef
		Randfontein quartzite		
		Johnstone conglomerate	Johnstone Reef	Johnstone Reef
		Langlaagte quartzite		
		Main conglomerate	Leader Reef South Reef Main Reef	Langlaagte
West Rand Group	Jeppestown	Roodepoort		

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – WEST RAND

CONTINUED

DOORNKOP



History

Exploration in the area started in the early 1930s with sinking of the main and ventilation shafts, by JCI, from 1983. By 1989, steady production had been achieved from mining the Kimberley Reef, which is shallower than the South Reef that is currently being mined. The South Reef shaft extension was approved in October 1991 and the reef was intersected in October 1993. Stoping of the South Reef began in 1995. Shaft deepening continued with stoppages between November 1996 and May 1999. Harmony acquired Doornkop in January 2000. The South Reef project was relaunched in January 2003, resulting in the deepening of the mine to 1 980m below collar.

Nature of the operation

Doornkop is a single-shaft operation currently exploiting the South Reef to some 2 000m below surface. The narrow South Reef is exploited by means of conventional stoping. The ore mined at Doornkop is processed at the mine's carbon-in-pulp plant, which is directly beside the shaft. Mining of the Kimberley Reef was suspended during FY14 to focus on the build-up production from the South Reef and to prevent losses as a result of the lower gold price. Mining of the Kimberley Reef may resume should economic circumstances improve sufficiently.

Mineral rights/legal aspects and tenure

The current mining right encompasses an area of 2 941.021 hectares and was successfully converted, executed and registered as a new order mining right at the Mineral and Petroleum Resources Titles Office (MPRTO) on 25 February 2009 under MPT 18/2009. The Department of Mineral Resources reference GP30/5/1/2/2/09MR is valid from 7 October 2008 to 6 October 2038.

Geology

The Doornkop shaft lease area lies to the south-east of the major north-easterly striking Roodepoort fault, which dips to the south and constitutes the southern edge of the Witpoortjie horst block or gap. This horst block comprises the stratigraphically older sediments of the West Rand Group, with the overlying Central Rand Group sediments having been removed by erosion. Doornkop is bounded by the Roodepoort fault and a number of other faults, including the Saxon fault, which constitute conspicuous structural breaks. Another major fault, the Doornkop fault, which trends in an east-west direction, occurs toward the southern portion of the lease area. This fault dips to the south and has an up-throw to the north.

As nearly the entire upper Witwatersrand section lies within the lease area, all major zones are present. However, given the distance of the area from the primary source of gold, the number of economic bands and their payability is limited. Eight of the well-known reefs are present in the area but only the South Reef and potentially the Kimberley Reef are considered viable at this stage.

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – WEST RAND (DOORNKOP) CONTINUED

The South Reef is between 7.5m and 60m above the Main Reef horizon. The hanging wall of the South Reef consists of siliceous quartzites with non-persistent bands of 'blue shot' grit and thin argillite partings. The South Reef footwall is a light coloured and fairly siliceous quartzite. Secondary conglomerate bands and stringers in the hanging wall and footwall of the South Reef may contain sporadic gold values. The general strike of the reef is east-west with a flat dip from 5 to 15 degrees.

Exploration drilling is set to continue in the coming financial year, and will target potential high-grade areas and those with limited geological information, to further increase geological confidence.

Mining methods and mine planning

The mining method used is longwall mining with stability pillars on major geological structures. The flat dip, which results in the development of long cross cuts, presents challenges in terms of ore handling, especially for the bottom part of the raises, ventilation and in the long lead times between the start of cross cut development to completion of stoping per raise line.

Mineral processing

The carbon-in-pulp plant has a monthly milling capacity of 225 000 tonnes. Before Sibanye-Stillwater's Cooke shafts were placed on care and maintenance, this included toll treatment of approximately 120 000 tonnes a month of ore from these shafts.

Infrastructure

Doornkop's surface and underground infrastructure, including its power and water supplies, can cope with current planned peak production level requirements. The 192, 197 and 202 levels are track-bound while current development on 207 and 212 levels is trackless. Plans are in place to eventually make these levels track bound. Work continues on certain essential underground infrastructure on the South Reef, including the permanent tipping arrangements required to bring 207 and 212 levels to full production. Ore is hoisted through the main shaft. Currently, the mine uses Sibanye-Stillwater's Cooke 1 shaft, which is 7km away, as a second escapeway.

Mineral resource estimation

The estimation method used for local measured data on the shaft is ordinary kriging. For local indicated and inferred data, it is simple macro kriging. Estimates are generally kriged into 30mx30m blocks for the measured resources from the point support data. Indicated resources are kriged into 60mx60m blocks, using the associated regularised variograms together with a macro kriging decluster. Similarly, inferred resources are estimated using the associated regularised variograms and kriging into 120mx120m blocks. Any unkriged areas in the inferred regions are then covered by global mean estimates. Geozones are based on grade distribution and structure to ensure correct grade estimates for the different areas.

Environmental impact

In line with the Mineral and Petroleum Resources Development Act, Doornkop has an approved environmental management plan (dated 2009), which is currently being revised and updated. The new plan will be made available to all interested and affected parties, as part of the public participation process, for public to comment in order to raise concerns prior to its being finalised and submitted to the Department of Mineral Resources for approval. The environmental management plan is being revised in order to provide for the recent development of the Doornkop shaft second escape and to ensure compliance with the template required by environmental impact assessment regulations.

All environmental impacts emanating from mining and processing activities are documented in the environmental management plan report and in the environmental aspect register, as required by the Mineral and Petroleum Resources Development Act and the ISO 14001 standard.

Annual performance monitoring and audits are conducted by the relevant government departments to verify status compliance with the following legislation:

- Mine Health and Safety Act, 29 of 1996
- National Water Act, 36 of 1998
- National Environmental Management Act, 107 of 1998
- Biodiversity Act, 10 of 2004

Doornkop

Doornkop

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – WEST RAND (DOORNKOP) CONTINUED

- Air Quality Act, 39 of 2004
- Waste Management Act, 59 of 2000
- Mineral and Petroleum Resources Development Act, 28 of 2002
- National Heritage Resources Act, 25 of 1992
- Noise Control Regulations

According to regulation 55(3) of the Mineral and Petroleum Resources Development Act, audits must be conducted to verify compliance with the approved environmental management plan. The audit report is then submitted to the Department of Mineral Resources for further evaluation. Internal environmental legal compliance audits are also conducted by an independent environmental practitioner.

An online Doornkop environmental legal register, available at *www.drayer-legal.co.za*, is used to monitor compliance and to obtain relevant legal environmental updates for the operation.

Biomonitoring surveys are conducted on surface water streams (Klip River upstream and downstream) close to the operation. In particular, these surveys aim to:

- determine the ecological status of the Klip River by monitoring indices such as South African System Version 5 (SASS5), Integrated Hazard Awareness System (IHAS) and Association of Healthcare Internal Auditors (AHIA), and to determine the chemical water quality in the river during the wet and dry seasons
- provide baseline reference conditions for future studies in order to assist Doornkop management in identifying environmental liabilities, particularly potential contamination of waterways, that might result from current mining activities
- determine the general habitat integrity and conditions for macro-invertebrates and aquatic macro-invertebrates

Doornkop has been ISO 14001-certified since 2010 and conforms with the related requirements. Doornkop has also been certified by the International Cyanide Management Institute and is audited annually to verify conformance with ISO 14001 and the Cyanide Management Code. In line with its certification, every effort is made to either eliminate or minimise the effects of mining activities on the environment and neighbouring communities.

MATERIAL RISKS

Material risks that may impact Doornkop's mineral resource and reserve statements

SIGNIFICANT RISKS	REMEDIAL ACTION
• Unexpected geological features	• Have undertaken extensive exploration drilling from underground platforms and long-incline borehole drilling. A seismic survey was also conducted recently

COMPETENT PERSON

Ore Reserve manager

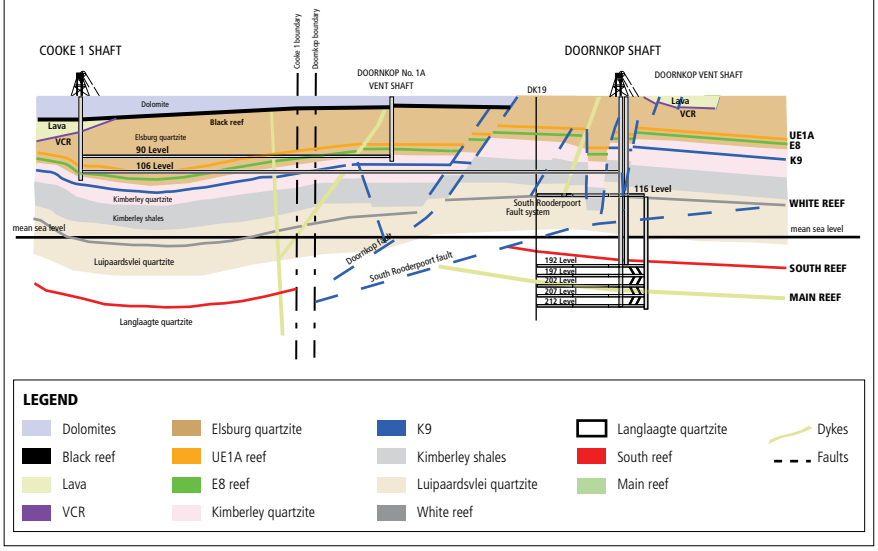
Hilton Chirambadare

BSc (Geology, Mathematics), BSc Hons (Geology), GDE, MENG, SACNASP

17 years' experience in gold mining, 14 years on Witwatersrand gold deposits (underground) and three years on the Kraaipan Greenstone Belt (surface).

DOORNKOP

Geological section looking west – not to scale



Doornkop

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – WEST RAND (DOORNKOP) CONTINUED

DOORNKOP

Gold – Mineral resource estimates at 30 June 2019

	Measured resources				Indicated resources				Inferred resources				Total mineral resources			
	Tonnes		Gold		Tonnes		Gold		Tonnes		Gold		Tonnes		Gold	
	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)
South Reef	4.5	8.00	36	1 150	4.7	7.67	36	1 148	4.2	7.89	33	1 074	13.4	7.85	105	3 373
Main Reef	0.1	5.38	0.4	14	0.05	5.51	0.3	8	0.02	5.32	0.1	3	0.1	5.41	1	25
Kimberley Reef	18.1	3.36	61	1 957	12.1	3.15	38	1 226	10.1	3.28	33	1 066	40.3	3.28	132	4 249
Total	**22.7**	**4.28**	**97**	**3 121**	**16.8**	**4.41**	**74**	**2 382**	**14.4**	**4.64**	**67**	**2 143**	**53.9**	**4.42**	**238**	**7 647**

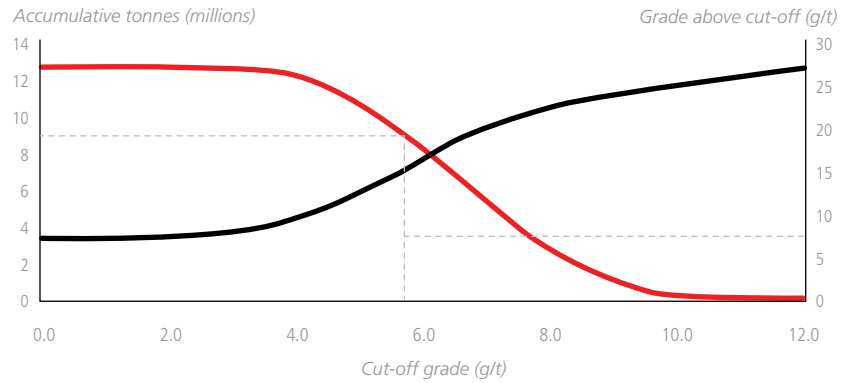
Modifying factors

South Reef	MCF (%)	SW (cm)	MW (cm)	PRF (%)	Cut-off (cmg/t)
2018	81	125	144	96	735
2019	81	123	146	96	735

Gold – Mineral reserve estimates at 30 June 2019

	Proved reserves				Probable reserves				Total mineral reserves			
	Tonnes		Gold		Tonnes		Gold		Tonnes		Gold	
	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)
South Reef	5.3	4.92	26	845	5.6	4.86	27	872	10.9	4.89	53	1 718

DOORNKOP:
South Reef
Measured and indicated resource grade-tonnage curve



Doornkop

MINERAL RESOURCES AND RESERVES BY OPERATION

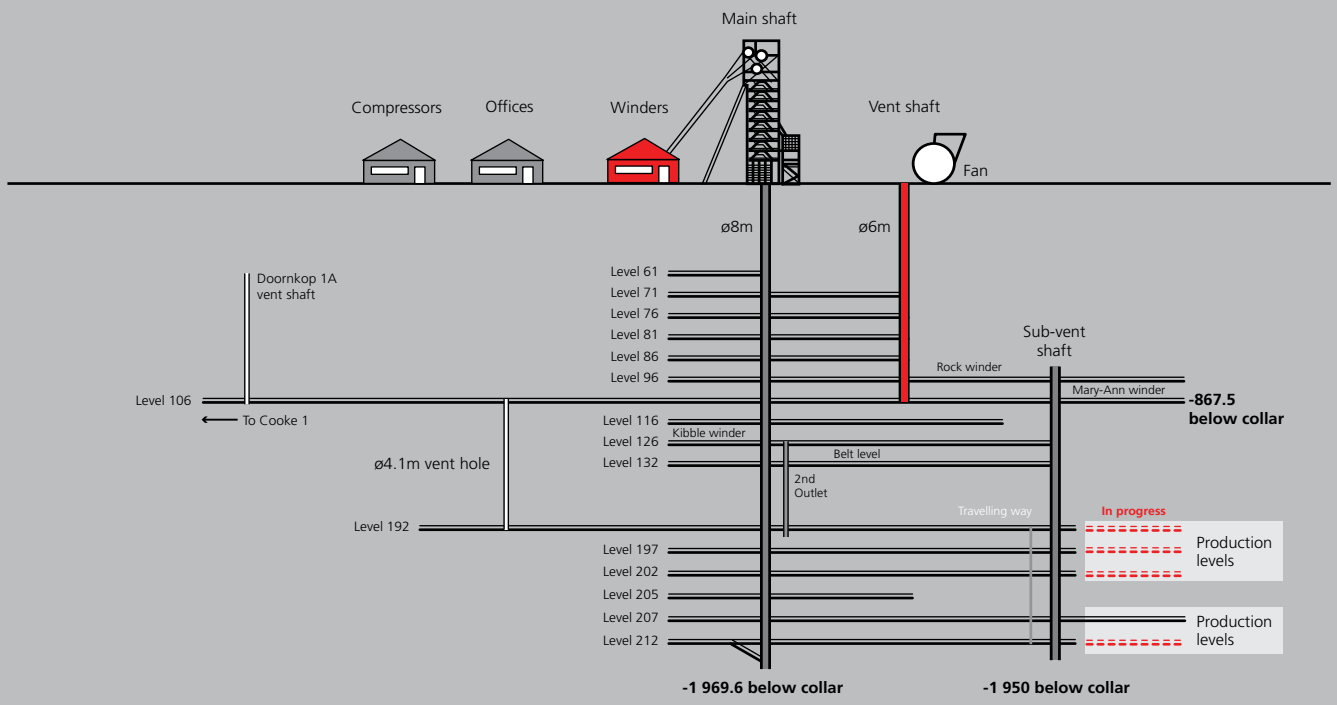
SOUTH AFRICA – WEST RAND (DOORNKOP) CONTINUED

OPERATIONAL PERFORMANCE

Doornkop – key operating statistics

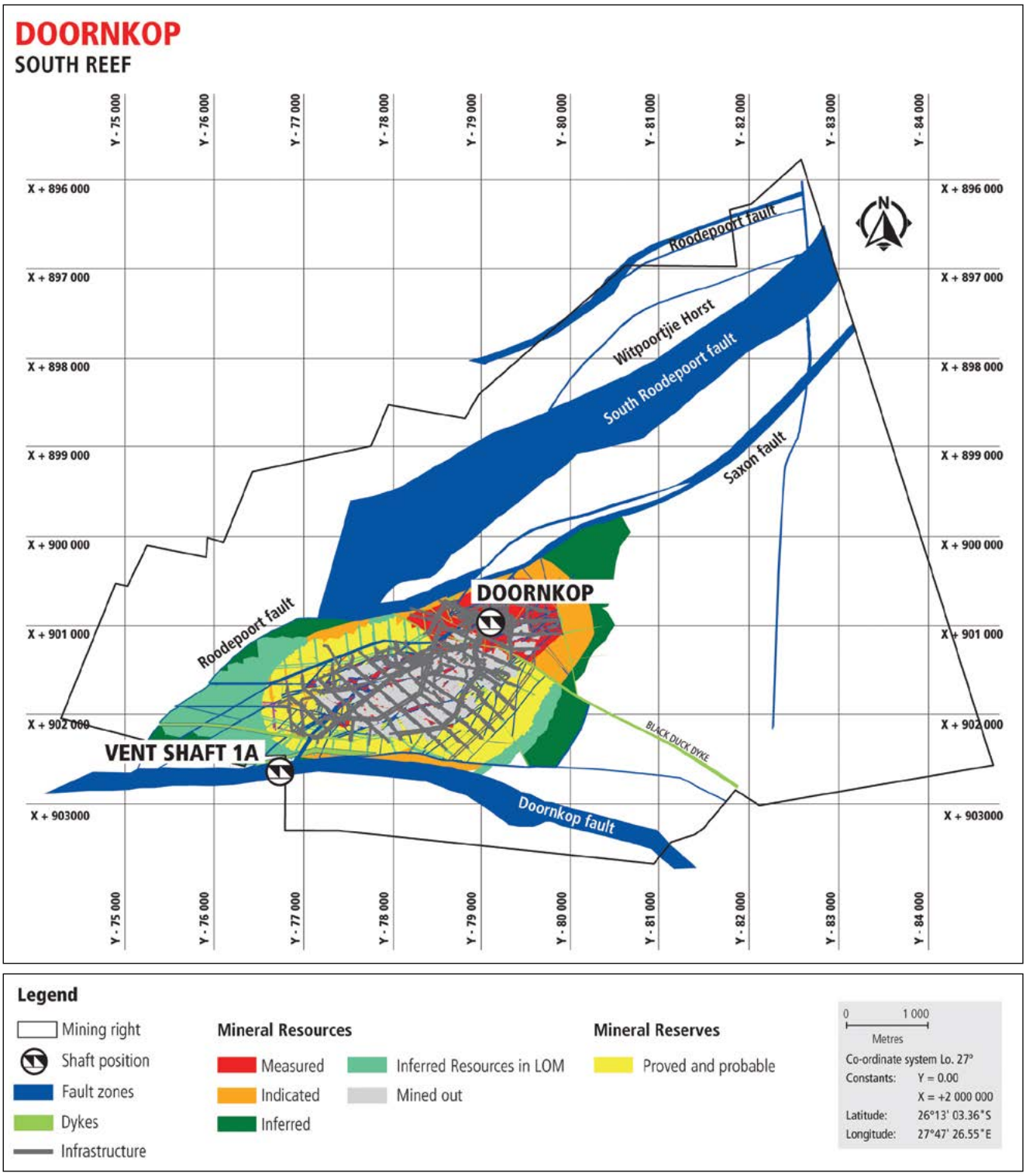
	Unit	FY19	FY18	FY17	FY16	FY15
OPERATION						
Volumes milled	000t (metric)	**730**	696	641	630	603
	000t (imperial)	**805**	767	706	695	665
Gold produced	kg	**3 273**	3 429	2 673	2 730	2 663
	oz	**105 229**	110 245	85 939	87 772	85 618
Grade	g/t	**4.48**	4.93	4.17	4.33	4.42
	oz/t	**0.131**	0.144	0.122	0.126	0.129
DEVELOPMENT						
Total metres (excl. capital metres)		**8 337**	9 595	9 961	7 766	8 919
Reef metres		**1 621**	1 478	1 337	1 688	1 701
Capital metres		**497**	806	1 316	0	0
FINANCIAL						
Average gold price received	R/kg	**593 301**	575 077	572 494	545 770	449 857
	US$/oz	**1 302**	1 392	1 310	1 171	1 222
Capital expenditure	Rm	**308**	274	243	208	245
	US$m	**22**	21	18	14	21
Cash operating cost	R/kg	**486 795**	413 586	457 752	387 585	402 065
	US$/oz	**1 068**	1 001	1 047	831	1 092
All-in sustaining cost	R/kg	**572 132**	508 065	562 907	473 562	501 151
	US$/oz	**1 255**	1 230	1 288	1 016	1 362

Doornkop: Schematic of shaft and mining layout



MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – WEST RAND (DOORNKOP) CONTINUED



MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – WEST RAND

CONTINUED

KUSASALETHU

History

Harmony acquired the Elandsrand and Deelkraal mines from the then AngloGold Limited in 2001. Shaft sinking of twin vertical shafts at Elandsrand had begun in January 1975 and been completed in December 1978. First gold was produced in 1979. In February 2010, Elandsrand changed its name to Kusasalethu, which means "our future" in Zulu.

Nature of the operation

The 10m-diameter rock/ventilation shaft was initially sunk to 2 195m and the man/material shaft to 2 127m. By June 1984, a 10m-diameter sub-vertical rock/service shaft had been completed to a depth of 3 048m and a 7m-diameter sub-vertical ventilation shaft to a depth of 3 048m. Both shafts were deepened to a final depth below surface of 3 318m and 3 388m respectively as part of the deepening project to extract the higher-grade pay shoot towards the west of the mine. In December 2014, a decision was taken to suspend operations in the old portion of Kusasalethu and to restructure the mine. Subsequently, mining above 98 level ceased.

Kusasalethu employs sequential-grid mining, which is in essence an upside-down Christmas tree configuration. This method is used to direct seismic stresses away from current working areas into virgin rock areas.

Given the decrease in the mineral reserve at Kusasalethu in recent years, a result of normal depletion, a revised, shortened life-of-mine plan was implemented in FY15. This plan aims to optimise the mine's cash flow at a higher grade and create a stronger operating margin while providing the flexibility necessary to access the high-grade payshoot of the Ventersdorp Contact Reef below infrastructure should economic circumstances allow.

Mineral rights/legal aspects and tenure

The current mining right encompasses a total area of 7 000ha. Kusasalethu's mining right has been successfully converted, executed and registered as a new order mining right at the Mineral and Petroleum Resources Titles Office (MPRTO). GP30/5/1/2/2/07MR is valid from 18 December 2007 to 17 December 2037. In terms of Section 102 of the Mineral and Petroleum Resources Development Act (MPRDA), the farms Buffelsdoorn and Deelkraal have been successfully included into Kusasalethu's mining right, increasing the extent of the original mining right from 51km² to 70km². These farms are contiguous to the south of the principal mining right.

Geology

Kusasalethu is situated in the West Wits Basin and mines the VCR as its main orebody.

The Ventersdorp Contact Reef facies model at Kusasalethu is based on the paleotopographic or slope and terrace model. Nine facies types have been recognised at Kusasalethu – eight sedimentological and one structural. Four of the facies are thick, high-grade, geologically distinct reef terraces separated from one another by a thin low-grade slope reef.

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – WEST RAND (KUSASALETHU) CONTINUED

The sand-filled channel is a thick low-grade facies. The Sandy Terrace Complex is found on the same elevation as the Terrace Complex but is essentially a pebbly quartzite with no grade. The Mondeor conglomerates have been identified sub-cropping against the Ventersdorp Contact Reef in stopes in certain areas and have been delineated as separate facies in these areas.

The Elsburgs conglomerates, found on the western side of Kusasalethu, form the footwall to the Ventersdorp Contact Reef and are part of the Turffontein Supergroup. It is a predominantly polymictic matrix-supported conglomerate of well-packed and moderately sorted, sub-rounded smoky (80%), black-grey (15%) quartz pebbles, chert (3%) and some elongated shale pebbles (2%). The matrix is pale yellow to light green and medium-grained and pyritic in places.

The Ventersdorp Contact Reef is overlain by the Ventersdorp Lava belonging to the Ventersdorp Supergroup. The reef is light to mid-grey in colour and fine crystalline, seldom containing phenocrysts. In places it is amygdaloidal with quartz and pyrite mineralisation. Flow structures are also present at the base of the lava. It breaks into very angular fragments due to weak jointing and flow banding – it would appear to be andesitic in composition.

Geological discontinuities observed at Kusasalethu include faults, dykes and sills. Sills may occur in the footwall in areas adjacent to certain dykes. Flat bedding plane faulting also occurs and results in reef duplication, elimination and brecciation. Faults and dykes are classified according to their relative geologic ages as follows: Pre-Ventersdorp Contact Reef, Ventersdorp, Platberg, Bushveld and Pilanesberg structures.

Kusasalethu mines in blocky ground created by structures in the form of dykes and faults. The dykes are fairly basic in composition and they tend to strike north-north-east and south-south-west with a general dip of 75 degrees. The faults, however, have a strike mostly of east-south-east and west-north-west with a few exceptions. Generally, these are normal faults with the accompanying loss of ground with varying throws – from mere centimetres to a massive 60m (the Kittims and De Twem faults).

Mining methods and mine planning

Mining is by means of sequential grids with regional dip stabilising pillars, backfill and pre-conditioning to offset the effects of mining at this depth. Mining is conducted over five levels from 98 level to 113 level. Large geological structures are stabilised by means of clamping pillars. Mine planning is done in two major phases, a life of mine plan is done annually and six-month mine plans are reviewed monthly to ensure ample time to react to changes in the dynamic mining environment. All planning is done in the digital environment by means of computer-assisted draughting.

Mineral processing

Ore mined is processed on site at the Kusasalethu gold plant. Gold is extracted by means of milling, cyanide leaching, carbon-in-pulp concentration and electrowinning to absorb the carbon to produce doré. No smelting is done on site and the gold doré is dispatched to Rand Refinery.

Infrastructure

Ore mined is transported by rail-bound equipment to the shaft's main ore pass system where it gravity feeds to 115 level. Ore is then hoisted via the sub-vertical shaft to above 73 level and then to surface. Given the depth of mining, major engineering infrastructure required includes refrigeration and cooling installations on surface and underground.

Mineral resource estimation

Data for valuation is obtained by means of chip sampling on the reef horizon in a 6m x 6m grid. Supplemental information is obtained from underground exploration drilling and existing surface exploration boreholes. All sampling done is subject to quality assurance/quality control, as prescribed by SAMREC, to ensure data quality and accuracy. Based on similarities in geology, the mining lease is divided into a total of eight geozones. Based on confidence levels for geostatistical data, valuation is by means of a computer-generated block model as follows:

- Measured blocks (30m x 30m grid)
- Indicated blocks (60m x 60m grid)
- Inferred blocks (120m x 120m grid)

Kusasalethu

Kusasalethu

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – WEST RAND (KUSASALETHU) CONTINUED

The block model is then digitally transferred to the digital environment for valuation.

Environmental impact

Kusasalethu's environmental aspects and impacts are managed according to the environmental management programme, as approved by the Department of Mineral Resources (DMR), in terms of the MPRDA. All environmental aspects and impacts emanating from mining activities are documented in a dedicated report and in the environmental aspect register, as required by the MPRDA and the ISO 14001:2015 standard.

The approved environmental management programme was amended in 2014, in terms of section 102 of the MPRDA. This amendment allowed for the inclusion of the dimensions of the waste rock dumps, as well as the new height details and footprint of the tailings storage facility, reclamation of the rock dumps and the expansion of the existing underground workings for numerous portions of farm Deelkraal 142 IQ. The DMR approved the amendments in 2018.

Annual performance monitoring audits are conducted by various departments, including the DMR and the Department of Water and Sanitation to verify compliance with the following legislation:

- Mine Health and Safety Act
- National Water Act
- National Environmental Management Act
- MPRDA

All environmental impacts arising from mining activities are managed in terms of the requirements of the approved environmental management programme, the water use licence, the waste permit and in line with the ISO 14001:2015 standards.

As required by relevant regulations, environmental audits or performance assessments to verify compliance with the approved environmental management programme are conducted every second year by independent environmental consultants and a report is submitted to the DMR. External and internal environmental legal compliance audits are also conducted. An off-site legal environmental register is used to monitor compliance, and to obtain applicable and relevant environmental legal updates for the operation.

In line with Harmony's biodiversity and rehabilitation position statement, Kusasalethu management has successfully implemented an alien invader plant eradication programme since 2016. To date, this programme, which continues to run, has cleared invasive plant species from more than 3 500ha of 5 113ha of the surface mining right area.

Bio-monitoring surveys are also conducted on surface water resources, close to the operation, to safeguard the scarce resource and to ensure compliance with the conditions of the water use licence issued in terms of National Water Act to:

- determine the condition of biological communities in the rivers and streams and to determine the chemical water quality in streams during the wet and dry seasons
- provide baseline reference conditions for future studies in order to assist Kusasalethu management in identifying environmental liabilities that might result from current mining activities regarding the potential contamination of surface streams

Full chemical analyses include:

- monthly sampling of surface streams
- quarterly analysis of borehole water to monitor groundwater quality

Kusasalethu is ISO 14001:2015-certified and complies with the requirements of the ISO 14001:2015 standard for which it is audited annually by an independent certification body. The operation was initially certified in 2011, and most recently in 2018, under the new ISO 14001 standard (2015). In line with this accreditation, every effort is made to eliminate or minimise the negative effects of mining activities on the environment and adjacent communities.

The operation has also been accredited in terms of the Cyanide Management Code by the International Cyanide Management Institute. Independent third-party audits are conducted every three years to check compliance with the Cyanide Code.

MATERIAL RISKS

Material risks that may impact Kusasalethu's mineral resource and reserve statement

SIGNIFICANT RISKS	REMEDIAL ACTION
• Seismicity	• Extended production breaks scheduled over past three years to allow for infrastructure upgrades
• Water build-up at Deelkraal	• Control of mining sequence and appropriate support systems
• Backfill volumes	• Dewatering of the Deelkraal area through 98 level
• Major engineering infrastructure failure	• Waste rock dump on surface used to supplement backfill volumes

COMPETENT PERSON

Ore Reserve manager

Johann Ackermann

BSc Geology with distinction (UFS, 2005), SAIMM

25 years' hard rock, deep-level and ultra-deep level gold mining experience in the Witwatersrand Supergroup.

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – WEST RAND (KUSASALETHU) CONTINUED

KUSASALETHU

Gold – Mineral resource estimates at 30 June 2019

	Measured resources				Indicated resources				Inferred resources				Total mineral resources			
	Tonnes		Gold		Tonnes		Gold		Tonnes		Gold		Tonnes		Gold	
	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)
Ventersdorp Contact Reef	2.8	11.40	32	1 037	15.6	8.73	136	4 379	3.8	8.70	33	1 051	22.2	9.07	201	6 467

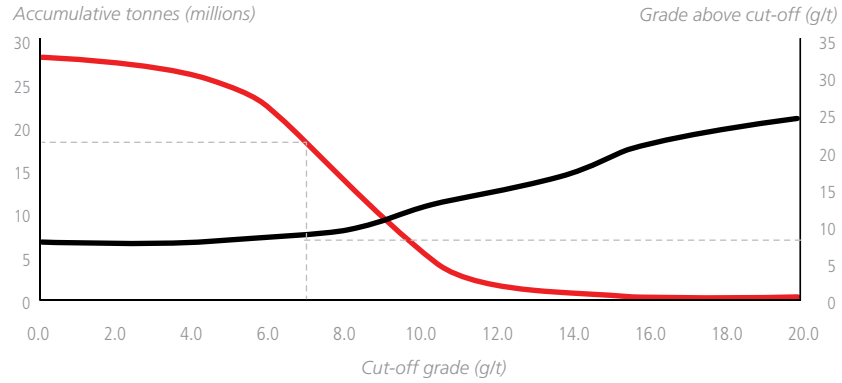
Modifying factors

Ventersdorp Contact Reef	MCF (%)	SW (cm)	MW (cm)	PRF (%)	Cut-off (cmg/t)
2018	86	136	154	92	1 100
2019	86	136	158	93	1 100

Gold – Mineral reserve estimates at 30 June 2019

	Proved reserves				Probable reserves				Total mineral reserves			
	Tonnes		Gold		Tonnes		Gold		Tonnes		Gold	
	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)
Ventersdorp Contact Reef	3.6	6.79	24	779	0.9	6.67	6	194	4.5	6.76	30	972

KUSASALETHU:
Ventersdorp Contact Reef
Measured and indicated resource grade-tonnage curve



Kusasalethu

MINERAL RESOURCES AND RESERVES BY OPERATION

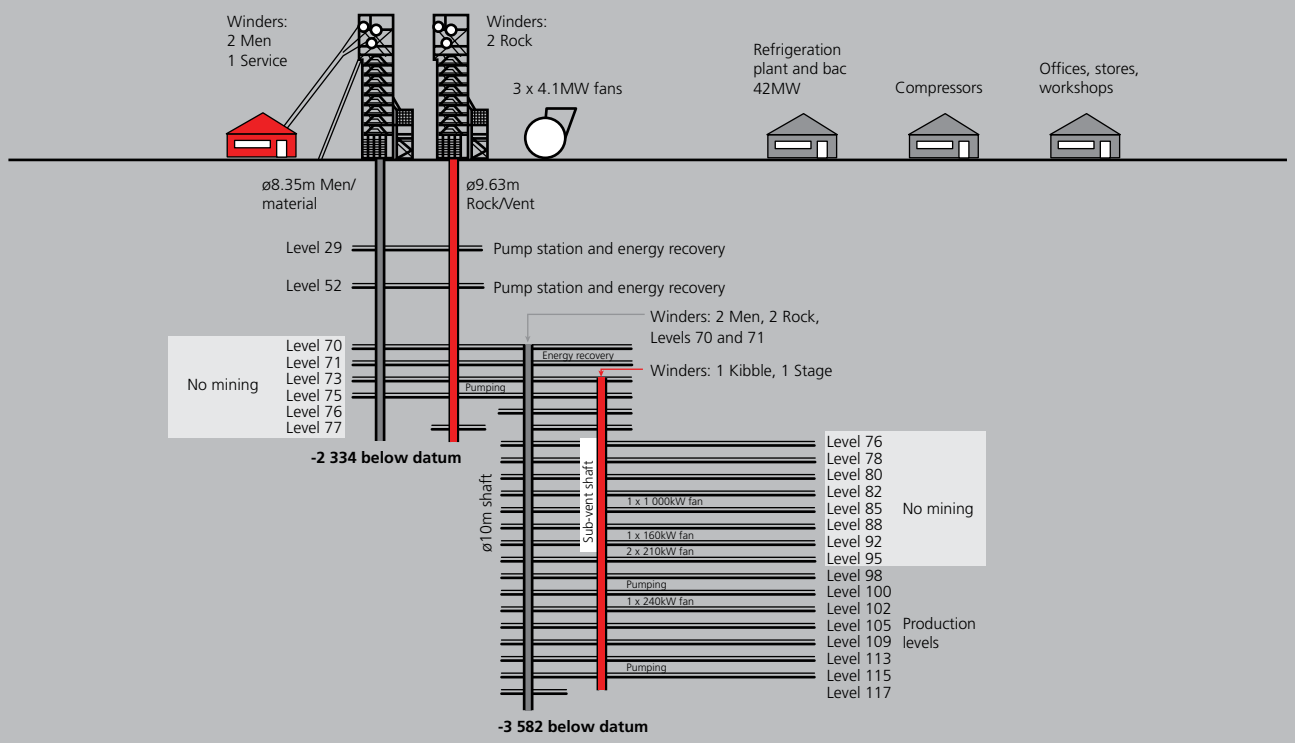
SOUTH AFRICA – WEST RAND (KUSASALETHU) CONTINUED

OPERATIONAL PERFORMANCE

Kusasalethu: Key operating statistics

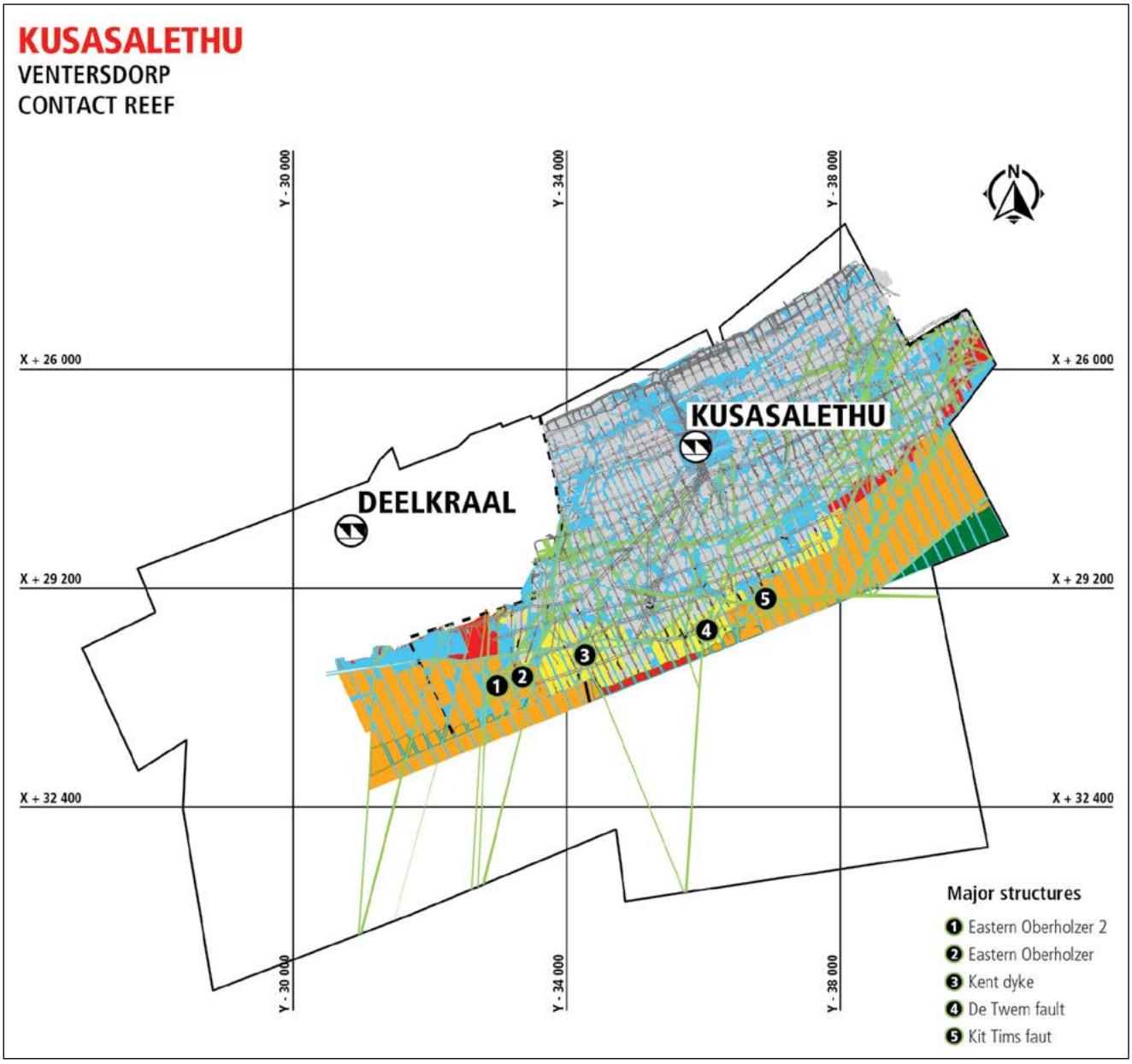
	Unit	FY19	FY18	FY17	FY16	FY15
OPERATION						
Volumes milled	000t (metric)	**742**	670	607	668	908
	000t (imperial)	**817**	738	670	736	1 001
Gold produced	kg	**4 989**	4 429	4 394	3 863	3 953
	oz	**160 400**	142 395	141 270	124 198	127 092
Grade	g/t	**6.72**	6.61	7.24	5.78	4.35
	oz/t	**0.196**	0.193	0.211	0.169	0.127
DEVELOPMENT						
Total metres (excl. capital metres)		**5 436**	4 016	5 101	7 183	13 777
Reef metres		**1 232**	776	1 185	1 517	2 436
Capital metres		**0**	0	0	0	59
FINANCIAL						
Average gold price received	R/kg	**591 742**	577 313	572 376	543 633	451 211
	US$/oz	**1 298**	1 397	1 309	1 166	1 226
Capital expenditure	Rm	**316**	289	289	360	463
	US$m	**22**	22	21	25	40
Cash operating cost	R/kg	**476 417**	472 177	459 422	478 277	472 112
	US$/oz	**1 045**	1 143	1 051	1 026	1 283
All-in sustaining cost	R/kg	**556 621**	554 302	541 247	584 498	587 406
	US$/oz	**1 221**	1 342	1 238	1 254	1 596

Kusasalethu: Schematic of shaft and mining layout



MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – WEST RAND (KUSASALETHU) CONTINUED



MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – KLERKSDORP GOLDFIELD

CONTRIBUTION TO GOLD MINERAL RESOURCES (Including gold equivalents)

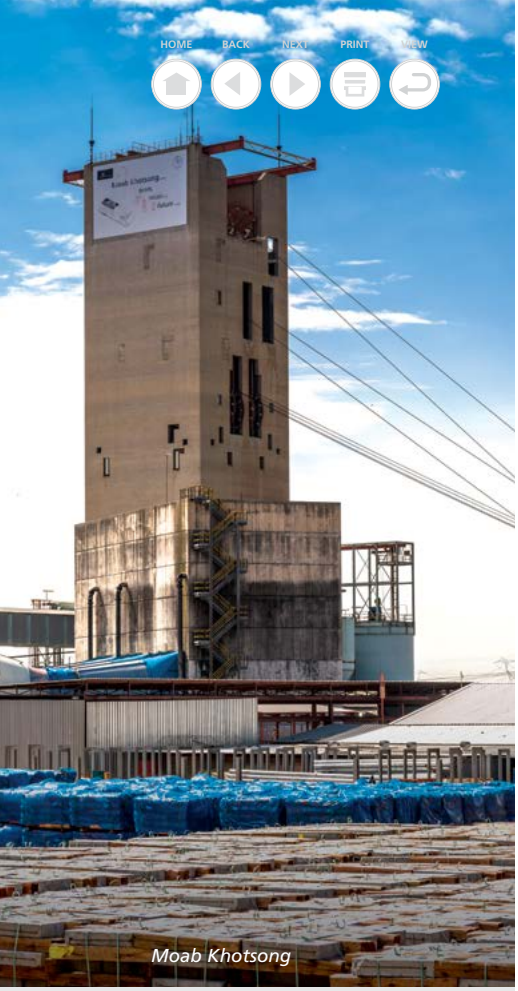
KLERKSDORP GOLDFIELD UNDERGROUND OPERATIONS **10%**

CONTRIBUTION TO GOLD MINERAL RESERVES (Including gold equivalents)

KLERKSDORP GOLDFIELD UNDERGROUND OPERATIONS **5%**

As at 30 June 2019, Harmony's operation in the Klerksdorp goldfield had mineral reserves of **1.8Moz** which are included in mineral resources of **12.1Moz**.

Klerksdorp goldfield – locality



Moab Khotsong

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – KLERKSDORP GOLDFIELD

LOCATION

Moab Khotsong, which includes the mining and surface infrastructure of the adjacent Great Noligwa, is located near the towns of Orkney and Klerksdorp, about 180km south-west of Johannesburg. The mining lease area lies just south of the Vaal River, which forms a natural boundary between South Africa's North West and Free State provinces.

REGIONAL GEOLOGY

Refer to the geological descriptions under Moab Khotsong.

KLERKSDORP GOLDFIELD STRATIGRAPHIC COLUMN

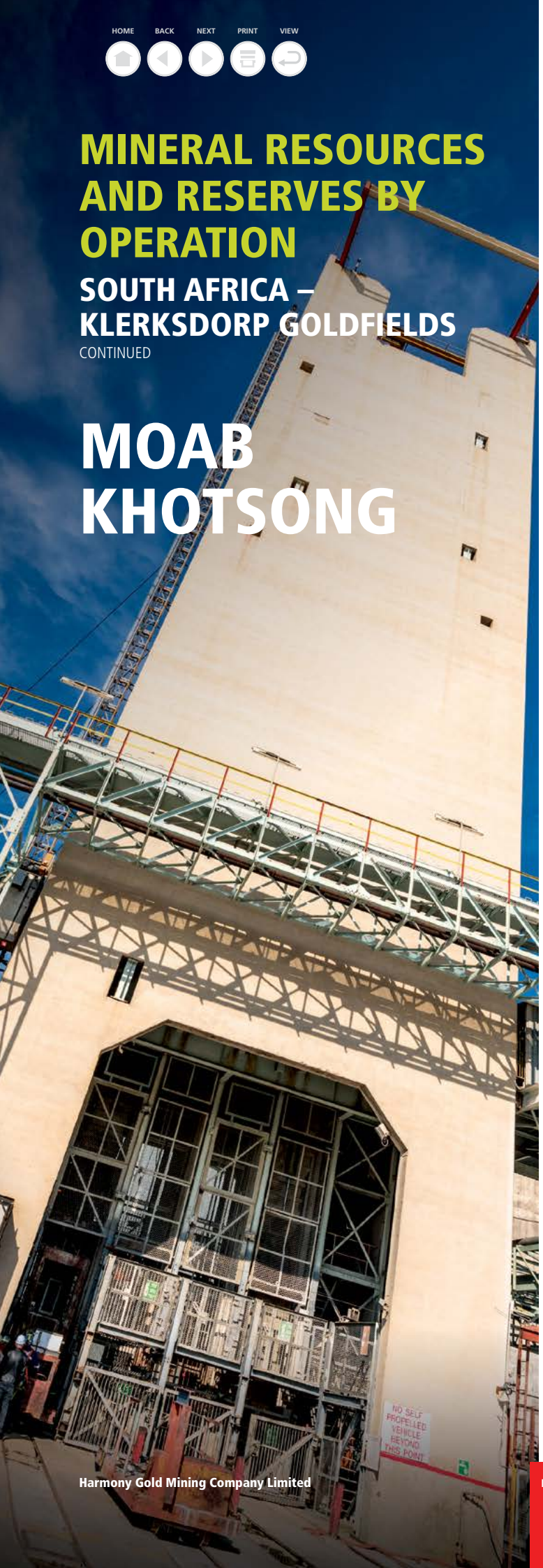
Group	Sub-group	Formation		Informal unit and fees	Member
Klipriviersberg		Alberton/Orkney		Lava beds	
		Venterspost		Ventersdorp Contact Reef	Ventersdorp Contact Reef
Central Rand Group	Turffontein	Mondeor		Elsburg massives and individuals	Modderfontein Waterpan
		Klerksdorp		Quartzites and conglomerates	Gold Estates Quartzite
					Dennys Reef
		Gold Estate			Kimberley Reefs
	Johannesburg	Crystalkop		C-Reef	C-Reef
		Strathmore		Zandpan marker Vaal Reef	Bird
		Stilfontein		Quartzite	Quartzites with minor interbedded conglomerates
				Millar Reef	Millar Reef
				Quartzites	
				Livingstone Reef	Livingstone Reef
		Commonage			Quartzite
				Commonage Reef Adda May Reef	
West Rand Group	Jeppestown	Roodepoort			

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – KLERKSDORP GOLDFIELDS

CONTINUED

MOAB KHOTSONG



History

The Moab Khotsong mine began production in 2003 while Great Noligwa, which was merged with Moab Khotsong in 2014, began production in 1968. These mines are collectively referred to as Moab Khotsong. Harmony acquired Moab Khotsong from AngloGold Ashanti Limited in March 2018.

Nature of the operation

Moab Khotsong is the youngest of the South African deep-level gold mines with three vertical shaft systems maintained to service the mine. The orebody is divided into three distinguishable blocks through major faulting. These geographical areas are referred to as top mine (Great Noligwa), middle mine and lower mine (Zaaiplaats growth project).

Mineral rights/legal aspects and tenure

Harmony holds the following mining rights, which have been successfully converted, executed and registered as new order mining rights at the Mineral and Petroleum Resources Titles Office (MPRTO).

- NW30/5/1/2/2/15MR valid from 12 September 2007 to 11 September 2037
- NW30/5/1/1/2/16MR valid from 20 August 2008 to 19 August 2038

Geology

The Vaal Reef is the primary economic horizon at Moab Khotsong. A secondary economic horizon, the C-Reef, contributes less than 5% of total mining volumes. Both reefs are narrow tabular deposits forming part of the Witwatersrand Supergroup and are stratigraphically located near the middle of the Central Rand Group. The Vaal Reef lies approximately 255m below the C-Reef.

The geology at Moab Khotsong is structurally complex with large fault-loss areas between the three mining areas (top mine, middle mine and Zaaiplaats). The geological setting is one of crustal extension, dominated by major south-dipping fault systems with north-dipping Zuiping faults wedged between the south-dipping faults. The De Hoek and Buffels East faults structurally bound the reef blocks of the middle mine to the north-west and south-east respectively. The northern boundary of Moab Khotsong's middle mine is the north-dipping Zuiping fault. Moab Khotsong (particularly middle mine) requires a reduced drill spacing pattern of the order of 50mx50m, which allows for accurate delineation of the structurally bound mineable blocks so that accurate and efficient mine designs can be implemented to ensure optimal extraction and maximum orebody utilisation.

The mineralisation model that has been adopted for the deposit is that of gold precipitation in the conglomerates through the actions of hydrothermal fluids. The fluids precipitated gold and other elements through reactions

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – KLERKSDORP GOLDFIELD (MOAB KHOTSONG) CONTINUED

that took place at elevated temperatures (300-350°C). Migrating liquid and gaseous hydrocarbons precipitated as solid hydrocarbon (carbon), which was then mesophased through metamorphism and structural deformation. Carbon was preferentially precipitated in bedding-parallel fractures that most commonly followed the base of the Vaal Reef package (A-bottom sub-facies), however, gold and uranium mineralisation is also commonly observed within the A-middle and A-top sub-facies of the Vaal Reef. Gold was precipitated very soon after the carbon, giving the critical gold-carbon association that characterises many of the high-grade Vaal Reef localities.

A geological model is employed to delineate variations (either lateral or vertical) in characteristics of the VR and C-Reef. The current geological model thus subdivides the Vaal Reef and the C-Reef into homogeneous zones based on geological and grade characteristics.

The Vaal Reef consists of a thin basal conglomerate (the C-facies) and a thicker sequence of upper conglomerates (A-facies). These two sedimentary facies are separated by the B-facies, which is a layer of barren orthoquartzite. The A-facies is the primary economic horizon at Moab Khotsong, however remnants of the C-facies are sporadically preserved below the A-facies. High gold values in the Vaal Reef are often located at the base of this unit and are associated with high uranium values and with the presence of carbon. Uranium is an important by-product recovered from the Vaal Reef.

The C-Reef is mined on a limited scale in the central part of top mine where a high-grade, north-south trending sedimentary channel, containing two economic horizons, has been exposed. To the east and the west of this channel, the C-Reef is poorly developed with limited areas containing economic concentrations of gold and uranium. As with the Vaal Reef, high uranium values are also often associated with high gold values. A carbon seam, with a thickness of 5mm to 20mm, commonly occurs at the base of the conglomerate. To the north of the mine, the C-Reef sub-crops against the Gold Estates Conglomerate Formation and, in the extreme south of the mine, the C-Reef has been eliminated by a deep Kimberley erosion channel and the Jersey fault.

Mining methods and mine planning

The tabular nature of the orebody, along with its depth and structural complexity, dictates the mining method employed at Moab Khotsong. Mining here is based on a scattered mining method together with an integrated backfill support system that incorporates bracket pillars. The economic reef horizons are exploited between 1 791m and 3 052m below surface.

Mineral processing

Moab Khotsong's mineral processing is done through the Great Noligwa gold plant with design capacity exceeding the maximum planned production volume from the operation. The plant uses the reverse gold leach method which recovers gold and uranium through gold cyanide and acid uranium leaching.

Infrastructure

Moab Khotsong and Great Noligwa's surface and underground infrastructure, as well as the power and water services, are designed to fully meet planned life-of-mine production and service capacity requirements. The operation has a dedicated ore processing plant within close proximity to Moab Khotsong and tailings are pumped to existing tailings storage facilities. Most of the waste rock is separated from reef ore underground and accounted for separately. All waste and reef is delivered to the metallurgical plant.

Mineral resource estimation

The geostatistical estimation model is created per reef type and per geological zone.

Measured model: Point data and drill hole data, capped to the 99th percentile, uses the ordinary kriging method with experimental semi-variograms, search/estimation parameters, kriging efficiency and slope of regression. Commonly measured models are done on a 10x10 and 30x30 estimation block size.

Indicated model: Declustered data uses simple macro kriging (SMK) with experimental semi-variograms, search/estimation parameters. Commonly indicated models are done on a 60x60 estimation block size.

Inferred model: Declustered data uses SMK with experimental semi-variograms, search/estimation parameters. Commonly indicated models are done on a 120x120 estimation block size.

Inferred model beyond estimation confidence: Global arithmetic mean of the declustered data for all the areas until the lease boundary.

Moab Khotsong

Moab Khotsong

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – KLERKSDORP GOLDFIELD (MOAB KHOTSONG) CONTINUED

Environmental impact

Harmony, holder of the tenement, has addressed the requirements of the Department of Mineral Resources. Moab Khotsong (Harmony) is in the process of applying for its own water use licence, which requires splitting the current approved licence between Harmony, Village Main Reef and AngloGold Ashanti. The air emissions licence for the uranium and gold plants and a waste disposal site permit, which mainly involve the change of licence/permit owner from AngloGold Ashanti to Moab Khotsong (Harmony), are also being addressed.

Harmony undertakes to regularly improve our processes and services to prevent pollution, minimise waste, increase carbon efficiency, use natural resources efficiently and protect the environment. There are no sensitive areas that may affect the project or any other environmental factors, including interested and affected parties and/or studies that could have a material effect on the likelihood of eventual economic extraction.

Regarding environmental rehabilitation liability, all costs associated with demolition and rehabilitation of the footprint after mining activities cease have been considered in the environmental rehabilitation liabilities. This liability covers all buildings, offices, water tanks, plants, tailings storage facilities, waste rock dumps and properties, among others. The liability is assessed annually and updated to include new infrastructure or demolition and all rates are updated (either escalated or revised) every year. These costs are then escalated to future values and discounted back to present value for inclusion in Harmony's current liability in the financial statements.

From 2018 to 2019, the mineral reserve increased by 14%. Opportunities from isolated blocks of ground and the Great Noligwa shaft pillar were consolidated over the life of mine and resulted in an increase in Moab Khotsong's mineral reserve. Future growth opportunities include the progression of the feasibility study for the Zaaiplaats project and selected additions from remaining isolated blocks.

Mineral resources declined by 2.2Moz as areas of Zaaiplaats were moved into inventory.

MATERIAL RISKS

Material risks that may impact Moab Khotsong's mineral resource and reserve statements

SIGNIFICANT RISKS	REMEDIAL ACTION
• Flooding from neighbouring mines	• Mitigated through pumping
• Seismicity	• Mining industry occupational safety and health programme
• Structural complexity	• Adoption and rollout of task action and response plan
	• Maintaining seismic network system
	• Comprehensive risk drilling programme

COMPETENT PERSON

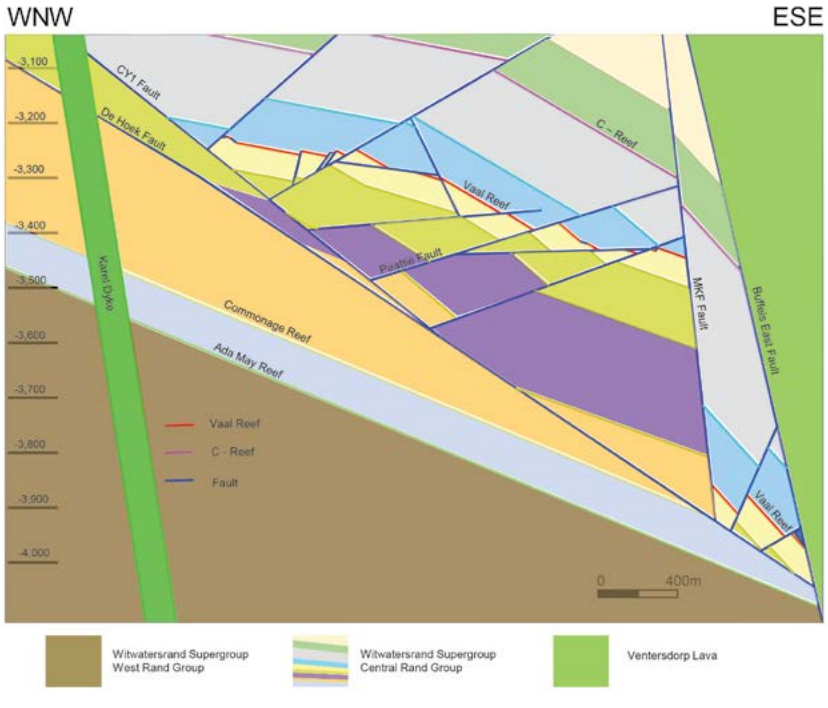
Ore Reserve manager

Leanne Brenda Freese

BSc Geology, BSc Hons (Geology), GDE, SACNASP, GSSA

21 years' hard rock, deep-level and ultra-deep level gold mining experience on the Witwatersrand Supergroup.

Geological cross-section through Moab Khotsong (west-north and east-south east)



MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – KLERKSDORP GOLDFIELD (MOAB KHOTSONG) CONTINUED

MOAB KHOTSONG

Gold – Mineral resource estimates at 30 June 2019

	Measured resources				Indicated resources				Inferred resources				Total mineral resources			
	Tonnes		Gold		Tonnes		Gold		Tonnes		Gold		Tonnes		Gold	
	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)
Moab Khotsong	3.5	18.29	63	2 037	11.9	16.40	195	6 257	5.9	20.15	119	3 840	21.3	17.75	377	12 134

Modifying factors

Moab Khotsong	MCF (%)	SW (cm)	MW (cm)	PRF (%)	Cut-off (cmg/t)
2018	74	167	215	96	1 197
2019	74	173	223	97	1 727

Gold – Mineral reserve estimates at 30 June 2019

	Proved reserves				Probable reserves				Total mineral reserves			
	Tonnes		Gold		Tonnes		Gold		Tonnes		Gold	
	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)
Moab Khotsong	4.0	7.29	29	945	2.8	9.70	28	887	6.9	8.28	57	1 832

Uranium – Mineral resource estimates at 30 June 2019

	Measured resources				Indicated resources				Inferred resources				Total mineral resources			
	Tonnes		U_3O_8		Tonnes		U_3O_8		Tonnes		U_3O_8		Tonnes		U_3O_8	
	(Mt)	(kg/t)	(Mkg)	(Mlb)	(Mt)	(kg/t)	(Mkg)	(Mlb)	(Mt)	(kg/t)	(Mkg)	(Mlb)	(Mt)	(kg/t)	(Mkg)	(Mlb)
Total	–	–	–	–	15.3	0.83	12 798	28	5.9	0.72	4 294	9	21.3	0.80	17 092	38

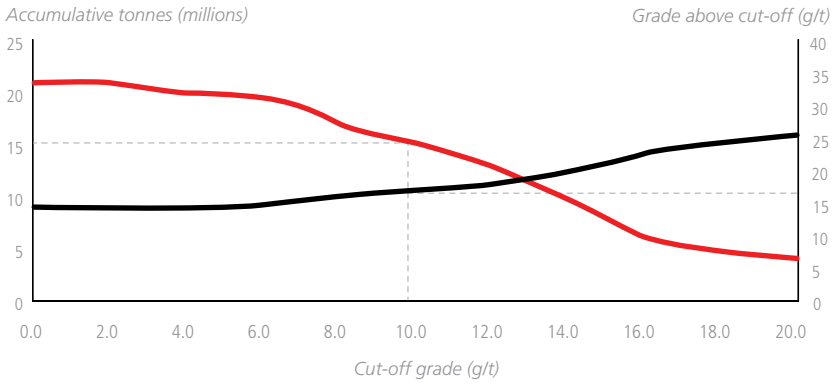
Modifying factors

Moab Khotsong	MCF (%)	SW (cm)	MW (cm)	PRF (%)
2018	100	167	215	62
2019	74	173	223	97

Uranium – Mineral reserve estimates at 30 June 2019

	Proved reserves				Probable reserves				Total mineral reserves			
	Tonnes		U_3O_8		Tonnes		U_3O_8		Tonnes		U_3O_8	
	(Mt)	(kg/t)	(Mkg)	(Mlb)	(Mt)	(kg/t)	(Mkg)	(Mlb)	(Mt)	(kg/t)	(Mkg)	(Mlb)
Total	–	–	–	–	6.9	0.22	1 494	3	6.9	0.22	1 494	3

MOAB KHOTSONG
Vaal Reef
Measured and indicated resource grade-tonnage curve Top, Middle and Lower Mines



MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – KLERKSDORP GOLDFIELD (MOAB KHOTSONG) CONTINUED

OPERATIONAL PERFORMANCE

Moab Khotsong: Key operating statistics

	Unit	FY19	FY18*
OPERATION			
Volumes milled	000t (metric)	**970**	327
	000t (imperial)	**1 069**	360
Gold produced	kg	**7 928**	3 296
	oz	**254 891**	105 969
Grade	g/t	**8.17**	10.08
	oz/t	**0.238**	0.294
DEVELOPMENT			
Total metres (excl. capital metres)		**9 040**	9 527
Reef metres		**1 202**	1 328
Capital metres		**1 432**	380
FINANCIAL			
Average gold price received	R/kg	**573 522**	528 387
	US$/oz	**1 258**	1 279
Capital expenditure	Rm	**559**	173
	US$m	**39**	13
Cash operating cost	R/kg	**399 414**	314 526
	US$/oz	**876**	761
All-in sustaining cost	R/kg	**477 581**	420 286
	US$/oz	**1 048**	1 017

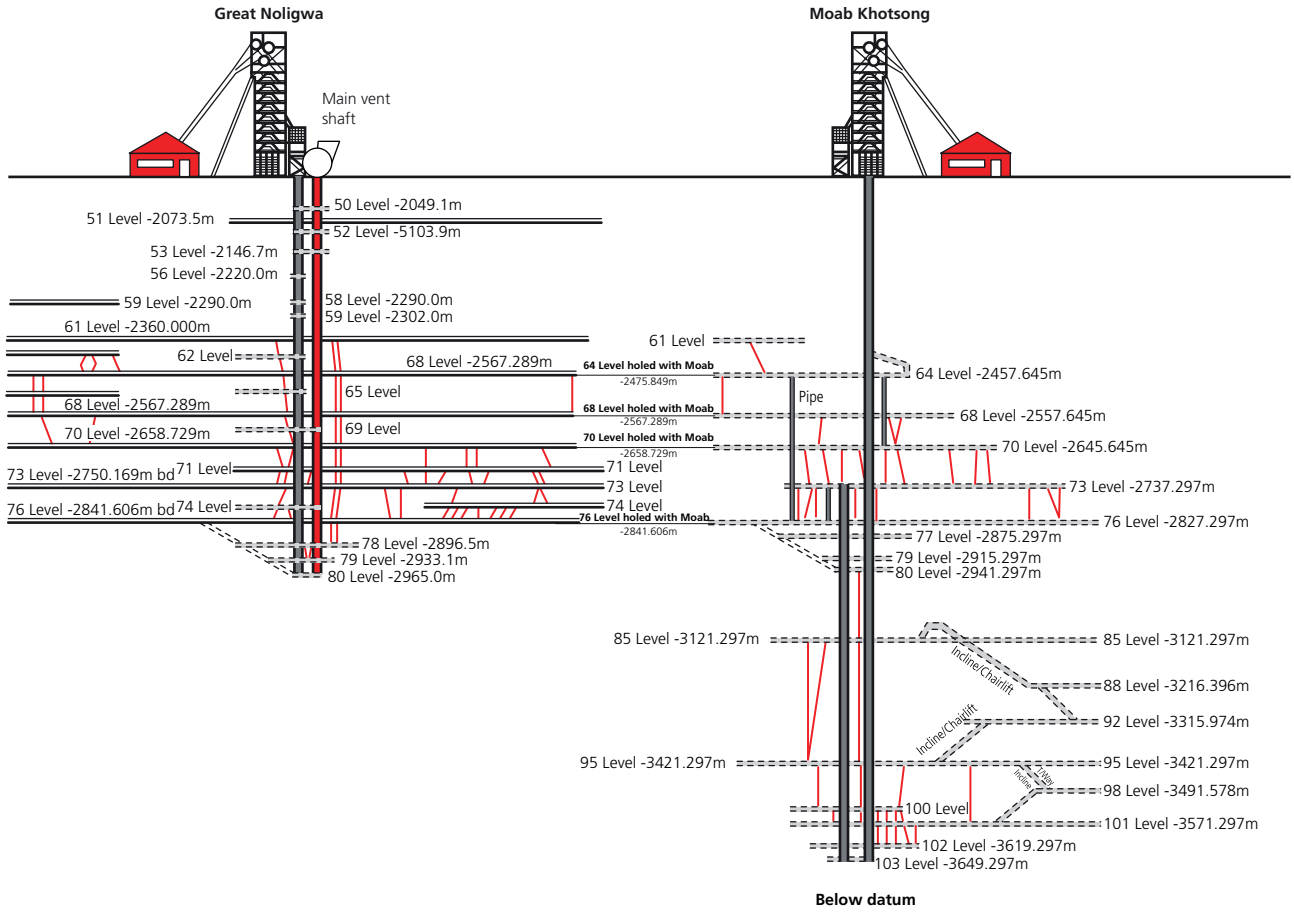
** Moab Khotsong was acquired on 1 March 2018. The FY18 data is for the four months from 1 March 2018 to end June 2018*

Moab Khotsong

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – KLERKSDORP GOLDFIELD (MOAB KHOTSONG) CONTINUED

Moab Khotsong: Schematic of shaft and mining layout of the Moab Khotsong and Great Noligwa shafts

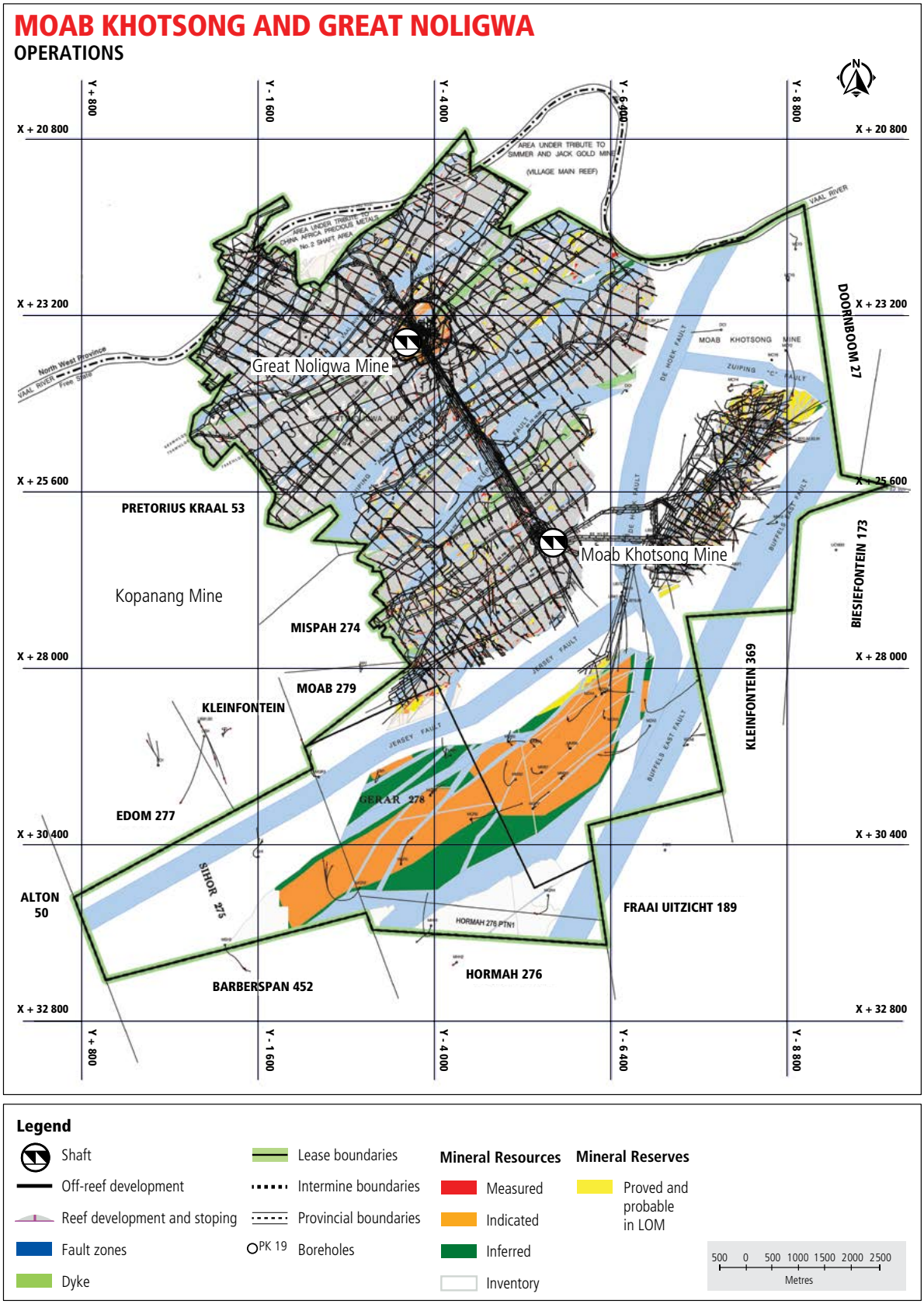


Moab Khotsong

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – KLERKSDORP GOLDFIELD (MOAB KHOTSONG) CONTINUED

MOAB KHOTSONG AND GREAT NOLIGWA OPERATIONS



Legend

- Shaft
- Off-reef development
- Reef development and stoping
- Fault zones
- Dyke
- Lease boundaries
- Intermine boundaries
- Provincial boundaries
- PK 19 Boreholes

Mineral Resources

- Measured
- Indicated
- Inferred
- Inventory

Mineral Reserves

- Proved and probable in LOM

500 0 500 1000 1500 2000 2500
Metres

Moab Khotsong

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – FREE STATE

CONTRIBUTION TO GOLD MINERAL RESOURCES (Including gold equivalents)

FREE STATE UNDERGROUND OPERATIONS **29%**

CONTRIBUTION TO GOLD MINERAL RESERVES (Including gold equivalents)

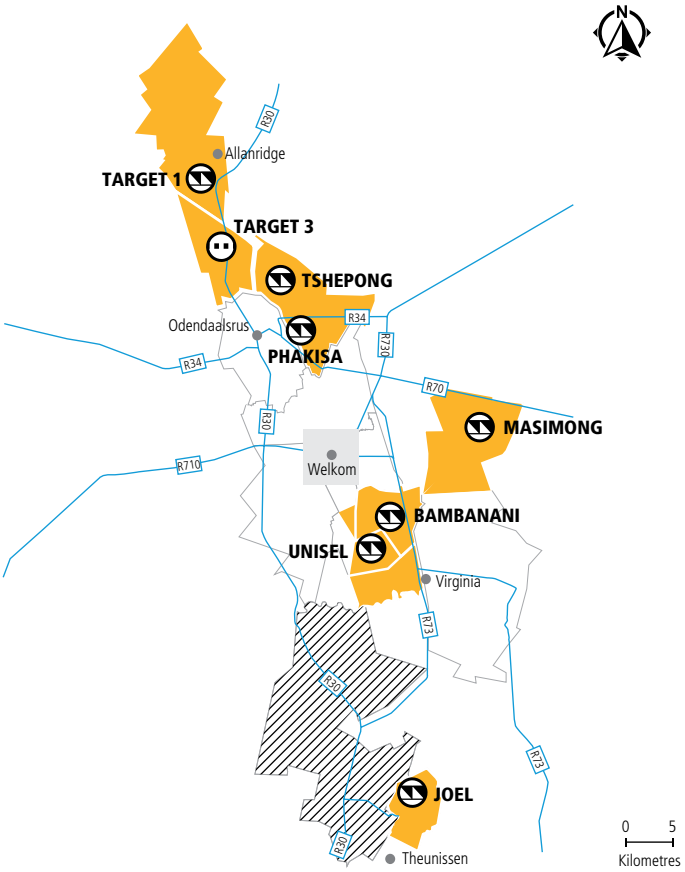
FREE STATE UNDERGROUND OPERATIONS **17%**

As at 30 June 2019, Harmony's underground mining operations in the Free State had combined mineral reserves of **6.1Moz** which are included in mineral resources of **34.3Moz**.

Free State operations – locality

LEGEND

- Location of operating shafts
- Free State operations
- Neighbouring mines
- Care and maintenance



Free State operations	Latitude	Longitude
Target 1	27°45'42.59"S	26°38'24.92"E
Target 3	27°49'42.93"S	26°38'29.27"E
Tshepong	27°51'56.45"S	26°42'45.15"E
Phakisa	27°54'1.27"S	26°43'30.05"E
Masimong	27°58'23.93"S	26°52'39.41"E
Bambanani	28°2'28.24"S	26°48'9.13"E
Unisel	28°3'49.85"S	26°47'11.43"E
Joel	28°16'17.19"S	26°48'57.97"E

LOCATION

Harmony's Free State operations comprise seven underground shafts – including the mechanised Target 1. These mines are located at the southwestern corner of the Witwatersrand Basin, between the towns of Allanridge, Welkom, Theunissen and Virginia.

Joel, the most southerly of the gold mines in the Harmony stable, is situated some 40km south of Welkom, 30km southeast of Virginia and 20km north of Theunissen. The mine has a common boundary with Sibanye-Stillwater's Beatrix gold mine to the west of the mine property.

Unisel is situated to the north of Joel between the city of Welkom and town of Virginia. It is bounded to the north by Brand 5 shaft and West shaft and to the east by Bambanani.

Bambanani is located 10km southeast of Welkom. The East shaft is bound to the west by Bambanani West shaft and to the north by President Steyn No. 2 shaft.

Masimong is located on the north eastern side of the De Bron Fault approximately 12km east from the city of Welkom and 10km north from the town of Virginia. It is bounded to the south by Masimong 4 shaft and Saaiplaas 3 shaft.

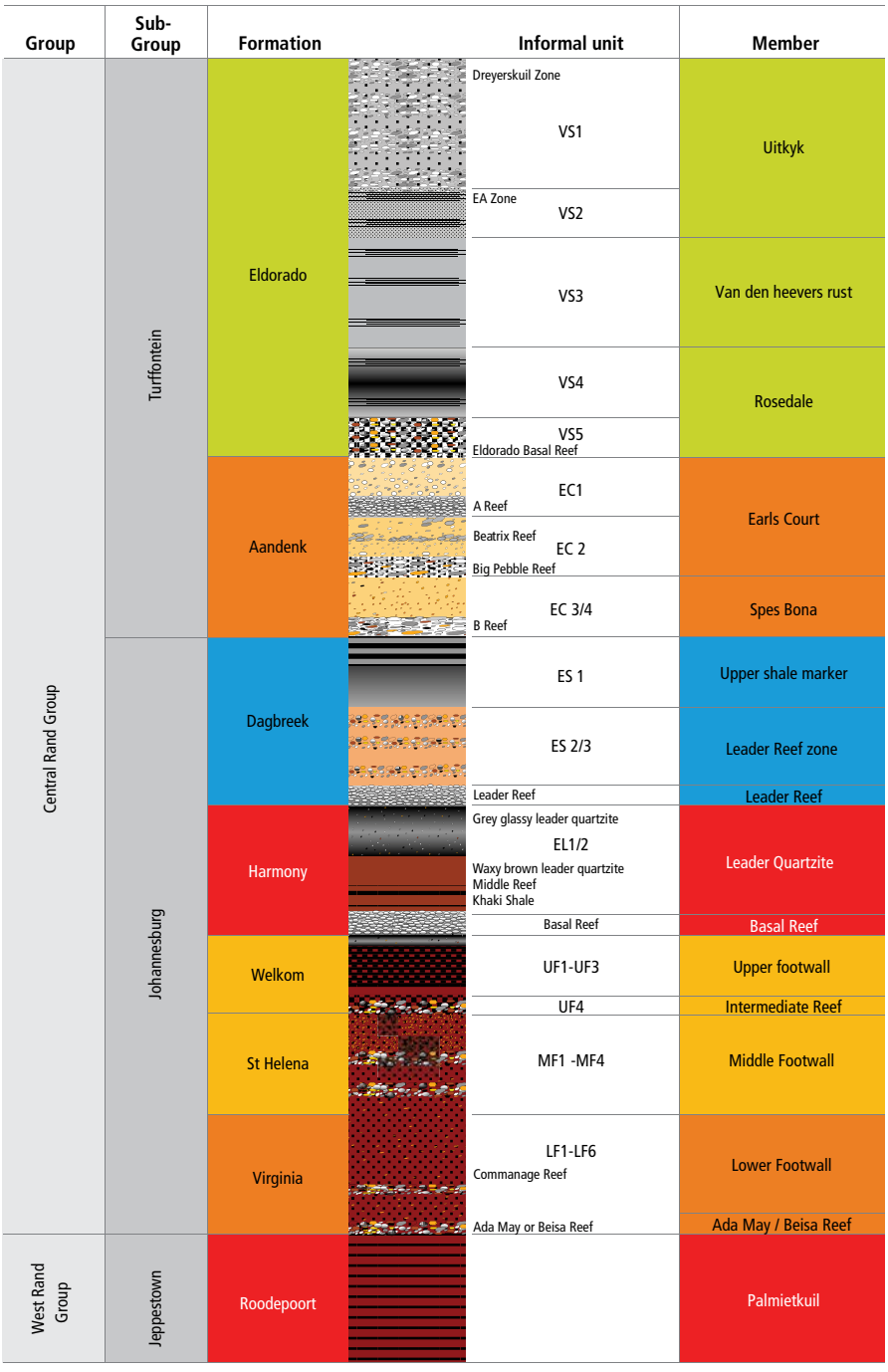
Tshepong operations comprises:

- **Phakisa section** is located north west of Masimong 5 shaft between the town of Odendaalsrus and the city of Welkom some 13km north of the city of Welkom. It is bounded to the south by Eland shaft, to the west by Nyala shaft and to the north by Tshepong shaft.
- **Tshepong section** is located to the north of Phakisa between the town of Odendaalsrus and the township of Kutloanong some 20km north of Welkom. It is bounded to the north by the dormant Jeanette mine, to the south and east by the Phakisa mine, and to the southwest by Nyala shaft.

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – FREE STATE

FREE STATE: STRATIGRAPHIC COLUMN



MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – FREE STATE CONTINUED

Target 1, the most northerly of Harmony's mines in the Free State, is situated some 30km north of the town of Welkom.

Target 3, located south of Target 1, is on care and maintenance.

REGIONAL GEOLOGY

The Witwatersrand basin, situated on the Kaapvaal Craton, has been filled by a 6km thick succession of sedimentary rocks, which extends laterally for hundreds of kilometres.

The Free State goldfield is divided into two sections, cut by the northsouth striking De Bron fault. This major structure has a downward vertical displacement to the west of about 1 500m in the region of Bambanani, as well as a dextral shift of 4km. This known lateral shift allows a reconstruction of the orebodies to the west and east of the De Bron fault. A number of other major faults, such as the Homestead fault, lie parallel to the De Bron fault.

To the west of the De Bron fault, current operating mines are Target, Tshepong, Phakisa, Unisel, Bambanani and Joel. Dips of the reef are mostly towards the east, averaging 30 degrees but become steeper approaching the De Bron fault. To the east of the fault lies Masimong mine. These reefs mostly dip towards the west at 20 degrees, although Masimong is structurally complex and dips of up to 40 degrees have been measured. Between these two blocks lie the uplifted Horst block of West Rand Group sediments with no reef preserved.

The western margin area is bound by synclines and reverse thrust faults and is structurally complex. Towards the south and east, reefs sub-crop against overlying strata, eventually cutting out against the Karoo to the east of the lease area.

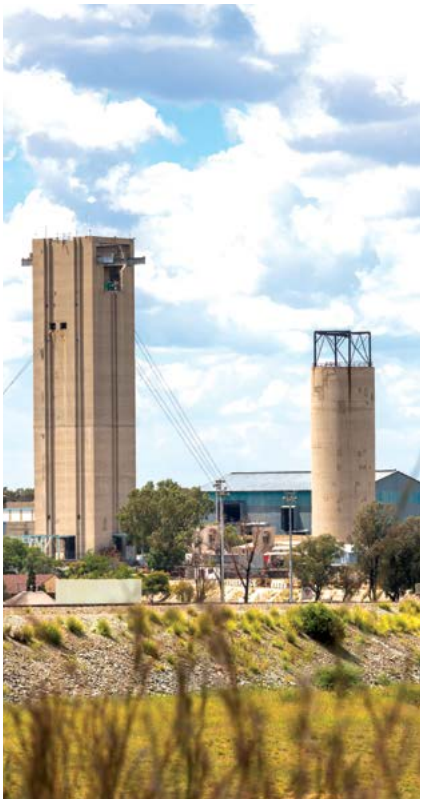
Most of the mineral resource tends to be concentrated in reef bands located on one or two distinct unconformities. A minority of the mineral resource is located on other unconformities. Mining that has taken place is mostly deep-level underground mining, exploiting the narrow, generally shallow dipping tabular reefs.

The Basal Reef is the most common reef horizon and is mined at all shafts except Target 1 and Joel. It varies from a single pebble lag to channels of more than 2m thick. It is commonly overlain by shale, which thickens northwards. Tshepong section has resorted to undercutting in its mining panels to reduce the effect of shale dilution.

The B Reef is a highly channelised orebody located 140m stratigraphically above the Basal Reef. Because of its erratic nature, it has only been mined at Masimong, Tshepong, and the Target 2 and Target 3 shafts. Within the channels, grades are excellent, but this reduces to almost nothing outside the channels. Consequently, these shafts have undertaken extensive exploration to locate these pay channels.

Joel mine, 30km south of Welkom, is the only Harmony Free State operation to mine the Beatrix Reef.

The Target operation is at the northern extent of the Free State goldfields, some 20km north of Welkom. The reefs currently exploited are the Elsburg-Dreyerskuil conglomerates, which form a wedge-shaped stacked package, comprising 35 separate reef horizons, often separated by quartzite beds. The Elsburg Reefs are truncated by an unconformity surface at the base of the overlying Dreyerskuil member. Below the sub-crop, the Elsburg dips steeply to the east, with dips becoming progressively shallower down dip. Close to the sub-outcrop, the thickness of the intervening quartzites reduces, resulting in the Elsburg Reefs coalescing to form composite reef packages that are exploited by massive mining techniques at Target mine. The Dreyerskuil also consists of stacked reefs dipping shallowly to the east. These reefs tend to be less numerous, but more laterally extensive than the underlying Elsburg Reefs.



Masimong

Tshepong

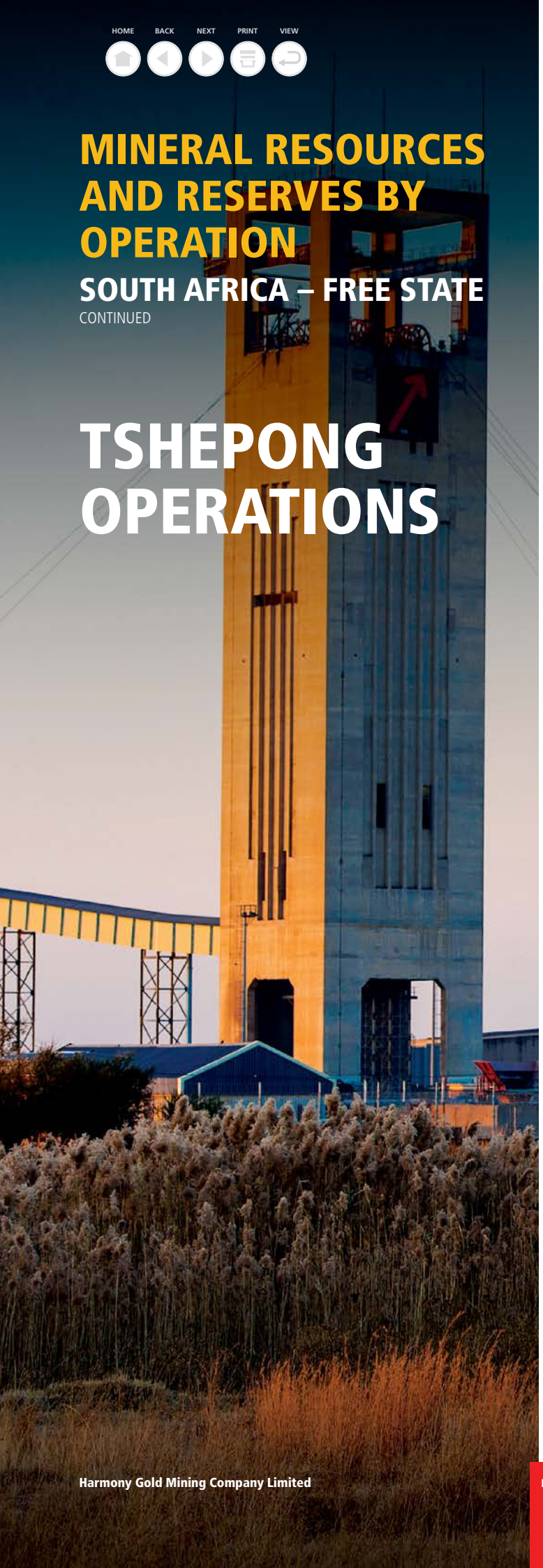
Free State

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – FREE STATE

CONTINUED

TSHEPONG OPERATIONS



Following the successful conclusion of the study to investigate their integration, the Tshepong and Phakisa sections were consolidated as a single entity, the Tshepong operations, in FY17. The integration and consolidation of these two mines will enable Harmony to optimise existing synergies, reduce costs and make better use of Tshepong's underused infrastructure.

History

The feasibility study for the initial development of the Tshepong section was concluded in 1984. Work to establish the site started in September 1984 and by 1986 shaft sinking was underway. Sinking and equipping of the shaft were completed in 1991, with the mine being commissioned in November 1991.

The Phakisa section began as a project in October 1993, with shaft sinking commencing in February 1994. It was formerly known as Free State Geduld 4, Freddies 4 and Tshepong South. In 1995, shaft sinking was halted on 59 level due to the low gold price prevailing at that time. Subsequently, the financial climate improved and operations resumed in September 1996. Sinking was then completed to the station brow on 75 level. Low gold prices again resulted in the shaft being mothballed in the last quarter of 1999. In January 2002, Harmony acquired a stake in Phakisa as part of the Freegold acquisition from the then AngloGold Limited, following which the operation was acquired in full in September 2003. Sinking and equipping of the shaft to a depth of 2 427m was completed in 2006.

Nature of the operation

The Tshepong section is a mature underground operation mining at moderate depths of between 1 600m and 2 400m below surface. The bulk of mining currently takes place in the decline (Sub 66) and north-eastern portions of the lease area.

The Phakisa section is a moderate- to deep-level conventional underground operation which now, together with the Tshepong section, makes up the Tshepong operations. Currently, mining activity takes place largely in the north and south of the mine lease area. However, over the next three years the focus will shift solely to the south of the lease area.

Geology

The principal gold-bearing orebody is the stratiform and strata-bound Basal Reef (known as the Basal Reef Zone or BRZ). This unit comprises a thin conglomerate at the base of the BRZ, overlain by clean 'placer' quartzites. The Basal Reef is underlain by a thick series of siliceous and argillaceous quartzites comprising the Welkom Formation and overlain by shales and quartzites of the Harmony Formation, both of the Johannesburg sub-Group of the Central Rand Group. Although not apparent within the mine lease area, the Basal Reef sits unconformably on the Welkom Formation.

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – FREE STATE (TSHEPONG) CONTINUED

In the Phakisa section, the reef dips towards the east at 25° in the north and up to 45° in the south. The Lower Cycle Black Chert facies predominates in the north with a north-west south-east value trend. The reef consists of an oligomictic small pebble matrix-supported conglomerate lag with fly-speck carbon contact. The rest of the reef package constitutes barren siliceous fine-grained reef quartzite. The entire reef package reaches up to 160cm thick and is overlain by 1cm to 30cm of lower Khaki Shale. This in turn is overlain by the approximately 3-4m thick Waxy Brown Leader Quartzite, above which lies the 3-4m thick Upper Khaki shale.

The Upper Cycle Black Chert facies Basal Reef prevails in the south of the lease area, and consists of a slightly polymictic (yellow shale specks present), matrix-supported medium-pebble conglomerate with a more gradational contact absent of carbon where mineralisation is associated with fine disseminated and buck-shot pyrite. The conglomerate is slightly thicker compared to the Lower Cycle, but is also overlain by barren reef quartzite, the entire package being characteristically up to only 40cm thick. The lower Khaki Shale is up to 1m thicker.

The Central Rand Group itself is overlain in turn by lavas and sediments of the Ventersdorp System and the more recent sediments of the Karoo Group.

The B Reef occurs approximately 150m stratigraphically above the Basal Reef (or approximately two production working levels). Consequently, the B Reef is not normally intersected in either Basal Reef development or routine diamond drilling.

The lowest unit is a basal lag (Zone A), sitting on the underlying Doornkop Quartzite Formation. Where this unit is developed (or preserved), it may be highly mineralised oligomictic or polymictic conglomerate, with visible gold, buckshot pyrite and carbon mineralisation. This unit may carry gold values of many thousands of cmg/t and represents a potentially rewarding exploration target.

The unit overlying the Zone A may be either Zone B, which is comprised of a mildly erosive pebbly quartzite formation, and/or the stratigraphically younger Zone C, which is a polymictic conglomerate with low values which is also erosional into the underlying A and B zones.

Mining method

At the Tshepong section, the reef horizon is accessed via conventional grid development. The shaft's primary economic reef horizon is the Basal Reef that is extracted by undercut mining, leaving a quartzite beam in the hangingwall to ensure the stability of the overlaying shale. Minor amounts of B Reef that do not exceed 18% of the on-reef area mined annually are extracted via open stoping mining. The B Reef is located approximately 140m stratigraphically above the Basal Reef, necessitating separate infrastructure (i.e. footwall development) from that for the Basal Reef. The presence of khaki shale approximately 6m thick above the Basal Reef strains the footwall development rates of the B Reef, requiring the installation of ring sets for the first 25m of development. The Tshepong section has significant reserves to maintain a long-term life, however, extraction of ore from pillars will become more important as the life of mine progresses, but volumetrically these reserves are not significant.

At the Phakisa section, the Basal Reef is mined conventionally from a single shaft barrel reaching a depth of 2 600m below collar. The reef horizon is accessed by means of conventional grid development and is extracted as an open mining operation to the south of the 69 raise line, but undercut mining began as the mining continued to the north. Phakisa reached full production in October 2016. Pillar crews are also planned as the life of mine progresses to ensure depletion of the pillar reserves within the life-of-mine time frame.

Infrastructure

The surface and underground infrastructure for the Tshepong section as well as the power and water supplies available exceed planned peak production requirements. Broken rock handling above 66 level is track-bound, transferred to a number of inter-level sub-vertical transfer systems that gravity feeds to the main silos on 68 level. The broken rock handling below 66 level is track-bound, transferred to a decline belt system that feeds to the silos on 66 level from where the rock is transferred by track to the main inter-level sub-vertical transfer system on 66 level. The rock is hoisted to surface through the main shaft. From the shaft the rock is transported to the processing plant by train.

Tshepong

Tshepong

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – FREE STATE (TSHEPONG) CONTINUED

At the Phakisa section, surface and underground infrastructure as well as the power and water services available exceed planned peak life of mine production requirements. Broken rock handling on all levels is track-bound. Several inter-level sub-vertical transfer systems feed the main silos on 77 level. From 77 level, the rock is hoisted to 55 level where a rail-veyor system transports the rock from Phakisa to the Nyala shaft, from where the rock is hoisted to surface by means of the koepe winder, and then transported to the processing plant by train.

Mineral processing

Stoping ore and development rock from the Tshepong section are hoisted and processed separately above 66 level. Currently, below 66 level, stoping and development rock is hoisted and processed as one product.

At the Phakisa section, stoping ore and development rock are hoisted and processed separately. The reef, or stoping ore, is milled and processed at Harmony One plant with gold recovered by means of cyanide leaching.

Tshepong operations shares the Harmony One plant with three other Harmony mines and four Harmony waste rock dumps. The plant's design capacity exceeds the maximum planned production from these sources. Gold is recovered by means of gold cyanide leaching.

Legal aspects and tenure

The current mining right for the Tshepong Operations encompasses an area of 10 798.74ha. The ARMgold/Harmony Freegold joint venture holds several mining rights in the Free State goldfields which have been successfully converted and executed as new order mining rights, some of which are still to be registered at the Mineral and Petroleum Resources Titles Office (MPRTO). The mining right for Tshepong operations, FS30/5/1/284MR, is valid from 11 December 2007 to 10 December 2029.

Mineral resource estimation

The Datamine valuation model uses all the underground chip sampling data points and boreholes values drilled in the Phakisa lease area. Geozones are determined based on reef facies types and value trends. The Phakisa and Tshepong sections share 14 geozones in the Tshepong operations mega-mine. The geozones are capped at an optimal percentile using a system called the quantile process to avoid over-estimation due to high outlying values. Based on confidence levels for geostatistical data, valuation is by means of a computer-generated block model as follows:

- Measured blocks 30m x 30m grid
- Indicated blocks 60m x 60m grid
- Inferred blocks 120m x 120m grid

The block model is then digitally transferred to the digital environment for valuation. The entire lease area is blocked and cut against major structure, geozones and haloes. The blocks are evaluated by importing the valuation model from Datamine into CadsMine, and applying the kriging method in the valuation browser of CadsMine.

Mineral resources have been estimated on the basis of geoscientific knowledge with input from the ore reserve manager, geologists and geostatistical staff. The mine's mineral resources are categorised, blocked-out and ascribed an estimated value. Computerised geostatistical estimation processes are used.

Environmental impact

The Tshepong Operations strive to prevent pollution, or otherwise minimise, mitigate and remediate harmful effects of our operations on the environment and hence maintain its ISO 14001 certification. We are also committed to ensuring compliance with applicable environmental legislation. A key focus is the development of integrated water and waste management plans. These plans will be pivotal to the overall management of water and will indicate how we can better use and re-use our water. Another area of focus is promoting awareness and training around green environmental management in general.

There has been a notable improvement in terms of waste management and the storage of potential contaminants. However, construction of a surface receiving store is possible solution to the management and control of chemical spills and housekeeping issues.

MATERIAL RISKS

Material risks that may impact the Tshepong Operations' mineral resource and reserve statements are:

Tshepong section:

SIGNIFICANT RISKS	REMEDIAL ACTION
• Orebody complexity	• Extensive exploration drilling
• Ventilation of decline area	• Installation of booster fans on 75 level

Phakisa section:

SIGNIFICANT RISKS	REMEDIAL ACTION
• Logistics	• Upgrade of Koepe rock winder and rail-veyor
• Ventilation	• Completion of Alimac hole and ice dam on 55 level and holing to the Tshepong section on 75 level
• Mining flexibility	• Increased development and more equipping crews in the south area of the mine

COMPETENT PERSON

Tshepong Operations

Theodorus Pieter van Dyk
BSc Hons (Geology), SACNASP
21 years' relevant experience.

Ore Reserve manager – Tshepong section	Ore Reserve manager – Phakisa section
Andrew Murray Louw	Bothepha Phetlhu
BSc Hons (Geohydrology)	BTech (Geology), MEng
23 years' relevant experience.	16 years' relevant experience.

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – FREE STATE (TSHEPONG) CONTINUED

TSHEPONG OPERATIONS

Gold – Mineral resource estimates at 30 June 2019

	Measured resources				Indicated resources				Inferred resources				Total mineral resources			
	Tonnes		Gold		Tonnes		Gold		Tonnes		Gold		Tonnes		Gold	
	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)
Tshepong operations	24.2	11.19	271	8 716	12.7	10.39	132	4 236	36.2	10.13	367	11 797	73.1	10.53	770	24 749

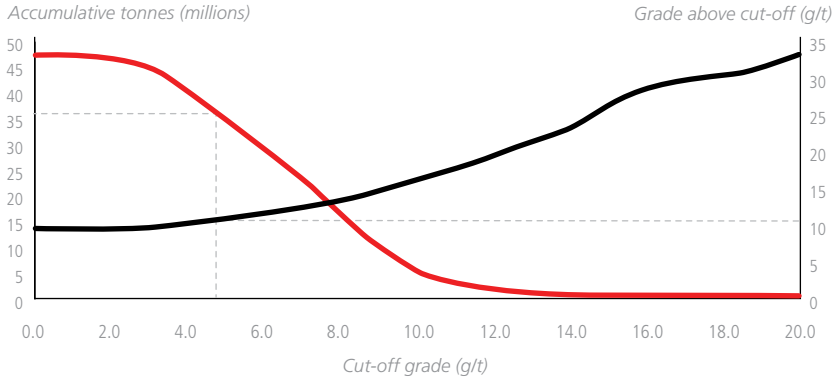
Modifying factors

Tshepong operations	MCF (%)	SW (cm)	MW (cm)	PRF (%)	Cut-off (cmg/t)
2018	74	111	132	96	679
2019	74	111	131	96	676

Gold – Mineral reserve estimates at 30 June 2019

	Proved reserves				Probable reserves				Total mineral reserves			
	Tonnes		Gold		Tonnes		Gold		Tonnes		Gold	
	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)
Tshepong operations	20.0	5.87	117	3 774	3.8	4.70	18	576	23.8	5.68	135	4 350

TSHEPONG OPERATIONS:
Basal Reef and B Reef
Measured and indicated resource grade-tonnage curve



Tshepong

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – FREE STATE (TSHEPONG) CONTINUED

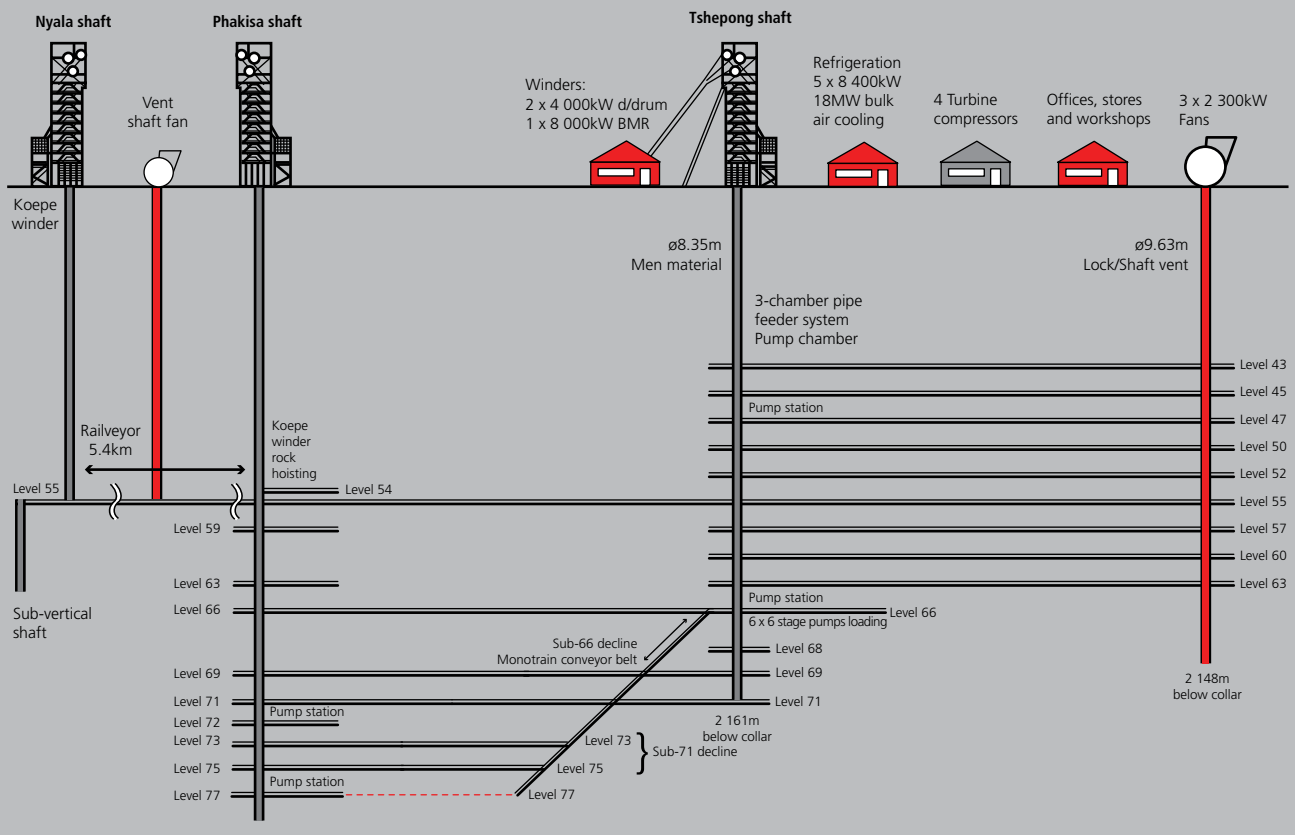
OPERATIONAL PERFORMANCE

Tshepong operations: Key operating statistics

	Unit	FY19	FY18	FY17*	FY16*	FY15*
OPERATION						
Volumes milled	000t (metric)	**1 612**	1 716	1 695	1 774	992
	000t (imperial)	**1 777**	1 893	1 869	1 956	1 095
Gold produced	kg	**7 967**	9 394	8 828	9 019	4 278
	oz	**256 146**	302 026	283 827	289 968	137 540
Grade	g/t	**4.94**	5.47	5.21	5.08	4.31
	oz/t	**0.144**	0.16	0.152	0.148	0.126
DEVELOPMENT						
Total metres (excl. capital metres)		**22 450**	23 089	19 462	23 099	13 053
Reef metres		**3 323**	3 159	3 028	3 530	1 822
Capital metres		**809**	588	599	0	0
FINANCIAL						
Average gold price received	R/kg	**591 331**	577 058	574 165	547 906	449 211
	US$/oz	**1 297**	1 397	1 314	1 175	1 221
Capital expenditure	Rm	**1 130**	1 008	717	630	313
	US$m	**80**	78	52	43	27
Cash operating cost	R/kg	**503 033**	407 575	416 493	357 345	371 149
	US$/oz	**1 103**	987	953	757	1 008
All-in sustaining cost	R/kg	**636 281**	514 537	507 368	437 550	454 512
	US$/oz	**1 396**	1 245	1 161	939	1 235

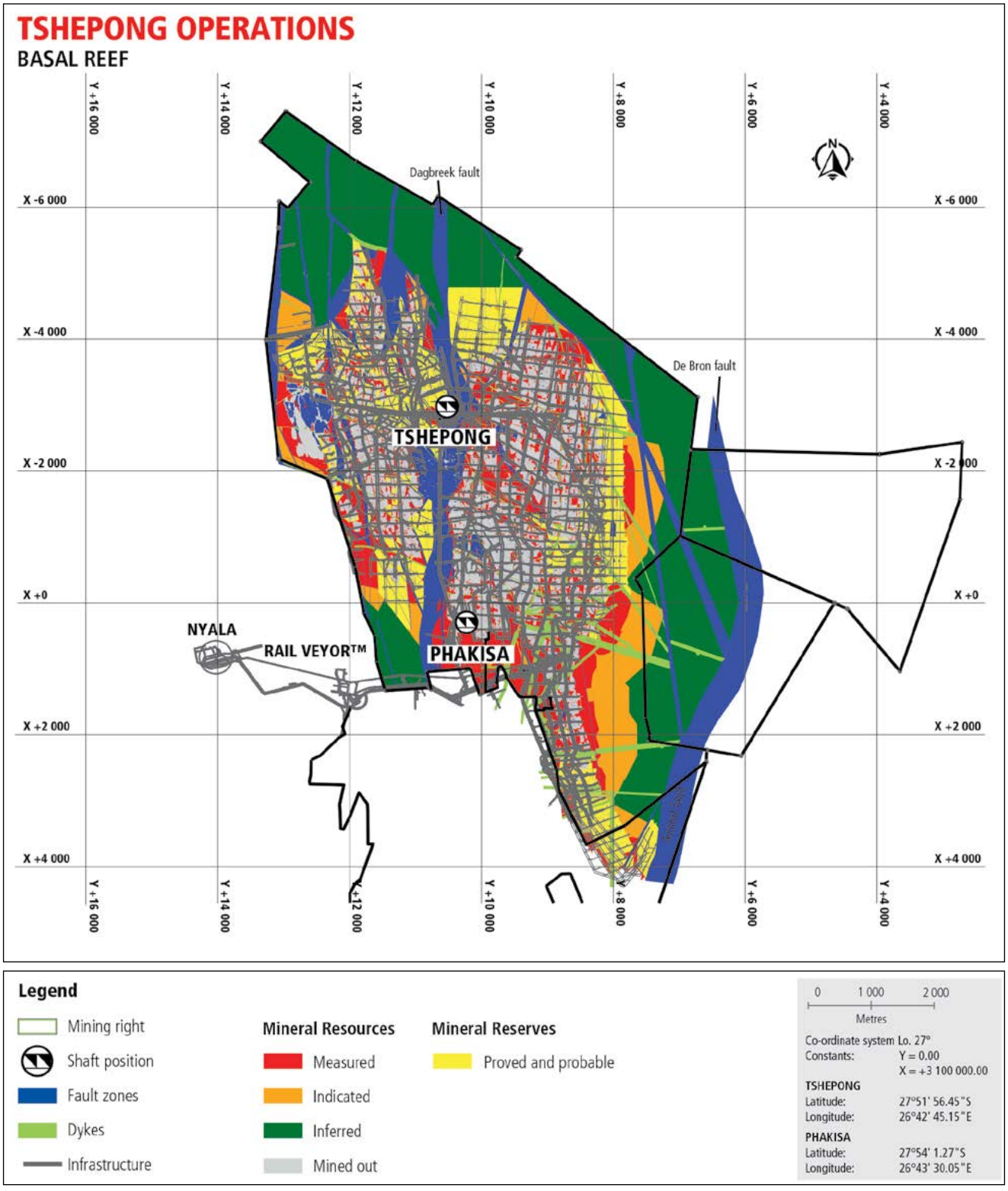
** Tshepong Operations, comprising the Phakisa and Tshepong sections, is reported as a single operating entity from FY18. As these were reported separately in previous years, the historic data for the years FY15 to FY17 has been combined*

Tshepong Operations: Schematic shaft and mining layout of the Nyala, Phakisa and Tshepong shafts



MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – FREE STATE (TSHEPONG) CONTINUED



MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – FREE STATE

CONTINUED

BAMBANANI

Bambanani

History

Shaft-sinking operations (by Anglo American Corporation) began at President Steyn 4 shaft in February 1969 and were completed, to a final depth of 2 365m below surface, in September 1971. The Basal Reef was intersected at a depth of 2 075m yielding 1 252cmg/t over 235.7cm. The sub-vertical shaft, sunk in the late 1970s to a depth of 3 328m below surface, came into production in 1982.

The shaft then became known as Freegold 1 East in 1997 when President Steyn was closed. In October 1998, the shaft became part of the then AngloGold and its name was changed again to Bambanani East. In January 2002, the shaft was sold to the Harmony/ARM consortium and, in October 2003, Harmony became the sole owner.

Geology

The Basal Reef is the predominant gold-bearing reef at Bambanani. The Steyn facies of the Basal Reef cover approximately 90% of Bambanani's mining lease area and overlays, with a very slight angular sub-conformity, the UF1 quartzite of the Welkom Formation. It is overlain by the khaki shale unit of the Harmony Formation in the north. To the south, it is overlain by the younger waxy brown leader quartzite, which erodes the khaki shale. The presence and thickness of the khaki shale may influence decisions to undercut the Basal Reef. While the reef's thickness may vary from a few centimetres to more than 10m, it is typically between 1m and 3m thick.

The Stuurmanspan Fault in the west and the De Bron-Vermeulenskraal Fault system in the east are bound to the Basal Reef at Bambanani. Both are northward-striking dextral extensional faults with significant westerly downthrows. The reef dips easterly and varies from 25 degrees in the west to 45 degrees in the east but, in places, local deformation against a fault leads to vertical reefs. Smaller faults break up the reef but are generally sub-parallel to the main structures.

Mineral rights, legal aspects and tenure

The current mining right encompasses an area of 2 355.85 hectares and was successfully converted, executed and registered as a new order mining right at the Mineral and Petroleum Resources Titles Office on 26 January 2008. The mining right FS30/5/1/2/2/83MR is valid from 11 December 2007 to 10 December 2029.

Mining methods and mine planning

Bambanani is in the final stages of its life of mine and mining is limited to the extraction of the shaft pillar. Mining of the shaft pillar is focused on mini longwalls on the north side and, centre of the pillar, it is separated by safety pillars that have been left along designated geological structures.

Most of the panels are mined on full width, leaving a reef beam of approximately 80cm in the hanging wall in order to build a beam to support the shale. The challenge remains to control the stoping width and the stability of the beam in a highly fractured and faulted environment

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – FREE STATE (BAMBANANI) CONTINUED

with sill intrusions, a weak waxy brown quartzite hanging wall above the shale being complicated by ball and pillow formations.

Backfill has been successfully introduced in all panels. The quality of installation has improved drastically as the crew has acquired knowledge and understanding of its underground application. The focus is currently on improving the volume of backfill placed versus the square metres mined, as well as quality control, which will include regular testing of the backfill product.

The seismic system is operational and the seismic data gathered is used and applied in the design of the mining sequence. Seismic responses are also monitored and correlated with monthly production data to establish the relationship between volumes mined and the seismic response.

Mineral processing

As Bambanani does not have its own mineral processing plant, the mine's ore is transported 7km by rail to the Harmony One plant for processing. This is a centrally located plant that is used by other Harmony mines in the Free State.

Infrastructure

Work on the shaft pillar continues at levels 66, 69, 71 and 73. Ore is transported via a decline system – from 58 to 75 levels – on the northern side of the shaft pillar, to Bambanani West, from where it is hoisted to surface. The shafts are linked by cross-tramming at 60 level.

Mineral resource estimation

The estimation method used for local measured estimates on the shaft is ordinary kriging and, for local indicated and inferred estimates, simple macro kriging. The orientations and ranges of each geozone's semi-variogram are used to determine the kriging search parameters, which are optimised. Estimates are generally kriged into 30m x 30m blocks for the measured resources from the point support data.

Environmental impact

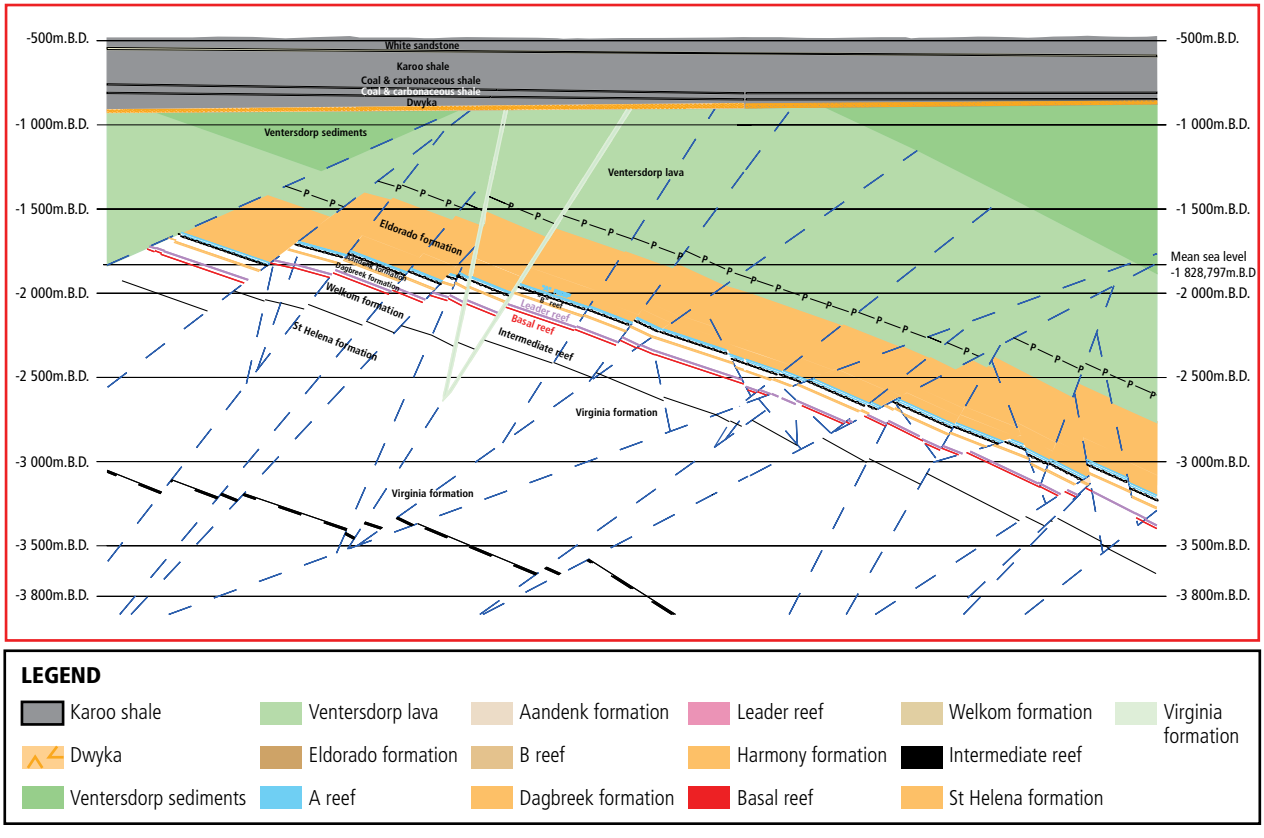
Bambanani's environmental aspects and impacts are managed according to its environmental management programme, as approved by the Department of Mineral Resources, in terms of the Mineral and Petroleum Resources Development Act (MPRDA). All environmental aspects and impacts emanating from mining activities are documented in the approved environmental management programme report and the environmental aspect register, as required by the MPRDA and ISO 14001:2004 standard, and are managed accordingly.

Annual performance monitoring and audits are conducted by the Department of Mineral Resources to verify compliance with the following legislation:

- Mine Health and Safety Act 29 of 1996
- National Water Act 36 of 1998
- National Environmental Management Act 107 of 1998
- Mineral and Petroleum Resources Development Act 28 of 2002

BAMBANANI

Geological section looking north – not to scale



LEGEND

Karoo shale	Ventersdorp lava	Aandenk formation	Leader reef	Welkom formation	Virginia formation
Dwyka	Eldorado formation	B reef	Harmony formation	Intermediate reef	
Ventersdorp sediments	A reef	Dagbreek formation	Basal reef	St Helena formation	

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – FREE STATE (BAMBANANI) CONTINUED

MATERIAL RISKS

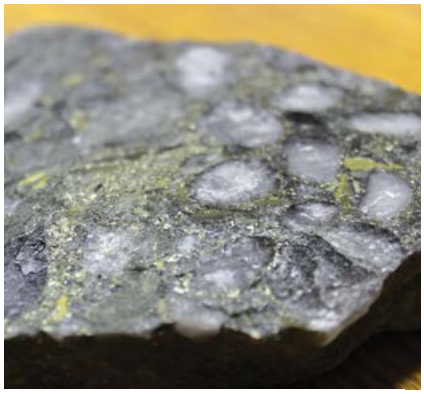
Material risks that may impact Bambanani's resource and reserve statement

SIGNIFICANT RISKS	REMEDIAL ACTION
• Seismicity	• Support design and monitoring system

COMPETENT PERSON

Ore Reserve manager

Fhulufhelo Olga Muthelo
BSc (Hons), Postgraduate Diploma in Engineering, SACNASP
12 years' experience in Witwatersrand gold mining.



Basal Reef

BAMBANANI

Gold – Mineral resource estimates at 30 June 2019

	Measured resources				Indicated resources				Inferred resources				Total mineral resources			
	Tonnes		Gold		Tonnes		Gold		Tonnes		Gold		Tonnes		Gold	
	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)
Bambanani	0.6	15.96	10	318	–	–	–	–	–	–	–	–	0.6	15.96	10	318

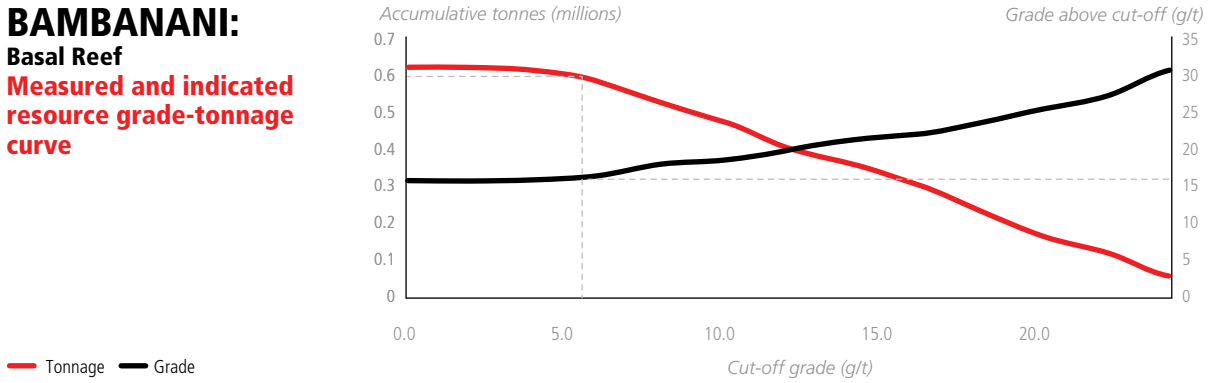
Modifying factors

Bambanani	MCF (%)	SW (cm)	MW (cm)	PRF (%)	Cut-off (cmg/t)
2018	96	190	225	96	1 952
2019	96	202	210	96	2 019

Gold – Mineral reserve estimates at 30 June 2019

	Proved reserves				Probable reserves				Total mineral reserves			
	Tonnes		Gold		Tonnes		Gold		Tonnes		Gold	
	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)
Bambanani	0.7	11.69	9	278	–	–	–	–	0.7	11.69	9	278

BAMBANANI:
Basal Reef
Measured and indicated resource grade-tonnage curve



MINERAL RESOURCES AND RESERVES BY OPERATION

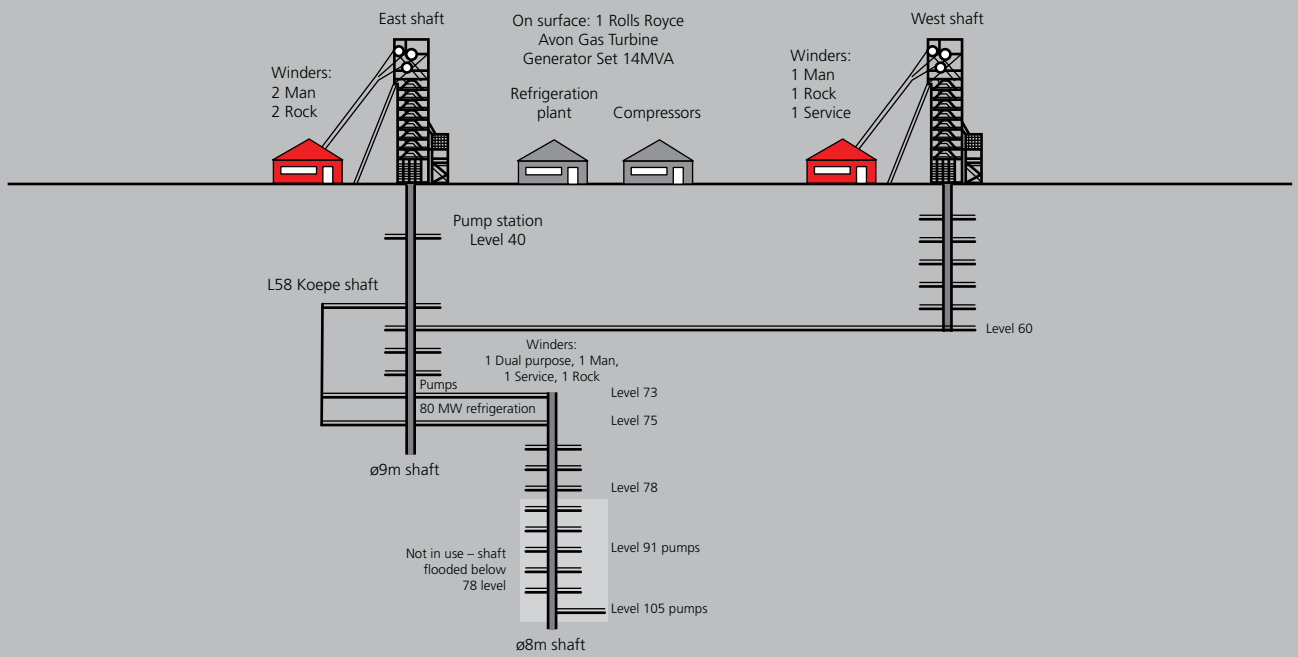
SOUTH AFRICA – FREE STATE (BAMBANANI) CONTINUED

OPERATIONAL PERFORMANCE

Bambanani: Key operating statistics

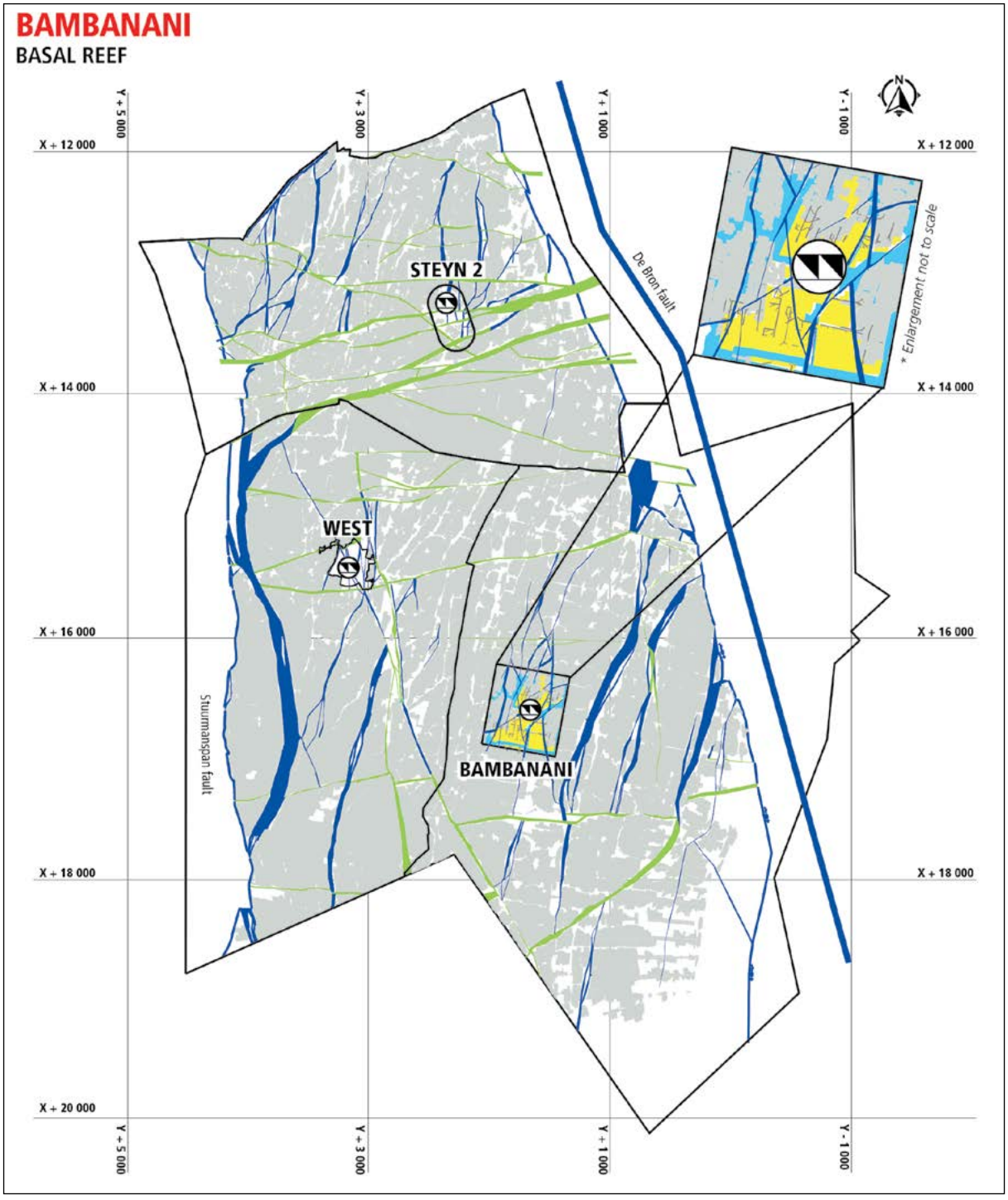
	Unit	FY19	FY18	FY17	FY16	FY15
OPERATION						
Volumes milled	000t (metric)	**230**	233	231	232	229
	000t (imperial)	**245**	257	254	256	253
Gold produced	kg	**2 515**	2 821	2 750	3 013	2 908
	oz	**80 860**	90 698	88 415	96 870	93 495
Grade	g/t	**10.93**	12.11	11.90	12.99	12.70
	oz/t	**0.318**	0.353	0.348	0.378	0.370
DEVELOPMENT						
Total metres (excl. capital metres)		**1 173**	1 495	1 591	1 743	1 150
Reef metres		**0**	0	130	105	15
Capital metres		**0**	0	0	0	0
FINANCIAL						
Average gold price received	R/kg	**591 962**	576 398	574 227	536 410	451 200
	US$/oz	**1 299**	1 395	1 314	1 151	1 226
Capital expenditure	Rm	**61**	64	77	106	110
	US$m	**4**	5	6	7	10
Cash operating cost	R/kg	**391 550**	320 724	317 833	268 305	239 552
	US$/oz	**859**	776	727	576	651
All-in sustaining cost	R/kg	**441 226**	360 462	357 025	304 634	270 623
	US$/oz	**968**	873	817	654	735

Bambanani: Schematic of shaft and mining layout



MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – FREE STATE (BAMBANANI) CONTINUED



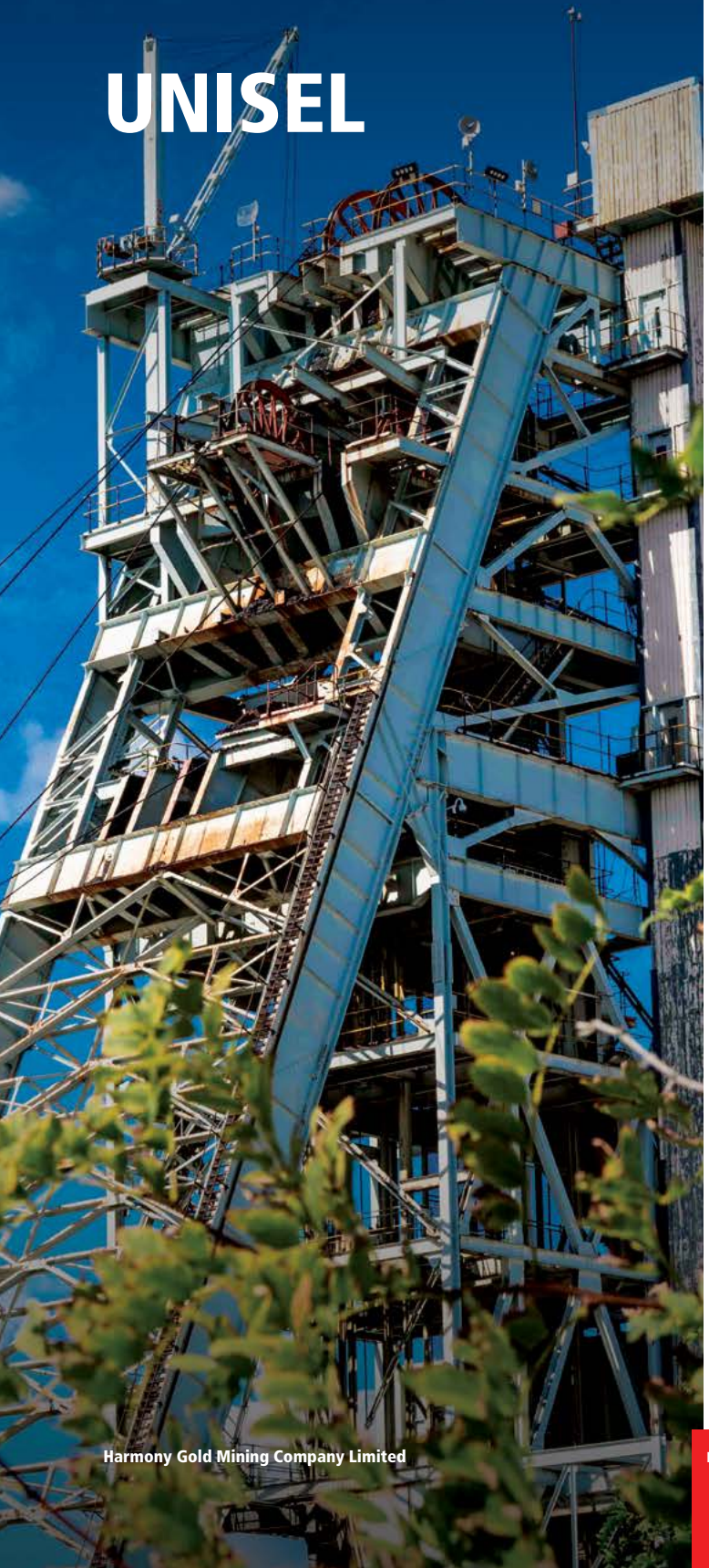
Bambanani

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – FREE STATE

CONTINUED

UNISEL



History

Unisel began as a joint venture between Union Corporation and African Selection Trust in 1972, following a drilling programme conducted between the Sand River and the President Brand mine. Site preparation and shaft sinking began in 1974 and production in 1979. With the amalgamation of Union Corporation and General Mining, Unisel continued operations under Gencor and then Gengold. In 1995, Randgold purchased Unisel from Gengold. When Randgold split, Unisel became part of the Harmony stable of mines.

Nature of the operation

Unisel is a mature, underground, single-shaft mine, operating at depths from 1 100m to 2 200m below surface. Mining operations are scattered and, due to the age of the shaft and the extent of mining, lie 2km to 4km from the shaft.

Geology

Unisel mines gold-bearing reefs from the Witwatersrand Super Group, which is on the Kaapvaal Craton. The mine lies in the Free State goldfields, on the south-western edge of the Witwatersrand Basin. The Basal Reef is the main economic horizon in the Unisel area. The Basal Reef occurs at the base of the Harmony Formation and overlies the footwall beds (Welkom Formation) with marked unconformity. This erosional unconformity cuts progressively deeper into the footwall when traced from north to south.

Structurally, the sedimentary package mined at Unisel strikes north-south and dips to the east ranging from 25 to 40 degrees. Faulting consists predominantly of north-south trending normal faults dipping to the west with a right lateral displacement. The most significant is the Stuurmanspan Fault of about 800m and the Unisel Fault of 110m. West-east trending thrust faults cut through the property.

Igneous intrusions, in the form of dykes and sills, are present with the sill sub-parallel to the Basal and Leader reefs which affects mining operations with the reef horizon being split by the sill.

Mineral rights and tenure

Unisel has mining rights on the farms Jurgaenhof 490, Tarka 656 and Vermeulens Kraal Noord 480. These mining rights are registered as new order mining rights. The extent of the area covered by the mining rights is 3 095.54 hectares

Mining methods and mine planning

Mining operations take place from 2 level to 13 level, mainly by means of breast panel mining. Limited down-dip panels and wide raises are undertaken periodically. Footwall development comprises haulages and crosscuts with serviceways and ore passes to access the reef horizons. Face length cannot exceed 30m and strike pillars are left as support between the panels.

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – FREE STATE (UNISEL) CONTINUED

Extraction of the higher-grade portions of the shaft pillar is continuing. This ground will be extracted by means of breast panel mining, as described above. The mine has a remaining operating life of one year.

Mineral processing

Unisel does not have its own mineral processing plant. Ore mined is transported by rail for 8km to the Harmony One plant for processing. This is a centrally located plant used by other Harmony mines in the Free State.

Infrastructure

The Unisel complex comprises a steel headgear with a collar elevation of 496m below datum, giving access to workings from 2 level (at 1 655m below datum) to 10 level (2 375m below datum). A decline shaft from 10 level to 13 level at 2 641m below datum gives access to the lowest shaft levels.

The shaft has a second outlet to Bambanani to the north at 10 level. Other holings to adjacent mines lead to the old Brand 5 shaft on 4 level.

Mineral resource estimation

The estimation method used, for local measured estimates on the shaft, is ordinary kriging and, for local indicated estimates, simple macro kriging. Estimates are generally kriged into 30m x 30m blocks for the measured resources from the point support data. The indicated resources are kriged into 60m x 60m blocks, using the associated regularised variograms together with a macro kriging declustered. Geozones are based on grade distribution to ensure correct grade estimates are done for each area.

Environmental impact

Unisel environmental aspects and impacts are managed in terms of the environmental management programme, approved by the Department of Mineral Resources in line with the Mineral and Petroleum Resources Development Act, and documented in the approved environmental management programme report and the environmental aspect register, as required by the Mineral and Petroleum Resources Development Act and ISO 14001:2004 standard.

Annual performance monitoring and audits are conducted by the Department of Mineral Resources to verify compliance with the following legislation:

- Mine Health and Safety Act
- National Water Act
- National Environmental Management Act
- Mineral and Petroleum Resources Development Act

All environmental impacts emanating from mining activities are managed in terms of the environmental management programme and ISO 14001:2004 requirements.

Free State

Unisel

MATERIAL RISKS

Material risks that may impact Unisel's resource and reserve statement

SIGNIFICANT RISKS	REMEDIAL ACTION
• Scaling of shaft ore pass system	• Maintain waste and reef systems
• Aged shaft infrastructure and equipment	• Schedule preventative maintenance and repairs
• Scattered mining and environmental risks (ventilation)	• Establish dedicated return airways

COMPETENT PERSON

Ore Reserve manager

Fhulufhelo Olga Muthelo

BSc (Hons), Postgraduate Diploma in Engineering, SACNASP

12 years' experience in Witwatersrand gold mining.

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – FREE STATE (UNISEL) CONTINUED

UNISEL

Gold – Mineral resource estimates at 30 June 2019

	Measured resources				Indicated resources				Inferred resources				Total mineral resources			
	Tonnes		Gold		Tonnes		Gold		Tonnes		Gold		Tonnes		Gold	
	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)
Unisel	0.6	8.22	5	156	0.2	8.62	2	53	–	–	–	–	0.8	8.32	6	209

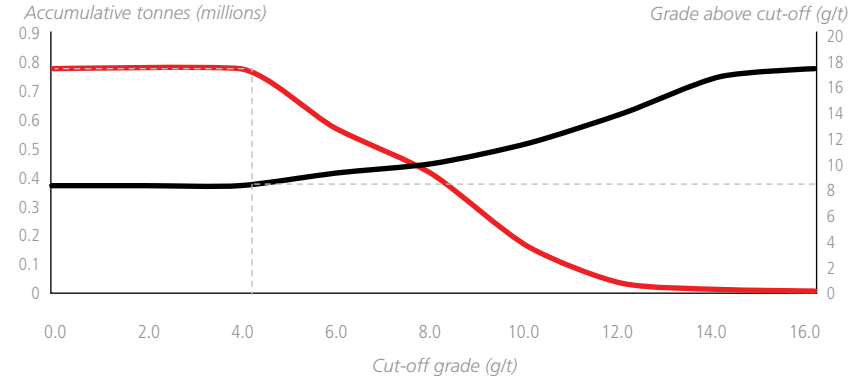
Modifying factors

Unisel	MCF (%)	SW (cm)	MW (cm)	PRF (%)	Cut-off (cmg/t)
2018	71	176	185	96	974
2019	71	200	211	96	1 163

Gold – Mineral reserve estimates at 30 June 2019

	Proved reserves				Probable reserves				Total mineral reserves			
	Tonnes		Gold		Tonnes		Gold		Tonnes		Gold	
	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)
Unisel	0.2	4.81	1	29	0.1	4.13	0.2	7	0.2	4.65	1	36

UNISEL:
Basal Reef
Measured and indicated resource grade-tonnage curve



Unisel

MINERAL RESOURCES AND RESERVES BY OPERATION

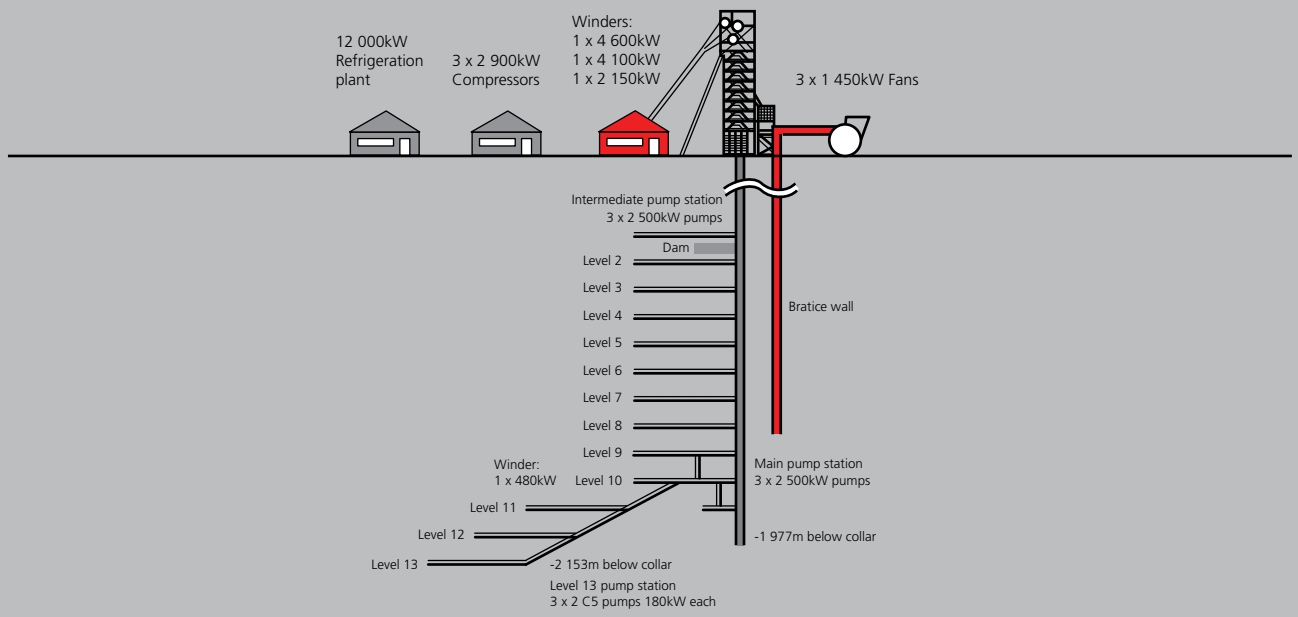
SOUTH AFRICA – FREE STATE (UNISEL) CONTINUED

OPERATIONAL PERFORMANCE

Unisel: Key operating statistics

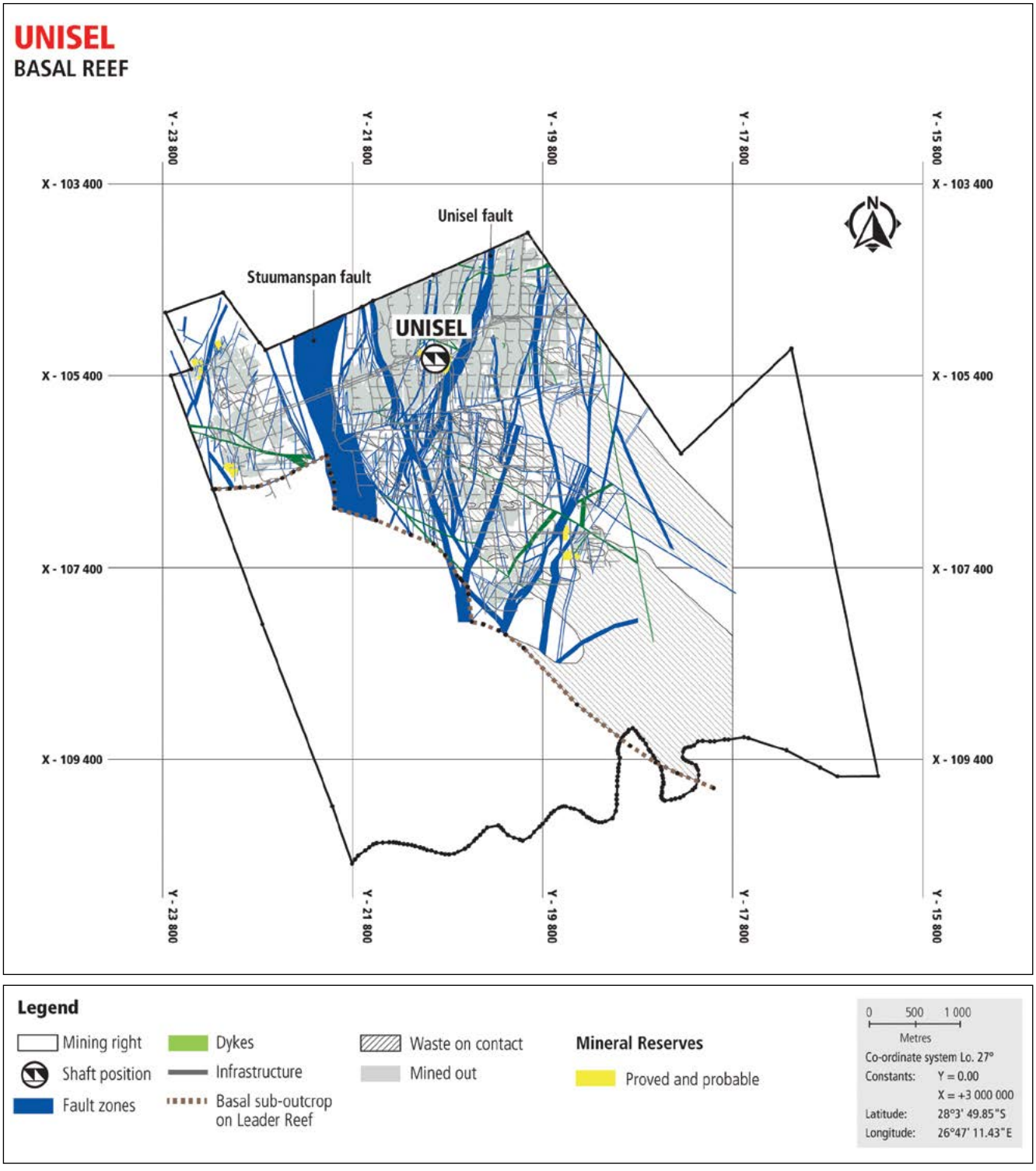
	Unit	FY19	FY18	FY17	FY16	FY15
OPERATION						
Volumes milled	000t (metric)	**256**	376	394	424	417
	000t (imperial)	**283**	415	436	467	460
Gold produced	kg	**1 212**	1 280	1 595	1 704	1 695
	oz	**38 966**	41 152	51 280	54 785	54 495
Grade	g/t	**4.73**	3.40	4.05	4.02	4.06
	oz/t	**0.138**	0.099	0.118	0.117	0.118
DEVELOPMENT						
Total metres (excl. capital metres)		**2 035**	2 921	3 647	3 145	5 177
Reef metres		**1 177**	1 325	1 575	1 917	2 816
Capital metres		**0**	1 028	0	0	0
FINANCIAL						
Average gold price received	R/kg	**590 468**	576 222	575 650	542 487	449 082
	US$/oz	**1 295**	1 395	1 317	1 164	1 220
Capital expenditure	Rm	**45**	85	78	62	99
	US$m	**3**	7	6	4	9
Cash operating cost	R/kg	**469 108**	604 311	525 732	442 359	397 615
	US$/oz	**1 029**	1 463	1 203	949	1 080
All-in sustaining cost	R/kg	**523 823**	678 436	591 913	496 099	469 246
	US$/oz	**1 149**	1 642	1 354	1 064	1 275

Unisel: Schematic of shaft and mining layout



MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – FREE STATE (UNISEL) CONTINUED



Unisel

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – FREE STATE

CONTINUED

JOEL

History

Active prospecting in the area began on the farms Leeuwbult 580 and Leeuwfontein 256 in 1981. Construction of the twin shaft system began in September 1985 and was completed by December 1987. Joel South was designed to be a fully trackless mining operation. Previously known as HJ Joel, the mine's name changed to Joel in 1998 when the then AngloGold Ltd was established. The mine's name was later changed to Taung in 1999, reverting to Joel in January 2002 when the Freegold joint venture between Harmony and ARMgold assumed responsibility for the operation.

Nature of the operation

Joel consists of two interconnected shaft complexes: the south shaft complex, which is currently in operation, and the north shaft complex.

The south shaft complex has two shafts, namely 3 shaft (men and material) and 4 shaft (mineral, ventilation and services). This shaft system was sunk beyond the reef sub-outcrop and is located on the southern extremity of the orebody. These two shafts go down to 1 050m below collar and cover four levels, namely 60 and 70 levels (which are mined-out trackless levels), 90 level, which is the main transfer level, and 95 level, which houses the pumping and loading facilities.

The north shaft complex is a single-shaft system, sunk and lined to 1 471m below collar, but not yet equipped to hoist people. Feasibility studies were conducted in 2005 to determine whether this shaft could assist in extending Joel's life of mine by opening up 129 level. This shaft was upgraded in February 2006 to enable hoisting of ore through the north shaft barrel. Hoisting was halted in March 2007, owing to the deteriorating shaft infrastructure. The shaft has since been re-equipped to hoist ore and acts as a second outlet for the mine. A short one-compartment lift shaft from 110 level gives access to 121 level. The single drum winder at this level is used to transport men and material down to 121 level and for hopper hoisting of development and some stoping ore. The lift shaft has since been deepened to access 129 level. The lift shaft will service men and material only whereas the north shaft will be dedicated to hoisting ore.

The two shaft complexes (north and south) are connected via a triple decline system, spanning four levels and consisting of an approximately 1 600m belt decline (decommissioned), a chairlift decline to 110 level and two material declines in tandem down to 117 level. The decline levels are 98, 104, 110 and 117 with the last two connected to the north shaft. Although they share a boundary, there are no holing connections between Joel and Beatrix.

Joel currently has a life-of-mine expectancy of nine years. This includes mining up to 137 level and the Beatrix block swop.

To access the orebody from 137 level, two declines are being developed at 12° from 129 level – a chairlift decline and a conveyor belt decline. Primary footwall development is currently underway on 137 level.

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – FREE STATE (JOEL) CONTINUED

Mineral rights/legal aspects and tenure

The current mining right, encompassing an area of 2 355.8ha, was successfully converted, executed and registered as a new order mining right at the Mineral and Petroleum Resources Titles Office on 6 August 2010 under 73/2010MR. The right was granted on 3 December 2007 for a period of 11 years, ending on 2 December 2018. The right has been successfully renewed in terms of Section 24 (1) of the Mineral and Petroleum Resources Development Act for a further 11 years, ending on 14 February 2030.

Geology

The main structures at Joel are associated with the Platberg Extensional event. These faults are north-south striking, steeply dipping and typically have downthrows to the east in the order of 10m to 100m. These downthrows form a graben against the De Bron Fault, which has a 450m upthrow to the east. East of the De Bron Fault, the reef has been truncated/eroded against the Karoo Supergroup.

Minor east-west striking faults are also present. However, displacements on these faults are generally less than 10m, which are believed to be Klipriviersberg in age. Low angle reverse faulting is also present. These structures trend north-south, have small displacements and dip towards the east. These structures may be related to the central Rand Contractional event.

The Klippan Formation has been preserved as an east-west trending erosional channel that has eroded deeply through the Witwatersrand sediments and has eliminated the Beatrix/VS5 horizon in the eastern portion of the mine and cut out a significant chunk in an east west direction through the middle of the lease area. Regionally the Klippan Formation is preserved in the north-south striking basin, known as the Virginia Basin in the Southern Free State, which parallels the De Bron Fault.

A deep erosional channel of Platberg Group volcano-sedimentary rock, known as the Klippan Channel, truncates the Beatrix Reef some 1.8km to the north of south shaft. This washout feature is wedge-shaped with its apex to the west and widens to the east.

The estimated dimension from the apex to the eastern property boundary is approximately 1.8km. The reef has been shown to be continuous to the north of this feature.

Where unaffected by the Klippan Channel, the reef is bound to the east by the De Bron Fault, which strikes north-north-east. The CD Fault, which strikes north-east and is roughly halfway between the two shafts and has a 320m sinistral lateral displacement, which has moved ground south of the fault towards the north-east.

The complex nature of the reef has resulted in a highly irregular distribution of gold throughout the mining area. There are broad low- and high-grade zones over hundreds of metres, which are considered likely to be repeated within the reef environment beyond the limits of the current development. However, the detailed grade distribution within these zones remains very unpredictable.

For the purposes of resource estimation, a detailed facies model is used and is based on detailed sedimentological observations.

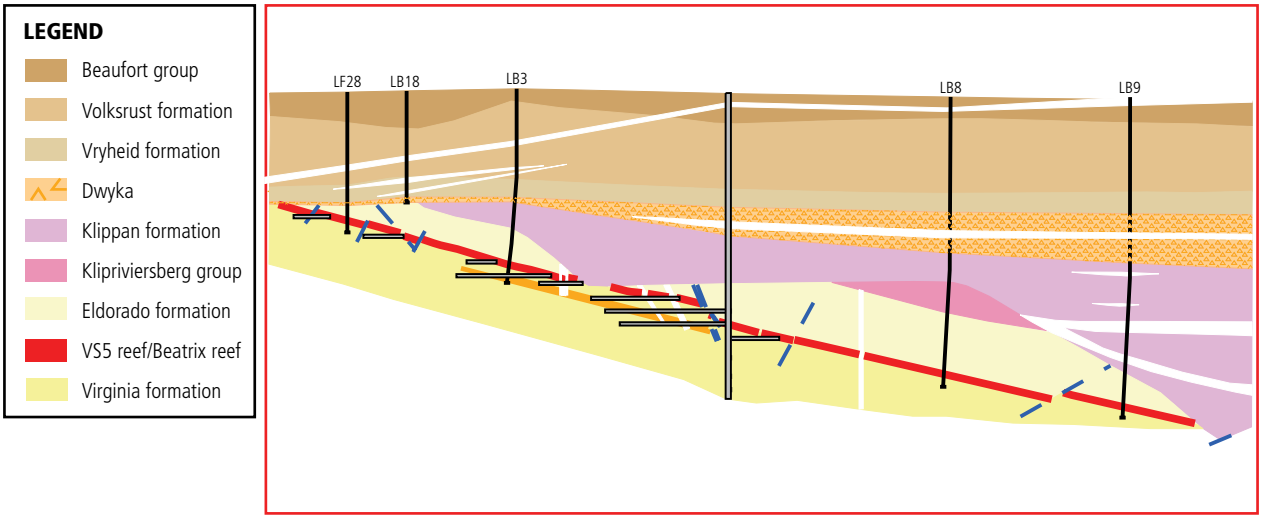
Mining methods and mine planning

Joel operates at an intermediate mining depth and the mining method is tailor-made for the variable grades intersected as well as the associated rock-related hazards anticipated at this depth.

Given the variable grades as well as geological complexity, mining is conducted mainly in terms of a pre-developed scattered mining system. This system allows for unpay and geologically complex areas to be left unmined with some cognisance taken of the overall panel configuration and stability of footwall development. This allows for selective mining, based on the proven ore reserve during the development phase.

JOEL

Geological section looking west – not to scale



MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – FREE STATE (JOEL) CONTINUED

In addition, the stability of stoping panels in an intermediate stress environment may require that additional stabilising pillars is left to support the immediate hangingwall. These take the form of inter-panel crush pillars between neighbouring mining panels. The major rock-related risk is the occurrence of unexpected panel collapses.

Minor falls of ground, due to geology, bedding, shale and jointing, do occur but are mostly addressed via a proven in-stope support system. As the largest portion of Joel's production is currently mined between 129 and 137 levels, production is focused mainly on five or six raise lines.

In addition, as mining has advanced into more complex geological areas, dip- and strike-related structures are more commonly intersected. The change to a higher support resistance system, given the intersection of a more complex geological environment, has been largely successful and the occurrence of large geological "back breaks" and falls of ground are rare. Timber-based packs were installed along gullies and as breaker line support in panels to improve hangingwall stability. From a management perspective, it is of utmost importance that geological structures are reported, mapped and properly supported using high-support resistance pack units to ensure a stable stoping horizon.

With the marginal increase in depth and the more complex geological environment, the incidence of low magnitude (<1.5) seismic events has slowly increased. This activity has manifested mainly in reasonably low stress (45Mpa) strike-orientated dyke intersections with stoping excavations. The installation of a 10-station regional seismic network to highlight potentially unstable areas and structures prone to bursting was completed with the seismic data used to highlight potential problem areas. The seismic network is maintained and its operational and health status are kept well above the 80% mark.

Mineral processing

Mined ore is transported by road for processing at the Harmony 1 carbon-in-pulp plant, which is situated some 40km from the shaft.

Infrastructure

Joel's upper mining levels are in a mature phase of operation. The decline project development, from 129 to 137 levels, which started in 2011, is scheduled for completion in 2019. Holing of the 137 level E5 raise is expected to be completed in January 2020. Production below the 129 level step over is currently underway.

Mineral resource estimation

The method used to estimate local measurements on the shaft is ordinary kriging and, for local indicated and inferred estimates, simple macro kriging is used. Estimates are generally kriged into 30m x 30m blocks for measured resources from the point support data. Indicated resources are kriged into 60m x 60m blocks, using associated regularised variograms together with a macro kriging decluster.

Similarly, inferred mineral resources are estimated using associated regularised variograms and kriging into 120m x 120m blocks. Any un-kriged areas in the inferred regions are then covered by global mean estimates. Geozones are based on grade distribution to ensure correct grade estimates are conducted for each area.

Environmental impact

Environmental aspects and impacts at Joel are managed in terms of an environmental management programme, as approved by Department of Mineral Resources, and in line with the Mineral and Petroleum Resources Development Act. All environmental aspects and impacts emanating from mining activities are documented in the associated environmental management programme report and the environmental aspect register as required by the Mineral and Petroleum Resources Development Act and the ISO 14001:2004 standard.

Annual performance monitoring and audits are conducted by the Department of Mineral Resources to verify compliance with the following legislation:

- Mine Health and Safety Act
- National Water Act
- National Environmental Management Act
- Mineral and Petroleum Resources Development Act

All environmental impacts emanating from mining activities are managed in terms of the environmental management programme and ISO 14001:2004 requirements.

Environmental audits or performance assessments are conducted by independent environmental consultants every second year to verify compliance with Joel's approved environmental management programme, as required by Regulation 55 of the Mineral and Petroleum Resources Development Act, and the report is submitted to the Department of Mineral Resources. In addition, an internal environmental legal compliance audit is conducted to verify compliance. An online environmental legal register is maintained at *www.drayer-legal.co.za* to monitor compliance and to provide applicable and relevant environmental legal updates for the operation.

Bio-monitoring surveys are also conducted on surface water streams close to the operation in compliance with draft water use licence conditions and the National Water Act to:

- determine the condition of biological communities as well as the chemical water quality in rivers and streams during the wet seasons
- provide baseline reference conditions for future studies in order to assist Joel mine management in identifying environmental liabilities relating to the potential contamination of surface streams resulting from current mining activities

The operation is ISO 14001 accredited and conforms with the requirements of the ISO 14001: 2004 standard for which it is audited annually. Joel is also accredited in line with the International Cyanide Management Code, initially in 2010 and most recently on 1 February 2017. Joel is committed to eliminating and/or minimising the effects of mining activities on the environment and adjacent communities.

Joel

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – FREE STATE (JOEL) CONTINUED

MATERIAL RISKS

Material risks that may impact Joel's resource and reserve statement

SIGNIFICANT RISKS

- Flooding of 145 level (shaft bottom)
- Lack of mining flexibility

REMEDIAL ACTION

- Installation of second submersible pump as a standby
- Clean up of dam on 145 level
- Prioritising development and construction of decline project

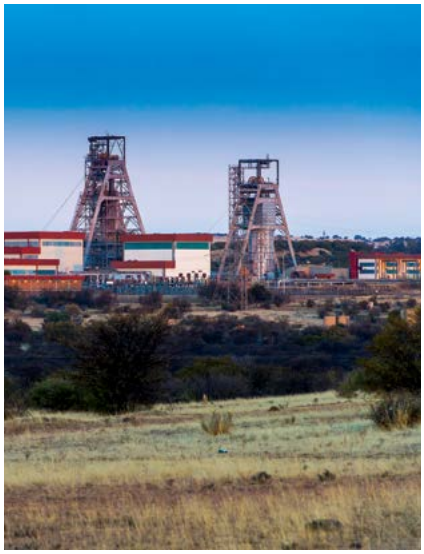
COMPETENT PERSON

Ore Reserve manager

Deon Lodder

Professional Mine Surveyor (PMS 0169 – PLATO), Business Management and Leadership Degree (UFS), Mine Surveyor's Certificate of Competency: National Higher Diploma – Mine Surveying, NTC 6 – Civil Engineering, Mine Manager's Certificate of Competency

33 years' experience in gold mining.



Joel

JOEL

Gold – Mineral resource estimates at 30 June 2019

	Measured resources				Indicated resources				Inferred resources				Total mineral resources			
	Tonnes		Gold		Tonnes		Gold		Tonnes		Gold		Tonnes		Gold	
	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)
Joel	4.1	7.69	32	1 019	3.9	8.29	32	1 040	7.1	5.18	37	1 190	15.2	6.66	101	3 249

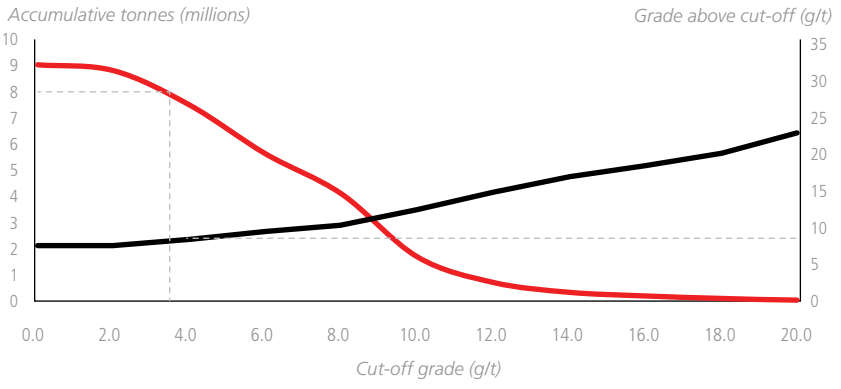
Modifying factors

Joel	MCF (%)	SW (cm)	MW (cm)	PRF (%)	Cut-off (cmg/t)
2018	84	163	187	95	792
2019	84	170	191	96	803

Gold – Mineral reserve estimates at 30 June 2019

	Proved reserves				Probable reserves				Total mineral reserves			
	Tonnes		Gold		Tonnes		Gold		Tonnes		Gold	
	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)
Joel	2.9	4.95	15	468	1.4	4.87	7	225	4.4	4.93	22	693

JOEL:
Beatrix Reef
Measured and indicated resource grade-tonnage curve



MINERAL RESOURCES AND RESERVES BY OPERATION

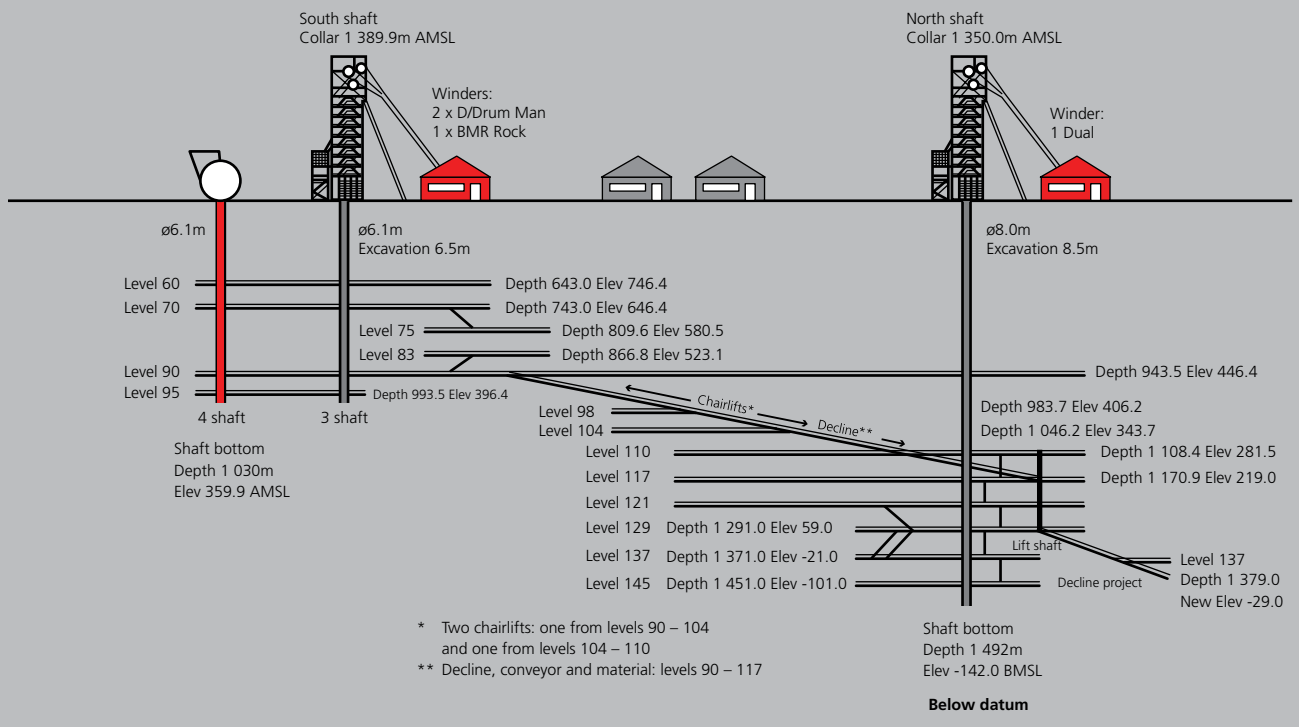
SOUTH AFRICA – FREE STATE (JOEL) CONTINUED

OPERATIONAL PERFORMANCE

Joel: Key operating statistics

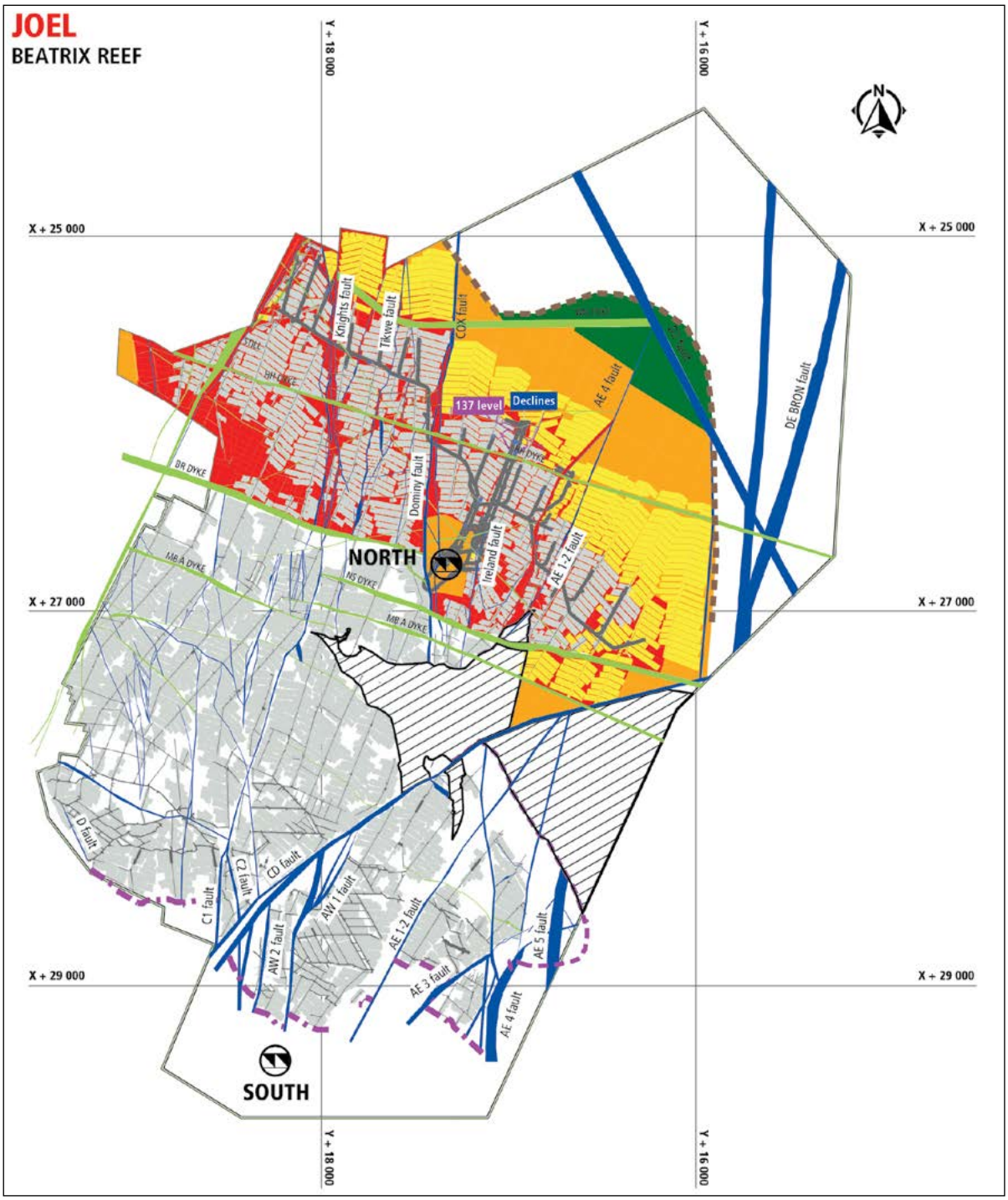
	Unit	FY19	FY18	FY17	FY16	FY15
OPERATION						
Volumes milled	000t (metric)	**429**	454	514	542	551
	000t (imperial)	**473**	501	567	597	607
Gold produced	kg	**1 567**	1 635	2 246	2 278	2 258
	oz	**50 379**	52 566	72 211	73 239	72 596
Grade	g/t	**3.65**	3.60	4.37	4.20	4.10
	oz/t	**0.107**	0.105	0.127	0.123	0.119
DEVELOPMENT						
Total metres (excl. capital metres)		**3 378**	3 331	3 477	3 541	3 200
Reef metres		**1 288**	431	1 596	2 315	1 037
Capital metres		**0**	620	532	485	338
FINANCIAL						
Average gold price received	R/kg	**593 531**	576 023	573 986	543 442	449 026
	US$/oz	**1 302**	1 394	1 313	1 166	1 220
Capital expenditure	Rm	**187**	250	243	215	182
	US$m	**13**	19	18	15	16
Cash operating cost	R/kg	**617 116**	556 468	413 088	371 080	334 168
	US$/oz	**1 354**	1 347	945	796	908
All-in sustaining cost	R/kg	**701 644**	661 921	477 484	424 617	384 022
	US$/oz	**1 539**	1 602	1 092	911	1 043

Joel: Schematic of shaft and mining layout



MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – FREE STATE (JOEL) CONTINUED



Legend

- Mining right
- Shaft position
- Klippan erosion channel
- Fault zones
- Dykes
- Beatrix sub-outcrop against Karoo supergroup
- Bearix sub-outcrop on VS5
- Mined out
- Infrastructure

Mineral Resources

- Measured
- Indicated
- Inferred

Mineral Reserves

- Proved and probable

0 500 1 000
Metres

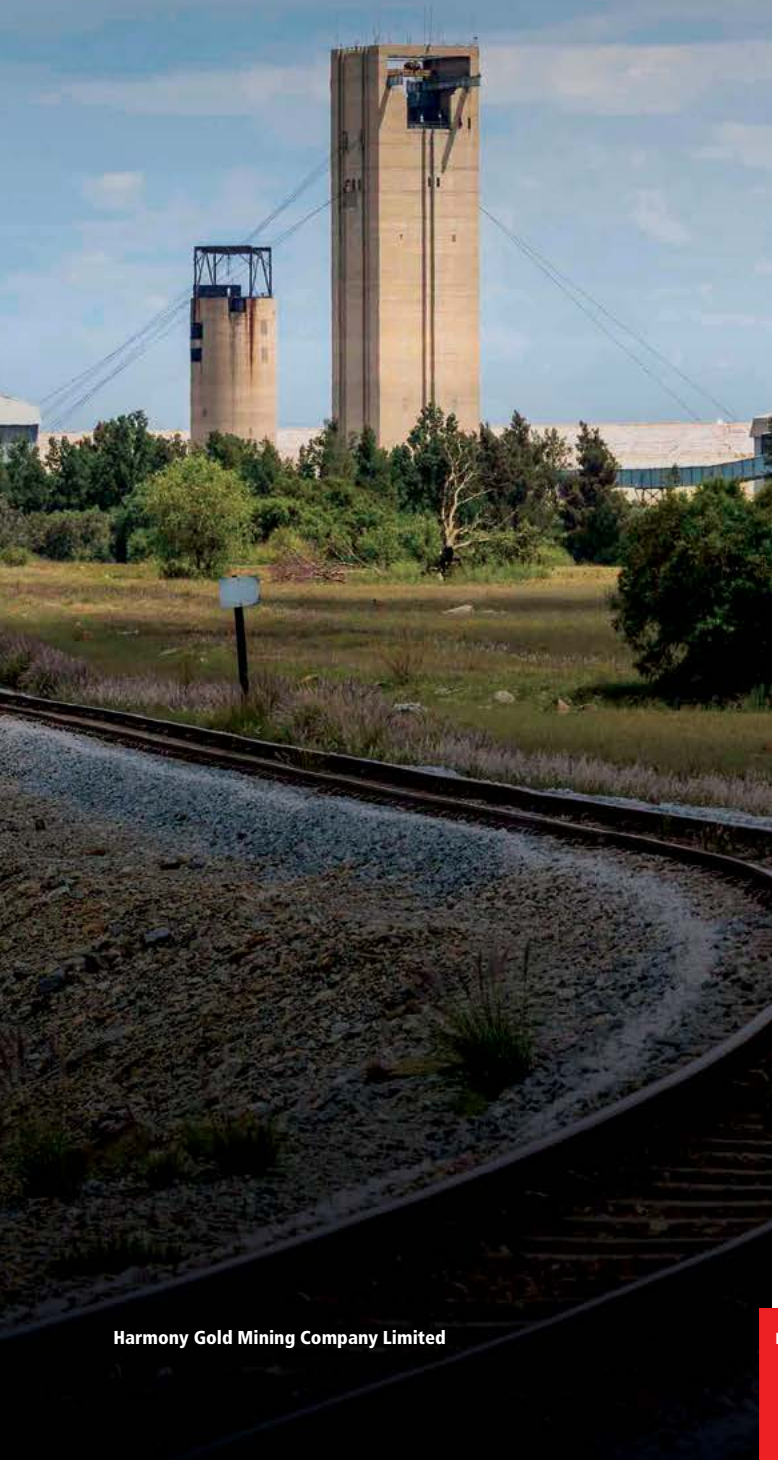
Co-ordinate system Lo. 27°
Constants: Y = 0.00
X = +3 100 000.00
Latitude: 28°16' 17.19"S
Longitude: 26°48' 57.97"E

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – FREE STATE

CONTINUED

MASIMONG



History

Masimong was originally known as Erfdeel when it was sunk by Anglo American's Gold and Uranium Division in 1985. Harmony purchased Saaiplaas 3 from Anglo American in March 1997 and the two Erfdeel shafts in September 1998, which were renamed Saaiplaas 4 and 5. After the closure of Saaiplaas 3 in early 1998, following the collapse of the gold price, an opportunity arose to re-open the entire shaft complex, comprising the Saaiplaas 4 and 5 shafts, in September 1998 when it was renamed Masimong.

Masimong 5 shaft (formerly Saaiplaas 5), the youngest of the shafts, was sunk in 1985. Reef and waste ore was transported via a twin haulage system to Masimong 4 (Saaiplaas 4) until September 2001, when equipping of the reef and waste-hoisting infrastructure was completed at 5 shaft. Mining operations at Masimong 4 and Saaiplaas 3, which had been sunk in 1981 and 1976 respectively, subsequently ceased as they were no longer economically viable. When hoisting operations began at Masimong 5 shaft, Masimong 4 was downscaled to a service and small-scale mining shaft in the quarter ended 30 June 2001.

By 30 June 2002, prevailing market conditions had improved and mining at Masimong 4 was once again economically viable. Additional personnel were redeployed to develop and access new areas of Masimong 4 to facilitate future production. Extraction of the Saaiplaas 3 shaft pillar was terminated due to technical difficulties. Subsequently, in June 2004, operations at Masimong 4 were also rationalised. The shaft is currently used solely for pumping.

During FY12, a bulkhead water plug was installed to seal off Saaiplaas 3 from the rest of the Masimong complex. The shaft was then abandoned due to flooding. Operations at Masimong 5 remain susceptible to changes in the gold price as it is one of the lowest average mining grade underground operations still in production on the Witwatersrand Basin.

Nature of the operation

Masimong is a single-shaft operation, which exploits two reef horizons, the Basal and B reefs at 1 650m to 2 010m below surface. The Basal and B reefs are narrow tabular bodies, which are mined by means of conventional open stoping.

Mineral rights, legal aspects and tenure

The current mining right, encompassing an area of 22 582.99ha, was successfully converted, executed and registered as a new order mining right at the Mineral and Petroleum Resources Titles Office on 11 December 2007 (Department of Mineral Resources Reference FS30/5/1/2/2/82MR valid from 11 December 2007 to 10 December 2029).

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – FREE STATE (MASIMONG) CONTINUED

Geology

Mining takes place in a structurally complex zone between two major north-south trending faults: the De Bron/Homestead Fault in the west and the Saaiplaas Fault in the east. The orebody has been subjected to severe deformation and contains numerous folds (anticlines and synclines) as well as an abundance of smaller faults.

The dip of the reef bands is very variable – from 45 degrees to the east, adjacent to the western side of the lease, to less than two degrees in parts of the southern area.

Production is hosted within two quartz pebble conglomerate bodies, developed above unconformity surfaces, termed reefs, the Basal and the B reefs. Approximately 80% of the centares (1 centare = 1 square metre) are from the Basal Reef horizon and 20% from the B Reef horizon.

Mining methods and mine planning

Masimong mines at moderate depths of between 1 650m and 2 010m below surface. The reef horizon is accessed by means of conventional grid development. The Basal Reef accounts for approximately 80% of the on-reef production profile, and is mined as open and undercut operations, depending on whether the reef is overlain by shale. B Reef mining makes up the remaining 20% of the on-reef production profile. It is located approximately 120m stratigraphically above the Basal Reef, which necessitates separate infrastructure (footwall development).

The presence of the upper shale marker, approximately 20m thick below the B Reef, strains the development rates of the B Reef, requiring drop raising for holing on all boxholes. In addition, all on-reef development must be conducted by means of wide raising. Despite the marginality of the orebody and the current economic environment, current mine reserves give a life expectancy of three years, mainly due to the successful opening of known value trend extensions.

Mineral processing

The ore mined is transported by rail for processing at the Harmony One carbon-in-pulp plant, situated some 12km from the shaft.

Infrastructure

Surface infrastructure includes a well-established network of paved roads and railway lines as well as a water pipeline and electrical lines to supply and deliver the materials required and to transport the ore hoisted to the Central gold plant for treatment.

The underground infrastructure is that of a mature, low-cost mining operation approaching the end of its economic life. The only undeveloped area of any economic significance lies to the south and south-east of the shaft in ground formerly located within the Masimong 4 shaft area.

Mineral resource estimation

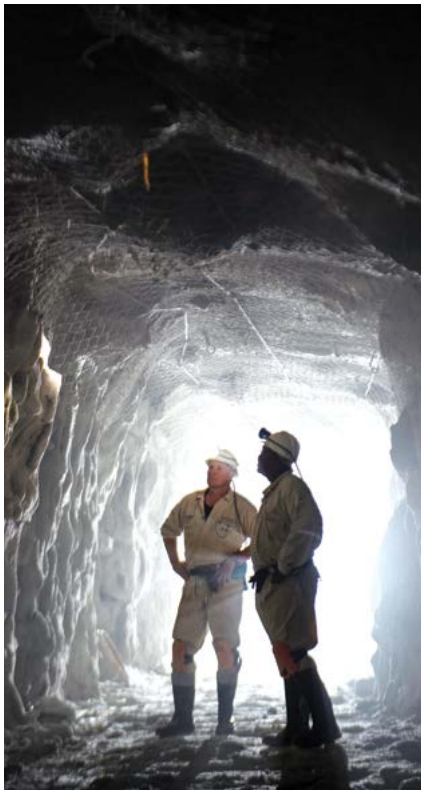
The estimation method used for local measured data on the shaft is ordinary kriging and, for local indicated and inferred estimates, simple macro kriging. Estimates are generally kriged into 30m x 30m blocks for measured resources from the point support data. Indicated resources are kriged into 60m x 60m blocks, using associated regularised variograms together with a macro kriging decluster. Similarly, inferred resources are estimated using the associated regularised variograms and kriging into 120m x 120m blocks. Geozones are based on grade and facies distribution to ensure correct grade estimates are calculated for each area.

Environmental impact

Masimong's environmental aspects and impacts are managed according to the environmental management programme approved by the Department of Mineral Resources in terms of the Mineral and Petroleum Resources Development Act. All environmental aspects and impacts emanating from mining activities are documented in the approved environmental management programme and the environmental aspect register, as required by the Mineral and Petroleum Resources Development Act and the ISO 14001:2004 standard.

Annual performance monitoring and audits are conducted by the Department of Mineral Resources to verify compliance with the following legislation:

- Mine Health and Safety Act
- National Water Act
- National Environmental Management Act
- Mineral and Petroleum Resources Development Act



Masimong

Masimong

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – FREE STATE (MASIMONG) CONTINUED

Environmental management programme and ISO 14001:2004 requirements

Environmental audits or performance assessments are conducted annually by independent environmental consultants to verify compliance with the approved environmental management programme, as required by Regulation 55 of the Mineral and Petroleum Resources Development Act, and the report is submitted to the Department of Mineral Resources. In addition, an internal environmental legal compliance audit is conducted to verify compliance. An online-based Masimong environmental legal register (at *www.dreyer-legal.co.za*) is used to monitor compliance, and to provide applicable and relevant environmental legal updates.

Biomonitoring surveys are also conducted on surface water streams close to the operation, in compliance with the draft water use licence conditions and the National Water Act, in order to:

- determine the condition of the biological communities in rivers through indices such as SASS5, IHAS (Version 2.2) and IHIA, and to determine the chemical water quality in the streams during the wet seasons
- provide baseline reference conditions for future studies in order to assist Masimong management in identifying environmental liabilities resulting from actions of current mining activities in respect of potential contamination of surface streams

The operation is ISO 14001-accredited and conforms with the requirements of the ISO 14001:2004 standard. It is audited annually as per ISO 14001 requirements. The operation was accredited in 2012 and remains committed to eliminating or minimising the effects of mining activities on the environment and adjacent communities.

MATERIAL RISKS

Material risks that may impact Masimong's resource and reserve statement

SIGNIFICANT RISKS	REMEDIAL ACTION
• Adverse changes in the gold price	• Open up the high-grade Basal Reef area, pillars and B Reef value zones as replacement ground
• Unexpected geological features	• Extensive exploration drilling from underground platforms
• Unexpected decline in value/grade	• Extensive exploration drilling to confirm grade trends ahead of extraction and to reduce external factors causing dilution

COMPETENT PERSON

Evans Malaola
MSCC, NHD Mineral Resource Management, Plato PMS 0196
34 years' experience.

Ore Reserve manager

Lana Cousin-Forster
B.Sc (Hons) Geology
17 years' relevant experience.

Masimong

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – FREE STATE (MASIMONG) CONTINUED

MASIMONG

Gold – Mineral resource estimates at 30 June 2019

	Measured resources				Indicated resources				Inferred resources				Total mineral resources			
	Tonnes		Gold		Tonnes		Gold		Tonnes		Gold		Tonnes		Gold	
	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)
Masimong	2.4	8.55	21	659	0.3	7.86	3	84	–	–	–	–	2.7	8.47	23	743

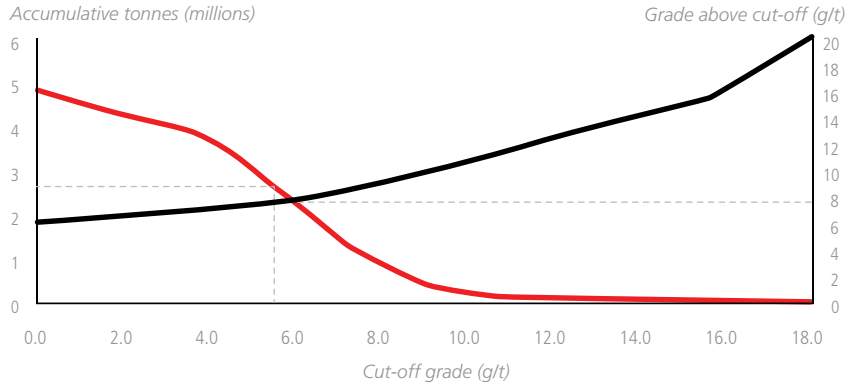
Modifying factors

Masimong	MCF (%)	SW (cm)	MW (cm)	PRF (%)	Cut-off (cmg/t)
2018	69	138	153	96	883
2019	61	140	152	96	973

Gold – Mineral reserve estimates at 30 June 2019

	Proved reserves				Probable reserves				Total mineral reserves			
	Tonnes		Gold		Tonnes		Gold		Tonnes		Gold	
	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)
Masimong	0.6	4.37	3	88	0.04	3.53	0.1	4	0.7	4.33	3	93

MASIMONG:
Basal Reef
Measured and indicated resource grade-tonnage curve



Masimong

MINERAL RESOURCES AND RESERVES BY OPERATION

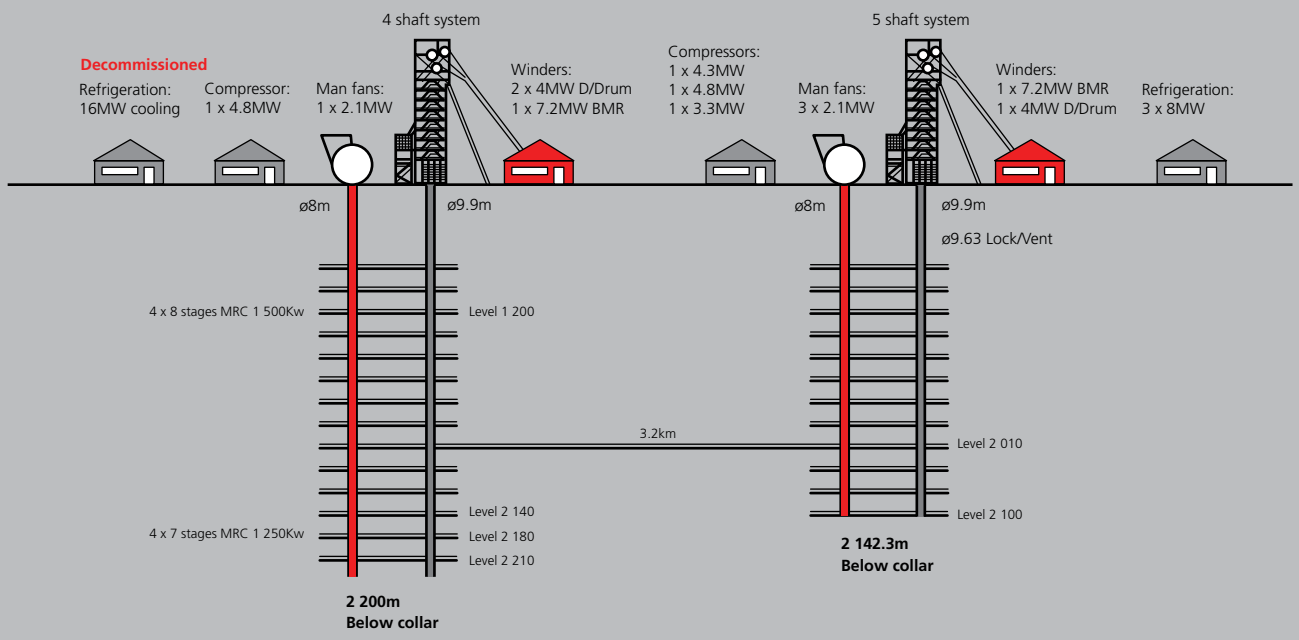
SOUTH AFRICA – FREE STATE (MASIMONG) CONTINUED

OPERATIONAL PERFORMANCE

Masimong: Key operating statistics

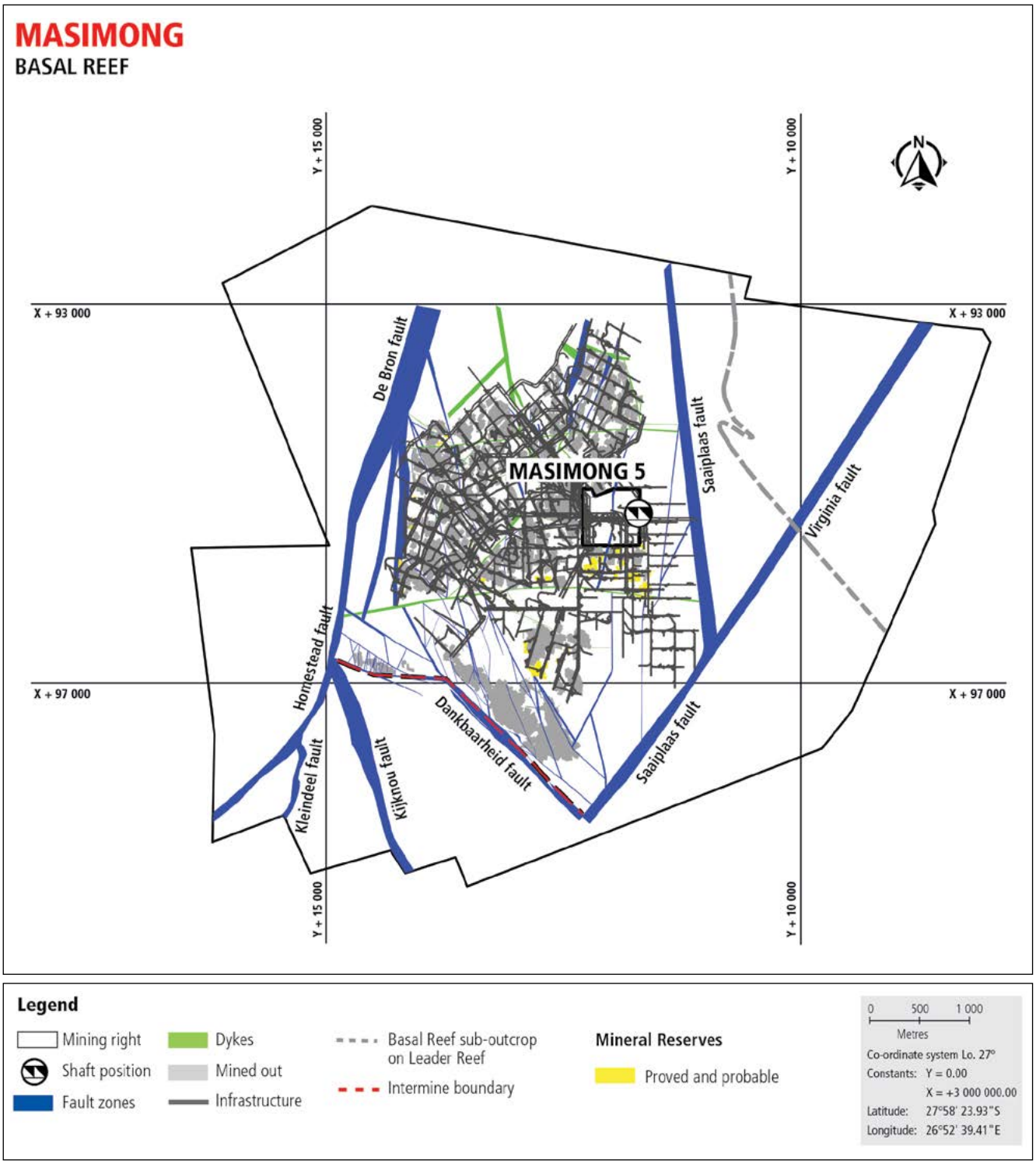
	Unit	FY19	FY18	FY17	FY16	FY15
OPERATION						
Volumes milled	000t (metric)	**602**	647	640	650	670
	000t (imperial)	**664**	714	706	716	739
Gold produced	kg	**2 309**	2 623	2 538	2 432	2 463
	oz	**74 237**	84 332	81 599	78 190	79 187
Grade	g/t	**3.84**	4.05	3.97	3.74	3.68
	oz/t	**0.112**	0.118	0.116	0.109	0.107
DEVELOPMENT						
Total metres (excl. capital metres)		**3 167**	5 287	4 754	4 755	9 855
Reef metres		**765**	2 067	1 054	1 549	2 376
FINANCIAL						
Average gold price received	R/kg	**593 003**	576 729	571 870	541 806	448 867
	US$/oz	**1 301**	1 396	1 308	1 162	1 220
Capital expenditure	Rm	**109**	129	119	110	166
	US$m	**8**	10	9	8	15
Cash operating cost	R/kg	**525 703**	442 586	439 457	426 904	397 380
	US$/oz	**1 153**	1 071	1 005	916	1 080
All-in sustaining cost	R/kg	**593 408**	513 197	500 938	493 527	479 096
	US$/oz	**1 302**	1 242	1 146	1 059	1 302

Masimong: Schematic of shaft and mining layout



MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – FREE STATE (MASIMONG) CONTINUED



MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – FREE STATE

CONTINUED

TARGET 1

Bambanani

History

Outcropping on the Target 1 property (originally Loraine) is an inlier of the Ventersdorp conglomerate (the Bothaville Formation). The similarity of these conglomerates to those of the Witwatersrand Sequence focused interest in this area and led to the discovery of the Free State goldfield. Prospecting on these conglomerates was first undertaken around 1890 via a vertical and incline shaft. The initial model for exploration north of the Loraine gold mine, which at the time was managed by Anglovaal Ltd, was proposed by DW Boshoff (chief geologist) in 1978. The Loraine gold mine held the mineral rights immediately to the north of the mine. The Target Exploration Company Ltd, a company formed by Anglovaal specifically for the purpose of exploration, later acquired this area. Options to mineral rights north of Target were acquired by Sun Mining and Prospecting Company (Pty) Ltd. Feasibly studies centred on Sun Concept Mine South (CMS). The formation of Avgold Ltd in 1996 was intended to further the gold mining and exploration interests of Anglovaal. Harmony acquired Target in 2002.

Nature of operation

The Target orebody is located some 5km to the north of the original Loraine 1 shaft and is accessed via a 6km-long 12-degree decline developed from 203 level of the vertical shaft system. Initially the decline was developed to provide a drilling platform for the exploration and evaluation of the orebody but was later used as the main access for all services, logistics, personnel and the extraction of ore.

The orebody is composed of some 67 individual conglomerates in the Uitkyk (Elsburg) and Van der Heeversrust (Dreyerskuil), members of the upper Eldorado (Elsburg) Formation. These reefs lend themselves to massive mining techniques where composited conglomerate units can be mined as one stope. These stopes are long-hole drilled and blasted, and tonnages are cleaned and transported by trackless machinery – some are operated remotely. Massive mining is particularly relevant where the reefs become condensed and steeper in the western portion of the orebody. Mining of the massives contributes most of total tonnes stoped. Massive stopes have to be mined in a sequence, broadly from down-dip to up-dip. Previously mined stopes are backfilled for support, and to address environmental and safety concerns.

Conventional narrow-reef scattered mining makes up the remaining stope tonnes mined where individual reefs are extracted in places where massive mining is inappropriate or uneconomical. Mine planning allows for the mining of certain stopes in the stratigraphically highest gold-bearing units to provide over-stoping for massive stopes to be mined in the future.

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – FREE STATE (TARGET 1) CONTINUED

Geology

Target is located on the western margin of the Achaean Witwatersrand Gold Basin, which is on the Kaapvaal Craton of South Africa. The sediments of the Central Rand Group occur within an oval-shaped basin, which has a 160km-long axis through the Welkom area and Johannesburg, and a short axis of about 80km. The Central Rand Basin is superimposed on the West Rand Group or Lower Witwatersrand Basin, which has a much larger aerial extent at the centre of the Kaapvaal Achaean Craton.

A thrust fault system has resulted in the post-depositional folding of the strata into a synclinal shape. This "border feature" is the western limit of the graben structure, some 10km wide, which hosts most of the Welkom gold mines. The eastern limit of this graben is the well-defined De Bron Fault. The Target 1 gold prospect is a northward continuation of the Free State goldfield.

The full potential of the Basal Reef, which produces 85% of the gold from this area, has yet to be established in the Target area because, given time constraints, initial drilling has focused on the shallower Elsburg and Kimberley reefs. The reefs in the Aandenk (Kimberley) Formation include the B Reef at the base, the Big Pebble Reef and the A Reef. The Eldorado (Elsburg) Formation is developed as a sequence of oligomictic auriferous conglomerates referred to as the EA Reefs, which have been mined extensively at the Loraine gold mine. The Elsburg reefs are overlain by a remnant of the diamictite facies of the south, termed the boulder beds at Lorraine. The reefs and associated quartzites represent alluvial sediment influx from a source area to the west. The distribution of gold mineralisation is clearly related to the sedimentology and this primary sedimentological control of gold distribution is understood. However, research has shown that some remobilisation of gold has taken place over small distances. This is not extensive enough to mask the sedimentary controls.

Mining methods and mine planning

Stoping methods employed are grouped as follows:

Long-hole stoping methods	
Massive open	Narrow-reef conventional
Wide open	

Development methods	
Drift and fill	Cut and fill
Drift and pillar	Narrow-reef

Massive open stoping

Massive open stoping is based on mining a large volume of ore at a low working cost. The proximity of the reefs in the sub-outcrop area allows for a combination of reefs to be mined using this method. The main fan massive open stopes are critical in the first three years of operation. The same principles and methodology are applied to areas where similar geology allows for mining of a massive stope.

Wide open stoping

The main focus area in the wide open stopes is the main fan block where two stoping areas will be mined. The stoping method involves an extraction process but the method can be applied to any block of similar dimensions (reef widths in excess of 10m and a dip in excess of 200m). The mining method has been designed to use the benefits of long-hole stoping methods and backfill.

Narrow-reef mining

The schedule indicates that 8% of the initial monthly tonnage is to be mined from the Dreyerskuil (DK1A, DK4 and DK9) reefs by means of conventional narrow-reef mining, which is essential as it must provide a destressed environment for the bulk of mechanised stoping. There is no practical and safer alternative to this method. The rate of overstoping must liberate sufficient destressed reserves to enable the planned 62 000tpm production rate to be achieved.

Target

Target

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – FREE STATE (TARGET 1) CONTINUED

Mineral processing

Target hoists its ore and development rock together, for milling and processing at the Target plant adjacent to the mine. Target shares its plant with a Harmony waste rock dump, which is monitored and managed by Surface Sources. The plant's design capacity exceeds the maximum planned production from these sources. Gold is recovered through gold cyanide leaching. The reef is milled and processed at the Target plant.

Infrastructure

The general area of Target 1 (mining right FS30/5/1/2/2/14MR) is well developed in terms of access and mining-related infrastructure. Mining has been conducted in the Free State goldfields for nearly 60 years. Access to all three Target shafts (1, 2 and 5) is via a well-maintained paved road. The area also has well-established rail links and an airfield.

The Target 1 operation includes a single underground mine constructed as an extension to the Loraine gold mine and uses 1 shaft as access. The mine has decline systems off this shaft, extending 6km to the mining areas, some 2 300m below surface.

The mine is essentially a trackless bulk mining operation using conventional labour-intensive methods.

The Target 1 shaft is used to transport men, material and rock from surface to 203 level. A single decline, equipped with a conveyor belt, connects 203 level to 255 level some 2 050m below surface. The decline splits at 255 level into a conveyor decline and a vehicle decline descending to the extent of development, currently at 291 level which is 2 300m below surface.

Mineral resource estimation

Geological modelling, via wire frames of faults and lower surfaces of mineralised packages, is the primary control in the geostatistical evaluation. The estimation method used for local measured, indicated and inferred estimates at Target is ordinary kriging. A total of 23 reef packages are estimated individually without data from adjacent reefs for estimation. Estimates are generally kriged into "parent cells" and then assigned to sub cells, using associated variograms and estimation parameters.

Discrimination between mineral resource categories on the basis of data density and spatial relationships of gold grades is defined through variography. Where block grades are estimated by data, separated by distances greater than the maximum grade continuity ranges, they have been classified as an inferred mineral resource. Blocks are therefore not informed by the first kriging run (where the search ellipse was matched to grade continuity ranges) and entirely inferred. Each reef model is then restored to its original wire-frame position and combined into a single 3D model. Geozones are based on structure while the mineral resource classification is based on the slope of regression.

The Datamine mining software system is currently in use on this shaft. A macro system has been generated, linked to a customised scripting menu. This menu allows for professional and easy management of the data and the building of geostatistical models.

Environmental impact

Harmony has also implemented a water management standard, which applies to water during the entire mining life cycle, including prospecting, project design and commissioning, operation and closure. This standard has led to several positive outcomes and long-term targets include reducing the volume of water used for primary activities by 4.5% annually.

A detailed environmental impact register has been developed to identify all potential environmental impacts of the operations. The main impacts were rated and mitigation measures proposed to minimise the environmental impact.

Target is situated in the Free State goldfields, a semi-arid region with an annual rainfall of between 400mm and 600mm. Local thunderstorms and showers are responsible for most of the precipitation during summer – from October to March and peaking in January. Hail is sometimes associated with thunderstorms and occurs mainly in early summer from October to January with its highest frequency in December.

The mine lease area is flat with an average height above sea level of around 1 320m. There is a gentle decrease in elevation to the west and north of Allanridge at a gradient of approximately 1:200. There are no prominent topographical landmarks in the area.

No significant topographical disturbances are expected. The topography will only be affected where the slimes dams, waste rock dumps and solid waste disposal sites are situated. The area is very flat with an overall slope to the south-west.

MATERIAL RISKS

Material risks that may impact Target's mineral resource and mineral reserve statement

SIGNIFICANT RISKS	REMEDIAL ACTION
• Grade dilution from waste/backfill in	• Reduce pillar mining between mined-out areas
• the massive stopes	• Weekly monitoring and tracking
• Trackless development production	• Optimise and schedule planned maintenance on solo machines
• Solo reserve drilling	• Optimise ventilation and
• Ventilation constraints	• cooling capability

COMPETENT PERSON

Ore Reserve manager

Cindi Henderson
BSc Hons (Geology), SACNASP
17 years' relevant experience.

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – FREE STATE (TARGET 1) CONTINUED

TARGET 1 AND 3

Gold – Mineral resource estimates at 30 June 2019

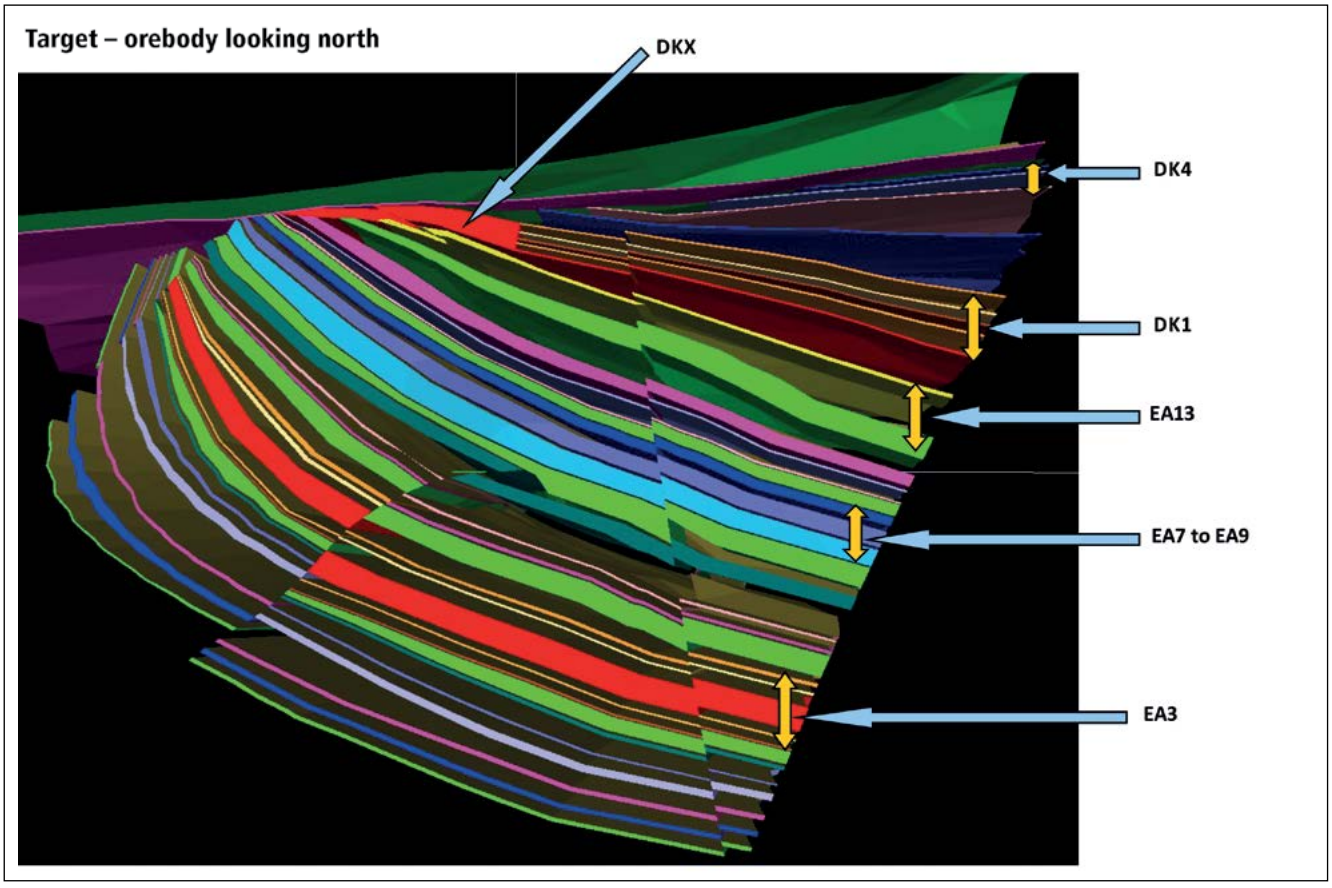
	Measured resources				Indicated resources				Inferred resources				Total mineral resources			
	Tonnes		Gold		Tonnes		Gold		Tonnes		Gold		Tonnes		Gold	
	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)
Target 1	7.2	7.69	55	1 783	4.8	6.83	33	1 059	3.9	6.00	23	750	15.9	7.02	112	3 592
Target 3	0.6	9.19	6	178	2.9	10.17	30	965	1.2	8.66	11	340	4.8	9.66	46	1 483

Modifying factors

Target 1	MCF (%)	SW (cm)	MW (cm)	PRF (%)	Cut-off (cmg/t)
2018	95	–	–	95	3.73
2019	95	–	–	95	3.80

Gold – Mineral reserve estimates at 30 June 2019

	Proved reserves				Probable reserves				Total mineral reserves			
	Tonnes		Gold		Tonnes		Gold		Tonnes		Gold	
	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)
Target 1	3.2	4.38	14	444	1.5	4.66	7	221	4.6	4.47	21	665



MINERAL RESOURCES AND RESERVES BY OPERATION

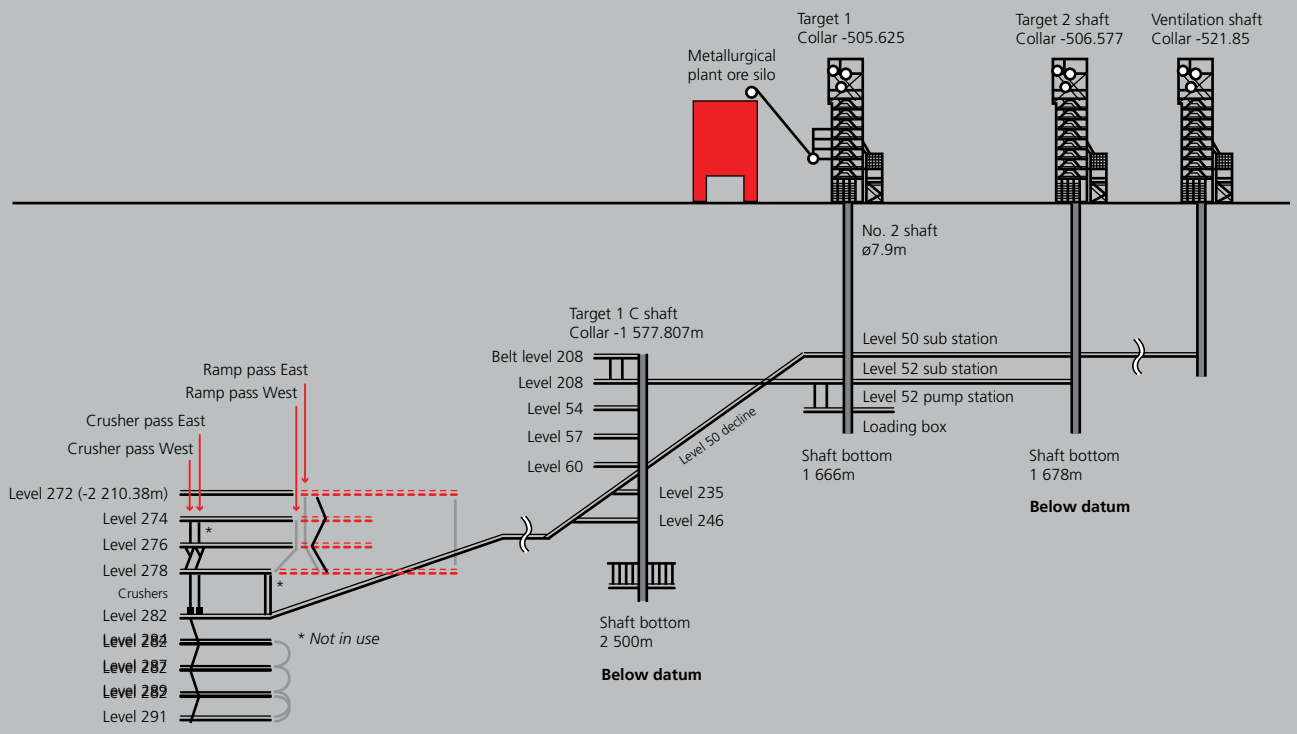
SOUTH AFRICA – FREE STATE (TARGET 1) CONTINUED

OPERATIONAL PERFORMANCE

Masimong: Key operating statistics

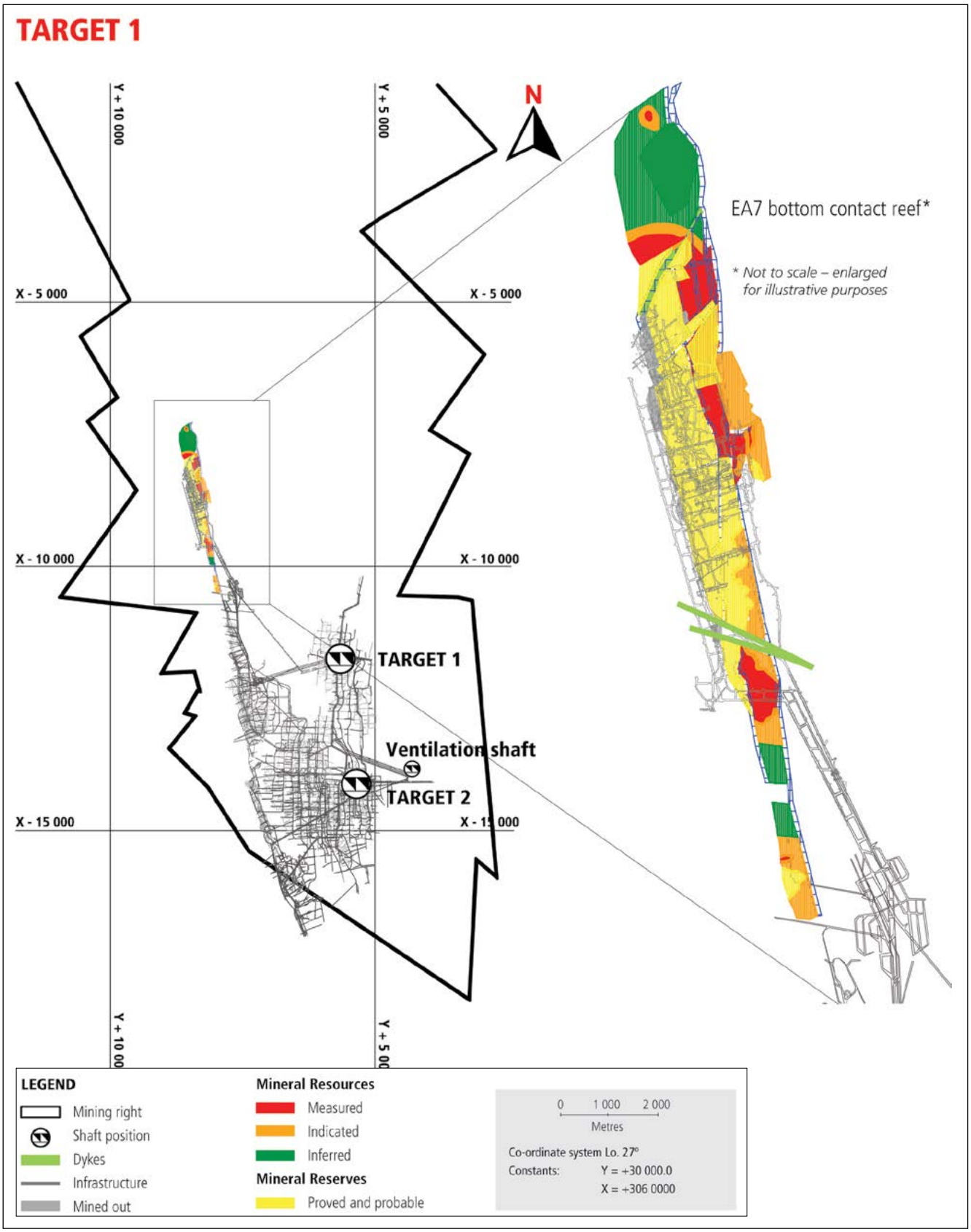
	Unit	FY19	FY18	FY17	FY16	FY15
OPERATION						
Volumes milled	000t (metric)	**588**	680	745	739	749
	000t (imperial)	**650**	749	822	814	826
Gold produced	kg	**2 653**	2 854	2 669	3 387	3 824
	oz	**85 296**	91 758	85 809	108 895	122 944
Grade	g/t	**4.51**	4.20	3.58	4.58	5.11
	oz/t	**0.131**	0.123	0.104	0.134	0.149
DEVELOPMENT						
Total metres (excl. capital metres)		**3 135**	3 883	3 656	3 459	4 174
Reef metres		**118**	431	104	182	290
Capital metres		**179**	620	0	0	0
FINANCIAL						
Average gold price received	R/kg	**590 298**	570 316	570 091	536 196	449 319
	US$/oz	**1 295**	1 395	1 304	1 150	1 221
Capital expenditure	Rm	**297**	309	324	322	296
	US$m	**21**	24	24	22	26
Cash operating cost	R/kg	**557 264**	467 271	508 082	366 814	308 156
	US$/oz	**1 222**	1 131	1 162	787	837
All-in sustaining cost	R/kg	**662 816**	582 200	651 833	471 876	395 669
	US$/oz	**1 454**	1 491	1 012	1 075	

Target 1: Schematic of Target shafts and mining layout



MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – FREE STATE (TARGET 1) CONTINUED



MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – SURFACE OPERATIONS

CONTRIBUTION TO GOLD MINERAL RESOURCES (Including gold equivalents)

SOUTH AFRICA SURFACE SOURCES **9%**

CONTRIBUTION TO GOLD MINERAL RESERVES (Including gold equivalents)

SOUTH AFRICA SURFACE SOURCES **18%**

As at 30 June 2019, Harmony's surface assets in South Africa had total combined mineral reserves of **6.6Moz** which are included in mineral resources of **10.8Moz**.

Location of Harmony's Surface operations in South Africa

LEGEND

Surface operations

	Latitude	Longitude
Kalgold	26°10'12.85"S	25°14'02.70"E
Saaiplaas plant	28° 3'37.68"S	26°53'14.59"E
Central plant	28° 2'8.36"S	26°52'8.99"E

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – SURFACE OPERATIONS

CONTINUED

KALGOLD

Location

Kalgold is located on the Kraaipan Greenstone Belt, 55km southwest of Mahikeng, between Mahikeng and Stella, along the Mahikeng-Vryburg road (N18) in North West Province, South Africa. The mine is surrounded by farm land. The closest community is at Kraaipan, approximately 15km to the south of the mine.

History

Exploration of the Kraaipan Greenstone belt, by Shell Minerals Division, began in 1980. The D-Zone one area was discovered in 1991 on the farm Goldridge. In 1994, West Rand Consolidated Exploration acquired the orebody and mining started in December 1995. Ore was treated by heap leaching until the installation of the first two mills in 1997. Harmony acquired the mine in 1999. In 2003, a third mill was added to increase treatment capacity. The D-Zone pit was mined out in 2009.

Nature of operation

Kalgold is an open-pit mining operation. The A-Zone pit, currently the only active mining pit, includes the former Watertank pit with which it merged.

Geology

The Kraaipan Greenstone Belt forms part of the Kaapvaal Craton and is overlain by late Archaean Ventersdorp lavas and tertiary sediments. The Kraaipan Group consists of three formations: the Khunwana, Ferndale and Gold Ridge formations. The Gold Ridge Formation is the oldest and contains banded iron formations, which is the host rock of gold mined in the Kalahari Goldridge deposits.

The Kalgold operation is located within the geological terrain of the Archaean Kraaipan Greenstone Belt. This greenstone environment is exposed in discontinuous outcrops of steeply dipping rocks, which define three narrow, sub-parallel belts that strike approximately north-south. The Goldridge deposits occur within the central belt, which comprises banded iron formations, magnetite quartzite, chert, greywacke, shale and schist. The greenstones are surrounded by intrusive granites and gneisses. These rocks have a complex history of deformation, which includes folding, faulting and shearing.

Younger cover rocks include isolated patches of lavas of the Ventersdorp Supergroup with much of the area blanketed by Aeolian Kalahari sands. Sparse outcrops of quartz porphyry belonging to the Makwasie Formation occur in the region. Several large dykes with a predominant east-west trend have intruded the region.

The geology of the lease area and its immediate vicinity is characterised by ferruginous chemical and clastic sediments inter-bedded with meta-lavas and non-ferruginous meta-sedimentary rocks. Outcrops in the

MINERAL RESOURCES AND RESERVES BY OPERATION

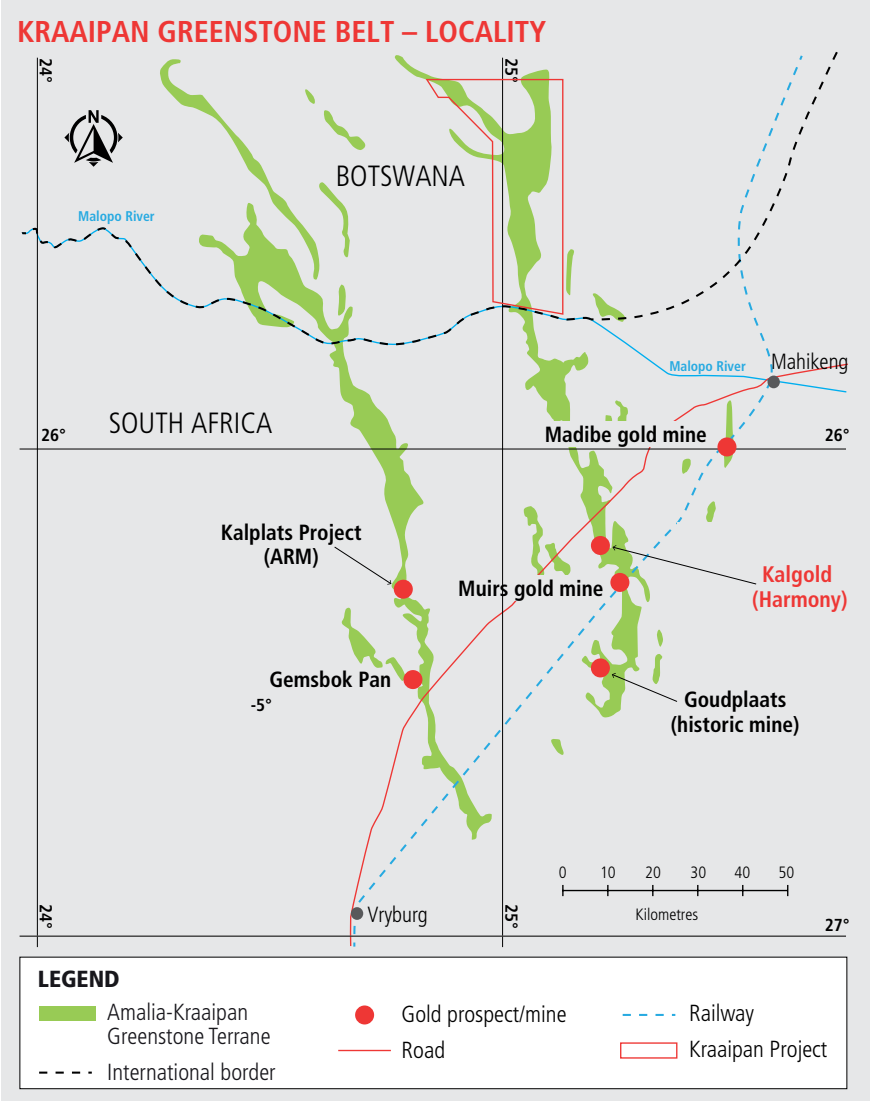
SOUTH AFRICA – SURFACE OPERATIONS (KALGOLD) CONTINUED

area are sparse and generally restricted to ferruginous rock types, which are more resistant to erosion. Magnetite quartzite and clastic sediments form a low ridge to the west of the lease area. Eastwards of this unit, the iron-rich rocks generally comprise chemical sediments represented by magnetite-rich banded iron formations, cherty banded iron formations and banded chert. These units are interbedded with mafic schist, greywacke and sparse black shale. The geology of the D-Zone is used as a benchmark at Kalgold. The new pits are well established at the A-Zone and Watertank areas, and the blast hole database is now significant. The geology consists of mafic schist, which forms the immediate footwall, a banded iron formation horizon as the main orebody and a succession of clastic sediments consisting of shale, greywacke and volcanic conglomerates as the hanging wall.

Gold mineralisation is hosted by steeply dipping banded iron formations interbedded with schist, shale and greywacke. Banded iron formations consist of rhythmically banded chemical sediments comprising alternating light and dark laminae, which vary from 10mm to 50mm in thickness.

The banded iron formations are oxidised to a depth of about 40m to 60m below surface. Near surface the material is red and porous, composed of quartz, hematite and goethite with minor magnetite. At depth, the unaltered banded iron formation consists of quartz, siderite, pyrite, pyrrhotite and magnetite with minor chlorite, calcite and stilpnomelane. In general, gold mineralisation has an erratic and localised distribution. Individual gold grains are on average less than 10µm in diameter and occur in clusters. Gold is generally associated with goethite in the weathered rocks and with pyrite and pyrrhotite in the fresh material.

Geological modelling has been completed using Datamine software. Drill holes and blast holes have been surveyed and used to construct a series of west-east sections from north to south through the various pit areas. The A-Zone and Watertank areas have been modelled as a single contiguous area as the geology and data is continuous and contiguous.



A wireframe geological model has been constructed by linking individual sections to form a continuous wireframe model.

The construction of the sections includes outlines for the mineralised zones and waste zones. The definition of the mineralised zones is based primarily on the lithological contacts between the banded iron formations and waste material (volcanic/sedimentary schists).

The geological model is constructed in the form of a wire frame from exploration borehole intersections, blast hole information and geological mapping within the pit.

Kalgold

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – SURFACE OPERATIONS (KALGOLD) CONTINUED

Mining methods and mine planning

Kalgold is an open-pit mining operation.

The upper 40m of the A-Zone and the Watertank pits have been combined in to one pit called A-Zone pit situated to the north of the D-Zone at a similar stratigraphic position. It is a composite deposit consisting of several mineralised banded iron formation units that are inter-bedded with schist and shale. The A-Zone has an overall strike of 1 800m and comprises individual zones of mineralisation, which dip steeply towards the east. Reef widths range between 15m to 120m.

The A-Zone West is situated in the footwall of the A-Zone orebody. The orebodies are separated by a chloritic schist unit that pinches out to the north. A-Zone West has an overall strike of 750m and width of 20m in the north. In all, 172 reverse-circulation boreholes were drilled along section lines spaced 25m apart. In all, 6 450m were drilled.

The Windmill deposit is the smallest of the Goldridge orebodies but contains generally higher gold grades. It is positioned stratigraphically below the other three deposits and is hoisted by a magnetite-rich banded iron formation unit, which is inter-bedded with schist. The host rock banded formation has a strike length of 950m and thins to the north and south with a maximum width of 25m at the centre. Mineralisation within this unit occurs over a length of 800m with widths ranging from 2m to 17m. This deposit is structurally complex with displacements by faulting and dips varying from 75 to 90 degrees east.

Kalgold's current mining right encompasses an area of 4 595.3ha and was successfully converted, executed and registered as a new order mining right at the Mineral and Petroleum Titles Registration Office on 9 November 2010 under the Mining Right Protocol 574/2008. The DMR reference number NW30/5/1/2/2/77MR is valid for a period of 30 years (from 28 August 2008 to 27 August 2038).

Mineral processing

Ore reception

The Kalgold plant receives ore from the pit at a rate of approximately 129 000t a month. The ore has an average moisture content of approximately 1%.

Ore is transported from the pit by truck and tipped into the plant run-of-mine pad. It is then fed into the pre-primary crusher for the first stage of comminution. Pre-primary product reports to the primary crusher before going through the final stage in the secondary and tertiary crushers. Tertiary crusher product is temporarily stored in the dome prior to milling.

Milling

Ore is fed from the dome to the A, B and C ball mills. The identical A and B mills are generally fed at 55tph. The C mill is the biggest with throughput of 105tph to 110tph. The mill product ranges from 75% to 80% passing 75 micron. The A and B mill cluster cyclone overflow gravitates into a vibrating screen for trash removal while the C mill uses a conventional linear screen. The cyclone overflow, which has a relatively low density, is pumped out to the thickeners for dewatering prior to leaching. Pebble lime is introduced in the system via the C14 conveyor belt for pH control.

Thickening

Lime and flocculant are the two main components of the thickening process. During thickening, lime acts as a coagulant and the flocculant binds the particles together to increase the settling rate of the particles. Lime addition generally ranges between 700g/t to 1 000g/t whereas flocculant addition usually ranges between 8g/t to 10g/t. The lime also maintains a protective level of alkalinity in the leach section to prevent generation of poisonous cyanide gas in the process. The two thickeners are equipped with two variable-speed underflow pumps to control the density in the cyanidation process. The thickener overflow gravitates to the mill process tanks for reuse in the milling process.

Leaching

The thickener underflow, which normally ranges from 50% to 55%, reports into the pre-aeration tank for pre-condition prior addition of the cyanide. The pre-conditioning is performed in order to render cynocides less reactive to cyanide. Cyanide is automatically added to either Leach 2 or Leach 3, depending on the degree of the pre-aeration stage. Kalgold ore requires large amounts of cyanide in order to complete the leaching process. Addition of cyanide generally ranges from 0.6kg/t to 1.8kg/t. Oxygen is injected into the leach tanks to improve the gold dissolution process. The leaching retention time generally varies from 30 to 40 hours. Generally, 75% dissolution takes places in the two leaching tanks. The slurry then gravitates to the carbon-in-leach (CIL) tanks for further leaching and adsorption.

Carbon in leach (CIL)

The dissolved gold, still in pulp, is transferred to the CIL circuit where activated carbon is added to adsorb the gold in solution. The CIL tanks are fitted with rotary screens to allow movement of the carbon in a counter-current manner with the slurry. There are seven stages in the CIL process. The slurry, with 85% of the gold extracted, is pumped through a cyanide destruction circuit into D-Zone pit, which is currently the tailings storage facility. Once the carbon loading in the head tank reaches required gold loading, the carbon is pumped to the loaded make-up screen for the elution process.

Recovery process

The Kalgold plant employs the Zadra elution process for gold recovery. Carbon is treated with a hot caustic and cyanide solution. The pregnant solution is pumped into the electro-winning circuit for gold recovery. Eluted carbon then passes through the acid column to be treated with hydrochloric acid for the removal of inorganic material. Acid-treated carbon is rinsed with high-pH water to neutralise the acid. Acid-treated carbon is then transferred into the kiln for regeneration of the carbon. The regeneration process takes place at

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – SURFACE OPERATIONS (KALGOLD) CONTINUED

temperatures above 700 degrees in the absence of air in order to drive off the organic material.

The electro-winning cathodes are washed through the gold table and filtered through the press to retain the gold sludge, which is then dried, weighed and dispatched to Rand Refinery for the refinery process.

Environmental impact

Kalgold's environmental aspects and impacts are managed in line with an environmental management programme (EMP) approved by the DMR in terms of Mineral and Petroleum Resources Development Act 28 of 2002 (MPRDA), as amended in 2008. All environmental aspects and impacts emanating from mining activities are documented in the approved EMP and the environmental aspect register, as required by the MPRDA and ISO 14001:2015 standard.

Annual environmental performance monitoring and compliance audits are conducted by the DMR and Department of Environmental Affairs to verify compliance with the following legislation:

- Mine Health and Safety Act 29 of 1996
- National Water Act 36 of 1998
- National Environmental Management Act 107 of 1998
- MPRDA Act 28 of 2002
- National Heritage Resources Act 25 of 1999
- National Forests Act 84 of 1998
- National Environmental Management: Air Quality Act 39 of 2004

Environmental performance assessments are conducted annually as per the commitments stipulated in the approved EMP, and environmental authorisations in terms of Regulation 55 of the Mineral and Petroleum Resources Development Regulations, by an independent environmental consultant, and the report is submitted to the DMR. Internal environmental legal compliance audits are also conducted every two years to verify compliance with all relevant legal requirements. An online-based Kalgold environmental legal register (at *www.dreyer-legal.co.za*) is updated to include changes in applicable and relevant environmental legislation and associated regulations.

Bio-monitoring surveys are conducted on a monthly basis to determine the status of surrounding surface water streams close to the operation. The status quo of the water bodies is monitored for water quality in relation to guidelines within the water use license conditions and in terms of the National Water Act.

In addition to the bio-monitoring surveys, a groundwater and dust monitoring programme is implemented monthly and quarterly to determine the status of groundwater quality and quantity, as well as levels of dust fallout in terms of the National Water Act and National Environmental Management: Air Quality Act, and to determine compliance with the conditions stipulated in the water use licence and provisional atmospheric emissions licence.

Kalgold is ISO 14001-accredited and conforms to the requirements of the ISO 14001:2004 standard. The operation attained its accreditation in 2010 and remains accredited to eliminate or minimise the effects of mining activities on the environment and adjacent communities. The mine is currently working towards ISO 14001 recertification in terms of the new ISO 14001:2015 requirements.

In September 2016, the mine received a water use licence from the Department of Water and Sanitation, and approval of the D-Zone open-pit closure plan from the DMR. In January 2017, the mine was granted approval for an amendment to its EMP.

MATERIAL RISKS

Material risks which may impact Kalgold's resource and reserve statement are as follows

SIGNIFICANT RISKS	REMEDIAL ACTION
• Slope failure	• Pre-split blasting to protect high walls

COMPETENT PERSON

Ore Reserve manager

Rebaone Francis Gaelejwe
BSc Hons (Geology), SACNASP
18 years' experience in gold mining.

Kalgold

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – SURFACE OPERATIONS (KALGOLD) CONTINUED

KALGOLD

Gold – Mineral resource estimates at 30 June 2019

	Measured resources				Indicated resources				Inferred resources				Total mineral resources			
	Tonnes		Gold		Tonnes		Gold		Tonnes		Gold		Tonnes		Gold	
	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)
Open pit	14.6	0.79	12	371	66.5	0.92	61	1 971	8.7	1.05	9	293	89.8	0.91	82	2 636
Tailings dam	–	–	–	–	–	–	–	–	23.8	0.26	6	201	23.8	0.26	6	201
Total	**14.6**	**0.79**	**12**	**371**	**66.5**	**0.92**	**61**	**1 971**	**32.5**	**0.47**	**15**	**494**	**113.6**	**0.78**	**88**	**2 837**

Modifying factors

Open pit	MCF (%)	Dilution (%)	PRF (%)	Cut-off (cmg/t)
2018	100	4.8	84	0.60
2019	100	10.0	84	0.58

Gold – Mineral reserve estimates at 30 June 2019

	Proved reserves				Probable reserves				Total mineral reserves			
	Tonnes		Gold		Tonnes		Gold		Tonnes		Gold	
	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)
Open pit	9.4	0.87	8	265	8.9	1.18	11	339	18.4	1.02	19	605

OPERATIONAL PERFORMANCE

Kalgold: Key operating statistics

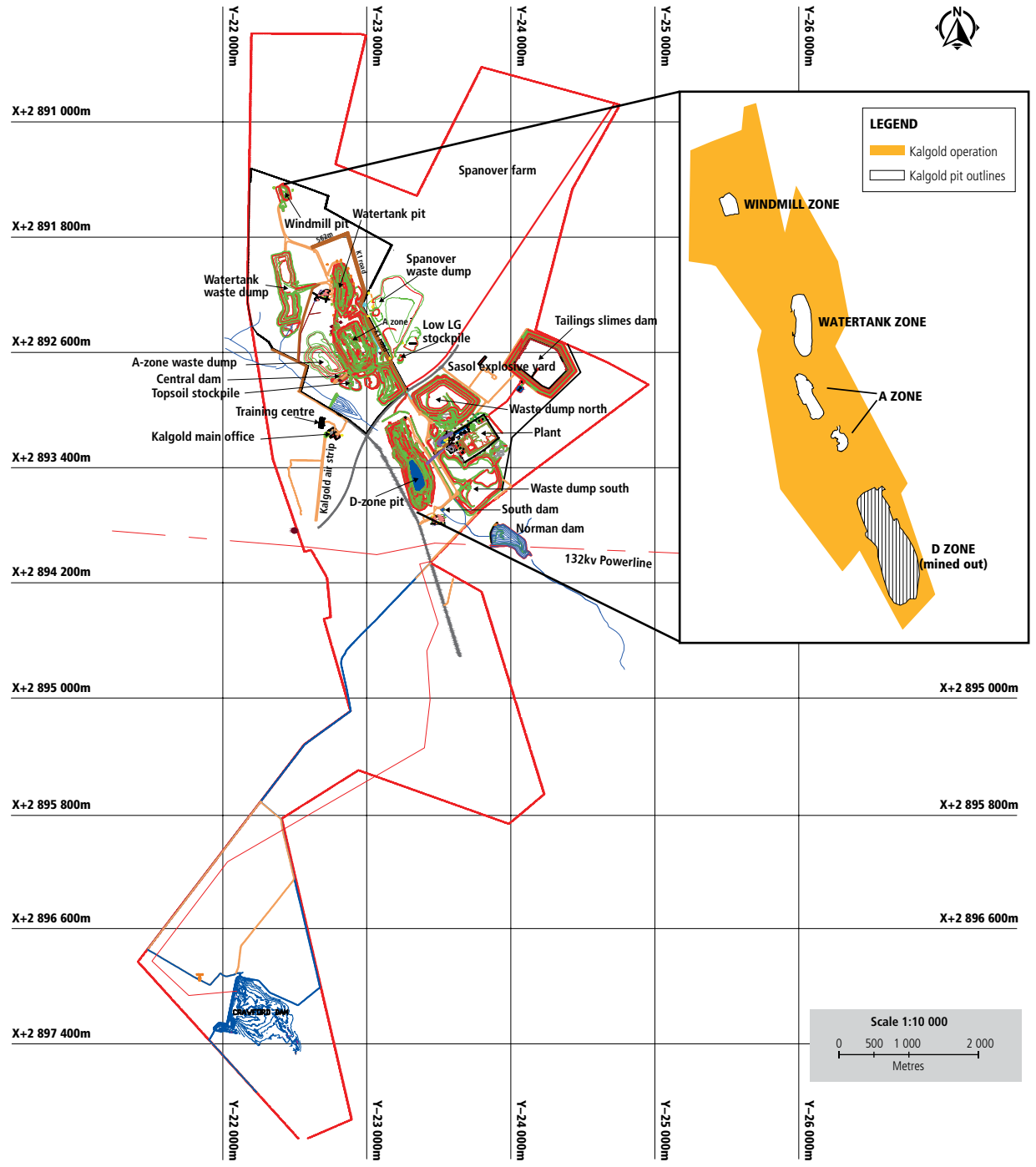
	Unit	FY19	FY18	FY17	FY16	FY15
OPERATION						
Volumes milled	000t (metric)	**1 619**	1 550	1 506	1 479	1 472
	000t (imperial)	**1 785**	1 709	1 660	1 630	1 623
Gold produced	kg	**1 249**	1 250	1 205	1 103	1 198
	oz	**40 156**	40 189	38 742	35 463	38 517
Grade	g/t	**0.77**	0.81	0.80	0.75	0.81
	oz/t	**0.022**	0.024	0.023	0.022	0.024
FINANCIAL						
Average gold price received	R/kg	**593 482**	576 630	573 010	548 072	448 230
	US$/oz	**1 302**	1 396	1 311	1 176	1 218
Capital expenditure	Rm	**61**	108	96	39	41
	US$m	**4**	8	7	3	4
Cash operating cost	R/kg	**556 284**	452 365	462 037	496 991	377 547
	US$/oz	**1 220**	1 095	1 057	1 066	1 026
All-in sustaining cost	R/kg	**642 147**	552 032	558 731	549 590	422 323
	US$/oz	**1 369**	1 336	1 278	1 179	1 148

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – SURFACE OPERATIONS (KALGOLD) CONTINUED

KALGOLD

KRAAIPAN GREENSTONE BELT



Kalgold

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – SURFACE OPERATIONS

CONTINUED

FREE STATE

The Free State surface source operations comprise the following:

- **The Phoenix (Tswelopele beneficiation) operation**, – located adjacent to Harmony's current and historical operations in the Free State, retreats tailings from TSFs in the region to extract any residual gold. The Phoenix operation makes use of the Saaiplaas plant, located close to the historic Saaiplaas 2 shaft area and in close proximity to Masimong 4 shaft. Phoenix began operating in 2007
- **St Helena** – although the project had a positive net present value in the feasibility study that was concluded in 2009, it was not implemented
- **Central Plant retreatment project** – tailings reclaimed from the FSS5 tailings storage facility are processed at Central Plant which was adapted for tailings retreatment. Plant commissioning began in June 2017 with ramp-up to a capacity of 300 000t a month achieved by the end of July 2017
- **Rock dumps** – around 3.9Mt of reserves are available in rock dumps in the vicinity of the Free State operations. A programme, run by Harmony's Metallurgical Services, to mill and process these dumps as and when there is spare plant capacity available, began in FY10
- **Tailings material** – 561.6Mt of tailings material contained in tailings storage facilities in the Free State are estimated to contain around 4Moz of gold
- **Moab Khotsong surface sources** – includes the Mispah tailings storage facilities, the Kop Paydam and the Moab MOD.

PHOENIX

The Phoenix operation, or the Tswelopele Beneficiation Operation, is a low-cost, high profit-margin low-grade tailings reprocessing operation.

Phoenix uses Harmony's Saaiplaas gold plant, which was built in 1954. Most of the original structures and equipment were broken down around 1990 and removed with the exception of the thickeners and pachuca tanks, which are still in use. The plant was expanded in 1980 with the addition of a run of mine (ROM) milling section, additional pachucas and filters. While the old sections have been decommissioned and progressively demolished since the 1990s, the newer sections remain in operation. The plant, with a design capacity of 330 000tpm, initially formed part of Anglo American's Free State gold mining operations.

The Saaiplaas plant originally processed ore from Saaiplaas 1, 2 and 3 shafts. Saaiplaas 1 closed around 1980, Saaiplaas 2 around 1996, and Saaiplaas 3 around 2000. The Saaiplaas plant once also processed ore from the Erfdeel (now Masimong) shafts. With the decline of mining in the area, the plant was relegated to processing

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – SURFACE OPERATIONS (FREE STATE) CONTINUED

unmilled surface source material (waste) at a rate of 110 000tpm until July 2007. As all material currently processed by the plant is recovered by hydromining from old, desiccated slimes dams in the area, crushing or milling is not required. The ore-receiving silos were demolished in July 2007 when milling ceased.

The original design life of the Phoenix slimes retreatment project was five years (to end 2011). The short operating life was due to the restricted deposition capacity for the residues generated at the planned processing rate of 500 000tpm. Given the stability concerns of the TSFs being deposited one at the time, this rate was reduced further to 424 000tpm from September 2011.

A major capital project was undertaken to build a replacement cyclone-deposition TSF at St Helena 1, 2 and 3 that would allow the deposition of 500 000tpm again, extending the operating life.

Nature of operations

Hydro-mining on two TSFs, Brand A and Dam 21, for the Phoenix operation and one TSF, FSS5 for the Central Plant retreatment project, is conducted under contract. Material is reclaimed using high-pressure water on the TSF, from where the material is pumped to the Saaiplaas plant in separate rubber-lined pipelines from Brand A and Dam 21, and to Central Plant from FSS5.

Two additional carbon-in-leach (CIL) tanks have been installed in the Saaiplaas Plant to increase leach residence time to improve dissolution and reduce soluble loss.

Location

The Saaiplaas plant is located in the heart of the Free State goldfields near Welkom in the Free State province of South Africa, at latitude 28°02'00"S and longitude 26°52'18"E.

Description of hydro-mining and mineral processing operations

Production plans

The current planned processing rate for the Phoenix operation is 500 000t a month with residue disposal at the St Helena 1, 2 and 3 cyclone TSF. The current life of the Phoenix operation has been extended to 2029.

Two surface sources are currently being mined:

- The Brand A TSF has had some 65% of its material removed already. It has a grade of 0.28g/t Au at 40% to 45% recovery
- The 21 TSF (which replaced the Harmony 1 TSF as a source from end-2011) has a grade of 0.27g/t Au at 40% to 45% recovery
- All the material from the Harmony 1 TSF has been reprocessed with only the clean-up remaining

Residue deposition onto the FSS6, FSS4 and FSS1 TSFs replaced the old Saaiplaas deposition TSFs at the end 2011. Deposition onto these TSFs and the Brand D TSF stopped with the commissioning of the St Helena 1, 2 and 3 cyclone TSF which can accept the full monthly production of 500 000t from the Saaiplaas plant.

Saaiplaas plant began depositing material on the St Helena 1, 2 and 3 TSF in February/March 2013. This TSF is now the sole deposition site for the Saaiplaas plant. Commissioning of the St Helena 1, 2 and 3 TSF allowed the planned increase in plant throughput to the required 500 000t a month until 2029.

As the St Helena 1, 2 and 3 cyclone TSF was constructed on an existing deposition site, it did not require the environmental permitting that a new site would have needed.

Hydro-mining from the Brand A and Dam 21 TSFs currently reclaims slimes at an average in situ grade of 0.25g/t. The Saaiplaas plant recovers between 40% and 45% of the contained grade in the recovered pulped material received, yielding 65kg of gold a month (planned).

While the Central Plant Retreatment operation reclaims slimes at an average in situ grade of 0.255g/t with a recovery rate of around 55%, yielding 50kg a month. This represents around 1.5% of Harmony's total gold production.

The operating unit cost of the Phoenix operation is R60/t at 500 000t a month and for the Central Plant Retreatment operation it is R52/t at 300 000t a month. These reclamation projects are positioned as safe, low-risk, low-cost, profitable, low-grade tailings reprocessing operations.

Hydromining

The hydro-mining (monitoring) process uses 100mm and 150mm diameter high-pressure water monitors (cannons) to re-pulp the consolidated slimes to a relative density of around 1.4. The re-pulped slime flows under gravity to an in-dam finger screen where large trash is removed and then to the sump from where a transfer pump delivers it to one of two vibrating screens for secondary screening to remove oversize and smaller trash material. The screen underflow falls into the transfer sump. A separate pump station at each reclamation TSF pumps the reclaimed screened pulp via rubber lined pipelines to the plant.

The transfer pumping of slimes to Saaiplaas and Central Plants is done by Envirotech D-frame with three to five pumps in series (depending upon the distance to be pumped).

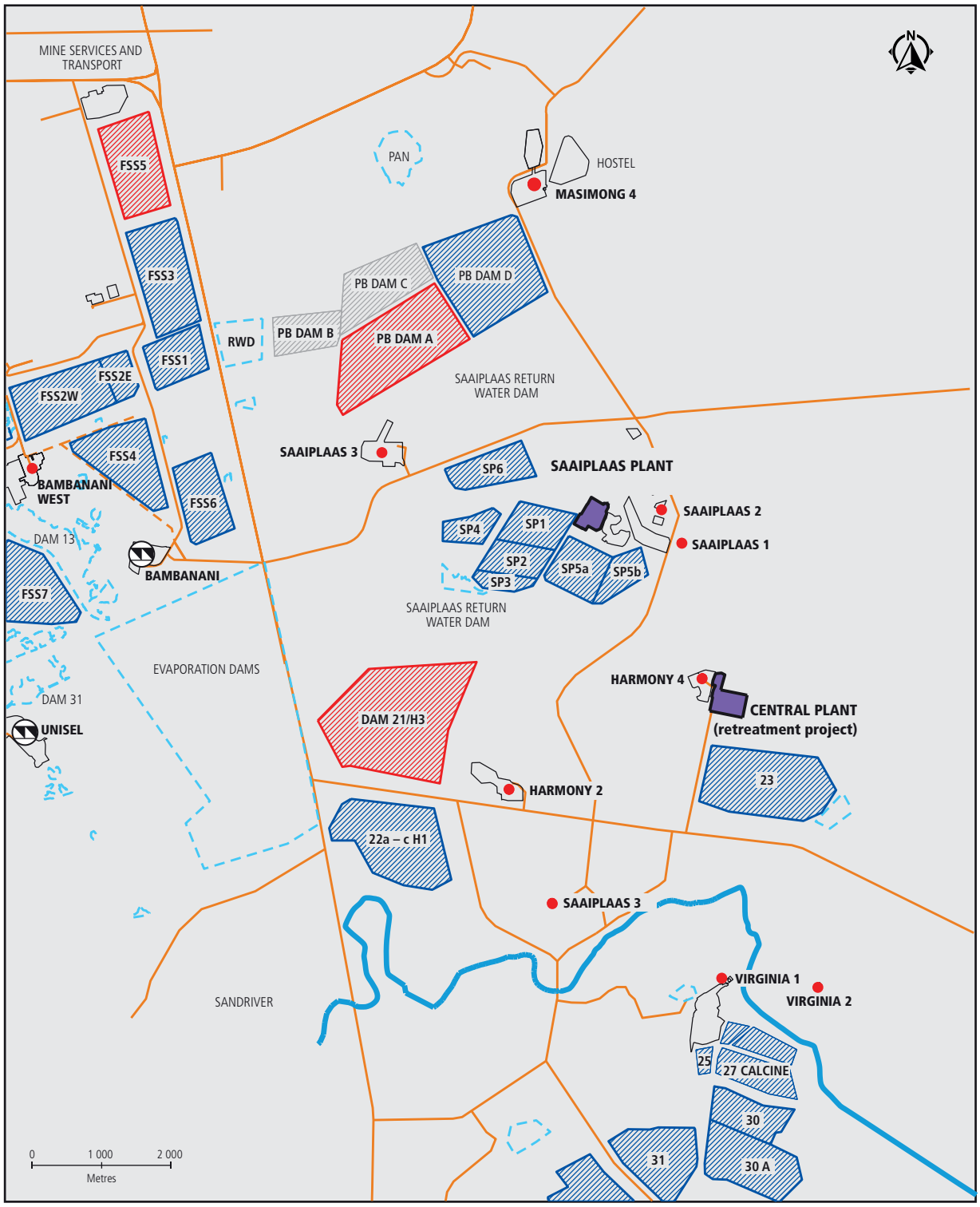
Oxygen is injected into the transfer pipeline at the reclamation site to neutralise cyanide consuming components which improves gold dissolution and reduces cyanide consumption in the plant.

Free State Surface Sources

MINERAL RESOURCES AND RESERVES BY OPERATION

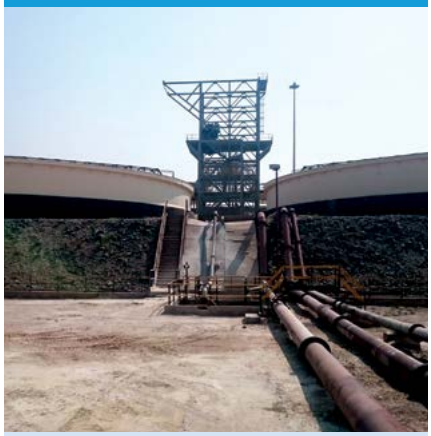
SOUTH AFRICA – SURFACE OPERATIONS (FREE STATE) CONTINUED

LOCATION OF HARMONY'S FREE STATE SURFACE OPERATIONS

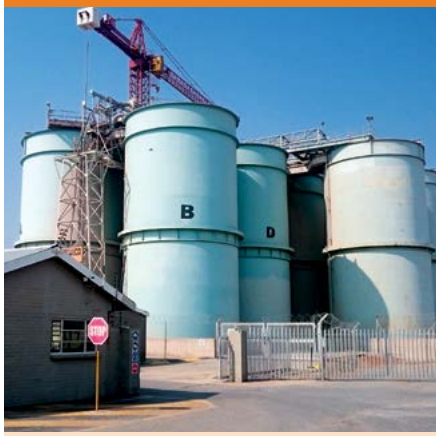


MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – SURFACE OPERATIONS (FREE STATE) CONTINUED



Saaiplaas Plant thickeners



Saaiplaas Plant pachuca tanks

Saaiplaas Plant linear screen

Saaiplaas Plant residue pump station pumping to the St. Helena 1, 2 and 3 TSF

The reclaimed tailings pulp is delivered to the thickener distribution tower at both the Saaiplaas and Central plants where hydrated lime is added to raise the pH to 10.5. The pulp is distributed to the thickeners where the relative density is increased to 1.45 prior to the addition of cyanide for the leaching process.

The thickened pulp is pumped to linear screens with 800µm apertures where any residual trash is removed prior to the addition of cyanide for the leach and adsorption stages in both plants.

Central Plant uses six mechanically agitated leach tanks and eight mechanically agitated carbon-in-pulp tanks with cascade flow between the tanks, while the Saaiplaas plant has two parallel circuits with six air agitated pachuca tanks operated in carousel mode. Two tanks in each circuit are used for leaching and four for the carbon-in-leach process.

The final product of both the Saaiplaas and Central plants is loaded carbon.

Carbon elution for the recovery of gold is carried out at Central Plant for both the Central Plant Retreatment and the Phoenix operations.

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – SURFACE OPERATIONS (FREE STATE) CONTINUED

SURFACE SOURCES

Gold – Mineral resource estimates at 30 June 2019

	Measured resources				Indicated resources				Inferred resources				Total mineral resources			
	Tonnes		Gold		Tonnes		Gold		Tonnes		Gold		Tonnes		Gold	
	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)
Phoenix	55.8	0.27	15	490	–	–	–	–	–	–	–	–	55.8	0.27	15	490
St Helena	191.3	0.27	52	1 656	–	–	–	–	–	–	–	–	191.3	0.27	52	1 656
Central Plant	–	–	–	–	60.5	0.27	16	517	–	–	–	–	60.5	0.27	16	517
Other:																
– Waste rock dumps	–	–	–	–	3.9	0.51	2	64	17.2	0.43	7	235	21.1	0.44	9	299
– Tailings	–	–	–	–	561.6	0.22	125	4 032	15.5	0.19	3	94	577.1	0.22	128	4 126
Mispah	–	–	–	–	73.3	0.30	22	710	–	–	–	–	73.3	0.30	22	710
Kop Paydam	11.0	0.20	2	72					–	–	–	–	11.0	0.20	2	72
Moab MOD	–	–	–	–	5.9	0.41	2	77	–	–	–	–	5.9	0.41	2	77
Grand total	258.1	0.27	69	2 218	705.2	0.24	168	5 400	32.6	0.31	10	329	995.9	0.25	247	7 947

Modifying factors

Surface Sources		MCF (%)	PRF (%)	Cut-off (cmg/t)
Phoenix	2018	100	45	0.29
	2019	100	45	0.27
St Helena	2018	100	45	0.27
	2019	100	45	0.27
Central Plant	2018	100	51	0.27
	2019	100	52	0.27
Other Tailings	2018	100	52	0.23
	2019	100	51	0.27
Other WRD	2018	100	84	0.51
	2019	100	84	0.51

Gold – Mineral reserve estimates at 30 June 2019

	Proved reserves				Probable reserves				Total mineral reserves			
	Tonnes		Gold		Tonnes		Gold		Tonnes		Gold	
	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)
Phoenix	55.8	0.27	15	490	–	–	–	–	55.8	0.27	15	490
St Helena	108.6	0.27	29	933	–	–	–	–	108.6	0.27	29	933
Central Plant	–	–	–	–	60.5	0.27	16	517	60.5	0.27	16	517
Other:												
– Waste rock dumps	–	–	–	–	3.9	0.51	2	64	3.9	0.51	2	64
– Tailings	–	–	–	–	561.6	0.22	125	4 032	561.6	0.22	125	4 032
Total	164.4	0.27	44	1424	626.0	0.23	143	4 613	790.4	0.24	188	6 036

Uranium – Mineral resource estimates at 30 June 2019

	Measured resources				Indicated resources				Inferred resources				Total mineral resources			
	Tonnes		U_3O_8		Tonnes		U_3O_8		Tonnes		U_3O_8		Tonnes		U_3O_8	
	(Mt)	(kg/t)	(Mkg)	(Mlb)	(Mt)	(kg/t)	(Mkg)	(Mlb)	(Mt)	(kg/t)	(Mkg)	(Mlb)	(Mt)	(kg/t)	(Mkg)	(Mlb)
Free State																
Surface Sources	–	–	–	–	184.7	0.10	18 462	41	–	–	–	–	184.7	0.10	18 462	41
Klerksdorp Goldfield																
Surface sources	–	–	–	–	84.3	0.12	10 357	23	–	–	–	–	84.3	0.12	10 357	23
Total					268.9	0.11	28 819	64	–	–	–	–	268.9	0.11	28 819	64

MINERAL RESOURCES AND RESERVES BY OPERATION

SOUTH AFRICA – SURFACE OPERATIONS (FREE STATE) CONTINUED

OPERATIONAL PERFORMANCE

Free State Surface Operations: Key operating statistics

	Unit	FY19	FY18	FY17	FY16	FY15
OPERATION						
Volumes milled	000t (metric)	**4 307**	2 821	2 810	3 041	2 701
	000t (imperial)	**4 749**	3 110	3 099	3 353	2 978
Gold produced	kg	**1 515**	1 081	1 055	1 065	862
	oz	**48 708**	34 755	33 918	34 241	27 713
Grade	g/t	**0.352**	0.383	0.375	0.350	0.320
	oz/t	**0.010**	0.011	0.011	0.010	0.009
FINANCIAL						
Average gold price received	R/kg	**587 483**	576 737	572 172	544 996	450 420
	US$/oz	**1 289**	1 374	1 309	1 169	1 224
Capital expenditure	Rm	**8**	3	7	18	6
	US$m	**1**	–	1	1	1
Cash operating cost	R/kg	**456 473**	415 993	434 715	401 033	382 959
	US$/oz	**1 001**	1 007	995	860	1 041
All-in sustaining cost	R/kg	**462 178**	417 462	445 451	442 205	403 906
	US$/oz	**1 014**	1 010	1 019	906	1 097

Free State drill site

MINERAL RESOURCES AND RESERVES BY OPERATION

PAPUA NEW GUINEA

Papua New Guinea

MINERAL RESOURCES AND RESERVES BY OPERATION

PAPUA NEW GUINEA

CONTRIBUTION TO MINERAL RESOURCES (gold and gold equivalent)

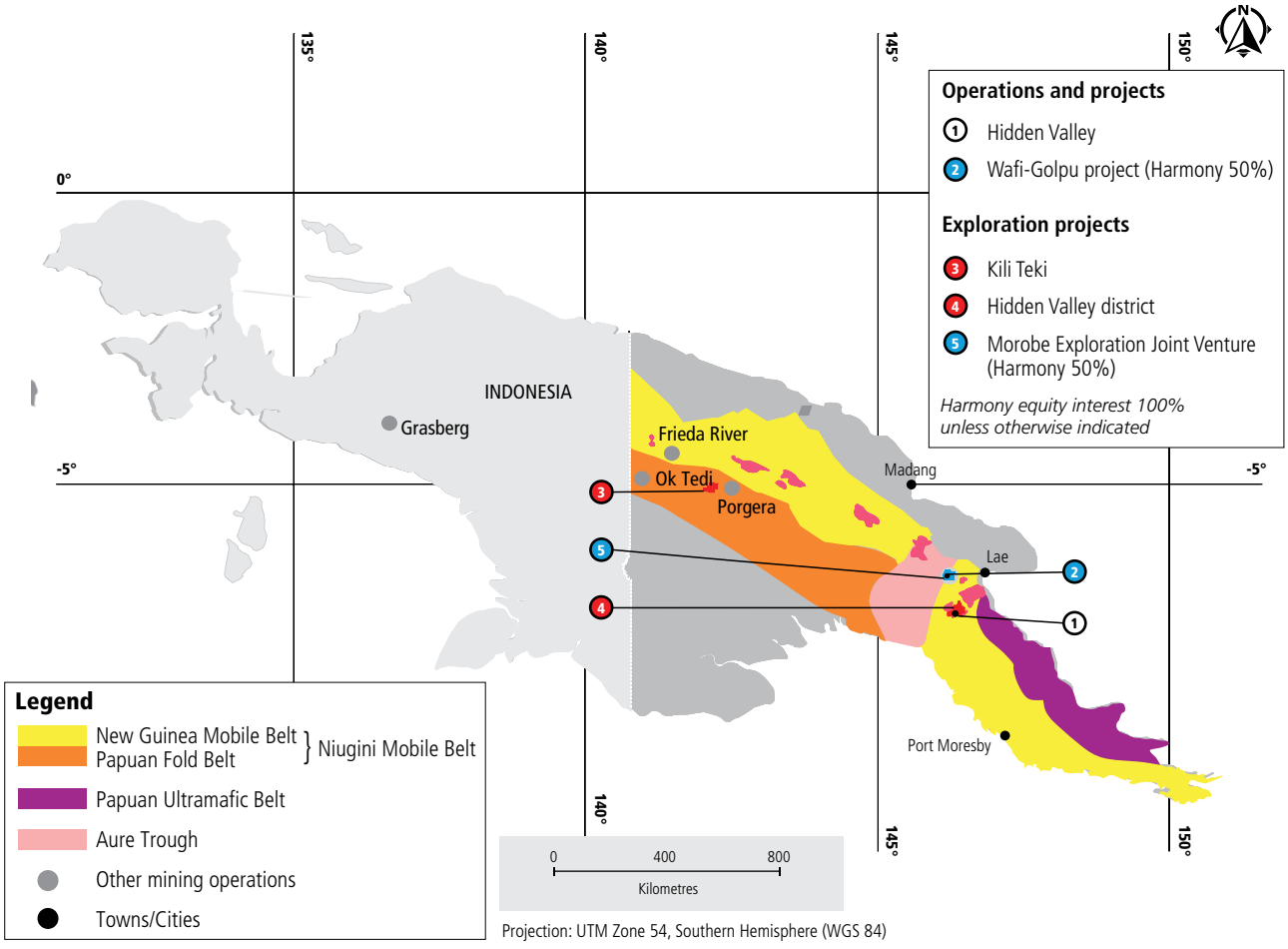
PAPUA NEW GUINEA **39%**

CONTRIBUTION TO MINERAL RESERVES (gold and gold equivalents)

PAPUA NEW GUINEA **53%**

As at 30 June 2019, Harmony assets in Papua New Guinea had combined attributable gold mineral reserves of **19.3Moz** (including gold equivalents) and attributable gold mineral resources of **45.9Moz** (including gold equivalents).

Harmony – Papua New Guinea



Projection: UTM Zone 54, Southern Hemisphere (WGS 84)

MINERAL RESOURCES AND RESERVES BY OPERATION

PAPUA NEW GUINEA

CONTINUED

HIDDEN VALLEY

Description and location

The Hidden Valley mine is located at latitude 7°22"S and longitude 146°39"E, approximately 15km south-southeast of the township of Wau and approximately 90km south-southwest from Lae, the capital of Morobe Province in Papua New Guinea. The closest major towns to the project are Wau and Bulolo. Lae, the nearest maritime port in the region, is connected to Bulolo by a two-lane main road. The operation is now wholly owned by Harmony through Morobe Consolidated Goldfields.

The mine is located at elevations between 2 800m and 1 700m above sea level within steep mountainous and forested terrain that experiences approximately 3m of rainfall per year.

History

The Hidden Valley deposits were discovered by CRA in 1980s and the deposits changed hands through various exploration companies until finally settling with Morobe Consolidated Goldfields, a wholly owned subsidiary of Harmony.

Mine construction commenced in 2007 with the 40km road access from Bulolo to the mine site.

In 2009, Harmony entered in to the Hidden Valley Joint Venture with Newcrest Mining Limited earning 50% of the deposit and joint management rights. First gold was poured in May 2009 with the mine being officially opened in September 2010.

Following the purchase of Newcrest's 50% portion on 25 October 2016, Harmony owns 100% of the Hidden Valley mine.

Nature of operations

Hidden Valley is an operating open pit gold and silver mine. Two separate open pit mines feed a 4.0Mtpa processing plant. Silver and gold doré bars are produced. Current mine life is to 2024 with opportunities for extension.

Mineral rights/legal aspects and tenure

The deposits lie on mining lease ML151 which was granted in 2005. The mining lease has a tenure of 20 years taking its expiry to 2025 with an option for extension.

The mine is 100% owned and managed by Harmony through Moroke Consolidated Goldfields.

Geology

The deposit is a structurally controlled vein-stockwork gold-silver deposit located in the Morobe Granodiorite of the Wau Graben. Gold-silver mineralisation is contained in carbonate-adularia-quartz-sulphide vein-stockworks and in a few instances in hydrothermal breccias. Discrete zones of intense stockwork fracture and mineralised veining comprise individual lodes. At the Hidden Valley deposit gold and silver are related to steeply dipping (Kaveroi Creek Zone) and flat-lying (Hidden Valley Zone) sheeted vein swarms associated with an underlying shallow thrust.

MINERAL RESOURCES AND RESERVES BY OPERATION

PAPUA NEW GUINEA (HIDDEN VALLEY) CONTINUED

Mining methods and mine planning

Mining operations occur in two open pits 6km apart, Hidden Valley and Hamata of which Hidden Valley is the largest. Both mines employ conventional open pit mining techniques with back-hoe excavators and rigid dump trucks as the primary load and haul equipment. Front-end loaders are used for crusher feed and stockpile reclaim. A number of articulated smaller dump trucks are used for construction, and to a lesser extent mining in Hamata.

Mining bench configuration consists of 18m inter-berm heights, mined as 3m x 6m benches of 2m x 3m flitches (in ore).

Waste is disposed of in engineered valley fill waste dumps, with toes keyed in and buttressed using competent non-acid producing rock. The waste is captured in the valley fill Western Sector and Niekywe waste dumps. Underdrains and toes have been constructed and now provide sufficient capacity for the life of mine waste.

Mineral processing

Crushed ore is conveyed from the Hidden Valley pit via a 3.8km long overland pipe conveyor. Ore from the Hamata pit is trucked to the Hamata crushing station, located next to the ore processing plant.

The Hidden Valley process plant was designed to treat nominally 4.0Mtpa of gold/silver bearing ore. The process uses a two stage crushing circuit followed by a SAG mill, gravity, CCD/Merril Crowe circuit for silver and carbon in leach circuit for the gold. A silver/gold ore bar is produced and flown off site for refining and sale.

Tailings are disposed of in a terrestrial tailings storage facility located to the South-West of the process plant. Dam-wall construction of the tailings storage facility is ongoing and largely constitutes placement of suitable oxide and fresh competent material sourced from mining in the Hamata pit. The processing inventory in this ore reserve estimate is constrained by the remaining storage capacity. Construction of an additional facility is under study to accommodate resource growth strategies.

Infrastructure

Hidden Valley is a well-established mine serviced from the port of Lae by partially sealed 100km road to Bulolo and then a well maintained gravel road for the remaining 40km to site. All goods are transported to site via this route with some emergency goods flown to Bulolo.

There is an airstrip at Bulolo from where the fly-in and fly-out workers commute. However the bulk of employees are from the local area and are bussed to their towns and village. The mining camp on site houses all employees and provides health and recreation facilities. Power is provided by the state owned PNG Power. This power is mostly generated by hydro schemes. 100% contingency is provided by a bank of diesel generators.

Waste dumps and the tailings storage facility are under construction and built as the mine progresses.

Mineral resource estimation

Both the Hidden Valley and the Hamata models have been estimated using a localised multiple indicator Kriged method using a 12m x 12m x 3m standard mining units (SMU) and constrained within broad three-dimensional wireframe domains based on gold and silver grade, alteration and structure. This method accommodates the large panels required for a robust estimate using a long-standing well-known estimation method, but also allows the estimation of localised SMU-sized blocks for mine planning purposes. A revised model for the Hidden Valley-Kaveroi deposit was completed during 2018 with change of support based on past reconciliation rather than grade control drilling. This has been reviewed by AMC and Derisk. Checks against historical production indicate that both these models are robust when appropriate modifying factors are applied.

Pit optimisations are run on measured and indicated resource categories only. All mineral resource classifications are maintained and converted to ore reserve classifications inside pit designs. There is no measured material classified in either pit, all measured resources reported comprise stockpile material only. All mine operating plans are compiled using measured, indicated and inferred resource categories.

Environmental impact

Hidden Valley's Environmental Impact Statement (EIS) was submitted to the Department of Environment and Conservation (DEC) in February 2004. The EIS was accepted by DEC, (now the Conservation and Environmental Protection Agency – CEPA) in June 2004 and was referred to all stakeholders and advertised publicly for review according to regulatory requirements. In March 2005, the original environmental waste discharge and environmental water extraction permits were issued to Hidden Valley which currently operates within mining lease ML151 and is the holder of the following environment permits:

- EP WE-L3 (38) last amended 23/11/2012 and expiring 29/03/2030
- EP WD-L3 (50) last amended 07/11/2012 and expiring 29/03/2030

The Hidden Valley environmental management plan (EMP) identifies potential environmental impacts and management strategies associated with the operation of the mine. The EMP describes Hidden Valley's approach to environmental management and outlines the standards, procedures and systems developed to meet the objectives set out in the mine's approvals and permits, as required under Papua New Guinea legislation. The EMP also details the environmental monitoring requirements and reporting commitments of Hidden Valley to CEPA. The EMP is updated every three years in accordance with Hidden Valley's Environment Permit.

A detailed environmental monitoring programme has been prepared as part of

MINERAL RESOURCES AND RESERVES BY OPERATION

PAPUA NEW GUINEA (HIDDEN VALLEY) CONTINUED

the EMP which includes water, sediment and air quality monitoring, hydrological studies, land clearance assessment and aquatic biota studies. Water quality monitoring within the major tributaries of the Watut and Bulolo Rivers forms a critical component of the monitoring program due to the potential for impacts on the downstream environment as a result of the mining operation.

The environmental improvement plan (EIP), approved by DEC on 26 April 2011 was developed in response to an independent environmental audit commissioned by DEC in 2010. The EIP included 40 specific actions to improve environmental management at the mine, the actions were completed in February 2015 and a close out report was submitted to CEPA in March of the same year. The EIP close-out was approved by CEPA in February 2017.

The were no major environmental non-compliances.

COMPETENT PERSON

Mineral Resources – Group resource geologist, Harmony Southeast Asia

Ronald Reid
Australian Institute of Geoscientists (AIG)
More than 20 years' experience.

Mineral Reserves – Executive general manager: Growth and resource development, Harmony Southeast Asia

Greg Job
AusIMM
More than 25 years' experience.

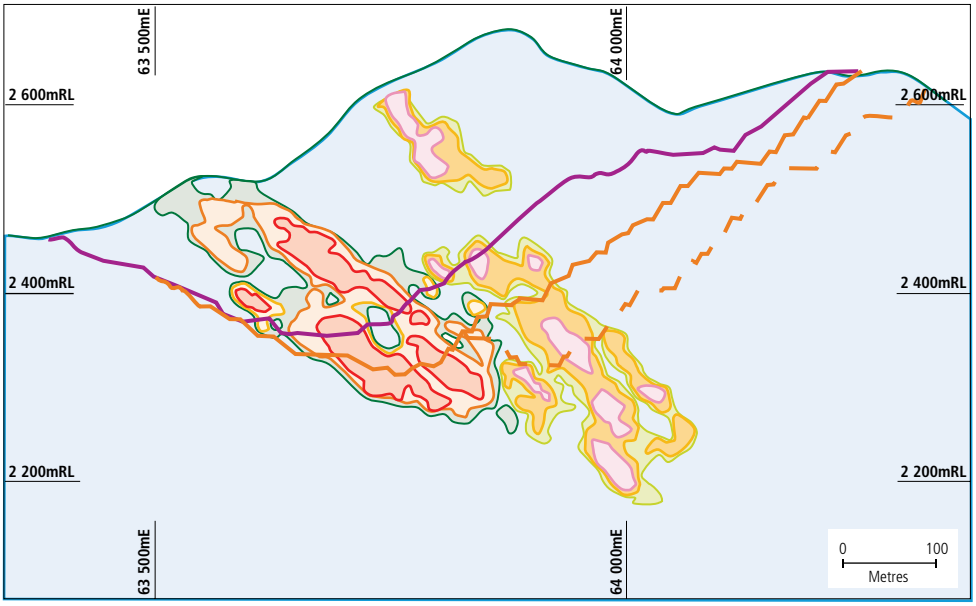
Hidden Valley

Hidden Valley – section 75 225mN

LEGEND

Hidden Valley	Kaveroi 500m N	Gold grade
		2.5 g/t Au
		1.3 g/t Au
		0.9 g/t Au

Original surface
Current surface
Stage 6
Stage 7 – life-of-mine design



MINERAL RESOURCES AND RESERVES BY OPERATION

PAPUA NEW GUINEA (HIDDEN VALLEY) CONTINUED

HIDDEN VALLEY AND HAMATA

Gold – Mineral resource estimates at 30 June 2019

	Measured resources				Indicated resources				Inferred resources				Total mineral resources			
	Tonnes		Gold		Tonnes		Gold		Tonnes		Gold		Tonnes		Gold	
	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)
Hidden Valley	2.7	0.96	3	85	64.5	1.53	99	3 169	1.5	1.06	2	53	68.8	1.50	103	3 307
Hamata	0.01	2.25	0.02	1	2.0	1.90	4	122	0.2	1.52	0.3	10	2.2	1.86	4	133
Total	**2.8**	**0.97**	**3**	**86**	**66.5**	**1.54**	**102**	**3 291**	**1.8**	**1.12**	**2**	**63**	**71.0**	**1.51**	**107**	**3 439**

Modifying factors

Hidden Valley	MCF (%)	Dilution (%)	PRF (%)	Cut-off (g/t)
2018	100	0	88	0.85
2019	100	0	88	0.85
Hamata				
2018	100	5	88	0.85
2019	100	5	88	0.85

Gold – Mineral reserve estimates at 30 June 2019

	Proved reserves				Probable reserves				Total mineral reserves			
	Tonnes		Gold		Tonnes		Gold		Tonnes		Gold	
	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)
Hidden Valley	2.7	0.96	3	85	13.6	1.91	26	833	16.3	1.75	29	918
Hamata	0.01	2.25	0.02	1	0.4	1.74	1	20	0.4	1.75	1	21
Grand total	**2.8**	**0.97**	**3**	**86**	**13.9**	**1.91**	**27**	**854**	**16.7**	**1.75**	**29**	**939**

Silver – Mineral resource estimates at 30 June 2019

	Measured resources				Indicated resources				Inferred resources				Total mineral resources			
	Tonnes		Ag		Tonnes		Ag		Tonnes		Ag		Tonnes		Ag	
	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)
Hidden Valley	2.7	21.13	58	1 863	64.5	26.12	1 684	54 151	1.5	25.21	39	1 256	68.8	25.90	1 781	57 270

Silver – Mineral resources as gold equivalent estimates at 30 June 2019

	Measured (000oz)	Indicated (000oz)	Inferred (000oz)	Total (000oz)
Hidden Valley	24	713	16	753

Modifying factors

Hidden Valley	MCF (%)	Dilution (%)	PRF (%)	Cut-off (g/t)
2018	100	0	61	0.85
2019	100	0	61	0.85

Silver – Mineral reserve estimates at 30 June 2019

	Proved reserves				Probable reserves				Total mineral reserves			
	Tonnes		Ag		Tonnes		Ag		Tonnes		Ag	
	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)
Hidden Valley	2.7	21.13	58	1 863	13.6	30.41	413	13 271	16.3	28.85	471	15 134

Silver – Mineral reserves as gold equivalents estimates at 30 June 2019

	Proved (000oz)	Probable (000oz)	Total (000oz)
Hidden Valley	25	175	199

MINERAL RESOURCES AND RESERVES BY OPERATION

PAPUA NEW GUINEA (HIDDEN VALLEY) CONTINUED

OPERATIONAL PERFORMANCE

Hidden Valley: Key operating statistics

	Unit	FY19	FY18	FY17	FY16	FY15
OPERATION						
Volumes milled	000t (metric)	**3 866**	2 499	2 889	1 729	1 825
	000t (imperial)	**4 285**	2 757	3 186	1 906	2 012
Gold produced	kg	**6 222**	2 862	2 965	2 257	2 943
	oz	**200 042**	92 015	95 327	72 565	94 619
Grade	g/t	**1.60**	1.36	1.07	1.31	1.61
	oz/t	**0.047**	0.039	0.035	0.038	0.047
FINANCIAL						
Average gold price received	R/kg	**579 902**	550 956	544 442	546 272	448 322
	US$/oz	**1 272**	1 283	1 246	1 210	1 218
Capital expenditure	Rm	**1 591**	1 563	1 335	121	121
	US$m	**112**	122	98	8	11
Cash operating cost	R/kg	**220 323**	287 028	466 847	479 196	391 774
	US$/oz	**483**	669	1 068	1 028	1 065
All-in sustaining cost	R/kg	**497 399**	466 256	543 186	597 398	514 690
	US$/oz	**1 090**	1 094	1 241	1 282	1 395

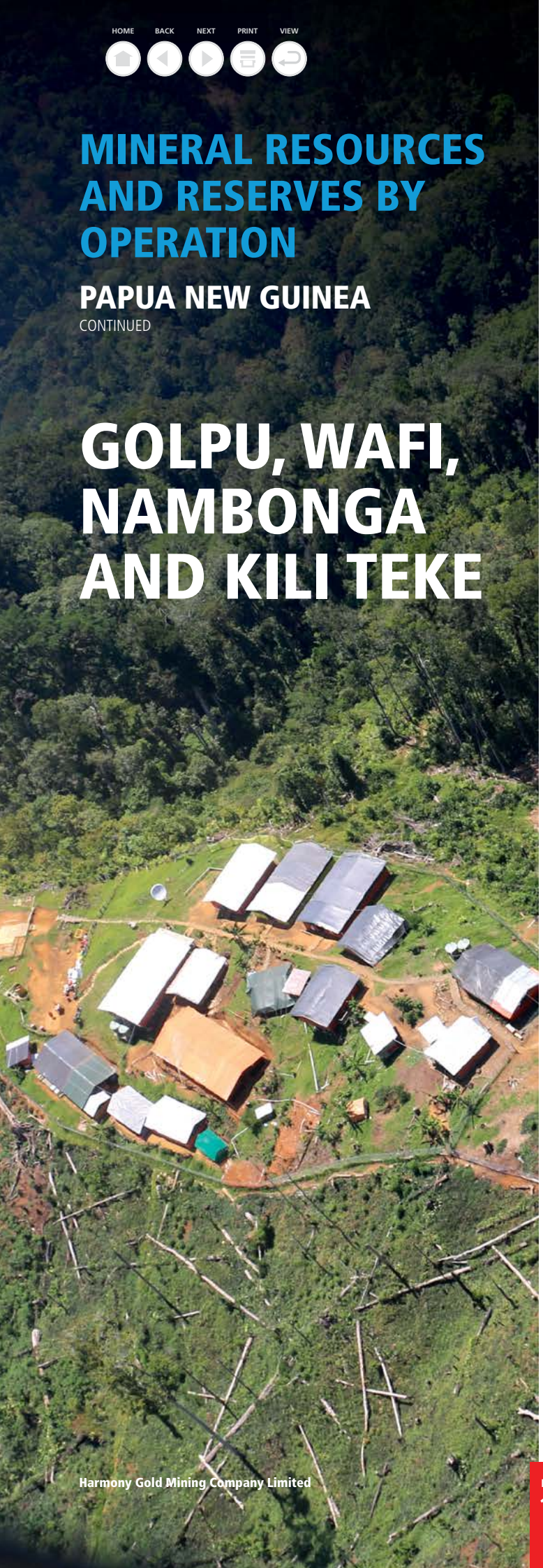
Hidden Valley

MINERAL RESOURCES AND RESERVES BY OPERATION

PAPUA NEW GUINEA

CONTINUED

GOLPU, WAFI, NAMBONGA AND KILI TEKE



Property description and location

The Golpu, Wafi and Nambonga deposits are located in eastern Papua New Guinea, approximately 60km southwest of Lae in Morobe Province. Access to the project from Lae is via a combination of tarred and untarred roads with a travel time of four hours. The operation is a 50:50 joint venture between Harmony (Wafi Mining Limited) and Newcrest Mining Limited (Newcrest PNG2 Limited).

History

The Wafi area mineralisation was first identified in 1979 by CRA Exploration with the discovery of the underlying Golpu Porphyry by Elders Resources Limited in 1990. Since then, several companies have completed exploration and resource-definition drilling programmes with associated mine development studies.

Nature of operations

The operations are in advanced exploration and project study phase. Golpu, the most advanced project, was covered in the feasibility study update which was published in March 2018. No mining has occurred in the project area.

Mineral rights/legal aspects and tenure

The deposits lie on exploration lease EL440 which is 50% owned by Harmony, through Wafi Mining Ltd, and by Newcrest Mining Ltd, through Newcrest PNG2 Limited.

Geology

The projects fall within the New Guinea Mobile Belt of Papua New Guinea which is one of the world's pre-eminent geological terrains for porphyry copper-gold and epithermal gold mineralisation.

Wafi-Golpu includes the Golpu copper-gold porphyry deposit (ranked as a world-class deposit in terms of its size and grade), the Nambonga copper-gold porphyry deposit, and the Wafi high sulphidation epithermal gold deposit. Knowledge of the Wafi-Golpu system is limited by the extent of drilling and the deposit remains open for future expansion. Exploration activity is guided by strong indications that the mineral resource will continue to grow at depth as a better understanding is gained of the nature and extent of the mineralised systems.

MINERAL RESOURCES AND RESERVES BY OPERATION

PAPUA NEW GUINEA (GOLPU, WAFI, NAMBONGA AND KILI TEKE) CONTINUED

GOLPU

Geology

The Golpu deposit is the largest of the deposits and found in a block of deformed Upper Mesozoic to Middle Miocene metasedimentary rocks cut by Miocene-Pliocene calc-alkaline dioritic intrusives. Copper and gold mineralisation results from a porphyry system with the upper portion overprinted by high sulphidation epithermal alteration. The deposit is also 60km north-northwest of the porphyry-related gold-silver-base metal Hidden Valley-Kaveroi mines and other related deposits in the Bulolo Graben (e.g. Edie Creek, Kerimenge, Upper Ridges).

The Golpu mineral resource is approximately 800m by 400m elliptical in plan and extends from 200m below surface to a depth of more than 2 000m. The deposit remains open at depth.

The system consists of multiple, hornblende-bearing diorite porphyries intruded into host sediments. Intrusives range from small dykes to small stocks and apopheses. Hydrothermal alteration related to the porphyry copper-gold mineralisation forms a predictable zonal arrangement grading from potassic core to propylitic margins. A high sulphidation epithermal system is 'telescoped' over the upper portion of the porphyry system forming a central alunite-quartz (advanced argillic) core grading out to dickite-kaolinite (argillic) with an outer margin of sericite alteration. This results in either epithermal-dominant, interaction (mixed) or porphyry-only zones.

Drilling update

Drill evaluation of the Golpu deposit was completed in 2014 with only limited drilling in 2015 through to 2019 associated with decline access, site investigations and near-term geotechnical interpretation. The underlying geology and the grade model remains unchanged from that used in the December 2014 mineral resource. The Golpu resource is constrained within a marginal breakeven shell using Wafi-Golpu Joint Venture 2015 gold and copper revenues and the estimated long-term cost structure developed in the 2016 Golpu Stage 2 prefeasibility study.

Golpu feasibility study update

The Golpu mineral reserve was updated following the release of the feasibility study update in March 2018.

Mining methods and mine planning

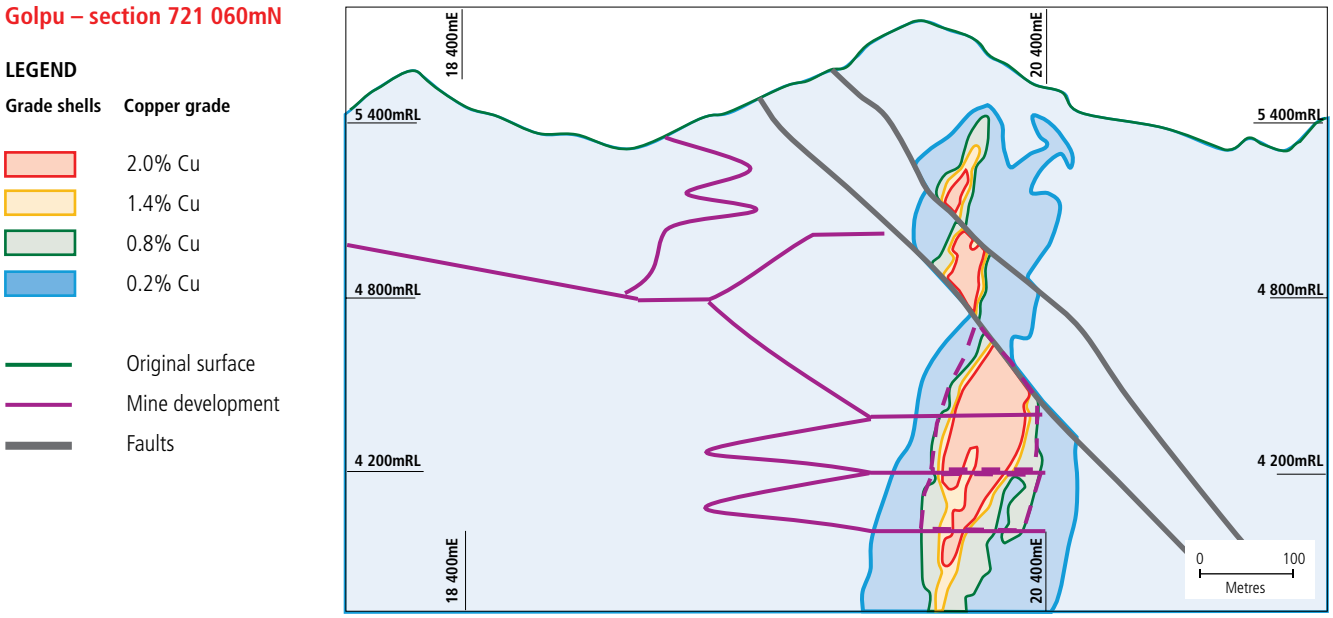
In March 2018 feasibility study update proposed the following mining approach:

- Secondary/initial underground access via the Nambonga decline to provide earlier and quicker access to underground drill platforms, second means of egress and ventilation
- Primary underground access is via the Watut portal and the twin Watut declines to the underground block cave mine. The Watut declines also form part of the primary ventilation circuit and materials handling system conveying ore to the Watut process plant
- A 'cave engineering level' established above the Reid Fault at 4870mRL for data gathering, further refinement of the rock mass, monitoring of the cave and potentially for dewatering
- Ore extracted via three block caves producing at a rate of 17Mtpa (design capacity)

Mineral processing

The proposed processing method has been based on known technology utilising testwork results gathered in the feasibility study update and previous studies. A copper and gold concentrate will be produced from a conventional crush, grind, float processing plant. Concentrate will be shipped from the port of Lae as a final product. Gold will also be produced as doré for delivery to a precious metal refinery.

Golpu – section 721 060mN



MINERAL RESOURCES AND RESERVES BY OPERATION

PAPUA NEW GUINEA (GOLPU, WAFI, NAMBONGA AND KILI TEKE) CONTINUED

Infrastructure

No major infrastructure is currently located at Golpu besides the exploration camp and access roads. The feasibility study update completed in March of 2018 discusses:

- Access road
- Ventilation and refrigeration plant
- Processing plant (copper concentrator)
- Deep sea tailings placement system including tailings pipeline from site to the discharge point near Lae
- Concentrate export pipeline plus associated dewatering and loading facilities at the existing port of Lae
- Accommodation camp
- On site power station

The Golpu mineral resource is estimated by ordinary kriging within alteration and lithological domains for gold, copper, silver, molybdenum and sulphur elements. The mineral resource is reported within a breakeven value shell that applies the 2016 Stage 2 prefeasibility study block-cave mining, treatment and general and administration costs with metallurgical recovery models and associated non-site realisation (TCRC) costs of the copper concentrate product. Revenue of gold and copper are the only economic elements included in the value estimate. The mineral resource reports the contained metal content of silver and molybdenum but revenues are not included in the estimation of the reporting cut-off. The prefeasibility study assumes no silver and molybdenum payable recovery, however, both elements have been included in the mineral resource as there are reasonable prospects of eventual economic extraction with limited changes to the metallurgical flow-sheet and operational procedures.

Permitting

The Wafi-Golpu Joint Venture entered into a Memorandum of Understanding (MOU) with the State in December 2018, targeting an SML grant by June 2019. Delays in discussions with the State, and litigation between the State and the Morobe Province concerning the MOU, prevented this target from being achieved.

Since the signing of the MOU in December 2018, a legal matter between the provincial and national government has interrupted the permitting process, and continues to do so. The WGJV remains ready to engage with the Government of PNG and the Regulators. At this stage the permitting timeline and roadmap are still to be redefined.

WAFI

The Wafi deposit is centred on high sulphidation epithermal mineralisation within a larger epithermal and porphyry related complex in granted exploration licence EL440, approximately 60km southwest of Lae, Papua New Guinea. The Wafi deposit outcrops less than 1km to the south of the top of the Golpu porphyry deposit.

The Wafi mineral resource was re-estimated in 2019 using an ordinary kriging method with updated domains. This was to reflect the potential large open pit mining method that will be tested in the future. The new resource is reported within a spatially constraining pit using revenue of US$1 400/oz gold and is not materially different to the previous estimate. Non-refractory gold (NRG) material is reported at a 0.4g/t cut-off where NRG is defined as greater than 70% cyanide soluble gold as gold-cyanide assays within the database. Refractory material below the NRG surface and within the spatial constraining pit shell is reported at a cut-off of 0.9 g/t gold.

The Wafi mineralisation has been defined over a surface area of 1 100m x 800m and up to 600m below surface, with the majority of the material potentially exploitable by open pit mining methods. No ore reserve is declared and no mining has been undertaken in the project area to date.

NAMBONGA

The Nambonga deposit is located 700m east of Golpu and is hosted in a diorite porphyry stock, termed the Nambonga Porphyry. Chalcopyrite is the dominant copper mineral in the porphyry, which is associated with silicification, either pervasive or as veins. Gold is thought to be intergrown with the chalcopyrite or pyrite.

The approximate extents of the system are 500m (east-west), 400m (north-south) and 1 000m vertically.

The Nambonga mineral resource is an ordinary kriged estimate based on a domained geological model and is reported within a 0.5g/t grade shell to provide a broad consistent mineralised zone.

The Nambonga mineral resource contains estimates for gold, silver, copper, lead, zinc and sulphur. Estimation domains are based on a combination of lithology, alteration and mineralisation. The Nambonga deposit is an advanced exploration target. No ore reserve is declared and no mining has been undertaken in the project area to date.

Environmental impact

The projects are in exploration and feasibility study stage and as such have only minor environmental impacts. Environmental aspects are regulated by the CEPA (Conversation and Environmental Protection Agency) and Wafi-Golpu reports regularly to this agency.

An environment impact assessment has been submitted to the Conservation and Environmental Protection Agency (CEPA) as part of permitting process.

COMPETENT PERSONS

GOLPU – MINERAL RESOURCE
Senior Resource Geologist Exploration Targeting, Newcrest Mining Limited

David Finn
AusIMM
More than 15 years' experience.

GOLPU – ORE RESOURCE
Group Manager Mining Projects, Newcrest Mining Limited

Pasqualino Manca
AusIMM
More than 30 years' experience.

WAFI AND NAMBONGA – MINERAL RESOURCE
Executive general manager: Growth and resource development, Harmony South-East Asia

Greg Job
AusIMM
More than 25 years' experience.

MINERAL RESOURCES AND RESERVES BY OPERATION

PAPUA NEW GUINEA (GOLPU, WAFI, NAMBONGA AND KILI TEKE) CONTINUED

WAFI (Harmony 50% portion)

Gold – Mineral resource estimates at 30 June 2019

	Measured resources				Indicated resources				Inferred resources				Total mineral resources			
	Tonnes		Gold		Tonnes		Gold		Tonnes		Gold		Tonnes		Gold	
	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)
Wafi	–	–	–	–	54.0	1.65	89	2 800	20.0	1.28	26	800	74.0	1.55	114	3 600

GOLPU (Harmony 50% portion)

Gold – Mineral resource estimates at 30 June 2019

	Measured resources				Indicated resources				Inferred resources				Total mineral resources			
	Tonnes		Gold		Tonnes		Gold		Tonnes		Gold		Tonnes		Gold	
	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)
Golpu	–	–	–	–	345.0	0.71	245	8 000	70.0	0.63	44	1 400	410.0	0.71	289	9 400

Modifying factors

	MCF	Dilution	PRF	Cut-off
Golpu	(%)	(%)	(%)	(% Cu)
2018	100	0	61	0.30
2019	100	0	61	0.30

Gold – Mineral reserve estimates at 30 June 2019

	Proved reserves				Probable reserves				Total mineral reserves			
	Tonnes		Gold		Tonnes		Gold		Tonnes		Gold	
	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)
Golpu	–	–	–	–	200.0	0.86	171	5 500	200.0	0.86	171	5 500

Silver – Mineral resource estimates at 30 June 2019

	Measured resources				Indicated resources				Inferred resources				Total mineral resources			
	Tonnes		Ag		Tonnes		Ag		Tonnes		Ag		Tonnes		Ag	
	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)
Golpu	–	–	–	–	345.0	1.29	449	14 000	70.0	1.10	77	2 300	410.0	1.28	526	16 500

Copper – Mineral resource estimates at 30 June 2019

	Measured resources				Indicated resources				Inferred resources				Total mineral resources			
	Tonnes		Cu		Tonnes		Cu		Tonnes		Cu		Tonnes		Cu	
	(Mt)	%	(Mkg)	(Mlb)	(Mt)	%	(Mkg)	(Mlb)	(Mt)	%	(Mkg)	(Mlb)	(Mt)	%	(Mkg)	(Mlb)
Golpu	–	–	–	–	345.0	1.00	3 750	8 250	70.0	0.85	600	1 250	410.0	1.00	4 300	9 500

Copper – Mineral resources as gold equivalents estimates at 30 June 2019

	Measured (000oz)	Indicated (000oz)	Inferred (000oz)	Total (000oz)
Golpu	–	19 150	2 960	22 100

Modifying factors

	MCF	Dilution	PRF	Cut-off
Golpu	(%)	(%)	(%)	(% Cu)
2018	100	0	92	0.30
2019	100	0	92	0.30

MINERAL RESOURCES AND RESERVES BY OPERATION

PAPUA NEW GUINEA (GOLPU, WAFI, NAMBONGA AND KILI TEKE) CONTINUED

Copper – Mineral reserve estimates at 30 June 2019

	Proved reserves				Probable reserves				Total mineral reserves			
	Tonnes		Cu		Tonnes		Cu		Tonnes		Cu	
	(Mt)	(%)	(Mkg)	(Mlb)	(Mt)	(%)	(Mkg)	(Mlb)	(Mt)	(%)	(Mkg)	(Mlb)
Golpu	–	–	–	–	200.0	1.20	2 450	5 400	200.0	1.20	2 450	5 400

Copper – Mineral reserves as gold equivalents estimates at 30 June 2019

	Proved reserves	Probable reserves	Total mineral reserves
	Au	Au	Au
	(000oz)	(000oz)	(000oz)
Golpu	–	12 538	12 538

Molybdenum – Mineral resource estimates at 30 June 2019

	Measured resources				Indicated resources				Inferred resources				Total mineral resources			
	Tonnes		Mo		Tonnes		Mo		Tonnes		Mo		Tonnes		Mo	
	(Mt)	(ppm)	(Mkg)	(Mlb)	(Mt)	(ppm)	(Mkg)	(Mlb)	(Mt)	(ppm)	(Mkg)	(Mlb)	(Mt)	(ppm)	(Mkg)	(Mlb)
Golpu	–	–	–	–	345.0	94	33	72	70.0	72	5	11	410.0	90	37	83

NAMBONGA (Harmony 50% portion)

Gold – Mineral resource estimates at 30 June 2019

	Measured resources				Indicated resources				Inferred resources				Total mineral resources			
	Tonnes		Gold		Tonnes		Gold		Tonnes		Gold		Tonnes		Gold	
	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)
Nambonga	–	–	–	–	–	–	–	–	20.0	0.82	16	500	20.0	0.82	16	500

Copper – Mineral resource estimates at 30 June 2019

	Measured resources				Indicated resources				Inferred resources				Total mineral resources			
	Tonnes		Copper		Tonnes		Copper		Tonnes		Copper		Tonnes		Copper	
	(Mt)	(%)	(Mkg)	(Mlb)	(Mt)	(%)	(Mkg)	(Mlb)	(Mt)	(%)	(Mkg)	(Mlb)	(Mt)	(%)	(Mkg)	(Mlb)
Nambonga	–	–	–	–	–	–	–	–	20.0	0.20	40	88	20.0	0.20	40	88

Copper – Mineral resources as gold equivalents estimates at 30 June 2019

	Measured	Indicated	Inferred	Total
	(000oz)	(000oz)	(000oz)	(000oz)
Nambonga	–	–	240	240

Rounding of figures may cause some slight computational discrepancies in totals

KILI TEKE

Location

Kili Teke is located on EL2310, some 50km north-northwest of the Tari Township (which is the provincial capital of the Hela Province in the Highlands of Papua New Guinea) and approximately 40km west-northwest of Porgera. The nearest road access point, which connects through to the Highlands Highway at Tari is approximately 14km from the Kili Teke prospect.

History

Outcropping mineralised breccia and copper gold skarn mineralisation at Kili Teke was initially identified in historic reconnaissance work undertaken in the early 1990s. Following a review of previous exploration results in the district, an exploration licence application over the area containing the Kili Teke resource was lodged by Harmony Gold Exploration (Papua New Guinea) Limited (Harmony Gold Exploration) in October 2013. EL2310 was subsequently granted in May 2014, and field work programmes by Harmony defined a broad (kilometre scale), high-tenor copper-gold anomaly at Kili Teke, indicative of the zonal geochemical distribution and alteration footprint associated with a major mineralised porphyry copper-gold system. Initial drilling began in November 2014 with significant results first returned in hole 7 of the drill programme:

- KTDD007: 422m @ 0.55% Cu, 0.43 g/t Au, from 131m
- Which included: 202m @ 0.74% Cu, 0.57g/t Au, from 137m

MINERAL RESOURCES AND RESERVES BY OPERATION

PAPUA NEW GUINEA (GOLPU, WAFI, NAMBONGA AND KILI TEKE) CONTINUED

Nature of operation
Kili Teke is at an advanced exploration stage which is currently placed on care and maintenance.

Legal aspects and tenure
The Kili Teke deposit is located on exploration licence EL2310 which is 100% owned by Harmony Gold Exploration. The tenement encompasses 252km^2.

The Papua New Guinea government issues and administers mining tenements under the Mining Act 1992, through the offices of the Mineral Resources Authority. Exploration licences are issued for a term not exceeding two years, and are renewable for further two-year terms subject to compliance with expenditure and other conditions. Each licence contains a condition conferring on the Papua New Guinea government the right to make a single purchase up to 30% equitable interest in any mineral discovery under the licence at a price pro rata to the accumulated exploration expenditure.

Although the renewal process was delayed by the Warden owing to security concerns in the Papua New Guinea Highlands, as at 31 August 2018, licence conditions and expenditure commitments for EL2310 had been fulfilled, and the tenement remains in good standing.

Geology
The Kili Teke deposit comprises porphyry style copper-gold mineralization hosted in a multiphase calc-alkaline dioritic to monzonitic intrusive complex. Host rocks comprise interbedded siliciclastics and limestone of the Papuan Fold Belt. Uranium-lead zircon age dating highlights Pliocene age dates in the range of 3.5 ± 0.04Ma (million years) to 3.59 ± 0.07Ma for emplacement of the mineralised porphyry phases. Late-mineral porphyry phases have been identified in the drilling and impact grade continuity within the deposit, where they intrude and stope out the earlier more mineralised phases. Overall the geometry of the deposit reflects a relatively steeply plunging, pipe like body, with mineralisation decreasing away from the central high grade stockwork zones of copper-gold mineralisation. Intense marbleisation and copper-gold skarn mineralisation is developed around the peripheral contact with the host sequence, and variably developed skarn mineralisation also occurs along internal structural and contact zones within the complex.

Mining methods and mine planning
Kili Teke is at the concept study level of work. This work has confirmed technically-viable solutions exist for mining, processing, infrastructure and logistics at Kili Teke, and no fatal flaws were identified.

Mining options consider open pit and bulk underground mining options with open pit the preferred option to take to further studies. This contemplated standard open pit mining with shovels and trucks. Waste dump locations have been preliminary identified as has terrestrial tailings storage facility locations.

Mineral processing
First pass rougher kinetic test work for metallurgical recovery shows that copper recovers extremely well (90%) and gold recovers well (65%) through standard copper flotation process. An option for smelting was considered but the high capital cost has precluded this with a copper concentrate product the most likely option to be considered by further studies.

Further deposit concept and study work is planned for FY18 in conjunction with the drill programme.

Mineral resource estimation
The current resource for Kili Teke has been generated from over 22 000m of drilling, along with detailed surface mapping, sampling and airborne geophysical survey data. Estimation has been constrained by a 0.125% copper shell, which represents the approximate natural break to mineralisation from the surrounding host sequence and unmineralised intrusive phases.

Modelling is based on estimation by ordinary kriging of 4m composites utilising a three-pass search ellipse into a regular block model comprising 60m x 60m x 60m parent blocks and 20m x 20m x 20m sub-blocks. An inferred resource has been reported from the resulting resource model and is based on a 0.2% Cu cut-off along with sample support criteria. The resource estimate is constrained approximately 650m below surface at the 780mRL, although mineralisation remains open at depth.

Environmental impact
The projects are in exploration and feasibility study stage and as such have only minor environmental impacts. The environment aspect are regulated by CEPA (Conversational and Environmental Protection Agency) and Kili Teki reports regularly to this agency.

Exploration
The Kili Teke deposit remains open to the southeast and at depth down plunge. Future exploration will be planned to assess the potential for a major increase to the resource base and for higher grade "value blocks" within the resource. Key targets will include:

- Zones of skarn mineralisation within and around the main intrusive complex. Skarn mineralisation has not yet been included in the model. These have potential to develop into high-grade massive sulphide lodes which could be selectively mined provided grade continuity and size (tonnage) can be established. KTDD025 for example intersected: 7.8m @ 12.98% Cu, 11.45 g/t Au from 920.5m
- The deposit remains open at depth where trends in the copper-sulphur ratios suggest higher-grade (bornite) stockwork mineralisation may be developed
- The deposit remains open to the southeast under cover of the limestone cap. Further drilling to scope out the full extent of the intrusive complex is recommended
- Additional intrusive centres with mineralisation outside of the current resource area; potentially driving marbleisation intersected at the Gold Ridge Anomaly or the intense alteration and accompanying sulphides evident at the Transfer Zone Porphyry target

MINERAL RESOURCES AND RESERVES BY OPERATION

PAPUA NEW GUINEA (GOLPU, WAFI, NAMBONGA AND KILI TEKE) CONTINUED

KILI TEKE

Gold – Mineral resource estimates at 30 June 2019

	Measured resources				Indicated resources				Inferred resources				Total mineral resources			
	Tonnes		Gold		Tonnes		Gold		Tonnes		Gold		Tonnes		Gold	
	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)	(Mt)	(g/t)	(000kg)	(000oz)
Kili Teke	–	–	–	–	–	–	–	–	237.0	0.24	56	1 810	237.0	0.24	56	1 810

Copper – Mineral resource estimates at 30 June 2019

	Measured resources				Indicated resources				Inferred resources				Total mineral resources			
	Tonnes		Cu		Tonnes		Cu		Tonnes		Cu		Tonnes		Cu	
	(Mt)	%	(Mkg)	(Mlb)	(Mt)	%	(Mkg)	(Mlb)	(Mt)	%	(Mkg)	(Mlb)	(Mt)	%	(Mkg)	(Mlb)
Kili Teke	–	–	–	–	–	–	–	–	237.0	0.34	802	1 767	237.0	0.34	802	1 767

Copper – Mineral resource estimates at 30 June 2019

As gold equivalents	Measured (000oz)	Indicated (000oz)	Inferred (000oz)	Total (000oz)
Kili Teke	–	–	4 108	4 108

Molybdenum – Mineral resource estimates at 30 June 2019

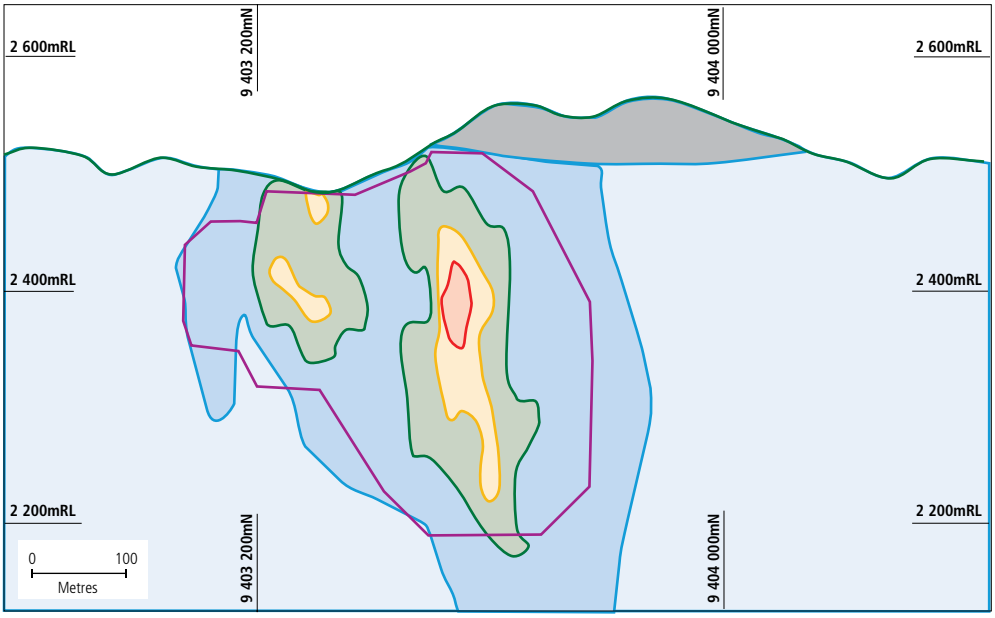
	Measured resources				Indicated resources				Inferred resources				Total mineral resources			
	Tonnes		Mo		Tonnes		Mo		Tonnes		Mo		Tonnes		Mo	
	(Mt)	(ppm)	(Mkg)	(Mlb)	(Mt)	(ppm)	(Mkg)	(Mlb)	(Mt)	(ppm)	(Mkg)	(Mlb)	(Mt)	(ppm)	(Mkg)	(Mlb)
Kili Teke	–	–	–	–	–	–	–	–	237.0	168	40	88	237.0	168	40	88

Kili Teke – section 688 790mE

LEGEND

Grade shells **Copper grade**

- 0.8% Cu
- 0.6% Cu
- 0.4% Cu
- 0.2% Cu
- Original surface
- Inferred resource outline
- Limestone cap



Kili Teke

APPENDIX

HARMONY SAMPLING STANDARD
FOR SAMREC COMPLIANCE REPORTING

The following standards, processes and procedures are followed and adhered to at all Harmony's underground mines in South Africa.

SAMPLING STANDARD
A standard procedure for the sampling of stopes and development ends is used to ensure quality of sampling information and safety in its collection. All samplers and sampling crews are trained based on the rules of the sampling standard. The standard specifies all the steps and rules involved in the preparation of the face and the collection of samples, as well as all safety aspects of sampling. Particular attention is given to quality of information captured, and planned task observations are routinely carried out to ensure adherence to the standard.

Quality assurance and quality control (QAQC)
Assessment of assaying accuracy and precision is carried out through the use of certified Standard Reference Materials, blanks and duplicates. Standard Reference Materials, blank samples and duplicate samples are added with the actual underground chip samples and drillhole samples sent to the assay laboratory. For analysis of underground chip-samples, the total number of Standard Reference Materials, blank samples and duplicate samples to be added to the daily underground samples will equal approximately 5% of the total underground samples submitted for that day. Generally, this equates to approximately 2% of each type of QAQC sample. For analysis of underground/surface drill-holes, QAQC is required to be more stringent in terms of numbers of Standard Reference Materials, blank samples and duplicate samples submitted. One gold Standard Reference Materials, one uranium Standard Reference Materials, one duplicate and one blank is required for every 20 drill-hole samples assayed. In other words, QAQC material will equate to approximately 15% of the total drill-hole samples analysed. If the Standard Reference Materials or blank sample has been deemed to have failed, the entire batch of samples assayed with this failed QAQC sample must be identified. A request must then be sent to the laboratory requesting them to repeat the assay procedure on all samples within this batch. A second Standard Reference Materials or blank sample must be provided to the laboratory to be included with the batch of samples. Should the batch of samples fail the QAQC standards again, these samples will be excluded from the sampling database (not captured in the sampling system), and the sampling will be repeated if necessary.

Assay laboratory
Fire assay is the oldest and, in most circumstances, still the best method for determining the concentration of precious metals in ores and metallurgical products. Essentially, the method consists of two consecutive pyrochemical separations. The finely ground sample is fused with a suitable flux, under reducing conditions which promote the separation of the precious metals from the gangue, with simultaneous collection, normally as a lead alloy. Subsequently, the lead is removed by oxidising fusion (cupellation) and the precious metals, thus isolated, are available for measurement.

Harmony's assay laboratory performs various types of analysis, but the laboratory is only ISO 17025 accredited for the analysis of gold and uranium. Underground ore samples are received and prepared for fire assay gold, uranium and relative density analysis. Plant samples e.g. residues, head samples, carbons, and solutions are also analysed for gold. Determination of gold fines is determined on bullion samples and sludge. The laboratory undertakes precious metal determinations on SAPS (exhibits) and securities recovered samples.

Water samples are also analysed to determine the quality. Tests are conducted for the presence of cyanide and trace metals tests, as is bacteriological testing.

APPENDIX CONTINUED

The laboratory is accredited to ISO/IEC 17025 for all gold analysis. This means that it is competent in meeting international and national laboratory standards and provides reliable testing services. In terms of the ISO/IEC 17025 laboratory systems accreditation, feedback is provided to the laboratory on whether it is conducting its work in accordance with international criteria for technical competence. This feedback assists the laboratory in continually improving its performance in terms of data quality and laboratory effectiveness.

Société Générale de Surveillance (SGS) – Performance Laboratories Randfontein is a fully equipped laboratory providing analytical services using fire assay, instrumental and classical techniques for precious and base metal ores. The laboratory provides services to the major mining houses, including Harmony, in South Africa as well as exploration companies currently active in Africa.

The laboratory is ISO 17025:2005 accredited for the analysis of gold, uranium and the platinum group metals. This international standard confirms that the laboratory operates a quality system, is technically competent and is able to generate valid results. The quality system is applied across the entire laboratory, irrespective of the accreditation status of the method. This is critical in providing results on which major decisions regarding mining and plant operations are based.

Sample preparation plant

To determine the grade of the ore hoisted at the mines, we make use of go-belt sampling.

A belt sample of up to 1 000kg is received at the plant from the shaft. The sample is first put through a 300mm screen prior to drying with infra-red heaters. Primary crushing to <70mm is then followed by a secondary crushing to <25mm, after which the sample is reduced. At the primary splitter 7/8 of the sample is discarded via a conveyor belt and 1/8 of the sample progress to final drying. Tertiary crushing to <6mm is then followed by secondary splitting. Again 7/8 of the sample is discarded and 1/8 of the sample is pulverised to 85% <106 micron. At the final splitting, all eight sub-samples are packaged and sent to the laboratory for analyses.

The sample ticket with the necessary information from the shaft, accompanies the sample throughout the process. Empty bins are hosed out, whilst cleaning continues as part of the procedure to avoid contamination. At regular intervals grading analyses are done at the assay laboratory. A quartz sample is done to monitor any possible contamination.

To ensure that a high standard of preparation is maintained at each step of the process, which includes the adherence to safety standards and is checked by a supervisor.

GLOSSARY OF TERMS

Term	Definition
Acidic	Descriptor for silica rich igneous rocks (containing greater than 65% silica) such as rhyolite or granite.
AHIA	Association of Healthcare Internal Auditors
Alluvium	Relatively recent deposits of sedimentary material laid down in riverbeds, flood plains, lakes, or at the base of mountain slopes.
Alteration	Any physical or chemical change in a rock resulting from fluids moving through the rock.
Anticline	An arch or fold in layers of rock.
Assay	An analysis to determine the presence and concentration of one or more chemical components.
Basalt	An extrusive mafic volcanic rock.
Basic	Descriptor for silica poor igneous rocks such as basalt or gabbro.
Below infrastructure	That part of a company's mineral reserve that can only be accessed following certain capital expenditure which has yet to be approved.
BIF	Banded iron formation
Block caving	A mining method suited for large low-grade orebodies that are unsuitable for open cut mining. In development a series of evenly spaced crosscuts are made at the bottom of the ore block from which raises are driven up into the ore. The ore block is then undercut so that it begins to collapse (or cave) into the raises. The weight of the material above provides the force to fracture and crush the underlying ore which is drawn from the drawpoints on the crosscuts. As ore is withdrawn the cave progresses up through the orebody.
Bornite	A copper iron sulphide that commonly defines the core of porphyry copper-gold deposits.
Breccia	Fractured and broken rock that results from structural, volcanic or sedimentary processes.
Bulk mining	Any large-scale mechanised method of mining involving significant volumes of material being extracted on a daily basis.
Caldera	A large, basin shaped volcanic depression, more or less circular in form, that results from the collapse of the earth's surface into an exhausted magma chamber.
Chalcocite	A copper sulphide mineral common in zones of secondary enrichment.
Chalcopyrite	A copper iron sulphide that comprises the bulk of ore in many copper mines.
Concentrate	The product of the milling process that contains a high percentage of the valuable metals. The concentrate is commonly the final product produced on-site and is sent to a third party for separation or smelting.
Conglomerate	A sedimentary rock consisting of rounded, water worn pebbles or boulders cemented into a solid mass.
Contact	A geological term used to describe the line or plane along which two different rock types meet.
Contact metamorphism	Metamorphism of country rocks adjacent to an intrusion caused by heat and fluids from the intrusion.
Craton	A part of the earth's crust that has attained stability and has been little deformed for a long period of geological time.
Crosscut	An opening underground that is cut at right angles from the main level drive or shaft that generally links to and cuts the orebody, may also refer to a link between different drives.
Country rocks	The surrounding "host" rocks into which an igneous intrusion or orebody is emplaced.
Cut-off grade	The lowest grade of copper or gold ore that is considered economic to mine.
DatamineTM	Software
Decline	A tunnel below the horizontal that allows access to the orebody.
Deposit	A concentration of mineral matter, sedimentary or volcanic material, commonly refers to an accumulation of mineralised material that need not be economic to extract.

GLOSSARY OF TERMS CONTINUED

Diamond drilling	A method of obtaining samples of rock that utilises a diamond encrusted drill bit to cut long cylindrical sticks of core.
Diatreme	A long vertical pipe or plug filled with volcanic breccia formed by explosive release of energy from a gas-charged magma.
Dilution	Unmineralised rock that is by necessity removed along with ore during the mining process that effectively lowers the overall grade of the ore.
Diorite	Plutonic or intrusive rocks of intermediate composition between acidic and basic.
Dip	The angle at which a bed, stratum, or vein is inclined from the horizontal, measured perpendicular to the strike and in the vertical plane.
Disseminated ore	Ore carrying small distributed particles or valuable minerals distributed more or less uniformly through the rock.
Drawpoint	An underground opening at the bottom of the stope through which broken ore is extracted.
Dyke	A long and relatively thin body of igneous rock that, while in the molten state, intruded a fissure in older rocks.
Enrichment	The process of upgrading the concentrations of various elements into more concentrated deposits.
Epithermal deposit	A mineral deposit consisting of veins and replacement bodies containing precious metals or, more rarely, base metals; that form close to the earth's surface at high levels in the crust.
Exploration	Prospecting, sampling, mapping, drilling and other work involved in the search for ore.
Fault	A break in the continuity of a body of rock. It is accompanied by a movement on one side of the break relative to the other so that what were once parts of one continuous rock stratum or vein are now separated. The amount of displacement of the parts may range from a few inches to thousands of feet. Various descriptive names have been given to different kinds of faults, including but not limited to; closed fault, dip fault, dip-slip fault, distributive fault, flaw fault, gravity fault, heave fault, hinge fault, horizontal fault, longitudinal fault, normal fault, oblique fault, oblique slip fault, open fault, overthrust fault, parallel displacement fault, pivotal fault, reverse fault, rotary fault, step fault, strike fault, strike-slip fault, thrust fault, transcurrent fault, translatory fault, underthrust, vertical fault.
Felsic	An igneous rock having abundant light-coloured minerals and enriched in lighter elements such as silica and aluminium.
Flotation	A milling process in which valuable particles are induced to become attached to bubbles and float where they are more easily separated.
Fold	A curve or bend of a planar structure such as rock strata, bedding planes, foliation, or cleavage. A fold is usually a product of deformation, although its definition is descriptive and not genetic and may include primary sedimentary structures.
Gabbro	A dark, coarse-grained mafic igneous rock.
Gangue	The commercially worthless material that surrounds, or is closely mixed with, the ore.
Gold equivalent ounces	In instances where individual deposits may contain multiple valuable commodities with a reasonable expectation of being recovered; for example gold + copper in the one deposit, Harmony computes a gold equivalent to more easily assess the value of the deposit against gold only mines. Harmony does this by calculating the value of each of the deposits commodities then divides the product by the price of gold. For example ((gold ounces* gold price per ounce) + (copper pounds* copper price per pound))/gold price per ounce; this will return the gold equivalent of a gold and copper deposit. All calculations are done using metal prices as stipulated in attached documentation. Harmony assumes a 100% metallurgical recovery in its calculations unless otherwise stated.
Graben	A block of rock bound by faults that has moved downward to form a depression between adjacent fault blocks.
Granite	A light coarse-grained felsic intrusive rock.
Granodiorite	A light coarse-grained intermediate intrusive rock.

GLOSSARY OF TERMS

Greenstone	A field term for any compact dark green altered or metamorphosed basic igneous rock that owes its colour to chlorite.
Head grade	The average grade of ore fed into the mill.
Horst	An elongate, relatively uplifted crustal unit or block that is bounded by faults, the opposite of a graben. It is a structural form and may or may not be expressed geomorphologically.
Hydrothermal	Relating to hot fluids circulating in the earth's crust; generally the source of metals found in mineral deposits
Igneous rock	Rocks formed by the solidification of molten material below the earth's crust.
IHAS	Integrated Hazard Awareness System
Intrusive	A body of igneous rock formed by the consolidation of magma intruded into country rock, in contrast to lava which is extruded onto the earth's surface.
Lava	A general name for the molten rock ejected by volcanoes.
Mafic	An igneous rock composed chiefly of dark, ferromagnesium minerals and enriched in heavier elements such as iron.
Magma	The molten material within the earth from which igneous rocks are formed.
Maramuni arc	A part of the New Guinea Mobile Belt, an arc across the island of Papua New Guinea within which a large portion of economic deposits are found.
Matrix	The finer-grained material between the larger particles of a rock or the material surrounding a fossil or mineral.
Metallurgy	The study of extracting metals from their ores.
Mesozoic	An era of geologic time, from the end of the Paleozoic to the beginning of the Cenozoic, or from about 225 million years to about 65 million years ago.
Mine call factor	Is the ratio, expressed as a percentage, which the specific product accounted for in "recovery plus residue" bears to the corresponding product "called for" by the mine's measuring and valuation methods.
MW	Milling width is a calculated width expressing the relationship between the total reef area excavated and the total tonnes milled from underground sources.
Mobile belt	A belt of folded and mountainous terrain that defines the core of the island of Papua New Guinea, considered to define the leading edge of the Australian content where it is in collision with the pacific ocean plate.
Non-refractory	Gold or copper ore that is easily extracted using standard and well tested mill and plant technologies.
Ophiolite	A section of the earth's oceanic crust and the underlying mantle that has been uplifted and often emplaced (or obducted) onto the edge of a continental plate; commonly the product of subduction systems. The material comprises mafic and ultramafic rocks and minerals.
Ore	A mixture of minerals and gangue from which at least one of the minerals can be extracted at a profit.
Orogeny	A period of mountain building characterised by compression and folding within the earth's crust.
Oxidation	Generically refers to a chemical reaction of the rock when exposed to oxygen and surface water, resulting in oxide material in a mining environment.
Plunge	The inclination and orientation of a fold axis or other linear feature, measured in the vertical plane.
Porphyry	An igneous rock of any composition that contains conspicuous phenocrysts in a fine-grained groundmass that has intruded into the upper crust rapidly. A rock name descriptive of the groundmass composition usually precedes the term e.g. diorite porphyry.
Porphyry copper	A specific deposit type associated with the intrusion of multiple phases of porphyry. The heat and associated fluids commonly carry and precipitate metals such as gold, copper, molybdenum and silver.
PRF	Plant recovery factor is the ratio, expressed as a percentage, of the mass of the specific mineral product actually recovered from ore treated at the plant to its total specific mineral content before treatment.

GLOSSARY OF TERMS CONTINUED

Pyrite	Iron sulphide that usually occurs in veins, as magmatic segregation, as an accessory in igneous rocks, and in metamorphic rocks, in sedimentary rocks including coal seams; It is commonly associated with gold.
Quartzite	A very hard metamorphosed sandstone, consisting chiefly of quartz grains that are so completely cemented with secondary silica that the rock breaks across or through the grains rather than around them.
Raise	Any tunnel having an inclination above the horizontal in the direction of workings.
Recovery	The percentage of valuable metal in the ore that can be recovered by metallurgical treatment.
Refractory	Ore type that contains gold or copper that is 'locked up' and difficult to extract without specialised processing equipment.
Resource	The estimated amount of material in a mineral deposit, based on limited drilling but considered to be available for eventual economic extraction.
Rhyolite	A fine-grained extrusive igneous rock with the same chemical composition as granite.
SASS5	South African Scoring System Version 5
Schist	A foliated metamorphic rock that has undergone sufficient strain so as to align all the mineral components into a roughly parallel arrangement.
Shaft	A vertical or inclined excavation in rock for the purpose of accessing the orebody, usually equipped with a hoist and winder to move miners and materials between the surface and various levels underground.
Silica	Fine grained silicon dioxide (such as quartz).
Siliceous	An alteration type where a large portion of the original rock has been replaced by silica.
Skarn	Lime-bearing silicates of any geologic age derived from nearly pure limestone or dolomite with the introduction of large amounts of silica, aluminium, iron and magnesium.
Stockwork	A mineral deposit in the form of a network of veinlets diffused in the country rock.
Stope	An excavation in a mine from which ore is, or has been, removed.
Strike	The bearing from north of a geological structure such as a bed, fault or orebody, defined as a horizontal line measured across the surface perpendicular to the dip.
Strip	To remove the overburden and waste to reveal the ore underneath.
Stripping ratio	The ratio of tonne of waste removed to tonnes of ore recovered in an open pit mine.
Subduction	The process in plate tectonics whereby a portion of one of the earth's plates is drawn down below another.
Sub-level	A level in an underground mine between two main working levels.
Sub-outcrop	A rock stratum that unconformably underlies another rock stratum.
Syncline	Concave fold in stratified rock, in which strata dip down to meet in a trough.
Tailings	Material rejected from the milling process from which much of the economic material has been removed.
SW	Stoping width is the width of the excavation made during stoping operations.
TSF	Tailings storage facility (or tailings pond) – where the tailings are stored until the end of mining when the facility is capped and rehabilitated.
Unconformity	The structural relationship between rock strata in contact, characterised by a lack of continuity in deposition due to a period of non-deposition, weathering, or erosion prior to the deposition of the younger beds. An unconformity is often marked by absence of parallelism between the strata where the younger overlying stratum does not conform to the dip and strike of the older underlying rocks.
Volcanic	Derived from volcanoes.
Waste	Unmineralised or low-grade material that cannot be mined at a profit.
Winze	Any tunnel having an inclination below the horizontal in the direction of workings.

FORWARD-LOOKING STATEMENTS

CAUTIONARY STATEMENT ABOUT FORWARD-LOOKING STATEMENTS

This annual report contains forward-looking statements within the meaning of the safe harbour provided by Section 21E of the Exchange Act and Section 27A of the Securities Act of 1933, as amended (the "Securities Act"), with respect to our financial condition, results of operations, business strategies, operating efficiencies, competitive positions, growth opportunities for existing services, plans and objectives of management, markets for stock and other matters.

These forward-looking statements, including, among others, those relating to our future business prospects, revenues, and the potential benefit of acquisitions (including statements regarding growth and cost savings) wherever they may occur in this annual report and the exhibits to this annual report, are necessarily estimates reflecting the best judgment of our senior management and involve a number of risks and uncertainties that could cause actual results to differ materially from those suggested by the forward-looking statements. As a consequence, these forward-looking statements should be considered in light of various important factors, including those set forth in this annual report. Important factors that could cause actual results to differ materially from estimates or projections contained in the forward-looking statements include, without limitation:

- overall economic and business conditions in South Africa, Papua New Guinea, Australia and elsewhere
- estimates of future earnings, and the sensitivity of earnings to the prices of gold and other metals
- estimates of future production and sales for gold and other metals
- estimates of future cash costs
- estimates of future cash flows, and the sensitivity of cash flows to the prices of gold and other metals
- estimates of provision for silicosis settlement
- estimates of future tax liabilities under the Carbon Tax Act
- statements regarding future debt repayments
- estimates of future capital expenditures
- the success of our business strategy, exploration and development activities and other initiatives
- future financial position, plans, strategies, objectives, capital expenditures, projected costs and anticipated cost savings and financing plans
- estimates of reserves statements regarding future exploration results and the replacement of reserves
- the ability to achieve anticipated efficiencies and other cost savings in connection with past and future acquisitions, as well as at existing operations
- fluctuations in the market price of gold
- the occurrence of hazards associated with underground and surface gold mining
- the occurrence of labour disruptions related to industrial action or health and safety incidents
- power cost increases as well as power stoppages, fluctuations and usage constraints
- supply chain shortages and increases in the prices of production imports and the availability, terms and deployment of capital
- our ability to hire and retain senior management, sufficiently technically-skilled employees, as well as our ability to achieve sufficient representation of historically disadvantaged persons in management positions
- our ability to comply with requirements that we operate in a sustainable manner and provide benefits to affected communities
- potential liabilities related to occupational health diseases
- changes in government regulation and the political environment, particularly tax and royalties, mining rights, health, safety, environmental regulation and business ownership including any interpretation thereof; court decisions affecting the mining industry, including, without limitation, regarding the interpretation of mining rights
- our ability to protect our information technology and communication systems and the personal data we retain
- risks related to the failure of internal controls
- the outcome of pending or future litigation or regulatory proceedings
- fluctuations in exchange rates and currency devaluations and other macroeconomic monetary policies
- the adequacy of the Group's insurance coverage
- any further downgrade of South Africa's credit rating
- socio-economic or political instability in South Africa, Papua New Guinea and other countries in which we operate

The foregoing factors and others described under "Risk Factors" should not be construed as exhaustive.

We undertake no obligation to update publicly or release any revisions to these forward-looking statements to reflect events or circumstances after the date of this annual report or to reflect the occurrence of unanticipated events, except as required by law. All subsequent written or oral forward-looking statements attributable to Harmony or any person acting on its behalf are qualified by the cautionary statements herein.

DIRECTORATE AND ADMINISTRATION

HARMONY GOLD MINING COMPANY LIMITED

Harmony Gold Mining Company Limited was incorporated and registered as a public company in South Africa on 25 August 1950

Registration number: 1950/038232/06

Corporate office

Randfontein Office Park
PO Box 2
Randfontein, 1760
South Africa

Corner Main Reef Road and Ward Avenue
Randfontein, 1759
South Africa

Telephone: +27 11 411 2000
Website: *www.harmony.co.za*

DIRECTORS

Dr PT Motsepe* (chairman)

JM Motloba* (deputy chairman)

M Msimang*^ (lead independent director)

PW Steenkamp ** (chief executive officer)

F Abbott ** (financial director)

HE Mashego** (executive director)

JA Chissano*[1]^

FFT De Buck*^

KV Dicks*^

Dr DSS Lushaba*^

HG Motau*^

KT Nondumo*^

VP Pillay*^

GR Sibiya*^

MV Sisulu*^

JL Wetton*^

AJ Wilkens*

** Non-executive*
*** Executive*
^ Independent
[1] Mozambican

INVESTOR RELATIONS

E-mail: HarmonyIR@harmony.co.za
Telephone: +27 11 411 2314
Website: *www.harmony.co.za*

COMPANY SECRETARY

Telephone: +27 11 411 2094
E-mail: companysecretariat@harmony.co.za

TRANSFER SECRETARIES

Link Market Services South Africa (Proprietary) Limited

(Registration number 2000/007239/07)

13th Floor, Rennie House,
Ameshoff Street, Braamfontein
PO Box 4844
Johannesburg, 2000
South Africa

Telephone: 0861 546 572
E-mail: info@linkmarketservices.co.za
Fax: +27 86 674 4381

ADR* DEPOSITARY

Deutsche Bank Trust Company Americas c/o American Stock Transfer and Trust Company

Deutsche Bank Trust Company Americas
c/o AST
Operations Centre
6201 15th Avenue
Brooklyn
NY11219

E-mail queries: db@astfinancial.com
Website: *www.astfinancial.com*

Toll free (within US): +1-886-249-2593
Int: +1-718-921-8124
Fax: +1-718-921-8334

**ADR: American Depositary Receipts*

SPONSOR

JP Morgan Equities South Africa (Pty) Ltd

1 Fricker Road, corner Hurlingham Road,
Illovo, Johannesburg, 2196
Private Bag X9936 Sandton, 2146

Telephone: +27 11 507 0300
Fax: +27 11 507 0503

TRADING SYMBOLS

JSE: HAR
New York Stock Exchange: HMY
ISIN: ZAE 000015228