HARMONY™

# MINERAL RESOURCES AND MINERAL RESERVES 2016

Harmony, a gold mining and exploration company with more than six decades of experience, has operations in South Africa – one of the world's best known gold mining regions – and in Papua New Guinea – one of the world's premier new gold regions. In FY16, Harmony was the third largest gold producer in South Africa and the twelfth largest in the world. 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.

HARMONY™

# KEY FEATURES
## YEAR-ON-YEAR

6% INCREASE IN
**RECOVERED UNDERGROUND GRADE**

54% REDUCTION IN NET DEBT TO
**R1.08 billion** (61% to US$74 million)

NET LOSS TURNED INTO NET PROFIT OF
**R949 million** (US$66 million)

DIVIDEND DECLARED OF
**50 SA cents** (4 US cents)

HEADLINE LOSS PER SHARE TURNED INTO HEADLINE EARNINGS PER SHARE OF
**221 SA cents** (15 US cents)

OUR SHARE PRICE
**OUTPERFORMED INDICES, GOLD PRICE AND OUR PEERS**

ENHANCING OUR PORTFOLIO OF
**GOLD-COPPER ASSETS**

# OUR VALUES

Our values are at the core of all we do – they underpin all our actions and are built into the design of our business.

**WE MEASURE OURSELVES AGAINST THESE IN EVERYTHING WE DO.**

**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

# OUR 2016 REPORTS

Our suite of reports for the financial year 2016 (FY16) records our activities and the progress we have made for the year running from 1 July 2015 to 30 June 2016. This suite of reports includes:

- Integrated Annual Report 2016, our primary report
- Financial Report 2016
- Mineral Resources and Mineral Reserves 2016
- Report to Shareholders 2016

These reports are available as pdfs at *www.har.co.za*, our reporting website and may also be accessed via our corporate website, *www.harmony.co.za*, where you will also be able to access more detailed information on the environmental, socio-economic and governance aspects of our business.

This QR code link will take you to information suitable to view on your mobile device. Download an application for your phone, take a picture of the code and the relevant page will open in your browser window.

THE CARBON PROTOCOL • CARBON NEUTRAL APPROVED •

# CONTENTS



## REFERENCE

A full glossary of terms is available on the website, *www.har.co.za*

Throughout this report, "$" or "dollar" refers to US dollar, unless otherwise stated.

"K" refers to kina, the currency of Papua New Guinea.

"Moz" refers to million ounces.

All production volumes are in metric tonnes (t) unless specifically stated as imperial tons.

This is an interactive pdf. The interactive links are indicated by text in *red italics.*

# COMPLIANCE AND SUMMARY

As at 30 June 2016

Harmony's statement of mineral resources and mineral reserves as at 30 June 2016 is produced in accordance with the South African Code for the Reporting of Mineral Resources and Mineral Reserves (SAMREC) and the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC). It should be noted that mineral resources are reported inclusive of mineral reserves.

Harmony uses certain terms in the summary 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 with the United States' Securities and Exchange Commission. United States investors are urged to consider the disclosure in this regard in our Form 20-F which is available on our website at *https://www.harmony.co.za/investors/reporting/20f.*

## HARMONY – TOTAL MINERAL RESOURCES AND RESERVES

The company's total attributable gold equivalent mineral resource of 105.2Moz was declared as at 30 June 2016, a 4.6% decrease year on year from the 110.3Moz declared on 30 June 2015. Gold contained in the mineral resources at the South African operations represented 55.2% of Harmony's total, with the Papua New Guinea assets representing 44.8% of total gold and gold equivalent mineral resources as at 30 June 2016.

Harmony's total attributable gold and gold equivalent mineral reserves amounted to 36.9Moz of gold, a 13.3% decrease on the 42.6Moz declared at 30 June 2015. Gold reserve ounces at our South African operations accounted for 45.4% while the Papua New Guinea gold and gold equivalent ounces represented 54.6% of Harmony's total mineral reserves as at 30 June 2016.

### SOUTH AFRICA

#### Underground operations

Mineral resources at our South African underground operations as at 30 June 2016 totalled 48.6Moz (162.1Mt at 9.32g/t), a decrease of 19.9% year on year from the 60.6Moz (217.2Mt at 8.68g/t) declared a year previously. This decrease was mainly due to depletion and reduced resources at Unisel, Masimong, and Doornkop.

Total mineral reserves at the South African underground operations as at 30 June 2016 were 9.7Moz (54.1Mt at 5.55g/t), a decrease of 35.7% year on year from the 15.0Moz (80.3Mt at 5.82g/t) declared a year previously. The decrease was a result of normal depletion and the revised, shortened life-of-mine plan for Kusasalethu. This plan aims to optimise the mine's cash flow at a higher grade and create a much stronger margin and to provide the flexibility, if we so choose, of accessing the high-grade payshoot of the Ventersdorp Contact Reef below infrastructure.

# COMPLIANCE AND SUMMARY CONTINUED

As at 30 June 2016

### Surface operations including Kalgold

Mineral resources at the South African surface operations as at 30 June 2016 totalled 9.5Moz (1 085.2Mt at 0.27g/t), virtually unchanged year on year from the 9.5Moz (1 082.3Mt at 0.27g/t) declared as at 30 June 2015. Total mineral reserves at the South African surface operations as at 30 June 2016 were 7.1Moz (840.3Mt at 0.26g/t), also in line with that declared a year earlier.

### PAPUA NEW GUINEA

### Operations

Mineral resources at our Papua New Guinea assets as at 30 June 2016 were 47.1Moz gold equivalent, an increase of 17.1% year on year from the 40.2Moz gold equivilent declared at 30 June 2015. This increase was due to the mineral resources declared at Kili Teke and increases resulting from the change in the gold equivalent ratios used given the revision to the long-term commodity prices used.

Mineral reserves at the Papua New Guinea assets as at 30 June 2016 were 20.2Moz, a decrease of 1.8% on the 20.5Moz declared as at 30 June 2015.

## AUDITING

Harmony's South African mineral resources and mineral reserves were comprehensively audited by a team of internal competent persons that functions independently of the operating units. The internal audit team verifies compliance with the Harmony code of resource blocking, valuation, resource classification, cut-off calculations, development of life-of-mine plans and SAMREC compliant statements from each operation and project which supports Harmony's annual mineral resources and mineral reserves declaration.

This audit process is specifically designed to comply with the requirements of internationally recognised procedures and standards such as:

- The South African Code for Reporting Mineral Resources and Mineral Reserves – SAMREC
- Industry Guide 7 of the United States' Securities and Exchange Commission
- Sarbanes-Oxley requirements
- The Australian Code for Reporting of Exploration Results, Mineral Resources and Mineral Reserves – JORC – which complies with SAMREC
- Harmony's South African mineral resources and reserves were reviewed by The Mineral Corporation for compliance with SAMREC. The mineral resources and reserves of the Papua New Guinea assets were reviewed by AMC Consultants Pty Ltd for compliance with the standards set out in JORC.

# COMPLIANCE SUMMARY CONTINUED

As at 30 June 2016

## 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 the operations of 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 in this report are based on information compiled by the following competent persons:

### RESOURCES AND RESERVES OF SOUTH AFRICA:

Jaco Boshoff, BSc (Hons), MSc, MBA, Pr. Sci. Nat, MSAIMM, MGSSA, who has 21 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.

**Jaco Boshoff**
26 October 2016

**Physical address:**
Randfontein Office park
Corner of Main Reef Road and Ward Avenue
Randfontein
South Africa

**Postal address:**
PO Box 2
Randfontein
1760
South Africa

### RESOURCES AND RESERVES OF PAPUA NEW GUINEA:

Gregory Job, BSc, MSc, who has 28 years' relevant experience and is a member of the Australian Institute of Mining and Metallurgy (AusIMM).

**Greg Job**
26 October 2016

**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 the report of the matters based on the information in the form and context in which it appears.

### ADMINISTRATIVE INFORMATION FOR PROFESSIONAL ORGANISATIONS

**AusIMM – The Australasian Institute of Mining and Metallurgy**
PO Box 660, Carlton South, Vic 3053, Australia
Telephone: +61 3 9658 6100; Facsimile: +61 3 9662 3662
*http://www.ausimm.com.au/*

**SACNASP – The legislated regulatory body for natural science practitioners in South Africa**
Private Bag X540, Silverton, 0127, Gauteng Province, South Africa
Telephone: +27 12 841 1075; Facsimile: +27 86 206 0427
*http://www.sacnasp.org.za/*

**SAIMM – The Southern African Institute of Mining and Metallurgy**
PO Box 61127, Marshalltown, 2107, Gauteng Province, South Africa
Telephone: +27 11 834 1273/7; Facsimile: +27 11 838 5923/8156
*http://www.saimm.co.za/*

# COMPLIANCE AND SUMMARY CONTINUED

As at 30 June 2016

## 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 2016, 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 which are available in a separate report, the Financial Report 2016, which is also available online at *www.har.co.za.*

## LEGAL ENTITLEMENT TO MINERALS REPORTED

The Harmony South Africa 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.

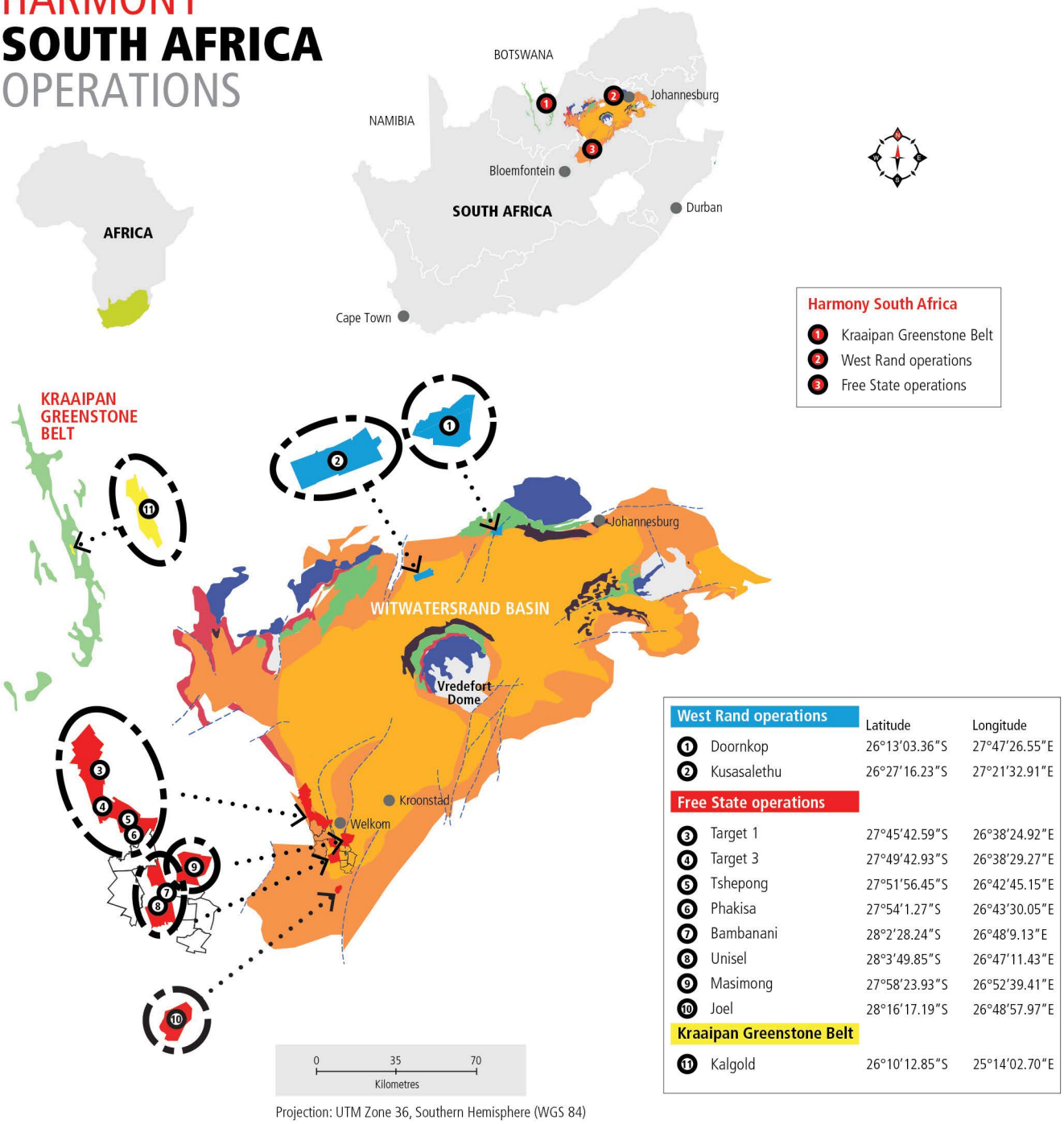
## ASSUMPTIONS

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

- A gold price of US$1 150/oz
- An exchange rate of R/US$12.85
- These parameters result in a rand gold price of R475 000/kg for the South African assets
- The Hidden Valley mine and Golpu project in the Morobe Mining Joint Ventures used commodity prices of US$1 150/oz Au, US$15.00/oz Ag, US$5.00/lb Mo and US$3.00/lb Cu at an exchange rate of US$0.80 per A$
- Gold equivalent ounces are calculated assuming US$1 150/oz Au, US$3.00/lb Cu and US$15.00/oz Ag, and assuming a 100% recovery for all metals

# LOCATION OF OPERATIONS

## HARMONY SOUTH AFRICA OPERATIONS



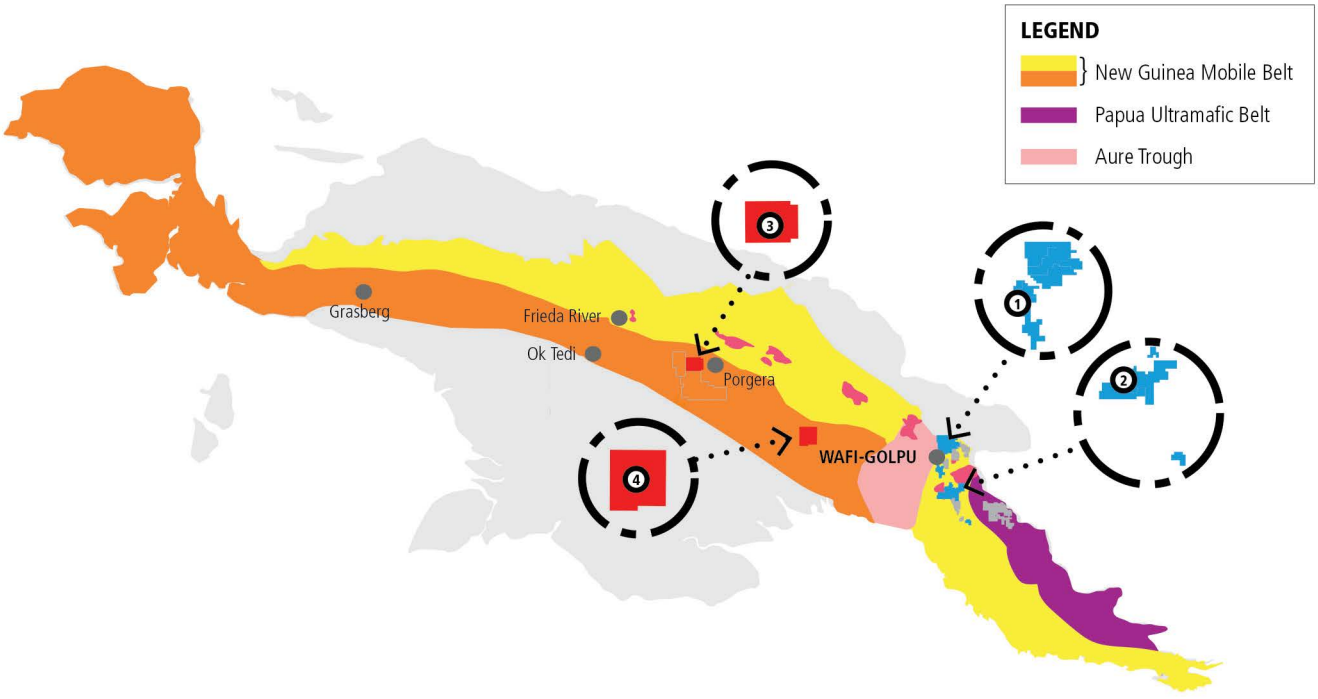

Projection: UTM Zone 36, Southern Hemisphere (WGS 84)

| | | 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 |
| **Free State operations** | | | |
| 3 | Target 1 | 27°45'42.59"S | 26°38'24.92"E |
| 4 | Target 3 | 27°49'42.93"S | 26°38'29.27"E |
| 5 | Tshepong | 27°51'56.45"S | 26°42'45.15"E |
| 6 | Phakisa | 27°54'1.27"S | 26°43'30.05"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 |

# LOCATION OF OPERATIONS CONTINUED

## HARMONY
## PAPUA NEW GUINEA
## OPERATIONS

| MMJV | | Latitude | Longitude |
|---|---|---|---|
| 1 | Wafi | 146°27'09.57" | 6°51'49.68" |
| | Golpu | 146°27'59.43" | 6°51'35.23" |
| 2 | Hidden Valley | 146°40'0.09" | 7°27'55.00" |
| **Harmony exploration projects** | | | |
| 3 | Kili Teki | 142° 42' 08"E | 5° 23' 12"S |
| 4 | Poru | 144° 17' 00"E | 6° 22' 00"S |


0 400 800
Kilometres

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

# EXPLORATION AND PROJECTS

## HIGHLIGHTS AND MILESTONES OF FY16 EXPLORATION PROGRAMME IN PAPUA NEW GUINEA

### Advancement of the Golpu project:

- Optimised feasibility and prefeasibility studies completed and results released in February 2016
- Completed and announced results of the feasibility study for stage 1 and the prefeasibility study for stage 2 of the Golpu project. For further details, see page 14.

### Maiden inferred resource declared for Kili Teke prospect:

- Drilling at Kili Teke continues to yield highly significant copper-gold mineralisation drill results. See page 12.

### Further rationalisation of the greenfield tenement package:

- Harmony (100%) tenement holding reduced by 25% to 764km$^2$ (FY15: 1 023km$^2$)
- Joint venture (Harmony 50%) tenement holding declined by 20% to 999 km$^2$ (FY15: 1 245km$^2$).
- Further, EL1629 is held under an option to purchase by Pacific Niugini Minerals and who are also responsible for maintaining the joint venture tenement in good standing.
- Harmony continues to manage exploration on the Morobe joint venture tenement package on behalf of the owners (Newcrest 50%; Harmony 50%)

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

In FY16, we spent R433 million (US$29.9 million) (FY15: R385 million, US$33.6 million) on exploration, both brownfields and greenfields exploration, all of which was spent in Papua New Guinea.

In line with the strategy of developing a world-class copper and gold portfolio in Papua New Guinea, the key work streams underpinning the FY16 exploration programme included:

- Optimised feasibility studies on a staged development path for the high-grade Golpu porphyry copper-gold deposit, and special mining lease permitting process
- Accelerated drill schedule at the Kili Teke porphyry copper-gold discovery to define resources and progress up the value curve
- Drill target development for epithermal gold at the at the Wau Domefield in the Morobe province;
- Continued rationalisation of the greenfield tenement package to maintain focus on the most prospective targets.

Harmony closely monitors the environment for new opportunities to enhance our project portfolio, in line with core operating capabilities. Given sustained low commodity prices, tenure over highly prospective target areas in Papua New Guinea continues to become available.

## KEY GEOLOGICAL FEATURES

### PAPUA NEW GUINEA:

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 associated with the emplacement of intrusive stocks and dykes. Porphyry systems are one of 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

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

### SOUTH AFRICA:

All of our underground mines are in the Witwatersrand Supergroup. Most of these can be found in the south-western corner of the Witwatersrand Basin or Free State goldfields, and comprise sedimentary rocks that extend laterally for hundreds of kilometres into the West Rand goldfields and East Rand Basin. The Kraaipan Greenstone Belt can be found further north-west where we have an open pit operation.

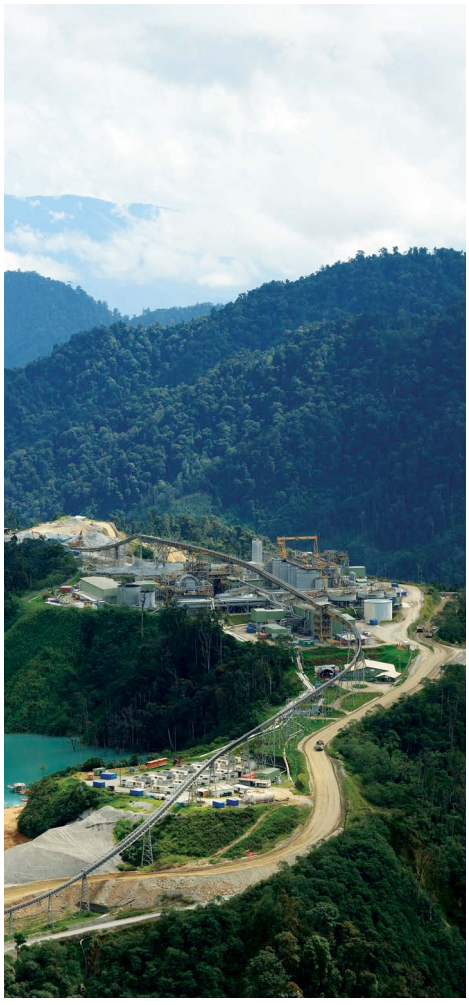
# EXPLORATION AND PROJECTS CONTINUED

## PAPUA NEW GUINEA

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

The case for exploration investment in Papua New Guinea remains strong. The country is hugely prospective, under-explored, and has a stable and transparent regulatory environment that promotes and supports mining investment. In addition, Harmony has an established track record of discovery and adding value through cost effective exploration:

- Since 2003, resource growth from both the Morobe joint venture tenements (Harmony's 50% equity share) and Harmony 100%-held tenements amounts to 12.7Moz of gold and 5.1Mt of copper (42.5Moz gold equivalent)
- Discovery cost on a per ounce gold equivalent basis of less than US$10 is among the best in the world



# EXPLORATION AND PROJECTS CONTINUED

## Morobe Exploration Joint Venture (50%)

The Morobe Exploration Joint Venture refers to a key strategic tenement holding in the Morobe Province that encompasses the Hidden Valley mine[1] and Golpu project. The tenement package is held jointly (50:50) between Harmony and Newcrest. The Morobe exploration strategy is to manage a portfolio pipeline of projects to develop bulk tonnage (~1Moz) or high-margin gold or gold-copper targets that provide new standalone opportunities or resource options to complement the operations at Hidden Valley and/or at the Golpu project.

During FY16, we spent R9 million (US$0.6 million) compared to R12 million (US$1.1 million) in FY15 on exploration in the area throughout the joint venture. This represents Harmony's share which is 50% of the total work programme expenditure. The Morobe Exploration Joint Venture tenement package currently stands at 999km$^2$ (FY15: 1 245km$^2$). Work on the Morobe Exploration Joint Venture tenements included:

- Rationalisation of peripheral and non-core tenements:
  - EL1590 was surrendered after prospectivity was downgraded
  - EL1629 is now managed by Pacific Niugini Minerals under an option and sale purchase agreement
- Prospect development at the historic Wau gold mining centre located approximately 12km northeast of Hidden Valley and reassessment of drill targets and potential at Wafi Golpu

A reduced budget of R6 million (US$0.4 million) has been proposed for FY17 to continue the generative work programme planned to develop quality targets with the potential to provide resource optionality and leverage infrastructure associated with operations at Hidden Valley or the Golpu project.

**The Papua New Guinea exploration and mine development programme is summarised below:**

**Golpu**

| Target | Progress in FY16 | Targets/plans for FY17 |
|---|---|---|
| Develop the Golpu deposit, a world-class gold-copper porphyry resource, into a mine with more than 28 years of low-cost copper and gold production. | Completed and announced the results for the prefeasibility and feasibility studies<br>For more detailed information, see Wafi Golpu | • Stakeholder engagement to initiate the permitting process: Compilation and submission of the special mining lease application including Environmental Impact Statement[2]<br>• Optimisation and de-risking studies<br>• Deep-sea tailings placement studies |

**Wafi Golpu district**

| Target | Progress in FY16 | Targets/plans for FY17 |
|---|---|---|
| Wafi transfer zone – greenfields exploration targeting discovery of additional resources to expand Golpu into a mineral district | Validation mapping and reconnaissance has confirmed Nambonga North as a priority drill target for FY17<br>Prospectivity of EL1590 was downgraded and the tenement was surrendered | Continue generative work programme and drill target development:<br>• Airborne geophysical survey trial over the Wafi Golpu system<br>• Reinterpretation of the Wafi gold system in context with latest structural model and geophysical data |

**Hidden Valley district**

| Target | Progress in FY16 | Targets/plans for FY17 |
|---|---|---|
| Brownfields exploration within a 10km radius of the Hidden Valley plant to develop replacement resources and support expansion | Grassroots level work focused on the historic Wau gold mining centre with detailed mapping and rock chip sampling and grid based soil geochemical sampling completed. In total, 1 082 surface samples were collected<br>A number of high tenor gold geochemical anomalies were generated for developing into drill targets | • Drill target definition and drill testing of high-priority targets in the historic Wau mining district |

# EXPLORATION AND PROJECTS CONTINUED

## Harmony Gold Exploration (Papua New Guinea) Limited (100%)

A total of R164 million (US$11.3 million) was spent on exploration outside of the Morobe joint venture on Harmony-owned projects in FY16 (FY15: R87 million/US$7.5 million). This work focused almost exclusively on developing and drill testing the Kili Teke prospect.

Harmony's 100%-owned greenfields tenement portfolio comprises 764km$^2$ compared to FY15: 1 023 km$^2$ (a 25% reduction in the size of the tenement portfolio year-on-year). The reduction in the tenement holding was driven by relinquishing part of EL2310, which was required as part of the licence renewal process.

Details of the FY16 work programme are outlined below. Drilling was successful in defining a maiden resource for Kili Teke, which now stands at 785 000t of copper, and 1.8Moz of gold, and the Kili Teke prospect has been proven as a new porphyry camp with the potential to develop into a major gold-copper discovery.

Subject to further drilling success, a FY17 budget of R227 million (US$17.6 million) has been earmarked to expand the resource base and progress "pre-concept" studies of the Kili Teke mineralisation.

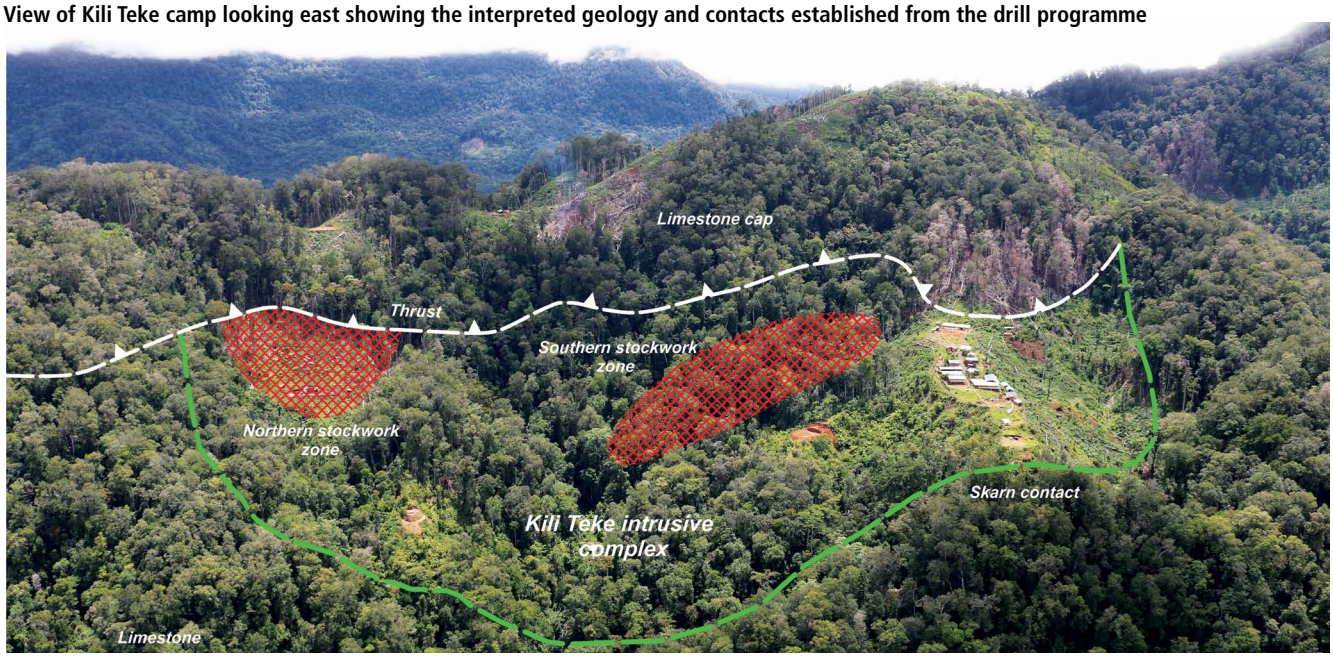
**Kili Teke prospect**

| Target | Progress in FY16 | Targets/plans for FY17 |
|---|---|---|
| Targeting gold-copper porphyry | 18 400m of drilling was completed during the year<br><br>128Mt maiden resource declared in November 2015. In June 2016 the inferred mineral resource increased to 222Mt @ 0.35% Cu, 0.25g/t gold and 170 ppm molybdenum containing 782 000t copper, 1.75Moz of gold and 38 000t molybdenum | • Drilling to continue for resource expansion (open to southeast and at depth). A budget of R227 million (US$17.6 million) has been earmarked<br>• Pre-concept study work to begin |

**Project generation**

| Target | Progress in FY16 | Targets/plans for FY17 |
|---|---|---|
| Develop a project pipeline capable of delivering additional quality resources to sustain growth and regional operations | EL2836 containing the Poru prospect area was progressed to grant and preliminary social mapping began<br><br>Tenement monitoring for new opportunities continued | • Prospect identification and development through ridge and spur soil sampling, mapping and rock-chip sampling |

**View of Kili Teke camp looking east showing the interpreted geology and contacts established from the drill programme**



PAPUA NEW GUINEA


**November 2015 – initial intercepts:**

**KTDD007:**
461m @ 0.51% Cu, 0.4 g/t Au, from 86m

Including 202m @ 0.74% Cu, 0.57g/t Au, from 137m

**KTDD013:**
542m @ 0.58% Cu, 0.41 g/t Au from 90m

Including 319m @ 0.79% Cu, 0.57 g/t Au from 166m

**June 2016 – revised mineral resource:**

The inferred mineral resource currently stands at 222Mt @ 0.4% copper and 0.2g/t gold and 170ppm molybdenum containing:

- 782 000t copper
- 1.75Moz gold
- 38 000t molybdenum.

# KILI TEKE PROSPECT – A SIGNIFICANT NEW GREENFIELD PORPHYRY COPPER DISCOVERY

Kili Teke represents the first greenfield porphyry copper-gold discovery in Papua New Guinea since Golpu, which was identified in 1990 and then materially expanded some 20 years later in 2010. Harmony's exploration team has played an integral role in both discoveries.

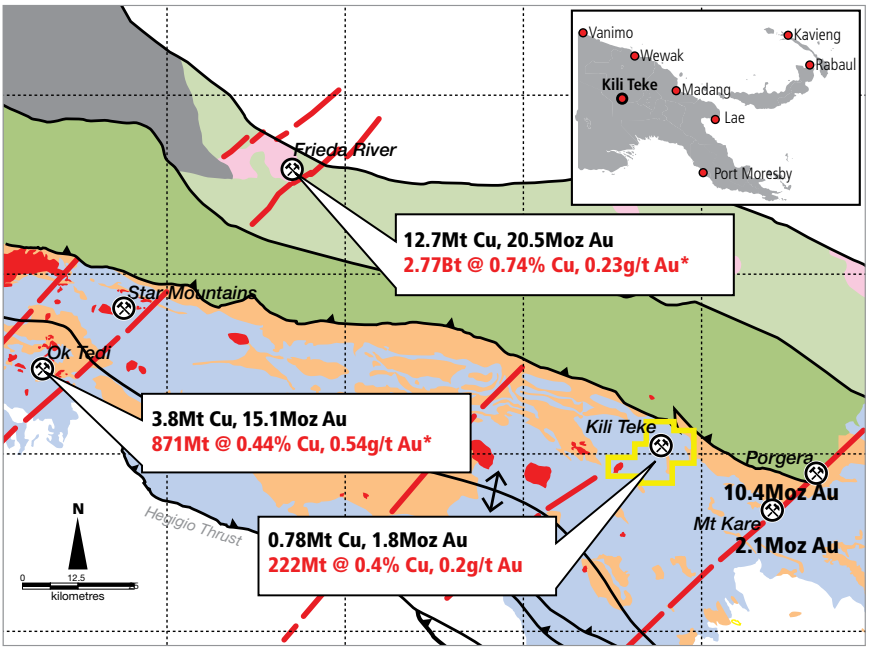
Regionally, the Kili Teke copper gold prospect is hosted in the Papuan fold belt which comprises the same limestone-sedimentary sequence that is host to the giant Ok Tedi and Grasberg copper-gold mines. Harmony is actively exploring the region for similar major porphyry copper-gold systems together with accompanying high-grade, copper-gold skarn mineralisation (see below).

In following up historic exploration results in FY15, 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 and was highly successful.

FY16 drilling comprised 26 holes for 18,400m and focused on infilling and extending the discovery mineralisation in the Central Mineralised Porphyry. A maiden mineral resource announced in November 2015 was subsequently revised in June 2016. The updated resource was grown 50% to 6.0Moz on a gold equivalent basis compared to the November model.

The additional drill data has led to an improved understanding of the geological model and the mineralised system. Cross-cutting relationships identified through detailed logging show that the copper-gold mineralisation is associated with a multiphase intrusive complex. Two early-mineral porphyry phases have been identified as the main host to the higher grade and more well developed stockwork mineralisation. Uranium-lead zircon age dating yield Pliocene age dates in the range of 3.5 ± 0.04Ma (million years) to 3.59 ± 0.07Ma for the mineralised phases. Late-mineral porphyry phases were also identified in the drilling and impact grade continuity within the deposit where they intrude and stope out the earlier more mineralised phases.

**Regional geological setting showing location of Kili Teke deposit, in relation to other major deposits and structure**



# EXPLORATION AND PROJECTS CONTINUED

The Kili Teke deposit remains open to the southeast and at depth down plunge and drilling at the prospect continues targeting:

- 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 planned
- 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

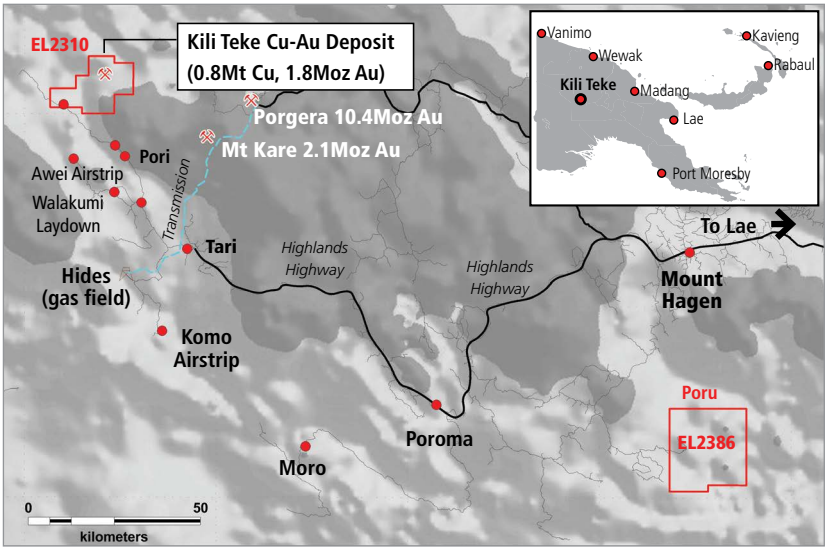
## Kili Teke infrastructure, scoping and desktop concepts

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.

Pre-concept study work has confirmed technically-viable solutions exist for mining, processing, infrastructure and logistics at Kili Teke, and no fatal flaws were identified. The copper-gold mineral resource at Kili Teke extends to surface and would lend itself to an open-pit operation. First pass rougher kinetic test work for metallurgical recovery shows that copper recovers extremely well (90%) and gold recovers well (65%). Further deposit concept and study work is planned for FY17 in conjunction with the drill programme.

The Hela Province and the Tari area in particular are currently undergoing a major infrastructure upgrade following on from the national liquefied natural gas project development. The Papua New Guinea government recently announced funding for several significant infrastructure projects including the sealing of the roads between Komo, Tari, Koroba and Mendi, and a major upgrade of the Hides gas-fired power plant and rural electrification programme. The Hides power plant supplies electricity to the Porgera gold mine. The Komo airstrip, located approximately 80km south of Kili Teke, is the largest sealed airstrip in the country and is capable of taking large cargo planes including Antonov aircraft (see below).

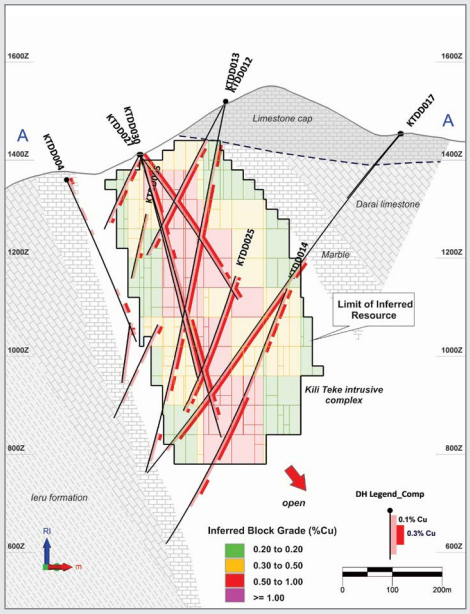
**Current projects in the Highlands area showing infrastructure and gasfields**



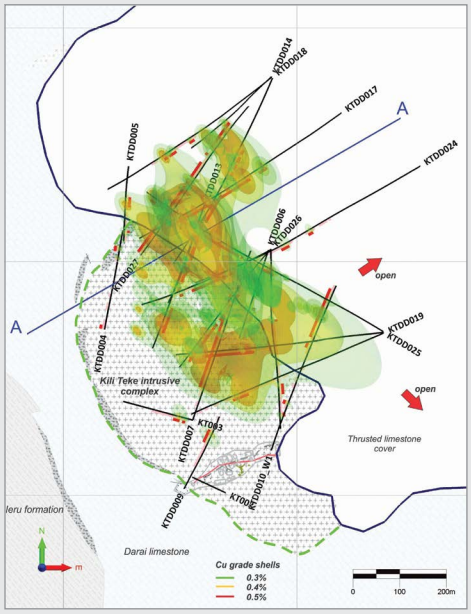

## Kili Teke deposit

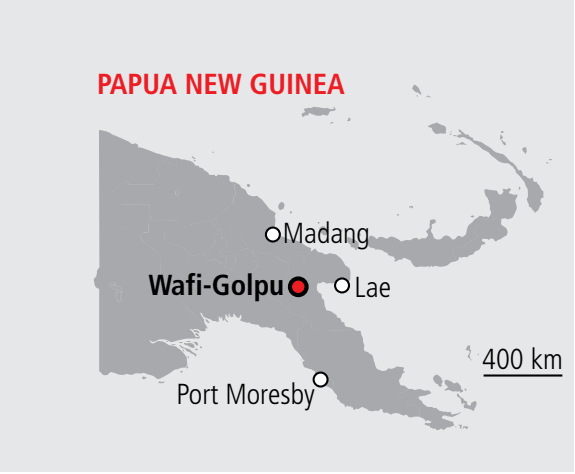
Overall the geometry of the deposit remains as a relatively steeply plunging, pipe-like intrusive complex, with mineralisation decreasing away from the central high-grade stockwork zones of copper gold mineralisation. Intense marbleisation and skarn mineralisation is developed around the peripheral contact with the host sequence. Variably developed skarn mineralisation also occurs along internal structural and contact zones. See diagrams below.

**Block model slice with schematic geology**




**Geology interpretation showing drill hole locations and copper grade shells**





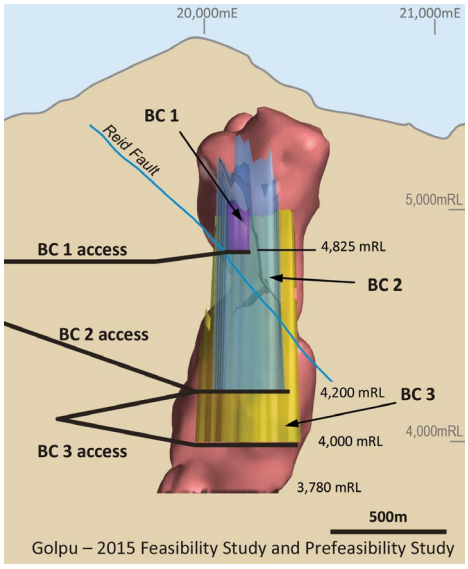

# WAFI GOLPU – A ROBUST INVESTMENT CASE

Harmony and Newcrest each currently own 50% of Golpu through the Wafi-Golpu Joint Venture. The Golpu deposit is located approximately 65km southwest of Lae in the Morobe Province of Papua New Guinea which is the second largest city in Papua New Guinea and will host Golpu's import and export facilities. The proposed mine site sits at an elevation of approximately 400m above sea level in moderately hilly terrain and is located near the Watut River, approximately 30km upstream from the confluence of the Watut and Markham rivers

In February 2016 the Wafi Golpu joint venture completed feasibility and prefeasibility studies for the Wafi Golpu copper-gold project and declared updated resources and reserves for the project. Both studies confirmed a robust investment case – one that supports proceeding with the project.

The initial project capital on a 100% basis is estimated at US$2.6 billion, yielding an internal rate of return of 16%. These feasibility study outcomes justify the development of twin exploration access declines, with two proposed block caves (BC 1 and BC 2) designed to extract approximately 50% of the contained metal (gold and copper) of the Golpu reserve. The remaining reserve is to be extracted by a deeper third block cave (BC 3) which is the subject of the prefeasibility study. The common path mining and processing infrastructure, as defined in the feasibility study, will be used in support of project optimisation, expansion and extended mine life as described in the prefeasibility study.

**Cross-section of Golpu porphyry**



Golpu – 2015 Feasibility Study and Prefeasibility Study

## FEASIBILITY STUDY

The feasibility study defines initial development of the Golpu resource and focuses on the development of the first two block caves, and all associated infrastructure required. The key findings of the feasibility study include:

- Low operating costs will withstand low commodity price cycles and will benefit from high returns during higher commodity price cycles
- The updated ore reserve at 31 December 2015, is estimated to contain 5.5Moz of gold and 2.4Mt of copper (Harmony's 50% interest)
- Project de-risked, with no significant deviation from the previous prefeasibility study economic outcomes and technical recommendations
- Golpu is amenable to "staged development"
  - allows for optimising capital efficiency
  - progressively de-risks the project prior to further investments
- Financial metrics include (the feasibility study is considered to be at ±15% accuracy)
  - net present value: US$1.1 billion
  - internal rate of return: ~16%
  - maximum negative free cash flow (100% basis): US$1.8 billion
- Initial mine development targets higher-grade sections of the deposit thereby optimising free cash flow
- Development of the near-surface block cave 1 affords early cash flow thereby reducing the maximum negative cash outflow
- Production parameters for the two block caves are:

| Block cave | Annual mining rate (Mt) | Tonnes mined (Mt) | Gold grade (g/t) | Copper grade (%) |
|---|---|---|---|---|
| Block cave 1 | 3.0 | 8 | 0.99 | 2.00 |
| Block cave 2 | 6.0 | 143 | 1.05 | 1.54 |

- Block caving is the preferred mining method for the following reasons:
  - ore body geometry and indicative rock mass characteristics are suited to block caving
  - it is a high productivity, low operating cost underground mining method
- The project is in close proximity to the city of Lae with established infrastructure such as roads, marine port, airport, and light industry

**Summary of the key metrics (100% basis) of the feasibility study:**

| Area | Measure | Unit | Results |
|---|---|---|---|
| **Production** | First ore milled | Months from start of earthworks | ~60 |
| | Steady-state production | Months from start of earthworks | ~90 |
| | Ore mined and milled | Mt | 149 |
| | Life of mine | Years | 28 |
| **Copper** | Metal produced | Mt | 2.2 |
| | Peak annual copper production | 000t pa | 135 |
| | Copper recoveries | % | 94 |
| **Gold** | Gold metal produced | Moz | 3.6 |
| | Peak annual gold production | 000oz | 297 |
| | Gold recoveries | % | 70 |
| **Capital** | Project capital | US$ billion | 2.6 |
| | Sustaining capital | US$ billion | 1.6 |
| | Total life of project capital | US$ billion | 4.2 |
| | Maximum negative cash flow | US$ billion | 1.8 |
| **Operating costs** | Total operating cost (real) | US$/t | 30.66 |
| | Realisation cost | US$/t | 17.61 |
| | Cash cost | US$/lb produced | 0.59 |
| | Total sustaining production cost | US$/lb produced | 0.89 |
| | Total production cost | US$/lb produced | 1.45 |
| **Economic assumptions** | Gold price | US$/oz | 1 200 |
| | Copper price | US$/lb | 3.00 |
| | Exchange rates | AU$/US$ | 0.80 |
| | | PGK/US$ | 2.85 |
| | Discount rate (real) | % | 8.50 |
| **Financial outcomes** | Net present value | US$ billion | 1.1 |
| | Internal rate of return | % | ~16 |

The operating cost estimate covers all operating expenditure to mine, treat and administer extraction of the ore body, as well as transporting, dewatering and ship-loading of the concentrate at the port of Lae. Cash costs and total production costs include treatment and refining charges, freight to end customers, royalties and mining levies. Total production cost includes sustaining and construction capital costs. The realisation cost estimate in the financial model is US$17.61/t, this includes treatment and refinery costs, concentrate transport and handling costs, and royalties and is not included in the total operating cost. Any real, above inflation, price escalation of costs to the time of forecast expenditure has been excluded. Costs are however sourced and forecast in the underlying currency in which they are incurred.

## Capital costs

Harmony's share (50%) of the estimated capital requirements (based on the feasibility study) from grant of the special mining lease are approximately as follows:

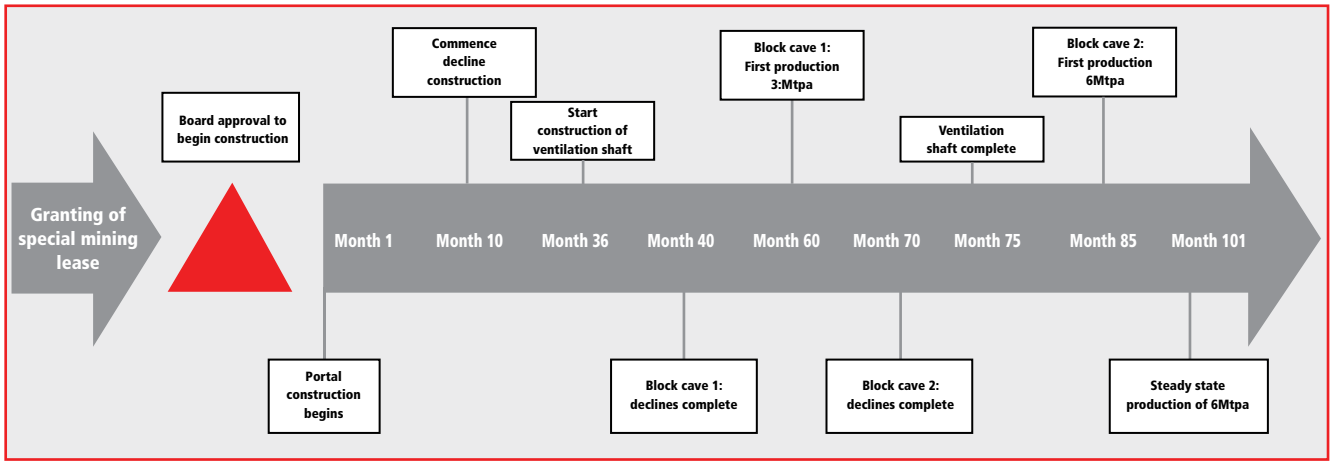
| No Government° buy-in (Harmony 50%) | | | Government° buy-in (Harmony 35%) | |
|---|---|---|---|---|
| Year | Project cash flow (incl capital expenditure) US$m | | Year | Project cash flow (incl capital expenditure) US$m |
| FY17 and FY18 | * | | FY17 and FY18 | * |
| FY19 | (115) | | FY19 | 37 |
| FY20 | (115) | External | FY20 | (81) |
| FY21 | (145) | funding of | FY21 | (102) |
| FY22 | (260) | US$250m | FY22 | (182) |
| FY23 | (240) | required | FY23 | (168) |
| **Total** | **(875)** | | **Total** | **(496)** |

← Grant of special mining lease and Government buys 30% for US$235m

° *Government of Papua New Guinea*

* *Insignificant expenditure up to granting of Special Mining Lease. The above funding requirements are based on the project permitting timeline with on-the-ground activities only commencing post grant of Special Mining Lease in FY19*

### Wafi Golpu: Development timeline




### Community engagement

Engagement with key stakeholders, including the Papua New Guinea national government, the Morobe provincial government, landowners and community representatives continues so as to ensure clear alignment on the project objectives. In parallel with further technical studies and project definition, the local communities will be actively engaged and appraised of the project development roadmap and next steps. The three major communities involved are the Hengambu, Yanta and Babuaf, spread over 15 villages in the region. The local communities remain supportive of the project.

### Further work on the feasibility study

The following areas will be the focus of further assessment to optimise the study outcomes and the incorporation of additional data which will be collected in the next study phase.

**Access declines:** Declines towards the ore body affording drilling platforms are required in order to verify geotechnical and hydrological interpretations of the ore body at depth.

**Geotechnical interpretation:** Further underground drilling and mapping work is required to confirm assumptions of the rock mass characteristics in each block cave and the rock mass response to the changing stress regime.

**Tailings management:** Further assessment of tailings disposal options including the potential for deep-sea tailings placement.

**Hydrology:** The management of water will be central to the success of the mining operation, primarily due to the nature of the geological environment of the project site. Further investigation and modelling of water will focus on increasing the confidence in the geohydrology model by obtaining additional data from drilling campaigns, modelling the effectiveness of a dewatering bore field around the block cave subsidence zone, and streamflow and surface hydrology modelling and management.

**Permitting and environmental approvals:** Work will continue with the Papua New Guinea Government to obtain statutory environmental approvals and other regulatory permits for the project

**Port and power:** Further assessment of optimal arrangements for port facilities and power supply

## PREFEASIBILITY STUDY

The prefeasibility study was conducted in parallel to the feasibility study. The first optimisation step looked at debottlenecking the 6Mtpa capacity from block cave 2. The debottlenecking increased the production capacity to 7Mtpa by making minor and low cost modifications to the process plant grinding circuit and the underground material handling system.

The access declines to the block caves in both the feasibility study and prefeasibility study were treated as common path access imbedding optionality and flexibility in the designs to scale the operation up with a relatively low capital investment in response to increasing commodity prices.

The second optimisation step was increasing the mine's production rate. By optimising all existing feasibility study infrastructure and increasing the size of the underground loader fleet a higher mining production output from block cave 2 can be achieved, without a significant capital investment. A second process plant with a capacity of 7Mtpa would be constructed to bring total plant capacity to 14Mtpa.

# EXPLORATION AND PROJECTS CONTINUED

The third and final optimisation investigated by the prefeasibility study was to extend the life of the operation with the construction of a third block cave below the second block cave. Additional capital is required to extend the decline access and conveyor belt system, the ventilation system and establish the associated underground infrastructure.

**Summary of the key metrics (100% basis) of the prefeasibility study:**

| | | Feasibility study | Prefeasibility study[1] | | |
|---|---|---|---|---|---|
| **Description** | **Unit** | | **Step 1** | **Step 2** | **Step 3** |
| **Financials** | | | | | |
| Net present value | US$ million (real) | 1 087 | 1 240 | 1 338 | 1 954 |
| Internal rate of return | % | 15.6 | 16.3 | 16.8 | 17.5 |
| Maximum negative cash flow (real) | US$ million | 1 763 | 1 763 | 1 763 | 1 763 |
| Free cash flow generation (annual real – steady state average) | US$ million | 249 | 298 | 405 | 402 |
| **Schedule** | | | | | |
| Maximum annual ore throughput | Mt | 6 | 7 | 14 | 14 |
| Life of mine | years | 28 | 25 | 18 | 35 |
| **Production** | | | | | |
| Ore mined | Mt | 149 | 153 | 155 | 379 |
| **Copper** | | | | | |
| Average grade | % | 1.58 | 1.58 | 1.57 | 1.26 |
| Total recovered | 000t | 2 233 | 2 301 | 2 306 | 4 547 |
| Annual average recovered over life of mine | 000t | 80 | 92 | 128 | 130 |
| **Gold** | | | | | |
| Average grade | g/t | 1.06 | 1.06 | 1.05 | 0.91 |
| Total recovered | 000oz | 3 573 | 3 527 | 3 509 | 7 058 |
| Annual average recovered over life of mine | 000oz | 128 | 141 | 195 | 202 |
| **Capital expenses[2]** | | | | | |
| Project capital | US$ millions (real) | 2 640 | 2 656 | 2 656 | 2 656 |
| Expansion capital | US$ millions (real | – | 10 | 572 | 1 261 |
| Sustaining and expansion capital | US$ millions (real) | 1 551 | 1 499 | 2 175 | 3 725 |
| **Operating expenses[2]** | | | | | |
| Total operating cost | US$/t ore milled | 30.66 | 28.12 | 24.16 | 23.95 |
| Cash cost | US$/lb Cu real (life-of-mine average) | 0.59 | 0.55 | 0.44 | 0.60 |

[1] *All prefeasibility study outcomes are shown on a life-of-mine basis*

[2] *Costs are based on 2016 real estimates*

## DEVELOPMENTS SUBSEQUENT TO YEAR END

In August 2016, an application for a special mining lease for the Wafi-Golpu project was submitted to the Mineral Resources Authority in Papua New Guinea. Submission of this application follows reviews of the project feasibility study project by the boards of directors of both Harmony and Newcrest and brings the project one step closer to realising more value for Golpu.

Work to optimise the outcome of the studies and to incorporate additional data continues. Further project development will be subject to the granting of the special mining lease, the obtaining of all necessary permits, approvals and agreements and, ultimately, approval by the boards of both Harmony and Newcrest.

# SOUTH AFRICA

## UNDERGROUND EXPLORATION

A total of 63 281m (FY15: 83 468m) was drilled across Harmony's underground operations in South Africa.

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

## BROWNFIELDS EXPLORATION IN SOUTH AFRICA

A summary of brownfields exploration conducted in South Africa in FY16 and planned for FY17:

| Tshepong B Reef | | |
|---|---|---|
| **Target:** | **Progress in FY16:** | **Targets/plans for FY17:** |
| Continuation of B Reef exploration to maintain current levels of B Reef mining. Drilling to identify areas of economic value in the down dip extensions of the B Reef channels currently being mined | Geological interpretation has been completed, drilling platforms have been identified and drilling schedules established to confirm the down dip extensions of the B Reef channels identified in the Leeubosch, Midas and Horizon dyke areas | Drilling will begin from six new areas on four levels at Tshepong |
| **Phakisa B Reef** | | |
| **Target:** | **Progress in FY16:** | **Targets/plans for FY17:** |
| Currently, the B Reef is not being mined. Exploration drilling to be undertaken to identify areas of economic value in the down dip extensions of the channels being mined at neighbouring Tshepong. Significant potential may exist to mine the B Reef north of the shaft pillar on Phakisa | Geological interpretation has been completed, drilling platforms have been identified and drilling schedules established to confirm the B Reef channel to the north of the Zindaba Dyke | Drilling will begin from levels 69 to 75 north of the Zindaba Dyke from the 65 line northwards |
| **Doornkop Main Reef** | | |
| **Target:** | **Progress in FY16:** | **Targets/plans for FY17:** |
| Drilling for Main Reef that is located 60-70m below the current economic South Reef and is classified as a minor reef that can be explored and mined utilising most of the current South Reef infrastructure | Geological interpretation has been done, drilling platforms has been identified and drilling schedules has been established to confirm the Main Reef channel | Drilling to begin from four drilling platforms on 197 level (13 holes have been planned) |
| **Doornkop South Reef** | | |
| **Target:** | **Progress in FY16:** | **Targets/plans for FY17:** |
| Current South Reef structural model in the inferred areas is based on that of the Kimberly Reef, which lies stratigraphically 800m above the South Reef. Drilling of long-incline boreholes will be done to assist with modelling of the South Reef on levels 202, 207 and 212 | Geological interpretation has been done, drilling platforms have been identified and drilling schedules established to confirm the levels where South Reef can be mined | Drilling will begin from seven different platforms to confirm the presence of the South Reef on levels 202, 207 and 212 |

# EXPLORATION AND PROJECTS CONTINUED

## Doornkop seismic study

| Target: | Progress in FY16: | Targets/plans for FY17: |
|---|---|---|
| Currently, our South Reef structural model is based on that for the Kimberly Reef, which lies stratigraphically 800m above the South Reef. The seismic survey will identify and locate major geological structures and South Reef levels | Geological interpretation has been conducted, traversing survey lines have been identified and schedules established to confirm major geological structures as well as those levels where the South Reef can be mined | The seismic survey, which consists of nine lines and 72 line kilometres of traversing, aims to cut across major structures within the mine boundary to enable us to determine the extent of these major structures and potential production levels |

## Kalgold

| Target: | Progress in FY16: | Targets/plans for FY17: |
|---|---|---|
| Three potential mineralised zones have been identified south of the D Zone pit | Geological interpretation has been done and drilling traverses planned | Reverse circulation drilling traverses will be drilled at the potential targets (38 boreholes have been planned) |

## Harmony – White Rivers Exploration joint venture

| Target: | Progress in FY16: | Targets/plans for FY17: |
|---|---|---|
| The main objective of this exploration joint venture is to explore and develop potential gold resources at White Rivers Exploration (Pty) Limited's Beisa Project and abutting exploration areas within Harmony's adjacent Target complex | In terms of the agreement, White Rivers and Harmony (through Loraine Gold Mines Limited and Avgold Limited) will have initial and fixed interests of 65% and 35% respectively in the exploration joint venture. White Rivers will fund and manage exploration activities to prefeasibility study level<br><br>Initial exploration activities, which include collation of historical data, interpretation and verification of data, and geological modelling, are in progress. The initial resource in the project area has been identified and the scoping study has been carried out | Good progress is being made and an initial resource is expected to be declared during FY17:<br>• Underground exploration drilling is planned but would require rehabilitation of the underground access area<br>• The prefeasibility study is to begin once exploration results become available |

### PROJECTS

A summary of projects underway in South Africa in FY16:

## Joel North

| Target: | Progress in FY16: | Targets/plans for FY17: |
|---|---|---|
| Mining down to 137 level | Infrastructural development on 129 level was completed and the declines have reached 137 level. Equipping of the conveyor decline has begun from 137 level up towards 129 level | Completion of capital development on 137 level, the twin declines and the installation of the permanent conveyor |

## Tailings retreatment expansion

| Target: | Progress in FY16: | Targets/plans for FY17: |
|---|---|---|
| Retreatment of additional tailings in the Free State | Initial water study completed. Investigated retreatment of a further 1Mt of tailings per month | Completion of prefeasibility and feasibility studies |

## Central plant tailings reclamation

| Target: | Progress in FY16: | Targets/plans for FY17: |
|---|---|---|
| Reclaim material from FSS5 tailings facility for processing at the central plant (to be converted for tailings re-treatment) at a rate of 300 000t annually. Central plant operation will be similar to the highly profitable Phoenix operation, which has been in operation since 2007 | Capital for this project was approved towards the end of the financial year and implementation has begun | Complete implementation of project by end of the financial year |

# RESOURCE AND RESERVE RECONCILIATION

## MINERAL RESOURCES

As at 30 June 2016, attributable gold equivalent mineral resources were 105.2Moz, down from 110.3Moz in June 2015. The following table and graph show the year on year reconciliation of the mineral resources.

### GOLD AND GOLD EQUIVALENT MINERAL RESOURCES RECONCILIATION

| | Tonnes | Moz |
|---|---|---|
| June 2015 – Gold and gold equivalents | 3 431 | 110.3 |
| **Changes during FY16** | | |
| Mined | (45) | (1.5) |
| Net effect of changes at operations. Refer to table on page 20, 21 and 22 – Mineral resources comparison | (305) | (9.8) |
| Gold equivalents | 192 | 6.2 |
| **June 2016 – Gold and gold equivalents** | **3 272** | **105.2** |

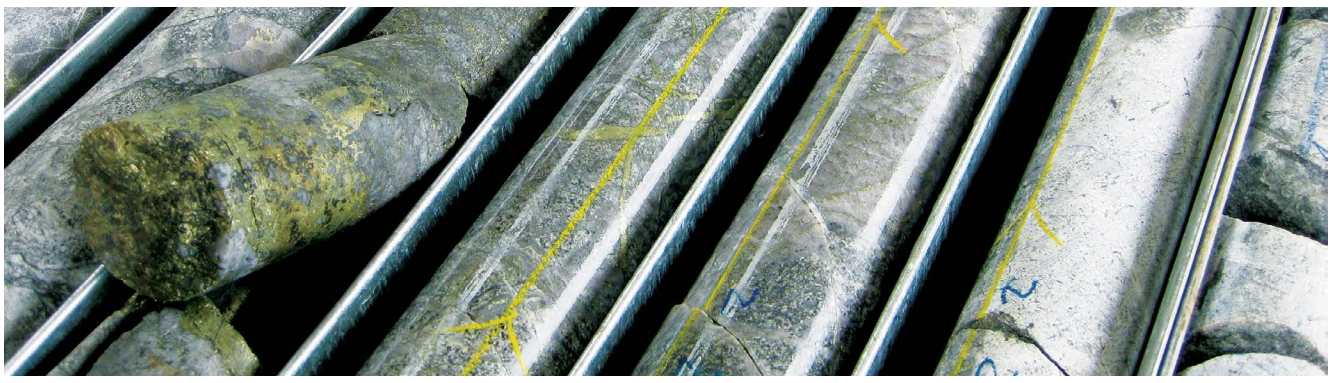
### MINERAL RESOURCES COMPARISON BY OPERATION – FY15 VS FY16

| Gold | FY15 Gold oz (mil) | FY16 Gold oz (mil) | Depletion Gold oz (mil) | Net of depletion variance Gold oz (mil) | Net of depletion % variance | Comments |
|---|---|---|---|---|---|---|
| **South Africa underground** | | | | | | |
| **Free State** | | | | | | |
| Bambanani | 0.632 | 0.523 | 0.112 | 0.004 | 0.6 | Grade down due to depletion for the year at a higher grade than the average reserve grade. Tonnes decreased due to depletion and a slight drop in stoping width |
| Joel | 3.105 | 2.858 | 0.099 | -0.149 | -4.8 | There was a change in the 137 level elevation which resulted in additional reef square metres and more waste development hence the increase in tonnes. There was a decrease in block estimates as a result of the lower grade sampled during the year |
| Masimong 5 | 3.727 | 0.711 | 0.124 | -2.891 | -77.6 | Resource blocks declared only in the areas that are mined in the life-of-mine plan |
| Phakisa | 14.267 | 14.665 | 0.174 | 0.573 | 4.0 | Lower block widths due to more undercut mining resulting in higher grades and lower tonnes |
| Target 1 | 5.599 | 4.846 | 0.127 | -0.626 | -11.2 | Increase in resources cut-off resulted in a decrease in resources tonnes and ounces |
| Target 3 | 3.119 | 3.119 | 0 | 0 | 0 | Work continues on steep stopes, reef overlaps and minor reefs |
| Tshepong | 9.666 | 8.601 | 0.244 | -0.822 | -8.5 | Decrease in tonnes and gold mainly due to structure changes as well as depletion |
| Unisel | 4.171 | 0.677 | 0.080 | -3.415 | -81.9 | Resource blocks declared only in the areas that are mined in the life-of-mine plan |
| **Total Free State underground** | **44.286** | **35.999** | **0.960** | **-7.327** | **-16.5** | |

# RESOURCE AND RESERVE RECONCILIATION CONTINUED

## MINERAL RESOURCES COMPARISON BY OPERATION – FY15 VS FY16

| Gold | FY15 Gold oz (mil) | FY16 Gold oz (mil) | Depletion Gold oz (mil) | Net of depletion variance Gold oz (mil) | Net of depletion % variance | Comments |
|---|---|---|---|---|---|---|
| **West Rand** | | | | | | |
| Doornkop South Reef | 7.407 | 4.469 | 0.112 | -2.826 | -38.2 | Lower grade South Reef removed from declaration |
| Doornkop Main Reef | 0.025 | 0.025 | 0 | 0 | 0 | No changes year-on-year, more exploration planned for FY16 |
| **Total** | **7.432** | **4.494** | **0.112** | **-2.826** | **38.0** | |
| **Kusasalethu** | 8.890 | 8.075 | 0.155 | -0.660 | -7.4 | Resources still include the old mine and the blocks outside the current life-of-mine pending completion of the optimisation study of the mine |
| **Total West Rand** | 16.322 | 12.569 | 0.267 | -3.486 | **-21.4** | |
| **Total South Africa underground** | 60.608 | 48.569 | 1.227 | -10.813 | **-17.8** | |
| **South Africa surface** | | | | | | |
| **Kraaipan Greenstone Belt** | | | | | | |
| Kalgold | 1.164 | 1.195 | 0.042 | 0.073 | 6.2 | Increases due to merger of A-Zone and Water tank pits |
| **Free State surface** | | | | | | |
| Free State (Phoenix) | 0.792 | 0.712 | 0.061 | -0.019 | -2.4 | |
| Free State (St Helena) | 2.230 | 2.230 | 0 | 0 | 0 | |
| Free State (Central Plant) | 0 | 0.551 | 0 | 0.551 | 100 | New project |
| Free State (other) | | | | | | |
| Waste rock dumps | 0.387 | 0.356 | 0.040 | 0.008 | 2.1 | |
| Tailings | 4.680 | 4.217 | 0 | -0.463 | -9.9 | Decreases due to start-up of new project |
| **Total Free State surface** | **8.090** | **8.066** | **0.101** | **0.077** | **1.0** | |
| **Total Kalgold Tailings dam** | **0.200** | **0.201** | **0** | **0.001** | **0.7** | |
| **Total South Africa surface (including Kalgold)** | **9.454** | **9.463** | **0.143** | **0.152** | **1.6** | |
| **Total South Africa (including underground, surface, Kalgold)** | **70.062** | **58.031** | **1.370** | **-10.661** | **-15.2** | |



# RESOURCE AND RESERVE RECONCILIATION CONTINUED

**MINERAL RESOURCES COMPARISON BY OPERATION – FY15 VS FY16** continued

| Gold | FY15 Gold oz (mil) | FY16 Gold oz (mil) | Depletion Gold oz (mil) | Net of depletion variance Gold oz (mil) | Net of depletion % variance | Comments |
|---|---|---|---|---|---|---|
| **Papua New Guinea** | | | | | | |
| Hidden Valley/Kaveroi | 2.044 | 1.881 | 0.091 | -0.071 | -3.5 | |
| Hamata | 0.122 | 0.110 | 0 | -0.012 | -10.0 | |
| Wafi | 3.621 | 3.621 | 0 | 0 | 0 | |
| Golpu | 10.103 | 9.282 | 0 | -0.821 | -8.1 | New feasibility and pre-feasibility study |
| Nambonga | 0.505 | 0.505 | 0 | 0 | 0 | |
| Kili Teke | | 1.751 | 0 | 0 | 100 | New resource declaration |
| **Total Papua New Guinea** | **16.396** | **17.151** | **0.091** | **0.847** | **5.2** | |
| **Grand total** | **86.458** | **75.182** | **1.461** | **-9.815** | **-11.4** | |
| **Silver – equivalent gold ounces** | | | | | | |
| Hidden Valley | 0.696 | 0.475 | 0 | -0.221 | -31.7 | |
| **Copper – equivalent gold ounces** | | | | | | |
| Golpu | 22.937 | 24.788 | 0 | 1.851 | 8.1 | Commodity prices and new project studies |
| Nambonga | 0.204 | 0.240 | 0 | 0.036 | 17.6 | Commodity prices and new project studies |
| Kili Teke | | 4.494 | 0 | 0 | 100 | |
| **Total gold equivalent** | **23.141** | **29.522** | **0** | **6.381** | **27.6** | |
| **Total Papua New Guinea equivalent gold ounces** | **23.837** | **29.997** | **0** | **6.160** | **25.8** | |
| **Total Papua New Guinea including equivalent gold ounces** | **40.232** | **47.148** | **0.091** | **7.007** | **17.4** | |
| **Grand total (excluding equivalents)** | **86.458** | **75.182** | **1.461** | **-9.815** | **-11.4** | |
| **Grand total (including equivalents)** | **110.294** | **105.179** | **1.461** | **-3.654** | **-3.3** | |

# RESOURCE AND RESERVE RECONCILIATION CONTINUED

## MINERAL RESERVES

As at 30 June 2016, Harmony's attributable gold equivalent mineral reserves were 36.9Moz, down from 42.6Moz. The year on year mineral reserves reconciliation is shown below.

### GOLD AND GOLD EQUIVALENT MINERAL RESERVES RECONCILIATION

| | Tonnes | Moz |
|---|---|---|
| June 2015 – Gold and gold equivalents | 1 325 | 42.6 |
| **Changes during FY16** | | |
| Mined | (37) | (1.2) |
| Net effect of changes at operations. Refer to table on page 23, 24, and 25 – Mineral reserves comparison | (153) | (4.9) |
| Gold equivalents | 13 | 0.4 |
| **June 2016 – Gold and gold equivalents** | **1 148** | **36.9** |

### MINERAL RESERVES COMPARISON BY OPERATION – FY15 VS FY16

| Gold | FY15 Gold oz (mil) | FY16 Gold oz (mil) | Depletion Gold oz (mil) | Net of depletion variance Gold oz (mil) | Net of depletion % variance | Comments |
|---|---|---|---|---|---|---|
| **South Africa underground** | | | | | | |
| **Free State** | | | | | | |
| Bambanani | 0.565 | 0.449 | 0.106 | -0.011 | -1.9 | Grade down due to depletion for the year at a higher grade than the average reserve grade. Tons decreased due to depletion and a slight drop in stoping width |
| Joel | 0.968 | 0.875 | 0.074 | -0.019 | -1.9 | Despite depletion of 0.5t the reserve tonnes only reduced by 0.2t as a result of the additional tonnes on 137 level. Current sampling data resulted in a decrease in block estimates |
| Masimong 5 | 0.235 | 0.223 | 0.082 | 0.071 | 30.1 | Reserve tonnes and grade based on all blocks accessible and mineable in the three-year life-of-mine time period. Increase in grade as result of good development sampling results and slight increase in B reef grades |
| Phakisa | 1.792 | 1.622 | 0.131 | -0.039 | -2.2 | Lower grade due to higher dilution factors to account for additional FW ripping and off-reef dilution |
| Target 1 | 1.187 | 0.992 | 0.119 | -0.076 | -6.4 | Geological changes and lower MCF rock engineering recommendations |
| Target 3 | 0.000 | | | | | Mine on care and maintenance |
| Tshepong | 3.768 | 3.522 | 0.167 | -0.079 | -2.1 | Decrease in tonnes and gold mainly due to structure changes as well as depletion |
| Unisel | 0.380 | 0.348 | 0.059 | 0.027 | 7.0 | Depletion replaced by additional Leader Reef reserves being included in the life-of-mine |
| **Total Free State underground** | **8.895** | **8.031** | **0.738** | **-0.126** | **-1.4** | |

# RESOURCE AND RESERVE RECONCILIATION CONTINUED

**MINERAL RESERVES COMPARISON BY OPERATION – FY15 VS FY16**

| Gold | FY15 Gold oz (mil) | FY16 Gold oz (mil) | Depletion Gold oz (mil) | Net of depletion variance Gold oz (mil) | Net of depletion % variance | Comments |
|---|---|---|---|---|---|---|
| **West Rand** | | | | | | |
| Doornkop South Reef | 0.847 | 0.709 | 0.091 | -0.047 | -5.6 | Reduction in tonnes and gold mainly as a result of depletion |
| Kusasalethu | 5.274 | 0.914 | 0.133 | -4.227 | -80.1 | Life-of-mine scope change to focus the mining operations on the higher grade portion of the ore body |
| **Total West Rand** | 6.121 | 1.623 | 0.224 | -4.274 | -69.8 | |
| **Total South Africa underground** | 15.016 | 9.654 | 0.962 | -4.400 | -29.3 | |
| **South Africa surface** | | | | | | |
| **Kraaipan Greenstone Belt** | | | | | | |
| Kalgold | 0.574 | 0.608 | 0.042 | 0.076 | 13.2 | Merger between the two pits resulted in additional tonnes and ounces |
| **Free State surface** | | | | | | |
| Free State (Phoenix) | 0.792 | 0.712 | 0.061 | -0.019 | -2.4 | |
| Free State (St Helena) | 1.507 | 1.507 | 0.000 | 0.000 | 0.0 | |
| Free State (Central Plant) | | 0.551 | 0.000 | 0.551 | 100 | New project |

# RESOURCE AND RESERVE RECONCILIATION CONTINUED

### MINERAL RESERVES COMPARISON BY OPERATION – FY15 VS FY16

| Gold | FY15 Gold oz (mil) | FY16 Gold oz (mil) | Depletion Gold oz (mil) | Net of depletion variance Gold oz (mil) | Net of depletion % variance | Comments |
|---|---|---|---|---|---|---|
| **Free State (other)** | | | | | | |
| Waste rock dumps | 0.065 | 0.065 | 0.000 | 0.000 | 0.0 | |
| Tailings | 4.123 | 3.661 | 0.000 | -0.463 | -11.1 | Decreases due to start-up of new project |
| **Sub-total (other)** | **4.188** | **3.726** | **0.000** | **-0.463** | **-11.1** | |
| **Total Free State** | **6.488** | **6.496** | **0.061** | **0.069** | **1.1** | |
| **Total South Africa surface (including Kalgold)** | **7.062** | **7.104** | **0.103** | **0.145** | **2.1** | |
| **Total South Africa** | **22.078** | **16.758** | **1.065** | **-4.255** | **-19.3** | |
| **Papua New Guinea** | | | | | | |
| Hidden Valley/Kaveroi | 0.743 | 0.644 | 0.085 | -0.015 | -2.0 | |
| Hamata | 0.085 | 0.074 | 0.000 | -0.011 | -12.9 | |
| Golpu | 6.194 | 5.522 | 0.000 | -0.672 | -10.9 | New project studies |
| **Total Papua New Guinea** | 7.022 | 6.239 | 0.085 | -0.698 | -9.9 | |
| **Grand total** | 29.100 | 22.997 | 1.150 | -4.953 | -17.0 | |
| **Silver – equivalent gold ounces** | | | | | | |
| Hidden Valley | 0.232 | 0.178 | 0.000 | -0.054 | -23.1 | Reduced silver resources |
| **Copper – equivalent gold ounces** | | | | | | |
| Golpu | 13.265 | 13.741 | 0.000 | 0.476 | 3.6 | Change in commodity prices |
| Total copper | 13.265 | 13.741 | 0.000 | 0.476 | 3.6 | Change in commodity prices |
| Total Papua New Guinea equivalent gold ounces | 13.497 | 13.919 | 0.000 | 0.422 | 3.1 | Change in commodity prices |
| Total Papua New Guinea including equivalent gold ounces | 20.519 | 20.159 | 0.000 | -0.360 | -1.8 | |
| Grand total (excluding equivalents) | 29.100 | 22.997 | 1.150 | -4.953 | -17.0 | |
| Grand total (including equivalents) | 42.597 | 36.916 | 1.150 | -4.531 | -10.6 | |

# 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 |
| 162.1 | 9.32 | 1 511 | 48 569 |

Reported as *in situ* mineralisation estimates

**Inferred**

| Tonnes | Gold | | |
|---|---|---|---|
| Mt | g/t | 000kg | 000oz |
| 45.7 | 9.03 | 412 | 13 248 |

**Indicated**

| Tonnes | Gold | | |
|---|---|---|---|
| Mt | g/t | 000kg | 000oz |
| 61.1 | 9.08 | 555 | 17 846 |

**Measured**

| Tonnes | Gold | | |
|---|---|---|---|
| Mt | g/t | 000kg | 000oz |
| 55.3 | 9.83 | 544 | 17 475 |

**Mineral reserves (total)**

| Tonnes | Gold | | |
|---|---|---|---|
| Mt | g/t | 000kg | 000oz |
| 54.1 | 5.55 | 300 | 9 654 |

Reported as mineable production estimates

**Probable**

| Tonnes | Gold | | |
|---|---|---|---|
| Mt | g/t | 000kg | 000oz |
| 16.6 | 4.96 | 82 | 2 645 |

**Proved**

| Tonnes | Gold | | |
|---|---|---|---|
| Mt | g/t | 000kg | 000oz |
| 37.6 | 5.81 | 218 | 7 008 |

Consideration of mining, metallurgical, 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 |
| 1 085.2 | 0.27 | 294 | 9 463 |

Reported as *in situ* mineralisation estimates

**Inferred**

| Tonnes | Gold | | |
|---|---|---|---|
| Mt | g/t | 000kg | 000oz |
| 75.0 | 0.44 | 33 | 1 051 |

**Indicated**

| Tonnes | Gold | | |
|---|---|---|---|
| Mt | g/t | 000kg | 000oz |
| 664.0 | 0.25 | 164 | 5 266 |

**Measured**

| Tonnes | Gold | | |
|---|---|---|---|
| Mt | g/t | 000kg | 000oz |
| 346.2 | 0.28 | 98 | 3 146 |

**Mineral reserves (total)**

| Tonnes | Gold | | |
|---|---|---|---|
| Mt | g/t | 000kg | 000oz |
| 840.4 | 0.26 | 221 | 7 104 |

Reported as mineable production estimates

**Probable**

| Tonnes | Gold | | |
|---|---|---|---|
| Mt | g/t | 000kg | 000oz |
| 579.4 | 0.25 | 147 | 4 720 |

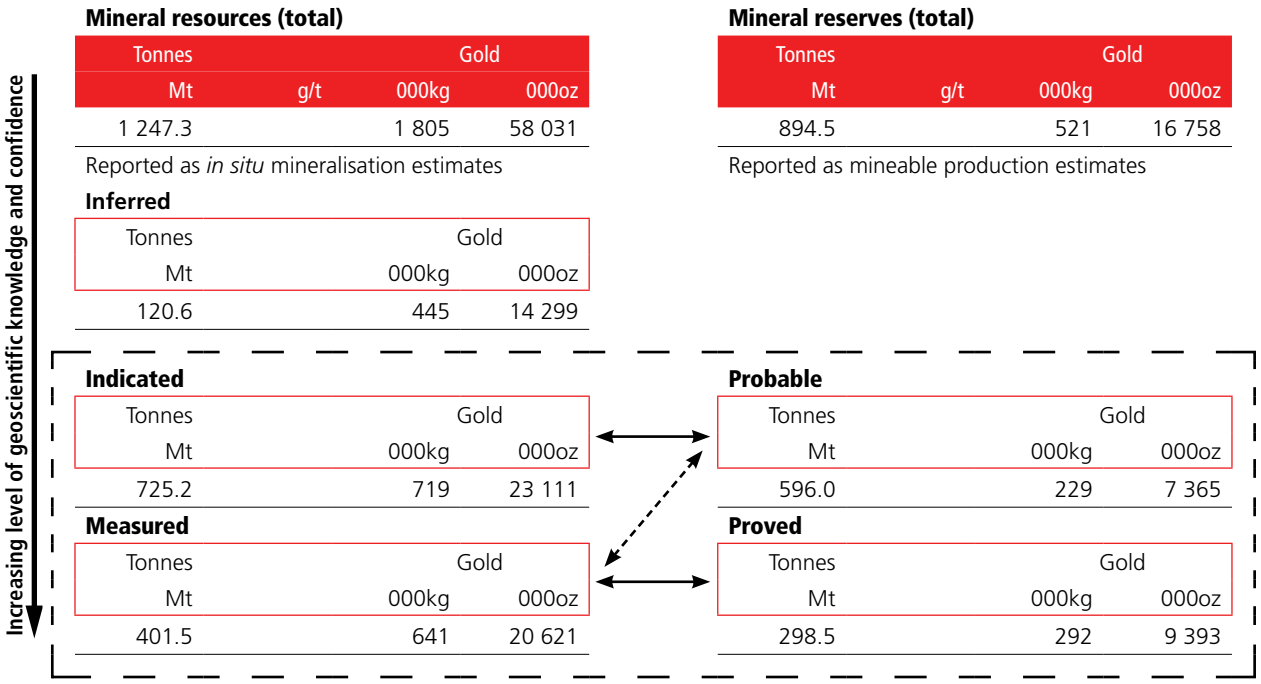
**Proved**

| Tonnes | Gold | | |
|---|---|---|---|
| Mt | g/t | 000kg | 000oz |
| 261.0 | 0.28 | 74 | 2 384 |

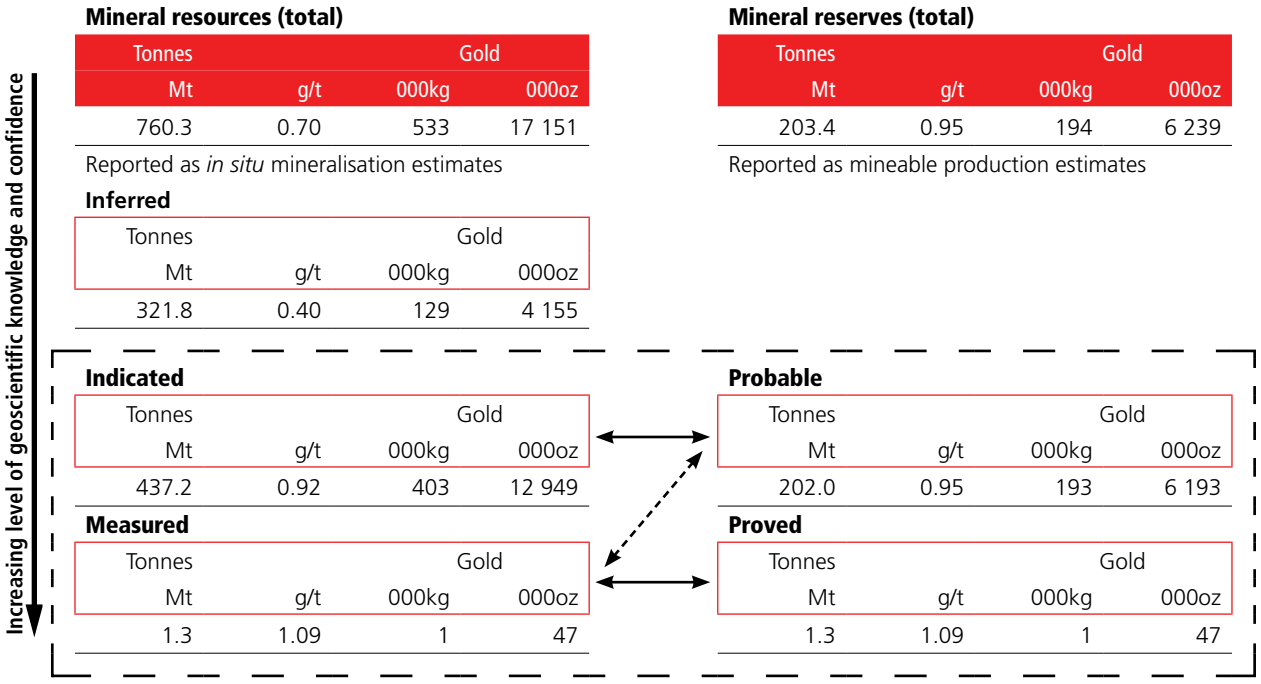
Consideration of mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors (the 'modifying factors').

# RELATIONSHIP BETWEEN HARMONY'S MINERAL RESOURCES AND MINERAL RESERVES CONTINUED

## SOUTH AFRICA TOTAL




## PAPUA NEW GUINEA – ATTRIBUTABLE GOLD



# 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 | g/t | 000kg | 000oz |
| 2 007.1 | | 2 338 | 75 182 |

Reported as *in situ* mineralisation estimates

**Mineral reserves (total)**

| Tonnes | Gold | | |
|---|---|---|---|
| Mt | g/t | 000kg | 000oz |
| 1 097.9 | | 715 | 22 997 |

Reported as mineable production estimates

**Inferred**

| Tonnes | Gold | | |
|---|---|---|---|
| Mt | g/t | 000kg | 000oz |
| 442.4 | | 574 | 18 454 |

**Indicated**

| Tonnes | Gold | | |
|---|---|---|---|
| Mt | g/t | 000kg | 000oz |
| 1 162.4 | | 1122 | 36 060 |

**Probable**

| Tonnes | Gold | | |
|---|---|---|---|
| Mt | g/t | 000kg | 000oz |
| 798 | | 422 | 13 558 |

**Measured**

| Tonnes | Gold | | |
|---|---|---|---|
| Mt | g/t | 000kg | 000oz |
| 402.8 | | 643 | 20 668 |

**Proved**

| Tonnes | Gold | | |
|---|---|---|---|
| Mt | g/t | 000kg | 000oz |
| 299.9 | | 294 | 9 440 |

Consideration of mining, metallurgical, 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 | g/t | 000kg | 000oz |
| 2 007.6 | | 3 271 | 105 179 |

Reported as *in situ* mineralisation estimates

**Mineral reserves (total)**

| Tonnes | Gold Equivalents | | |
|---|---|---|---|
| Mt | g/t | 000kg | 000oz |
| 1 097.9 | | 1148 | 36 916 |

Reported as mineable production estimates

**Inferred**

| Tonnes | Gold Equivalents | | |
|---|---|---|---|
| Mt | g/t | 000kg | 000oz |
| 442.4 | | 825 | 26 521 |

**Indicated**

| Tonnes | Gold Equivalents | | |
|---|---|---|---|
| Mt | g/t | 000kg | 000oz |
| 1 162.4 | | 1803 | 57 979 |

**Probable**

| Tonnes | Gold Equivalents | | |
|---|---|---|---|
| Mt | g/t | 000kg | 000oz |
| 798.0 | | 854 | 27 465 |

**Measured**

| Tonnes | Gold Equivalents | | |
|---|---|---|---|
| Mt | g/t | 000kg | 000oz |
| 402.8 | | 643 | 20 679 |

**Proved**

| Tonnes | Gold Equivalents | | |
|---|---|---|---|
| Mt | g/t | 000kg | 000oz |
| 299.9 | | 294 | 9 451 |

Consideration of mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors (the 'modifying factors').

# MINERAL RESOURCES STATEMENT (IMPERIAL)

| Operations | Measured resources | | | Indicated resources | | | Inferred resources | | | Total mineral resources | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 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** | | | | | | | | | | | | |
| **Gold** | | | | | | | | | | | | |
| Bambanani | 1.2 | 0.441 | 523 | – | – | – | – | – | – | 1.2 | 0.441 | 523 |
| Joel | 6.2 | 0.206 | 1 284 | 8.4 | 0.167 | 1 396 | 1.1 | 0.159 | 177 | 15.7 | 0.182 | 2 856 |
| Masimong | 2.6 | 0.187 | 490 | 1.0 | 0.134 | 130 | 0.5 | 0.183 | 92 | 4.1 | 0.174 | 711 |
| Phakisa | 8.7 | 0.313 | 2 721 | 12.3 | 0.341 | 4 197 | 25.5 | 0.304 | 7 747 | 46.5 | 0.315 | 14 665 |
| Target 1 | 7.3 | 0.243 | 1 768 | 10.5 | 0.233 | 2 445 | 3.4 | 0.188 | 633 | 21.1 | 0.230 | 4 846 |
| Target 3 | 7.7 | 0.265 | 2 057 | 5.1 | 0.207 | 1 063 | – | – | – | 12.9 | 0.242 | 3 119 |
| Tshepong | 18.5 | 0.331 | 6 120 | 4.3 | 0.287 | 1 222 | 4.7 | 0.265 | 1 259 | 27.5 | 0.313 | 8 601 |
| Unisel | 1.5 | 0.194 | 287 | 2.0 | 0.194 | 390 | – | – | – | 3.5 | 0.194 | 677 |
| **Total Free State underground** | **53.7** | **0.284** | **15 249** | **43.5** | **0.249** | **10 843** | **35.2** | **0.281** | **9 908** | **132.5** | **0.272** | **35 999** |
| **West Rand** | | | | | | | | | | | | |
| **Doornkop** | | | | | | | | | | | | |
| Doornkop South Reef | 2.9 | 0.226 | 660 | 4.2 | 0.236 | 993 | 13.5 | 0.209 | 2 816 | 20.6 | 0.217 | 4 469 |
| Doornkop Main Reef | 0.1 | 0.157 | 14 | 0.1 | 0.161 | 8 | 0.0 | 0.155 | 3 | 0.2 | 0.158 | 25 |
| **Total** | **3.0** | **0.225** | **674** | **4.3** | **0.233** | **1 001** | **13.5** | **0.208** | **2 819** | **20.8** | **0.216** | **4 494** |
| Kusasalethu | 4.2 | 0.370 | 1 553 | 19.6 | 0.306 | 6 001 | 1.6 | 0.321 | 521 | 25.4 | 0.318 | 8 075 |
| **Total West Rand** | **7.2** | **0.309** | **2 227** | **23.9** | **0.293** | **7 003** | **15.1** | **0.221** | **3 340** | **46.2** | **0.272** | **12 569** |
| **Total South Africa underground** | **60.9** | **0.287** | **17 475** | **67.4** | **0.265** | **17 846** | **50.3** | **0.263** | **13 248** | **178.7** | **0.272** | **48 569** |
| **SOUTH AFRICA SURFACE** | | | | | | | | | | | | |
| **Kraaipan Greenstone Belt** | | | | | | | | | | | | |
| Kalgold | 8.5 | 0.024 | 203 | 19.1 | 0.028 | 528 | 14.7 | 0.032 | 464 | 42.3 | 0.028 | 1 195 |
| Kalgold tailings dam | – | – | – | – | – | – | 26.2 | 0.008 | 201 | 26.2 | 0.008 | 201 |
| **Total Kalgold** | **8.5** | | **203** | **19.1** | | **528** | **40.9** | | **665** | **68.5** | | **1 396** |
| **FREE STATE – SURFACE** | | | | | | | | | | | | |
| Free State (Phoenix) | 88.0 | 0.008 | 712 | – | – | – | – | – | – | 88.0 | 0.008 | 712 |
| Free State (St Helena) | 285.1 | 0.008 | 2 230 | – | – | – | – | – | – | 285.1 | 0.008 | 2 230 |
| Free State (Central Plant) | – | – | – | 73.2 | 0.008 | 551 | – | – | – | 73.2 | 0.008 | 551 |
| Free State (other): | | | | | | | | | | | | |
| – Waste rock dumps | – | – | – | 4.3 | 0.015 | 65 | 24.6 | 0.012 | 291 | 29.0 | 0.012 | 356 |
| – Tailings | – | – | – | 635.4 | 0.006 | 4 123 | 17.0 | 0.006 | 94 | 652.4 | 0.006 | 4 217 |
| – Sub-total | – | – | – | 639.7 | 0.007 | 4 187 | 41.7 | 0.009 | 386 | 681.4 | 0.007 | 4 573 |
| **Total Free State** | **373.2** | **0.008** | **2 942** | **712.9** | **0.007** | **4 738** | **41.7** | **0.009** | **386** | **1 127.7** | **0.007** | **8 066** |
| **Total South Africa surface (including Kalgold)** | **381.6** | **0.008** | **3146** | **732.0** | **0.007** | **5 266** | **82.6** | **0.013** | **1 051** | **1 196.2** | **0.008** | **9 463** |
| **Total South Africa** | **442.5** | | **20 621** | **799.4** | | **23 111** | **133.0** | | **14 299** | **1 374.9** | | **58 031** |
| **PAPUA NEW GUINEA** | | | | | | | | | | | | |
| Hidden Valley [1] | 1.4 | 0.032 | 45 | 38.5 | 0.047 | 1 796 | 1.1 | 0.036 | 41 | 41.1 | 0.046 | 1 881 |
| Hamata [1] | 0.07 | 0.031 | 2 | 1.6 | 0.063 | 102 | 0.1 | 0.052 | 5 | 1.8 | 0.061 | 110 |
| Wafi [1] | – | – | – | 62.5 | 0.050 | 3 146 | 12.5 | 0.038 | 475 | 75.0 | 0.048 | 3 621 |
| Golpu [1] | – | – | – | 379.2 | 0.021 | 7 905 | 74.8 | 0.018 | 1 377 | 454.0 | 0.020 | 9 282 |
| Nambonga [1] | – | – | – | – | – | – | 21.9 | 0.023 | 505 | 21.9 | 0.023 | 505 |
| Kili Teke | – | – | – | – | – | – | 244.2 | 0.007 | 1 751 | 244.2 | 0.007 | 1 751 |
| **Total Papua New Guinea** | **1.5** | **0.032** | **47** | **481.9** | **0.027** | **12 949** | **354.7** | **0.012** | **4 155** | **838.1** | **0.020** | **17 151** |
| **Grand total** | **444.0** | | **20 668** | **1 281.3** | | **36 060** | **487.7** | | **18 454** | **2 213.0** | | **75 182** |

# MINERAL RESOURCES STATEMENT (IMPERIAL) CONTINUED

| Operations | Measured resources | | Indicated resources | | Inferred resources | | Total mineral resources | |
|---|---|---|---|---|---|---|---|---|
| | Tons (Mt) | Au eq (000oz) | Tons (Mt) | Au eq (000oz) | Tons (Mt) | Au eq (000oz) | Tons (Mt) | Au eq (000oz) |
| **GOLD EQUIVALENTS [2]** | | | | | | | | |
| **Silver** | | | | | | | | |
| Hidden Valley [1] | 1.4 | 11 | 38.5 | 450 | 1.1 | 14 | 41.1 | 475 |
| **Total** | **1.4** | **11** | **38.5** | **450** | **1.1** | **14** | **41.1** | **475** |
| **Copper** | | | | | | | | |
| Golpu [1] | – | – | 379.2 | 21 469 | 74.8 | 3 319 | 454.0 | 24 788 |
| Nambonga [1] | – | – | | | 21.9 | 240 | 21.9 | 240 |
| Kili Teke | – | – | | | 244.2 | 4 494 | 244.2 | 4 494 |
| **Total** | **–** | **–** | **379.2** | **21 469** | **341.0** | **8 053** | **720.2** | **29 522** |
| **Total silver and copper as gold equivalents** | **1.4** | **11** | **417.7** | **21 919** | **342.1** | **8 067** | **761.2** | **29 997** |
| **Total Papua New Guinea including gold equivalents** | **1.5** | **58** | **481.9** | **34 868** | **354.7** | **12 222** | **838.1** | **47 148** |
| **Total Harmony including equivalents** | **444.0** | **20 679** | **1 281.3** | **57 979** | **487.7** | **26 521** | **2 213.0** | **105 179** |

**Other metals**

| | 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) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **PAPUA NEW GUINEA** | | | | | | | | | | | | |
| **Silver** | | | | | | | | | | | | |
| Hidden Valley [1] | 1.4 | 0.63 | 882 | 38.5 | 0.90 | 34 526 | 1.1 | 0.92 | 1 057 | 41.1 | 0.89 | 36 466 |
| Golpu [1] | – | – | – | 379.2 | 0.04 | 14 247 | 74.8 | 0.03 | 2 322 | 454.0 | 0.04 | 16 569 |
| Nambonga [1] | – | – | – | – | – | – | 21.9 | 0.08 | 1 836 | 21.9 | 0.08 | 1836 |
| **Total** | **1.4** | **0.63** | **882** | **417.7** | **0.12** | **48 774** | **97.9** | **0.05** | **5 215** | **517.1** | **0.11** | **54 871** |

| | Tons (Mt) | Grade (%) | Cu (Mlb) | Tons (Mt) | Grade (%) | Cu (Mlb) | Tons (Mt) | Grade (%) | Cu (Mlb) | Tons (Mt) | Grade (%) | Cu (Mlb) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Copper** | | | | | | | | | | | | |
| Golpu [1] | – | – | – | 379.2 | 0.985 | 8 232 | 74.8 | 0.771 | 1 273 | 454.0 | 0.950 | 9 505 |
| Nambonga [1] | – | – | – | – | – | – | 21.9 | 0.191 | 92 | 21.9 | 0.191 | 92 |
| Kili Teke | – | – | – | – | – | – | 244.2 | 0.320 | 1 723 | 244.2 | 0.320 | 1 723 |
| **Total** | **–** | **–** | **–** | **379.2** | **0.985** | **8 232** | **341.0** | **0.182** | **3 088** | **720.2** | **0.604** | **11 320** |

| | Tons (Mt) | Grade (lb/t) | Mo (Mlb) | Tons (Mt) | Grade (lb/t) | Mo (Mlb) | Tons (Mt) | Grade (lb/t) | Mo (Mlb) | Tons (Mt) | Grade (lb/t) | Mo (Mlb) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Molybdenum** | | | | | | | | | | | | |
| Golpu [1] | – | – | – | 379.2 | 0.188 | 71 | 74.8 | 0.143 | 11 | 454.0 | 0.180 | 82 |
| Kili Teke | – | – | – | – | – | – | 244.2 | 0.339 | 83 | 244.2 | 0.339 | 83 |

| | 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) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SOUTH AFRICA** | | | | | | | | | | | | |
| Uranium | | | | | | | | | | | | |
| Free State underground | | | | | | | | | | | | |
| Masimong | – | – | – | 3.2 | 0.397 | 1 | 0.9 | 0.286 | 0 | 4 | 0.373 | 2 |
| Tshepong | 5.7 | 0.397 | 2 | 13.6 | 0.451 | 6 | 8.1 | 0.266 | 2 | 27 | 0.385 | 11 |
| Phakisa | 8.7 | 0.398 | 3 | 12.3 | 0.401 | 5 | 25.5 | 0.216 | 5 | 47 | 0.299 | 14 |
| **Total** | **14.4** | **0.398** | **6** | **29.1** | **0.424** | **12** | **34.5** | **0.229** | **8** | **78** | **0.333** | **26** |
| **Total South Africa underground** | **14.4** | **0.398** | **6** | **29.1** | **0.424** | **12** | **34.5** | **0.229** | **8** | **78** | **0.333** | **26** |
| **Free State surface** | **–** | **–** | **–** | **194.8** | **0.199** | **39** | **–** | **–** | **–** | **194.8** | **0.199** | **39** |
| **Grand total** | **14.4** | **–** | **6** | **223.9** | **0.228** | **51** | **34.5** | **0.229** | **8** | **272.9** | **0.237** | **65** |

*[1] Harmony's 50% attributable portion*
*[2] Gold equivalent ounces are calculated assuming a US$1 150/oz Au, US$3.00/lb Cu and US$15.00/oz Ag with 100% recovery for all metals*
*Rounding of numbers may result in slight computational discrepancies*
*Note: 1 tonne = 907kg = 2 000 lbs*
*1 troy ounce = 31.10348 grams*

# MINERAL RESOURCES STATEMENT (METRIC)

| Operations | Measured resources | | | Indicated resources | | | Inferred resources | | | Total mineral resources | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 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** | | | | | | | | | | | | |
| **Gold** | | | | | | | | | | | | |
| Bambanani | 1.1 | 15.10 | 16 | – | – | – | – | – | – | 1.1 | 15.10 | 16 |
| Joel | 5.7 | 7.07 | 40 | 7.6 | 5.72 | 43 | 1.0 | 5.47 | 5 | 14.3 | 6.23 | 89 |
| Masimong | 2.4 | 6.40 | 15 | 0.9 | 4.59 | 4 | 0.5 | 6.26 | 3 | 3.7 | 5.95 | 22 |
| Phakisa | 7.9 | 10.72 | 85 | 11.2 | 11.68 | 131 | 23.1 | 10.42 | 241 | 42.2 | 10.81 | 456 |
| Target 1 | 6.6 | 8.34 | 55 | 9.5 | 8.00 | 76 | 3.0 | 6.46 | 20 | 19.2 | 7.87 | 151 |
| Target 3 | 7.0 | 9.10 | 64 | 4.7 | 7.10 | 33 | – | – | – | 11.7 | 8.31 | 97 |
| Tshepong | 16.8 | 11.35 | 190 | 3.9 | 9.84 | 38 | 4.3 | 9.1 | 39 | 24.9 | 10.73 | 268 |
| Unisel | 1.3 | 6.65 | 9 | 1.8 | 6.67 | 12 | – | – | – | 3.2 | 6.66 | 21 |
| **Total Free State underground** | **48.7** | **9.73** | **474** | **39.5** | **8.54** | **337** | **31.9** | **9.65** | **308** | **120.2** | **9.32** | **1 120** |
| **West Rand** | | | | | | | | | | | | |
| Doornkop South Reef | 2.6 | 7.75 | 21 | 3.8 | 8.10 | 31 | 12.2 | 7.17 | 88 | 18.7 | 7.44 | 139 |
| 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 |
| **Total** | **2.7** | **7.68** | **21** | **3.9** | **8.07** | **31** | **12.2** | **7.17** | **88** | **18.8** | **7.43** | **140** |
| Kusasalethu | 3.8 | 12.69 | 48 | 17.8 | 10.49 | 187 | 1.5 | 10.99 | 16 | 23.1 | 10.89 | 251 |
| **Total West Rand** | **6.5** | **10.60** | **69** | **21.6** | **10.06** | **218** | **13.7** | **7.58** | **104** | **41.9** | **9.33** | **391** |
| **Total South Africa underground** | **55.3** | **9.83** | **544** | **61.1** | **9.08** | **555** | **45.7** | **9.03** | **412** | **162.1** | **9.32** | **1 511** |
| **SOUTH AFRICA SURFACE** | | | | | | | | | | | | |
| **Kraaipan Greenstone Belt** | | | | | | | | | | | | |
| Kalgold open pit | 7.7 | 0.82 | 6 | 17.3 | 0.95 | 16 | 13.4 | 1.08 | 14 | 38.3 | 0.97 | 37 |
| Kalgold tailings dam | – | – | – | – | – | – | 23.8 | 0.26 | 6 | 23.8 | 0.26 | 6 |
| **Total Kalgold** | **7.7** | | **6** | **17.3** | | **16** | **37.2** | | **20** | **62.1** | | **43** |
| **FREE STATE – SURFACE** | | | | | | | | | | | | |
| Free State (Phoenix) | 79.8 | 0.28 | 22 | – | – | – | – | – | – | 79.8 | 0.28 | 22 |
| Free State (St Helena) | 258.7 | 0.27 | 69 | – | – | – | – | – | – | 258.7 | 0.27 | 69 |
| Free State (Central Plant) | – | – | – | 66.4 | 0.26 | 17 | – | – | – | 66.4 | 0.26 | 17 |
| Free State (other): | | | | | | | | | | | | |
| – Waste rock dumps | – | – | – | 3.9 | 0.51 | 2 | 22.3 | 0.41 | 9 | 26.3 | 0.42 | 11 |
| – Tailings | – | – | – | 576.4 | 0.22 | 128 | 15.5 | 0.19 | 3 | 591.9 | 0.22 | 131 |
| – Sub-total | – | – | – | 580.4 | 0.22 | 130 | 37.8 | 0.32 | 12 | 618.2 | 0.23 | 142 |
| **Total Free State** | **338.2** | **0.27** | **92** | **646.7** | **0.23** | **147** | **37.8** | **0.32** | **12** | **1 023.1** | **0.25** | **251** |
| **Total South Africa surface (including Kalgold)** | **346.2** | **0.28** | **98** | **664.0** | **0.25** | **164** | **75.0** | **0.44** | **33** | **1 085.2** | **0.27** | **294** |
| **Total South Africa** | **401.5** | | **641** | **725.2** | | **719** | **120.6** | | **445** | **1 247.3** | | **1 805** |
| **PAPUA NEW GUINEA** | | | | | | | | | | | | |
| Hidden Valley [1] | 1.3 | 1.09 | 1 | 35.0 | 1.6 | 56 | 1.0 | 1.24 | 1 | 37.3 | 1.57 | 59 |
| Hamata [1] | 0.07 | 1.06 | 0.07 | 1.5 | 2.16 | 3 | 0.1 | 1.79 | 0.2 | 1.6 | 2.10 | 3 |
| Wafi [1] | – | – | – | 56.7 | 1.72 | 98 | 11.3 | 1.30 | 15 | 68.1 | 1.65 | 113 |
| Golpu [1] | – | – | – | 344.0 | 0.71 | 246 | 67.9 | 0.63 | 43 | 411.9 | 0.70 | 289 |
| Nambonga [1] | – | – | – | – | – | – | 19.9 | 0.79 | 16 | 19.9 | 0.79 | 16 |
| Kili Teke | – | – | – | – | – | – | 221.5 | 0.25 | 54 | 221.5 | 0.25 | 54 |
| **Total Papua New Guinea** | **1.3** | **1.09** | **1** | **437.2** | **0.92** | **403** | **321.8** | **0.40** | **129** | **760.3** | **0.70** | **533** |
| **Grand total** | **402.8** | | **643** | **1 162.4** | | **1 122** | **442.4** | | **574** | **2 007.6** | | **2 338** |

# MINERAL RESOURCES STATEMENT (METRIC) CONTINUED

| Operations | Measured resources | | Indicated resources | | Inferred resources | | Total mineral resources | |
|---|---|---|---|---|---|---|---|---|
| | Tonnes (Mt) | Au eq (000kg) | Tonnes (Mt) | Au eq (000kg) | Tonnes (Mt) | Au eq (000kg) | Tonnes (Mt) | Au eq (000kg) |
| **GOLD EQUIVALENTS [2]** | | | | | | | | |
| **Silver** | | | | | | | | |
| Hidden Valley [1] | 1.3 | 0.4 | 35.0 | 14 | 1.0 | 0.4 | 37.3 | 15 |
| **Total** | **1.3** | **0.4** | **35.0** | **14** | **1.0** | **0.4** | **37.3** | **15** |
| **Copper** | | | | | | | | |
| Golpu [1] | – | – | 344.0 | 668 | 67.9 | 103 | 411.9 | 771 |
| Nambonga [1] | – | – | – | – | 19.9 | 7 | 19.9 | 7 |
| Kili Teke | | | | | 221.5 | 140 | 221.5 | 140 |
| **Total** | **–** | **–** | **344.0** | **668** | **309.3** | **250** | **653.3** | **918** |
| **Total silver and copper as gold equivalents** | **1.3** | **0.4** | **379.0** | **682** | **310.3** | **251** | **690.6** | **933** |
| **Total Papua New Guinea including gold equivalents** | **1.3** | **2** | **437.2** | **1 085** | **321.8** | **380** | **760.3** | **1 466** |
| **Total Harmony including equivalents** | **402.8** | **643** | **1 162.4** | **1 803** | **442.4** | **825** | **2 007.6** | **3 271** |

**Other metals**

| | 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) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **PAPUA NEW GUINEA** | | | | | | | | | | | | |
| **Silver** | | | | | | | | | | | | |
| Hidden Valley [1] | 1.3 | 21.52 | 27 | 35.0 | 30.72 | 1 074 | 1.0 | 31.69 | 33 | 37.3 | 30.43 | 1 134 |
| Golpu [1] | – | – | – | 344.0 | 1.29 | 443 | 67.9 | 1.06 | 72 | 411.9 | 1.25 | 515 |
| Nambonga [1] | – | – | – | – | – | – | 19.9 | 2.87 | 57 | 19.9 | 2.87 | 57 |
| **Total** | **1.3** | **21.52** | **27** | **379.0** | **4.00** | **1 517** | **88.8** | **1.83** | **162** | **469.1** | **3.64** | **1 707** |

| | Tonnes (Mt) | Grade (%) | Cu (000t) | Tonnes (Mt) | Grade (%) | Cu (000t) | Tonnes (Mt) | Grade (%) | Cu (000t) | Tonnes (Mt) | Grade (%) | Cu (000t) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Copper** | | | | | | | | | | | | |
| Golpu [1] | – | – | – | 344.0 | 1.09 | 3 734 | 67.9 | 0.85 | 577 | 411.9 | 1.05 | 4 311 |
| Nambonga [1] | – | – | – | – | – | – | 19.9 | 0.21 | 42 | 19.9 | 0.21 | 42 |
| Kili Teke | – | – | – | – | – | – | 221.5 | 0.35 | 782 | 221.5 | 0.35 | 782 |
| **Total** | **–** | **–** | **–** | **344.0** | **1.09** | **3 734** | **309.3** | **0.45** | **1 401** | **653.3** | **0.79** | **5 135** |

| | Tonnes (Mt) | Grade (ppm) | Mo (000t) | Tonnes (Mt) | Grade (ppm) | Mo (000t) | Tonnes (Mt) | Grade (ppm) | Mo (000t) | Tonnes (Mt) | Grade (ppm) | Mo (000t) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Molybdenum** | | | | | | | | | | | | |
| Golpu [1] | – | – | – | 344.0 | 94 | 32 | 67.9 | 72 | 5 | 411.9 | 90 | 37 |
| Kili Teke | – | – | – | – | – | – | 221.5 | 170 | 38 | 221.5 | 170 | 38 |
| **Total** | **–** | **–** | **–** | **334.0** | **94** | **32** | **289.4** | **147** | **42** | **633.4** | **118** | **75** |

| | 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) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SOUTH AFRICA** | | | | | | | | | | | | |
| Uranium | | | | | | | | | | | | |
| Free State underground | | | | | | | | | | | | |
| Masimong | – | – | – | 2.9 | 0.20 | 1 | 0.8 | 0.14 | 0 | 3.7 | 0.19 | 1 |
| Tshepong | 5.2 | 0.20 | 1 | 12.3 | 0.23 | 3 | 7.4 | 0.13 | 1 | 24.9 | 0.19 | 5 |
| Phakisa | 7.9 | 0.20 | 2 | 11.2 | 0.20 | 2 | 23.1 | 0.11 | 2 | 42.2 | 0.15 | 6 |
| **Total** | **13.1** | **0.20** | **3** | **26.4** | **0.21** | **6** | **31.3** | **0.11** | **4** | **70.8** | **0.17** | **12** |
| **Total South Africa underground** | **13.1** | **0.20** | **3** | **26.4** | **0.21** | **6** | **31.3** | **0.11** | **4** | **70.8** | **0.17** | **12** |
| **Free State surface** | **–** | **–** | **–** | **176.7** | **0.10** | **18** | **–** | **–** | **–** | **176.7** | **0.10** | **18** |
| **Grand total** | **13.1** | **0.20** | **3** | **203.1** | **0.11** | **23** | **31.3** | **0.11** | **4** | **247.5** | **0.12** | **29** |

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

[2] *Gold equivalent ounces are calculated assuming a US$1 150/oz Au, US$3.00/lb Cu and US$15.00/oz Ag with 100% recovery for all metals*
*Rounding of numbers may result in slight computational discrepancies*
*Note: 1 tonne = 1 000 kg = 2 204 lbs*
*1 troy ounce = 31.10348 grams*

# MINERAL RESERVES STATEMENT (IMPERIAL)

| Operations | Proved reserves | | | Probable reserves | | | Total mineral reserves | | |
|---|---|---|---|---|---|---|---|---|---|
| | 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** | | | | | | | | | |
| **Gold** | | | | | | | | | |
| Bambanani | 1.4 | 0.323 | 449 | – | – | – | 1.4 | 0.323 | 449 |
| Joel | 2.8 | 0.153 | 435 | 3.3 | 0.134 | 440 | 6.1 | 0.143 | 875 |
| Masimong | 1.6 | 0.118 | 193 | 0.3 | 0.112 | 30 | 1.9 | 0.117 | 223 |
| Phakisa | 6.2 | 0.191 | 1 185 | 2.1 | 0.209 | 437 | 8.3 | 0.196 | 1 622 |
| Target 1 | 3.0 | 0.134 | 401 | 4.3 | 0.139 | 591 | 7.3 | 0.137 | 992 |
| Tshepong | 18.9 | 0.160 | 3 022 | 3.9 | 0.128 | 500 | 22.8 | 0.155 | 3 522 |
| Unisel | 1.4 | 0.122 | 167 | 1.4 | 0.127 | 180 | 2.8 | 0.124 | 348 |
| **Total Free State underground** | **35.3** | **0.166** | **5 852** | **15.2** | **0.143** | **2 178** | **50.5** | **0.159** | **8 031** |
| **West Rand** | | | | | | | | | |
| Doornkop South Reef | 1.9 | 0.147 | 278 | 2.8 | 0.152 | 431 | 4.7 | 0.150 | 709 |
| Kusasalethu | 4.2 | 0.209 | 878 | 0.2 | 0.155 | 36 | 4.4 | 0.206 | 914 |
| **Total West Rand** | **6.1** | **0.189** | **1 156** | **3.1** | **0.152** | **467** | **9.2** | **0.177** | **1 623** |
| **Total South Africa underground** | **41.4** | **0.169** | **7 008** | **18.3** | **0.145** | **2 645** | **59.7** | **0.162** | **9 654** |
| **SOUTH AFRICA SURFACE** | | | | | | | | | |
| **Kraaipan Greenstone Belt** | | | | | | | | | |
| Kalgold | 5.8 | 0.028 | 165 | 13.6 | 0.033 | 444 | 19.4 | 0.031 | 608 |
| **Free State – surface** | | | | | | | | | |
| Free State (Phoenix) | 88.0 | 0.008 | 712 | – | – | – | 88.0 | 0.008 | 712 |
| Free State (St Helena) | 193.9 | 0.008 | 1 507 | – | – | – | 193.9 | 0.008 | 1 507 |
| Free State (Central Plant) | – | – | – | 73.2 | 0.008 | 551 | 73.2 | 0.008 | 551 |
| Free State (other): | | | | | | | | | |
| – Waste rock dumps | – | – | – | 4.3 | 0.015 | 65 | 4.3 | 0.015 | 65 |
| – Tailings | – | – | – | 547.5 | 0.007 | 3 661 | 547.5 | 0.007 | 3 661 |
| – Sub-total | – | – | – | 551.9 | 0.007 | 3 725 | 551.9 | 0.007 | 3 725 |
| **Total Free State** | **281.9** | **0.008** | **2 219** | **625.0** | **0.007** | **4 276** | **906.9** | **0.007** | **6 495** |
| **Total South Africa surface (including Kalgold)** | **287.7** | **0.008** | **2 384** | **638.6** | **0.007** | **4 720** | **926.3** | **0.008** | **7 104** |
| **Total South Africa** | **329.1** | | **9 393** | **656.9** | | **7 365** | **986.0** | | **16 758** |
| **PAPUA NEW GUINEA** [1] | | | | | | | | | |
| Hidden Valley | 1.4 | 0.032 | 45 | 12.6 | 0.047 | 599 | 14.0 | 0.046 | 644 |
| Hamata | 0.07 | 0.031 | 2 | 1.1 | 0.065 | 72 | 1.2 | 0.063 | 74 |
| Golpu | – | – | – | 209.0 | 0.026 | 5 522 | 209.0 | 0.026 | 5 522 |
| **Total Papua New Guinea** | **1.5** | **0.032** | **47** | **222.7** | **0.028** | **6 193** | **224.2** | **0.028** | **6 239** |
| **Grand total** | **330.6** | | **9 440** | **879.6** | | **13 558** | **1 210.2** | | **22 997** |

# MINERAL RESERVES STATEMENT (IMPERIAL) CONTINUED

| Operations | Proved reserves | | Probable reserves | | Total mineral reserves | |
|---|---|---|---|---|---|---|
| | Tons (Mt) | Au eq (000oz) | Tons (Mt) | Au eq (000oz) | Tons (Mt) | Au eq (000oz) |
| **GOLD EQUIVALENTS [1, 2]** | | | | | | |
| **Silver** | | | | | | |
| Hidden Valley | 1.4 | 12 | 12.6 | 167 | 14 | 178 |
| **Total** | **1.4** | **12** | **12.6** | **167** | **14** | **178** |
| **Copper** | | | | | | |
| Golpu | – | – | 209.0 | 13 741 | 209.0 | 13 741 |
| **Total** | **–** | **–** | **209.0** | **13 741** | **209.0** | **13 741** |
| **Total silver and copper as gold equivalents** | **1.4** | **12** | **221.6** | **13 908** | **223.0** | **13 919** |
| **Total Papua New Guinea including gold equivalents** | **1.5** | **58** | **222.7** | **20 100** | **224.2** | **20 159** |
| **Total Harmony including equivalents** | **330.6** | **9 451** | **879.6** | **27 465** | **1 210.2** | **36 916** |

**Other metals**

| | Tons (Mt) | Grade (oz/t) | Ag (000oz) | Tons (Mt) | Grade (oz/t) | Ag (000oz) | Tons (Mt) | Grade (oz/t) | Ag (000oz) |
|---|---|---|---|---|---|---|---|---|---|
| **PAPUA NEW GUINEA [1]** | | | | | | | | | |
| **Silver** | | | | | | | | | |
| Hidden Valley | 1.4 | 0.628 | 882 | 12.6 | 1.012 | 12 789 | 14.0 | 0.973 | 13 671 |
| Golpu | – | – | – | – | – | – | – | – | – |
| **Total** | **1.4** | **0.628** | **882** | **12.6** | **1.012** | **12 789** | **14.0** | **0.973** | **13 671** |

| | Tons (Mt) | Grade (%) | Cu (Mlb) | Tons (Mt) | Grade (%) | Cu (Mlb) | Tons (Mt) | Grade (%) | Cu (Mlb) |
|---|---|---|---|---|---|---|---|---|---|
| **Copper** | | | | | | | | | |
| Golpu | – | – | – | 209.0 | 1.144 | 5 269 | 209 | 1.144 | 5 269 |

[1] *Harmony's 50% attributable portion*
[2] *Gold equivalent ounces are calculated assuming a US$1150/oz Au, US$3.00/lb Cu and US$15.00/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 = 2 000 lbs*
*1 troy ounce = 31.10348 grams*

# MINERAL RESERVES STATEMENT (METRIC)

| Operations | Proved reserves | | | Probable reserves | | | Total mineral reserves | | |
|---|---|---|---|---|---|---|---|---|---|
| | 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** | | | | | | | | | |
| **Gold** | | | | | | | | | |
| Bambanani | 1.3 | 11.08 | 14 | – | – | – | 1.3 | 11.08 | 14 |
| Joel | 2.6 | 5.26 | 14 | 3.0 | 4.61 | 14 | 5.5 | 4.91 | 27 |
| Masimong | 1.5 | 4.05 | 6 | 0.2 | 3.82 | 1 | 1.7 | 4.02 | 7 |
| Phakisa | 5.6 | 6.56 | 37 | 1.9 | 7.17 | 14 | 7.5 | 6.72 | 50 |
| Target 1 | 2.7 | 4.59 | 12 | 3.9 | 4.75 | 18 | 6.6 | 4.69 | 31 |
| Tshepong | 17.1 | 5.49 | 94 | 3.5 | 4.39 | 16 | 20.7 | 5.30 | 110 |
| Unisel | 1.2 | 4.18 | 5 | 1.3 | 4.35 | 6 | 2.5 | 4.27 | 11 |
| **Total Free State underground** | **32.0** | **5.69** | **182** | **13.8** | **4.90** | **68** | **45.8** | **5.45** | **250** |
| **West Rand** | | | | | | | | | |
| **Doornkop** | | | | | | | | | |
| Doornkop South Reef | 1.7 | 5.03 | 9 | 2.6 | 5.21 | 13 | 4.3 | 5.14 | 22 |
| Kusasalethu | 3.8 | 7.15 | 27 | 0.2 | 5.31 | 1 | 4.0 | 7.06 | 28 |
| **Total West Rand** | **5.5** | **6.49** | **36** | **2.8** | **5.22** | **15** | **8.3** | **6.07** | **50** |
| **Total South Africa underground** | **37.6** | **5.81** | **218** | **16.8** | **4.96** | **82** | **54.1** | **5.55** | **300** |
| **SOUTH AFRICA SURFACE** | | | | | | | | | |
| **Kraaipan Greenstone Belt** | | | | | | | | | |
| Kalgold | 5.3 | 0.97 | 5 | 12.3 | 1.12 | 14 | 17.6 | 1.07 | 19 |
| **Free State – surface** | | | | | | | | | |
| Free State (Phoenix) | 79.8 | 0.28 | 22 | – | – | – | 79.8 | 0.28 | 22 |
| Free State (St Helena) | 175.9 | 0.27 | 47 | – | – | – | 175.9 | 0.27 | 47 |
| Free State (Central Plant) | – | – | – | 66.4 | 0.26 | 17 | 66.4 | 0.26 | 17 |
| Free State (other): | | | | | | | | | |
| – Waste rock dumps | – | – | – | 3.9 | 0.51 | 2 | 3.9 | 0.51 | 2 |
| – Tailings | – | – | – | 496.7 | 0.23 | 114 | 496.7 | 0.23 | 114 |
| – Sub-total | – | – | – | 500.6 | 0.23 | 116 | 500.6 | 0.23 | 116 |
| **Total Free State** | **255.7** | **0.27** | **69** | **567.0** | **0.23** | **133** | **822.7** | **0.25** | **202** |
| **Total South Africa surface (including Kalgold)** | **261.0** | **0.28** | **74** | **579.4** | **0.25** | **147** | **840.4** | **0.26** | **221** |
| **Total South Africa** | **298.5** | | **292** | **596.0** | | **229** | **894.5** | | **521** |
| **PAPUA NEW GUINEA** [1] | | | | | | | | | |
| Hidden Valley | 1.3 | 1.09 | 1 | 11.5 | 1.62 | 19 | 12.7 | 1.57 | 20 |
| Hamata | 0.07 | 1.06 | 0.07 | 1.0 | 2.23 | 2 | 1.1 | 2.16 | 2 |
| Golpu | – | – | – | 189.6 | 0.91 | 172 | 189.6 | 0.91 | 172 |
| **Total Papua New Guinea** | **1.3** | **1.09** | **1** | **202.0** | **0.95** | **193** | **203.4** | **0.95** | **194** |
| **Grand total** | **299.9** | | **294** | **798.0** | | **422** | **1 097.9** | | **715** |

# MINERAL RESERVES STATEMENT (METRIC) CONTINUED

| Operations | Proved reserves | | Probable reserves | | Total mineral reserves | |
|---|---|---|---|---|---|---|
| | Tonnes (Mt) | Au eq (000kg) | Tonnes (Mt) | Au eq (000kg) | Tonnes (Mt) | Au eq (000kg) |
| **GOLD EQUIVALENTS [1, 2]** | | | | | | |
| **Silver** | | | | | | |
| Hidden Valley | 1.3 | 0.4 | 11.5 | 5 | 12.7 | 6 |
| **Total** | **1.3** | **0.4** | **11.5** | **5** | **12.7** | **6** |
| **Copper** | | | | | | |
| Golpu | – | – | 189.6 | 427 | 189.6 | 427 |
| **Total** | **–** | **–** | **189.6** | **427** | **189.6** | **427** |
| **Total silver and copper as gold equivalents** | **1.3** | **0.4** | **201.0** | **433** | **202.3** | **433** |
| **Total Papua New Guinea including gold equivalents** | **1.3** | **2** | **202.0** | **625** | **203.4** | **627** |
| **Total Harmony including equivalents** | **299.9** | **294** | **798** | **854** | **1 097.9** | **1 148** |

**Other metals**

| | Tonnes (Mt) | Grade (g/t) | Ag (000kg) | Tonnes (Mt) | Grade (g/t) | Ag (000kg) | Tonnes (Mt) | Grade (g/t) | Ag (000kg) |
|---|---|---|---|---|---|---|---|---|---|
| **PAPUA NEW GUINEA [1]** | | | | | | | | | |
| **Silver** | | | | | | | | | |
| Hidden Valley | 1.3 | 21.52 | 27 | 11.5 | 34.69 | 398 | 12.7 | 33.37 | 425 |
| **Total** | **1.3** | **21.52** | **27** | **11.5** | **34.69** | **398** | **12.7** | **33.37** | **425** |

| | Tonnes (Mt) | Grade (%) | Cu (000t) | Tonnes (Mt) | Grade (%) | Cu (000t) | Tonnes (Mt) | Grade (%) | Cu (000t) |
|---|---|---|---|---|---|---|---|---|---|
| **Copper** | | | | | | | | | |
| Golpu | – | – | – | 189.6 | 1.26 | 2 390 | 189.6 | 1.26 | 2 390 |
| **Total** | **–** | **–** | **–** | **189.6** | **1.26** | **2 390** | **189.6** | **1.26** | **2 390** |

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

*[2] Gold equivalent ounces are calculated assuming a US$1 150/oz Au, US$3.00/lb Cu and US$15.00/oz Ag with 100% recovery for all metals*

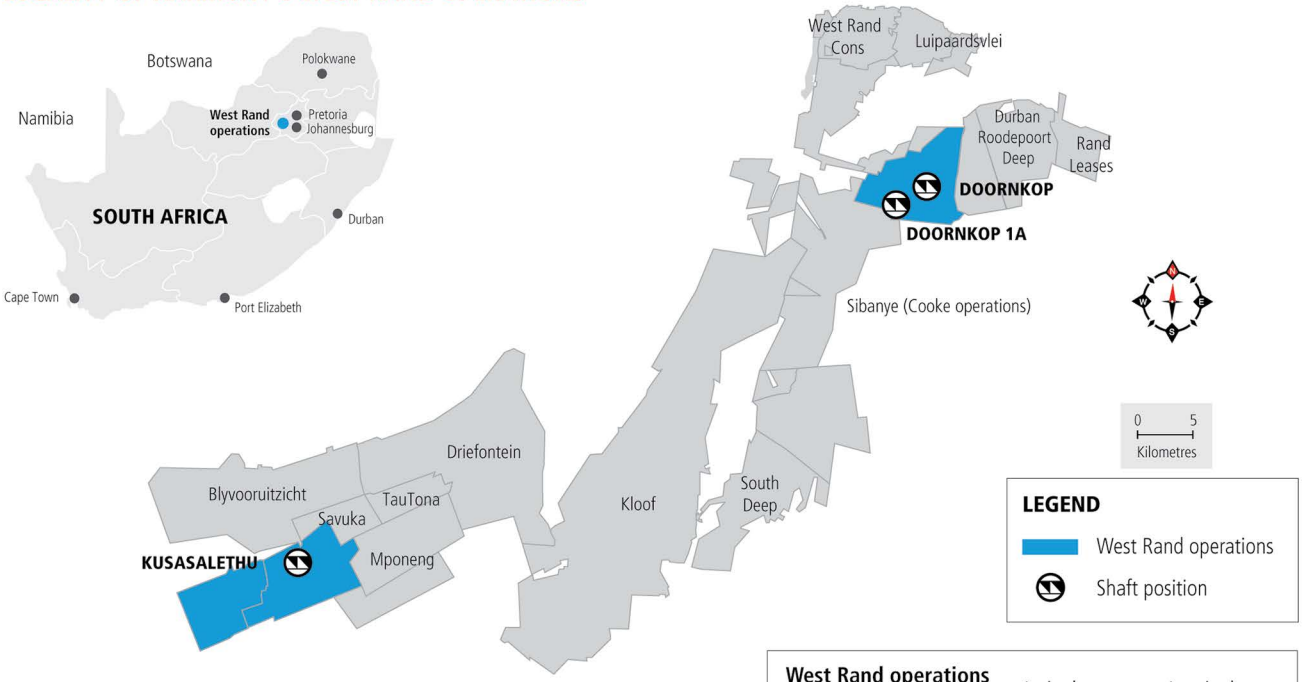
*Metal figures are fully inclusive of all mining dilutions and gold losses, and are reported as mill delivered tonnes and head grades*
*Metallurgical recovery factors have not been applied to the reserve figures*

*Rounding of numbers may result in slight computational discrepancies*
*Note: 1 tonne = 1 000 kg = 2 204 lbs*
*1 troy ounce = 31.10348 grams*

# RESOURCES AND RESERVES BY OPERATION
# SOUTH AFRICA – WEST RAND

Harmony's West Rand operations are Doornkop and Kusasalethu, which together have mineral resources of 12.6Moz and mineral reserves of1.6Moz as at 30 June 2016.

## LOCALITY OF HARMONY'S WEST RAND OPERATIONS




| 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 |

## DOORNKOP

### LOCATION

The Doornkop shaft complex is located south of Krugersdorp, 30km west of Johannesburg, on the northern rim of the Witwatersrand Basin, in the province of Gauteng. The property lies between Cooke 1 shaft, belonging to Sibanye Gold Limited, and Durban Roodepoort Deep Mines.

### NATURE OF THE OPERATION

Doornkop is a single-shaft operation which exploits the South Reef some 2 000m below surface. The South Reef is a narrow reef, exploited by means of conventional stoping. The ore mined at Doornkop is processed at Doornkop's carbon-in-pulp plant, situated directly next to Doornkop shaft. Mining of the Kimberley Reef was suspended during FY14 so as to focus on the build-up of mining of the South Reef and to prevent losses resulting from the lower gold price. Mining of the Kimberley Reef may be resumed should economic circumstances improve sufficiently.

### REGIONAL GEOLOGY

The structure of the West Rand goldfield is dominated by the Witpoortjie and Panvlakte Horst blocks, which are superimposed over broad-folding associated with the southeast plunging West Rand syncline.

The Doornkop shaft lease area is bounded by and lies to the southeast of the major northeasterly 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, the overlying Central Rand Group sediments having been removed by erosion. A number of other faults, forming part of and lying southeast of the Roodepoort fault, including the Saxon fault, also constitute conspicuous structural breaks. A second major fault, the Doornkop fault, which trends in an eastwest direction, occurs toward the southern portion of the lease area. This fault dips to the south and has an up throw to the north.

# RESOURCES AND RESERVES BY OPERATION
## SOUTH AFRICA – WEST RAND CONTINUED

Nearly the entire upper Witwatersrand section is present in the lease area and therefore all the major zones are present, though due to 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 is considered viable at this stage.

The South Reef is between 7.5m and 60m above the Main Reef horizon. The hanging wall to the South Reef consists of siliceous quartzites with non-persistent bands of 'blue-shot' grit and thin argillite partings. The footwall to the South Reef 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 eastwest, with a flat dip from 5 to 15 degrees. Due to the limited geological information, one of the biggest risks for the operation is the intersection of any geological structures that may have a significant change in the reef elevations which can result in some of the resources ending up below infrastructure, rendering it inaccessible from current levels with a potential to negatively affect the declared reserves. To curb this risk, Doornkop has embarked on extensive exploration drilling from underground platforms.

### DOORNKOP

#### Gold – Mineral resources

| | 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 | 2.6 | 7.75 | 21 | 660 | 3.8 | 8.10 | 31 | 993 | 12.2 | 7.17 | 88 | 2 816 | 18.7 | 7.44 | 139 | 4 469 |
| 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 |
| **Grand total** | **2.7** | **7.68** | **21** | **674** | **3.9** | **8.07** | **31** | **1 001** | **12.2** | **7.17** | **88** | **2 819** | **18.8** | **7.43** | **140** | **4 494** |

#### Modifying factors

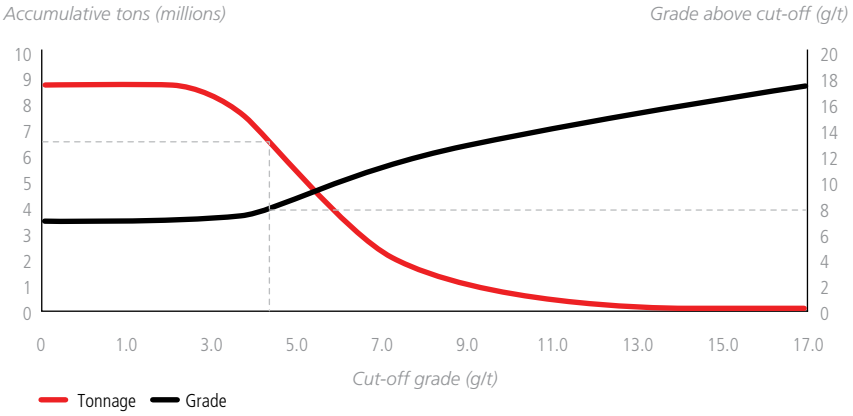
| | MCF (%) | SW (cm) | MW (cm) | PRF (%) |
|---|---|---|---|---|
| South Reef | 81 | 125 | 147 | 97 |

#### Gold – Mineral reserves

| | 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 | 1.7 | 5.03 | 9 | 278 | 2.6 | 5.21 | 13 | 431 | 4.3 | 5.14 | 22 | 709 |

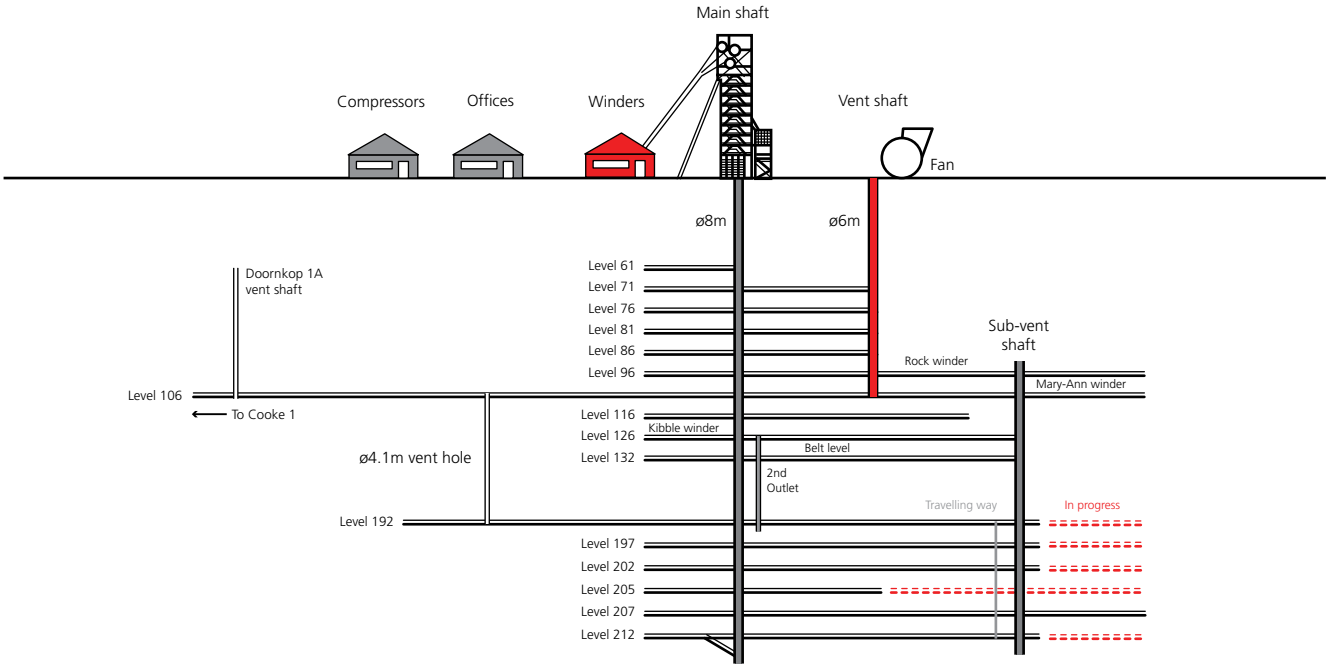
**Doornkop: Measured and indicated resource grade-tonnage curve**

*South Reef*



# RESOURCES AND RESERVES BY OPERATION
## SOUTH AFRICA – WEST RAND CONTINUED

### Doornkop: Schematic of shaft and mining layout




**DOORNKOP**
**SOUTH REEF**

**LEGEND**

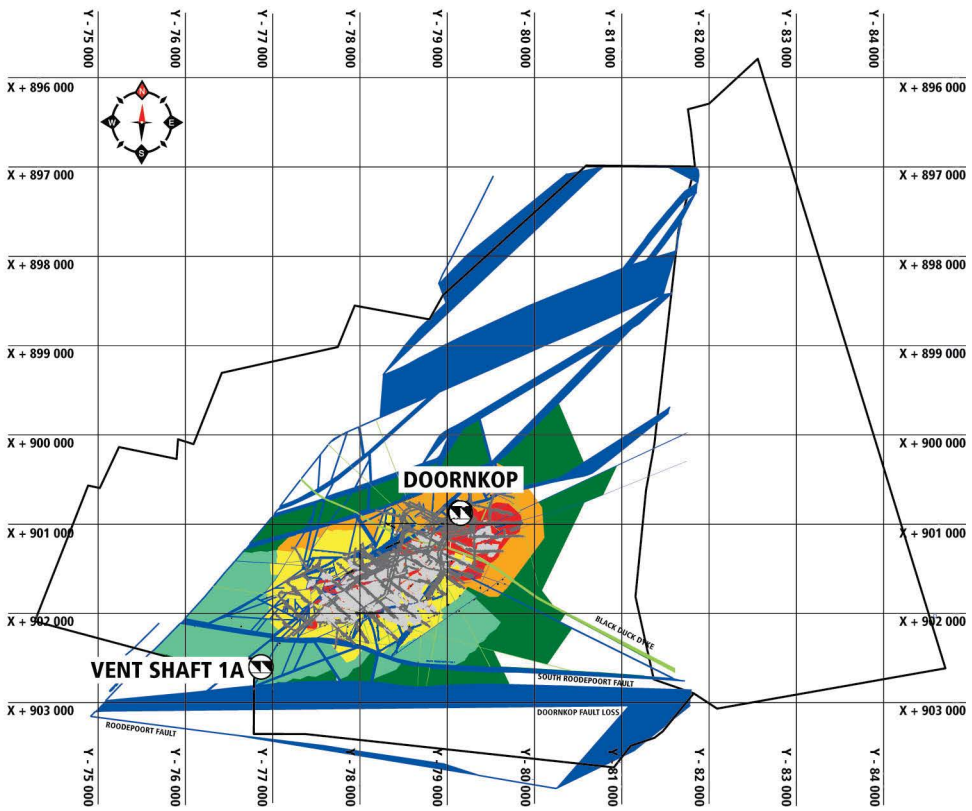
- Mining right
- Shaft position
- Fault zones
- Dykes
- Infrastructure
- Mined out

**Mineral Resources**

- Measured
- Indicated
- Inferred
- Inferred resources in LOM

**Mineral Reserves**

- Proved and probable




0 1 000 2 000
Metres

Co-ordinate system Lo. 27°
Constants: Y = 0.00
X = +2 000 000
Latitude: 26°13' 03.36"S
Longitude: 27°47' 26.55"E

# RESOURCES AND RESERVES BY OPERATION
# SOUTH AFRICA – WEST RAND CONTINUED

## KUSASALETHU

### LOCATION

Kusasalethu is situated on the West Wits Line and is nestled between the Savuka and Mponeng mines to the east and the dormant Deelkraal to the west. Kusasalethu is situated 14km south of Carletonville and 90km southwest of Johannesburg.

### NATURE OF THE OPERATION

The 10m-diameter rock/ventilation shaft was sunk to 2 195m and the man/material shaft to 2 127m. By June 1984, a 10m-diameter sub-vertical rock/service shaft was completed to a depth of 3 048m and a 7m-diameter sub-vertical ventilation shaft to a depth of 3 048m. Both of these shafts were deepened as part of the deepening project to extract the higher-grade pay-chute towards the west of the mine. In December 2014, a decision was taken to stop the Old mine portion of Kusasalethu and to restructure the mine. Subsequently mining above 98 level has ceased.

Kusasalethu employs the sequential-grid method of 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.

#### New life-of-mine strategy

The decrease in reserves at Kusasalethu was a result of normal depletion and the revised, shortened life-of-mine plan for Kusasalethu. This plan aims to optimise the mine's cash flow at a higher grade and create a much stronger margin and to provide the flexibility, if we so choose, of accessing the high-grade payshoot of the Ventersdorp Contact Reef below infrastructure.

### REGIONAL GEOLOGY

Kusasalethu is situated in the West Wits Basin and mines the Ventersdorp Contact Reef as its main ore body. The Ventersdorp Contact Reef rests uncomformably on the quartzites of the Witwatersrand Supergroup.

These Witwatersrand quartzites belong to the Mondeor Formation in the western part of the lease area and the Elsburgs Quartzite Formation in the eastern part of the lease area. The unconformity angle becomes more perceptible towards the east. The Ventersdorp Contact Reef has an average dip of 25 degrees to the southeast and an average strike of N72 degrees east.

The Ventersdorp Contact Reef is generally a clast-supported conglomerate of small sub-angular to sub-rounded milky and smoky (60:40 respectively) quartz pebbles. The matrix is dark grey and medium-grained and comprises mostly quartzite, separating the two units as internal quartzites. It is mineralised by some pyrrhotite, chalcopyrite and, in rare instances, by some carbon flyspecks. Sometimes there are changes to the reef appearance in the form of thickness and, to some degree, elimination. These changes are brought about by either erosion (lava erosion channels – lava appearing at different elevations, with resultant undulations of the reef), or flat faulting (as evidenced by the presence of mylonite at the top contact of the reef).

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 thin low-grade slope reef. The sand-filled channel is a thick low-grade facies. Sandy Terrace Complex (TC2) is found on the same elevation as 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 a separate facies in these areas.

The Elsburgs conglomerates are found on the western side of Kusasalethu, forming the footwall to the Ventersdorp Contact Reef. The Elsburgs 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, also, pyritic in places.

The Ventersdorp Contact Reef is overlain by the Ventersdorp Lava. The lava belongs to the Ventersdorp Supergroup. It 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 the 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 many 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, and are as follows: Pre-Ventersdorp Contact Reef structures, Ventersdorp structures, Platberg structures, Bushveld structures and Pilanesberg structures.

# RESOURCES AND RESERVES BY OPERATION
## SOUTH AFRICA – WEST RAND CONTINUED

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 northeast and south southwest with a general dip of 75 degrees. The faults, however, have a strike mostly of east southeast and west northwest with a few exceptions. Generally, faults here are normal faults with the accompanied loss of ground with varying throws, from a throw of mere centimetres to a massive 60m throw (Kittims and De Twem Fault).

### KUSASALETHU

### Gold – Mineral resources

| | 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 | 3.8 | 12.69 | 48 | 1 553 | 17.8 | 10.49 | 187 | 6 001 | 1.5 | 10.99 | 16 | 521 | 23.1 | 10.89 | 251 | 8 075 |

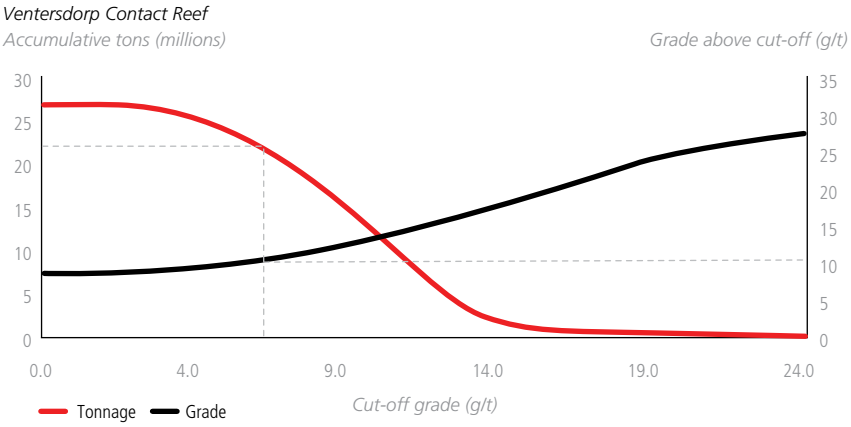
### Modifying factors

| | MCF (%) | SW (cm) | MW (cm) | PRF (%) |
|---|---|---|---|---|
| Ventersdorp Contact Reef | 85 | 132 | 158 | 93 |

### Gold – Mineral reserves

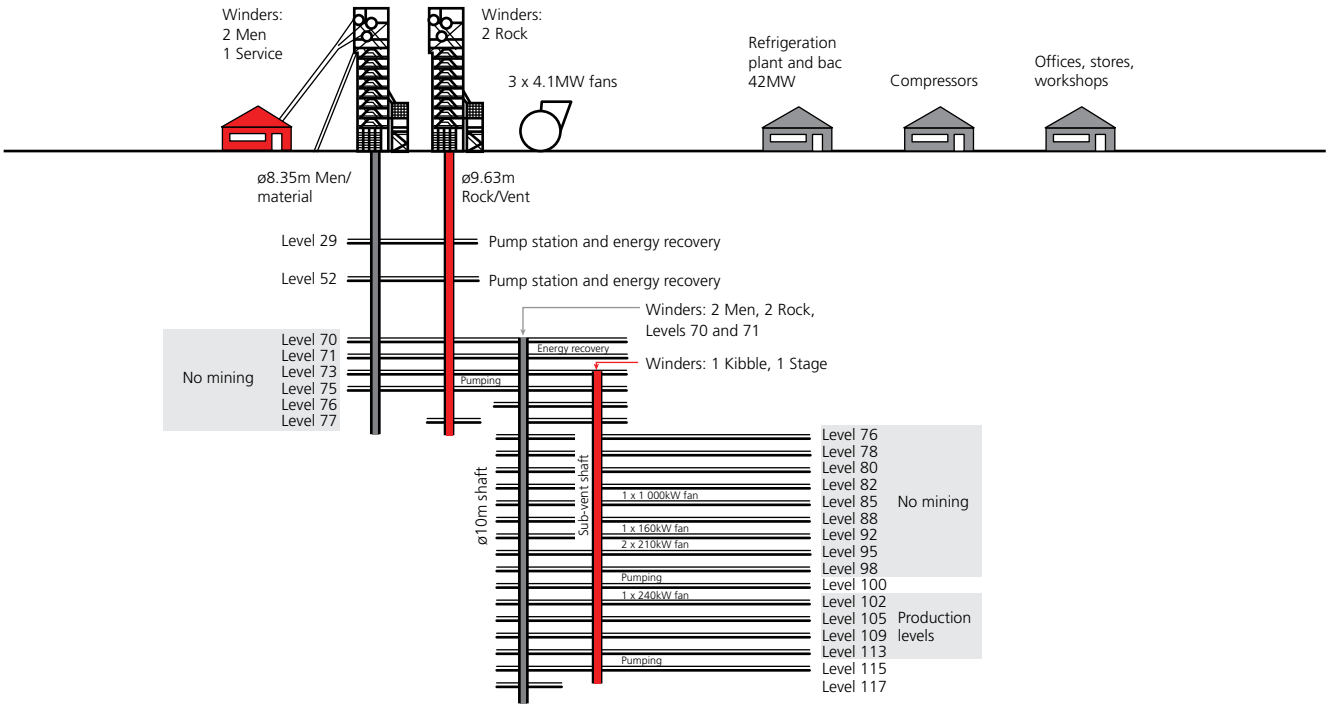
| | Proved reserves | | | | Probable reserves | | | | Total mineral reserves | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Tonnes | | Gold | | Tonnes | | Gold | | Tonnes | | Gold | |
| | (Mt) | (g/t) | (000kg) | (000oz) | (Mt) | (g/t) | (000kg) | (000oz) | (Mt) | (g/t) | (000kg) | (000oz) |
| Ventersdorp Contact Reef | 3.8 | 7.15 | 27 | 878 | 0.2 | 5.31 | 1 | 36 | 4.0 | 7.06 | 28 | 914 |

**Kusasalethu: Measured and indicated resource grade-tonnage curve**



# RESOURCES AND RESERVES BY OPERATION
## SOUTH AFRICA – WEST RAND CONTINUED

### Kusasalethu: Schematic of shaft and mining layout




**KUSASALETHU**
**VENTERSDORP CONTACT REEF**

**LEGEND**

- Mining right
- Shaft position
- Intermine boundary
- Fault zones
- Dykes
- Abandoned pillars
- Infrastructure
- Mined out

**Mineral Resources**

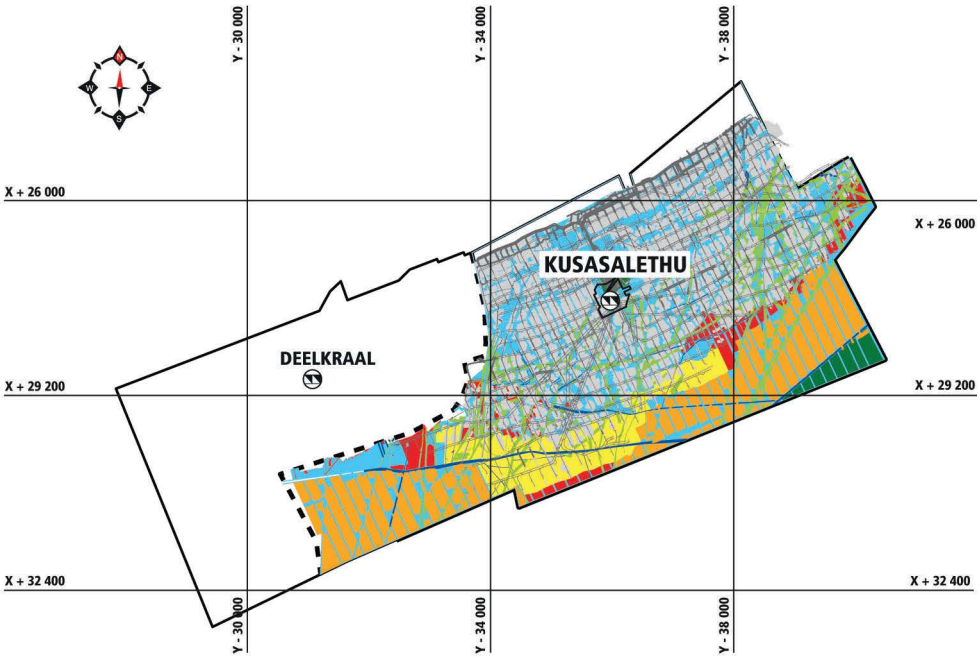
- Measured
- Indicated
- Inferred

**Mineral Reserves**

- Proved and probable

0 500 1 000
Metres

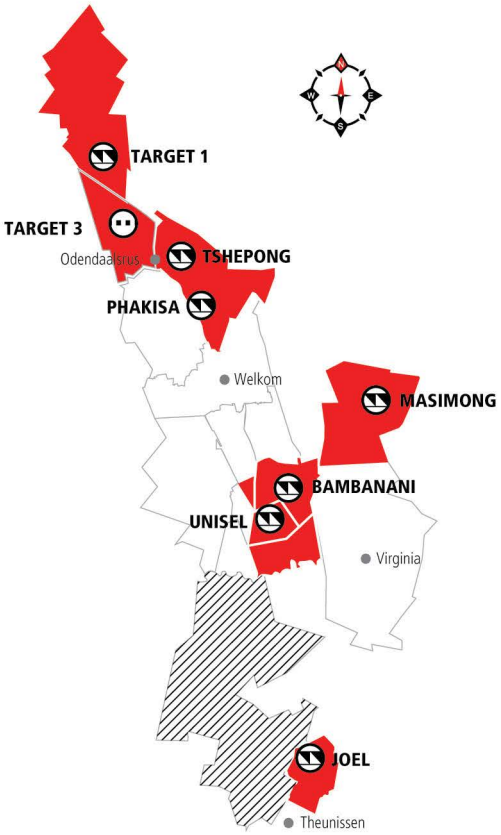
Co-ordinate system Lo. 27°
Constants: Y = -0.00
X = +2 900 000
Latitude: 26°13' 03.36"S
Longitude: 27°47' 26.55"E



# RESOURCES AND RESERVES BY OPERATION
# SOUTH AFRICA – FREE STATE OPERATIONS

Harmony's Free State operations comprise seven underground mines. Together they have mineral resources of 36.0Moz and mineral reserves of 8.0Moz as at 30 June 2016.

## LOCALITY OF HARMONY'S FREE STATE OPERATIONS


**LEGEND**

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

0 5
Kilometres

| 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 |
| Bambanani | 28°2'28.24"S | 26°48'9.13"E |
| Unisel | 28°3'49.85"S | 26°47'11.43"E |
| Masimong | 27°58'23.93"S | 26°52'39.41"E |
| Joel | 28°16'17.19"S | 26°48'57.97"E |

## FREE STATE OPERATIONS

### LOCATION

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

**Joel** mine is the most southerly of the gold mines mined within the Harmony stable and is situated some 40km south of Welkom, 30km southeast of Virginia and 20km north of Theunissen. The mine has a common boundary with the Sibanye gold mine (Beatrix Mine) to the west of the mine property.

**Unisel** mine 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** mine 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** mine 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.

# RESOURCES AND RESERVES BY OPERATION
## SOUTH AFRICA – FREE STATE OPERATIONS CONTINUED

**Phakisa** mine 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** mine 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.

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

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

### NATURE OF THE OPERATIONS

**Joel** mines at moderate depths of ±1 300m below surface. The primary economical reef horizon at Joel is the narrow tabular Beatrix Reef deposit which is accessed through conventional grid development. The reef dips northwards at an average angle of 14 degrees with an inherited concept of using winzes rather than raises to generate ore reserves. Extraction is done conventionally.

**Unisel** is a mine in a mature phase of operation, mining at intermediate depths ranging from 1 100m to 2 100m below surface. Conventional mining is scattered over all levels and takes place from 2km to 4km from the shaft. Mining takes place mainly on the Leader and Basal Reefs with a lesser amount on the Middle Reef, normally limited to less than 5% of mining. This distribution of mining is not expected to change over the life of mine. Pillar and fault block mining will become more important and constitute a greater percentage of mining as ore reserves are depleted. Limited blocks of ground below infrastructure will be accessed and mined from winzes.

Mining at **Bambanani** is limited to the extraction of the shaft pillar (Basal Reef only) at depths between 1 911m and 2 197m below surface. This is done by means of mini longwalls (subdivided on local geological structures and geotechnical conditions) established on the northern side of the shaft pillar (by means of wide raises), and mining advances in a southerly direction in a pre-determined sequence. Some mining is also done in the centre of the shaft pillar. Panels will be mined on undercut or open depending on geological conditions and rock engineering recommendations. More panels are mined on undercut, leaving a reef beam of approximately 80cm underneath the shale.

**Masimong** mines at moderate depths between 1 650m to 2 010m below surface. The reef horizon is accessed by means of conventional grid development. The economical reef horizons extracted are the Basal Reef and the B Reef. Basal Reef accounts for approximately 85% of the on-reef production profile, and is mined on open and undercut operations, depending on whether the reef is overlain by shale. B Reef mining comprises the other 15% of the on-reef production profile. It is located approximately 120m stratigraphically above the Basal Reef, thus necessitating separate infrastructure (i.e. footwall development) from the Basal. 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 to be done to effect holing on all box holes, also all on-reef development needs to be done by means of wide raising. The marginality of the ore body and the current economic situation has significantly reduced the reserves on the mine giving a life expectancy of two to three years. The amount of pillar mining will increase as development of new areas has been curtailed.

**Phakisa** mine's primary economical reef horizon is the Basal Reef. 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 commenced as the mining operation continues to the north. Phakisa is still in the process of building up to full production. It is envisaged that at the current rate of development, Phakisa will reach full production within the next three years. 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.

**Tshepong** mines at moderate depths of between 1 600m and 2 200m below surface. The reef horizon is accessed via conventional grid development. The shaft's primary economical reef horizon is the Basal Reef that is extracted as an undercut mining operation leaving a quartzite beam in the hanging wall to ensure the stability of the overlaying shale. Minor amounts of B Reef that do not exceed 5% of the on-reef area mined per annum are extracted as an open stoping mining operation. The B Reef is approximately 140m stratigraphically above the Basal Reef, thus necessitating separate infrastructure (i.e. footwall development) from the Basal. 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 mine 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 is not significant.

# RESOURCES AND RESERVES BY OPERATION
## SOUTH AFRICA – FREE STATE OPERATIONS CONTINUED

### REGIONAL GEOLOGY

Harmony's Free State operations are located on the southwestern corner of the Witwatersrand Basin, between the towns of Allanridge, Welkom, Theunissen and Virginia. The 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 lateral shift can allow a reconstruction of the ore bodies of Unisel to the west of the De Bron and Masimong to the east. A number of other major faults (Stuirmanspan, Dagbreek, Arrarat and Eureka) 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 has resorted to undercutting in its mining panels to reduce the effect of shale dilution.

The second major reef is the Leader Reef, 15m to 20m above the Basal Reef. This is mined at Unisel to the south. Further north, it becomes poorly developed with erratic grades. The reef consists of multiple conglomerate units, separated by thin quartzitic zones, often totaling up to 4m thick. A selected mining cut on the most economic horizon is often undertaken.

The B Reef is a highly channelised ore body located 140m stratigraphically above the Basal Reef. Because of its erratic nature, it has only been mined at Masimong, Tshepong, 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.

The A Reef is also a highly channelised reef, located some 40m above the B Reef, within an extensive channel that lies along the western margin from Nyala to Lorraine. It consists of multiple conglomerate bands of up to 4m thick and a selected mining cut is usually required to optimise the ore body.

Joel mine, 30km south of Welkom, is the only Harmony Free State operation to mine the Beatrix Reef. This reef varies from a single-pebble lag to a multiple conglomerate, often showing mixing of the reef with some of the overlying lower-grade VS5 (mixed pebble conglomerate) material. None of the other reefs are present this far south, having sub-cropped against 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.

# RESOURCES AND RESERVES BY OPERATION
# SOUTH AFRICA – FREE STATE OPERATIONS CONTINUED

## TARGET 1

### LOCATION

This report describes the area surrounding and the resource generation process for Target 1 (including the former Loraine property), the most northerly operation in the Free State (Welkom) goldfield. The area extends from the southern boundary of the mine lease area northwards to the position of the Siberia fault. The resources quoted cover the area from the southern boundary of the mine lease area northwards to the Blast dyke.

### NATURE OF OPERATION

The Target ore body is located some 5km to the north of the original Lorraine No. 1 shaft and is accessed via a 6km long 12 degree decline developed from the 203 Level of the No. 1 shaft vertical shaft system.

Initially the decline was developed to provide a drilling platform for the exploration and evaluation of the ore body, but was later used as the main access for all services, logistics, personnel and the extraction of ore.

The ore body is composed of some 60 or more individual conglomerates located in the Uitkyk (Elsburg – EAs) and van der Heeversrust (Dreyerskuil – DKs), members of the upper Eldorado (Elsburgs) 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 of this being remotely operated. Massive mining is particularly relevant where the reefs become condensed and steeper in the western portion of the ore body. Massive mining contributes to 80% 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, environmental and safety concerns.

Conventional narrow reef scattered mining makes up the remaining 16% of stope tonnes where individual reefs are extracted in places where massive mining is inappropriate or uneconomic. In addition to mining for gold, some stopes are planned to be mined on the stratigraphically highest gold-bearing units to provide over-stoping for the future massive stopes.

### REGIONAL GEOLOGY

The gold deposits of the Witwatersrand lie in an arcuate form, along the northern and western edges of a kidney-shaped basin. The Welkom goldfield, which lies in the southernmost part of this Witwatersrand Basin, has produced 25% of all the gold mined from the Witwatersrand Basin, which in turn has accounted for 66% of all the gold ever mined in the world. It would seem that the western limit of the Welkom goldfield is an edge feature of a mountainous hinterland, through which sediment was debouched into the Witwatersrand depository. 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 contains the majority of the Welkom gold mines. The eastern limit of this graben is the well-defined De Bron fault. The Target gold prospect is a northward continuation of the Welkom goldfield.

The full potential of the Basal Reef, which produced 85% of the gold from this area has yet to be established in the Target area, because the initial drilling focused on the shallower Elsburg and Kimberley Reefs due to time constraints. 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 and which have been mined extensively at Lorraine Gold Mine. The EA 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.

# RESOURCES AND RESERVES BY OPERATION
## SOUTH AFRICA – FREE STATE OPERATIONS CONTINUED

### MINING METHODS

The stoping methods can be grouped into long-hole stoping methods, development and narrow reef mining techniques. In order that more clarity be attained, the methods are broken down into seven stoping methods detailed below:

| Long-hole stoping methods: | |
|---|---|
| Massive open | Narrow-reef |
| Wide open | |
| **Development methods:** | |
| Drift and fill | Cut and fill |
| Drift and pillar | Narrow-reef |

### MASSIVE OPEN STOPING

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

### WIDE OPEN STOPING

The main area of focus for the wide open stopes is the main fan block where two such stoping areas will be mined. The stoping method describes the extraction process for these two stopes, but the method can be applied to any block of similar dimensions i.e. reef widths in excess of 10m and a dip in excess of 200m. The mining method has been designed to utilise the benefits of long-hole stoping methods and backfill.

### NARROW-REEF MINING

The schedule reflects that 8% of the initial monthly tonnage is to be mined from the Dreyerskuil (DK1A) Reefs by means of the conventional narrow-reef mining method. The mining method is essential, as it must provide a de-stressed environment for the bulk of the mechanised stoping, and there is no practical and safe alternative to this method. The rate of overstoping must liberate sufficient destressed reserves to enable the planned 68 000tpm production rate to be achieved.

### TARGET 1 AND 3

**Gold – Mineral resources**

| | 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 | 6.6 | 8.34 | 55 | 1 768 | 9.5 | 8.00 | 76 | 2 445 | 3.0 | 6.46 | 20 | 633 | 19.2 | 7.87 | 151 | 4 846 |
| Target 3 | 7.0 | 9.10 | 64 | 2 057 | 4.7 | 7.10 | 33 | 1 063 | – | – | – | – | 11.7 | 8.31 | 97 | 3 119 |
| **Grand total** | **13.6** | **8.73** | **119** | **3 825** | **14.2** | **7.70** | **109** | **3 508** | **3.0** | **6.46** | **20** | **633** | **30.8** | **8.03** | **248** | **7 966** |

**Modifying factors**

| | MCF (%) | SW (cm) | MW (cm) | PRF (%) |
|---|---|---|---|---|
| Target 1 (massives) | 96 | – | – | 96 |

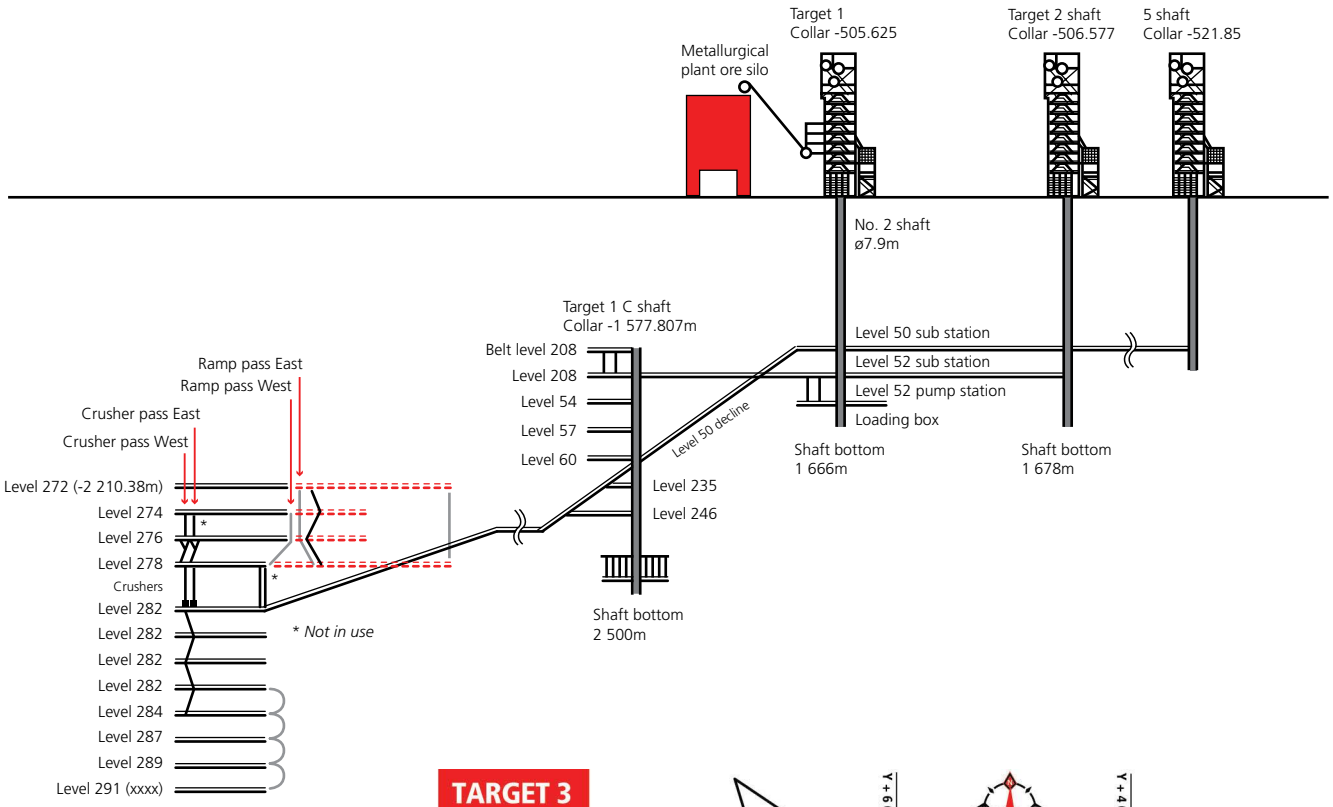
**Gold – Mineral reserves**

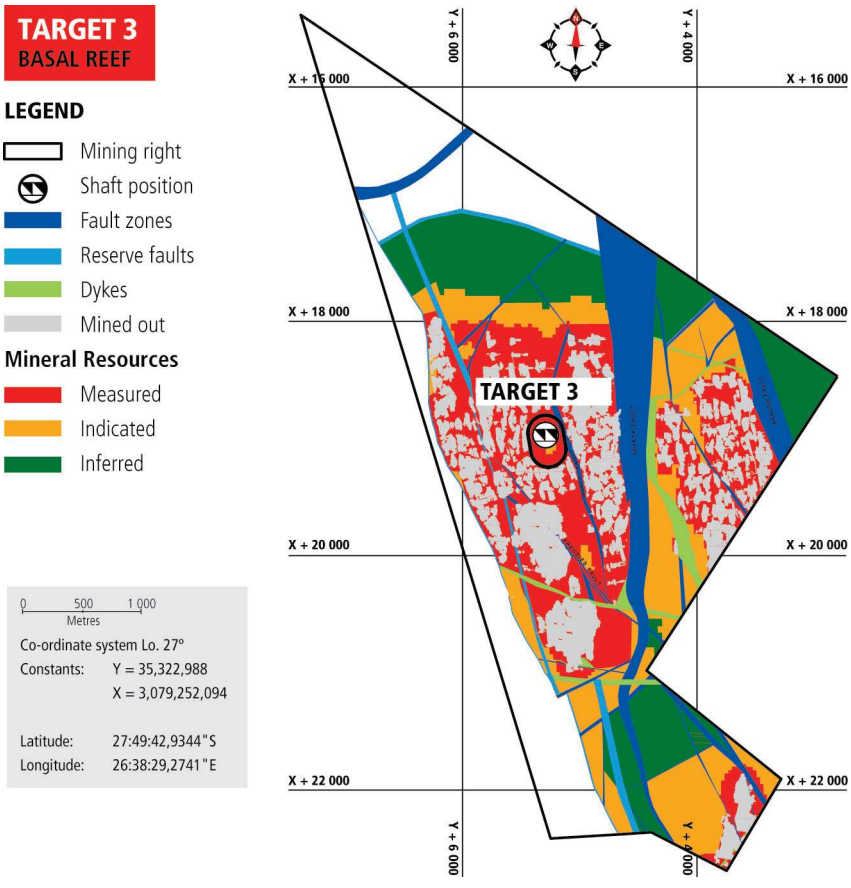
| | Proved reserves | | | | Probable reserves | | | | Total mineral reserves | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Tonnes | Gold | | | Tonnes | Gold | | | Tonnes | Gold | | |
| | (Mt) | (g/t) | (000kg) | (000oz) | (Mt) | (g/t) | (000kg) | (000oz) | (Mt) | (g/t) | (000kg) | (000oz) |
| Target 1 | 2.7 | 4.59 | 12 | 401 | 3.9 | 4.75 | 18 | 591 | 6.6 | 4.69 | 31 | 992 |

# RESOURCES AND RESERVES BY OPERATION

## SOUTH AFRICA – FREE STATE OPERATIONS CONTINUED

### Target 1: Schematic of shaft and mining layout



# RESOURCES AND RESERVES BY OPERATION

## SOUTH AFRICA – FREE STATE OPERATIONS CONTINUED

### TARGET 1

**LEGEND**

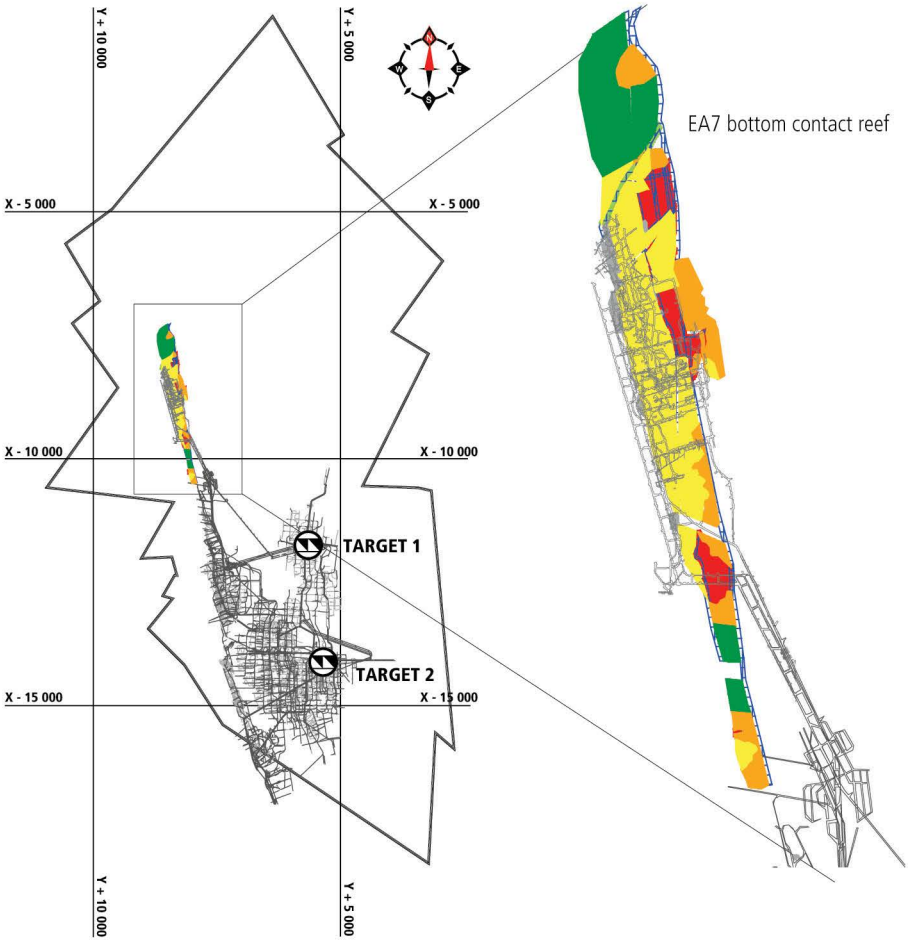
- Mining right
- Shaft position
- Fault zones
- Dykes
- Infrastructure
- Mined out

**Mineral Resources**

- Measured
- Indicated
- Inferred

**Mineral Reserves**

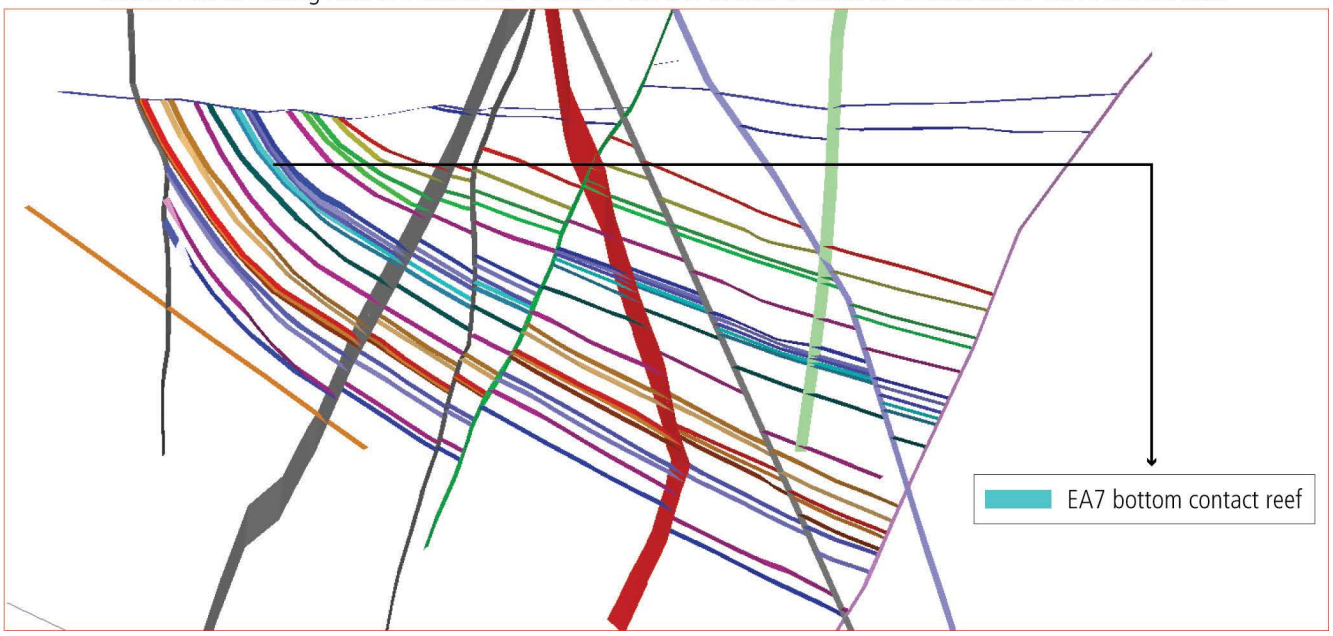
- Proved and probable




-500 0 500 1 000 1 500 2 000
Metres

Co-ordinate system Lo. 27°
Constants: Y = +30 000.0
X = +306 0000

Section view of Elsburg reefs to indicate the relation of the EA7 bottom contact reef in accordance with the other reefs



# RESOURCES AND RESERVES BY OPERATION
## SOUTH AFRICA – FREE STATE OPERATIONS CONTINUED

### TSHEPONG

**Gold – Mineral resources**

| | 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 | 16.8 | 11.35 | 190 | 6 120 | 3.9 | 9.84 | 38 | 1 222 | 4.3 | 9.10 | 39 | 1 259 | 24.9 | 10.73 | 268 | 8 601 |

**Modifying factors**

| | MCF (%) | SW (cm) | MW (cm) | PRF (%) |
|---|---|---|---|---|
| Tshepong | 71 | 105 | 131 | 96 |

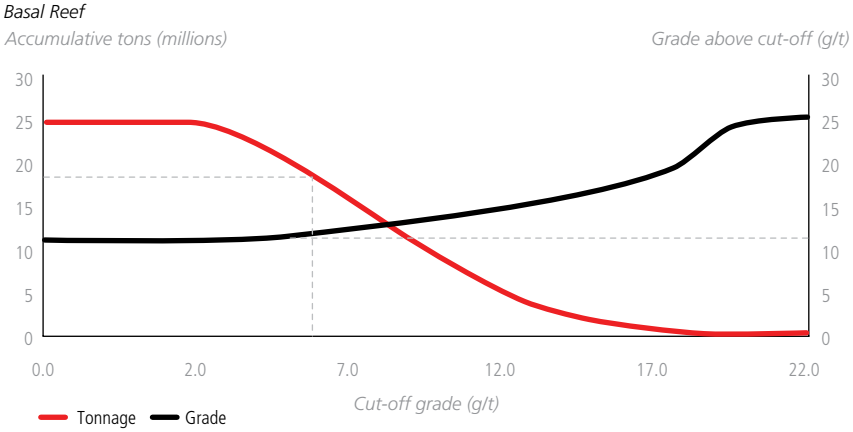
**Gold – Mineral reserves**

| | 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 | 17.1 | 5.49 | 94 | 3 022 | 3.5 | 4.39 | 16 | 500 | 20.7 | 5.30 | 110 | 3 522 |

**Uranium – Mineral resources**

| | Measured resources | | | | Indicated resources | | | | Inferred resources | | | | Total mineral reserves | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Tonnes | | $U_3O_8$ | $U_3O_8$ | Tonnes | | $U_3O_8$ | $U_3O_8$ | Tonnes | | $U_3O_8$ | $U_3O_8$ | Tonnes | | $U_3O_8$ | $U_3O_8$ |
| | (Mt) | (kg/t) | (Mkg) | (Mlb) | (Mt) | (kg/t) | (Mkg) | (Mlb) | (Mt) | (kg/t) | (Mkg) | (Mlb) | (Mt) | (kg/t) | (Mkg) | (Mlb) |
| Tshepong | 5.2 | 0.20 | 1 033 | 2 | 12.3 | 0.23 | 2 781 | 6 | 7.4 | 0.13 | 980 | 2 | 24.9 | 0.19 | 4 794 | 11 |

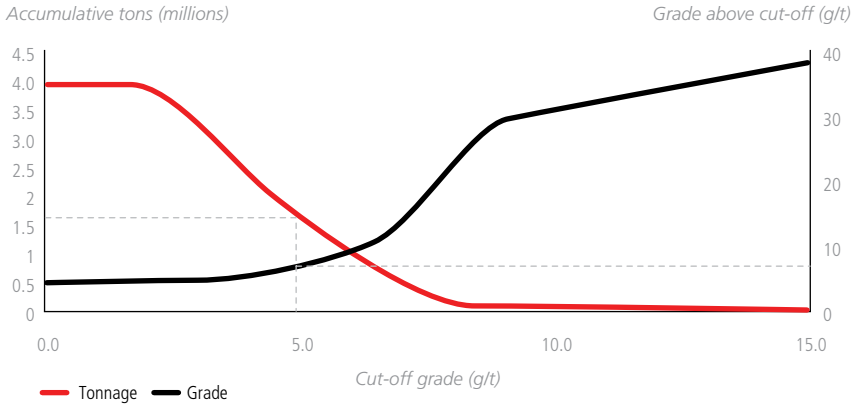
**Tshepong: Measured and indicated resource grade-tonnage curve**



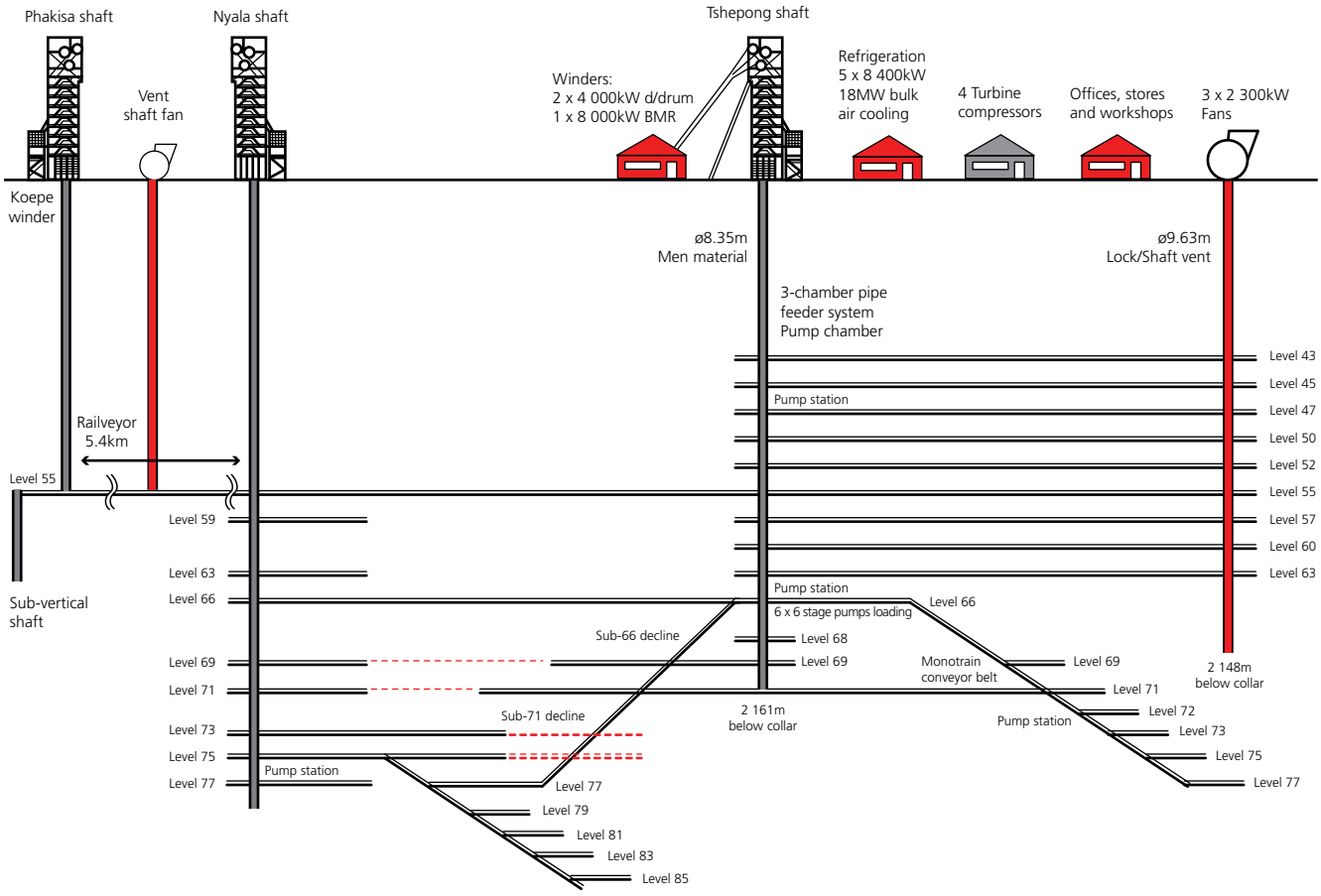
# RESOURCES AND RESERVES BY OPERATION
## SOUTH AFRICA – FREE STATE OPERATIONS CONTINUED

### Tshepong: Measured and indicated resource grade-tonnage curve

*B Reef*




### Phakisa, Nyala and Tshepong: Schematic shaft and mining layout



# RESOURCES AND RESERVES BY OPERATION
## SOUTH AFRICA – FREE STATE OPERATIONS CONTINUED

### TSHEPONG AND PHAKISA
BASAL REEF

**LEGEND**

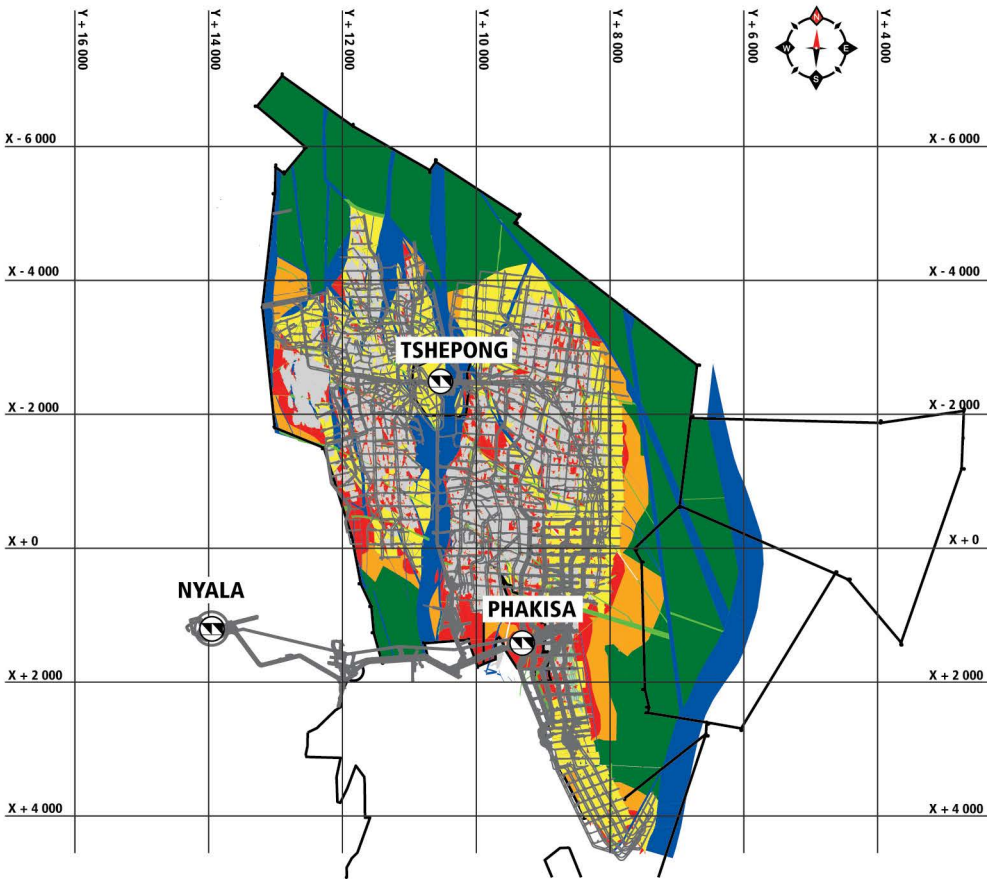
- Mining right
- Shaft position
- Fault zones
- Dykes
- Infrastructure
- Mined out

**Mineral Resources**

- Measured
- Indicated
- Inferred

**Mineral Reserves**

- Proved and probable



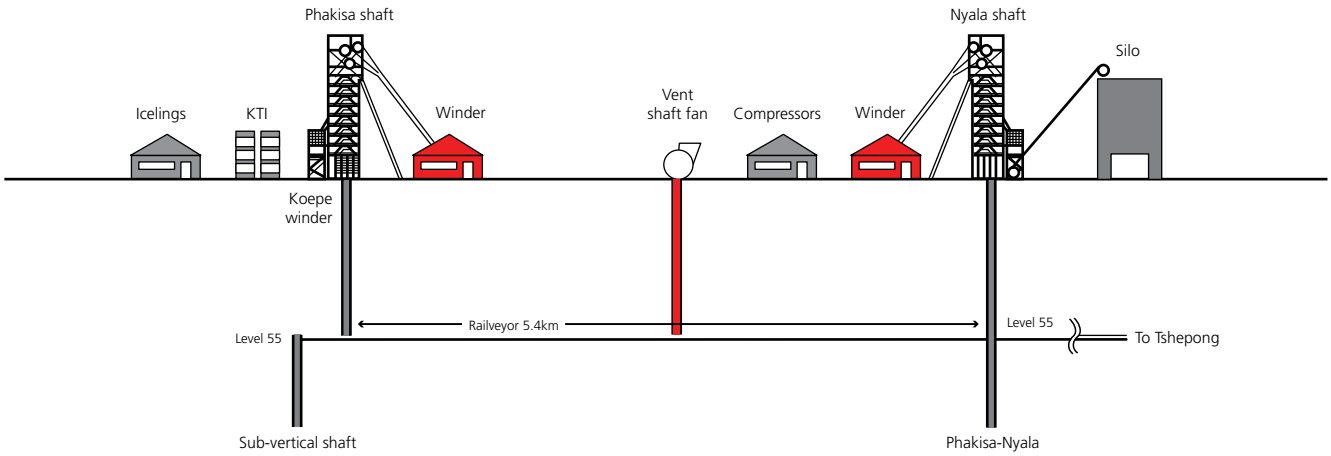

0 500 1 000
Metres

Co-ordinate system Lo. 27°
Constants: Y = 0.00
X = +3 100 000.00

**TSHEPONG**
Latitude: 27°51' 56.45"S
Longitude: 26°42' 45.15"E

**PHAKISA**
Latitude: 27°54' 1.27"S
Longitude: 26°43' 30.05"E

**Phakisa and Nyala: Schematic of shaft and mining layout**



# RESOURCES AND RESERVES BY OPERATION
## SOUTH AFRICA – FREE STATE OPERATIONS CONTINUED

### PHAKISA

**Gold – Mineral resources**

| | 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) |
| Phakisa | 7.9 | 10.72 | 85 | 2 721 | 11.2 | 11.68 | 131 | 4 197 | 23.1 | 10.42 | 241 | 7 747 | 42.2 | 10.81 | 456 | 14 665 |

**Modifying factors**

| | MCF (%) | SW (cm) | MW (cm) | PRF (%) |
|---|---|---|---|---|
| Phakisa | 80 | 119 | 145 | 96 |

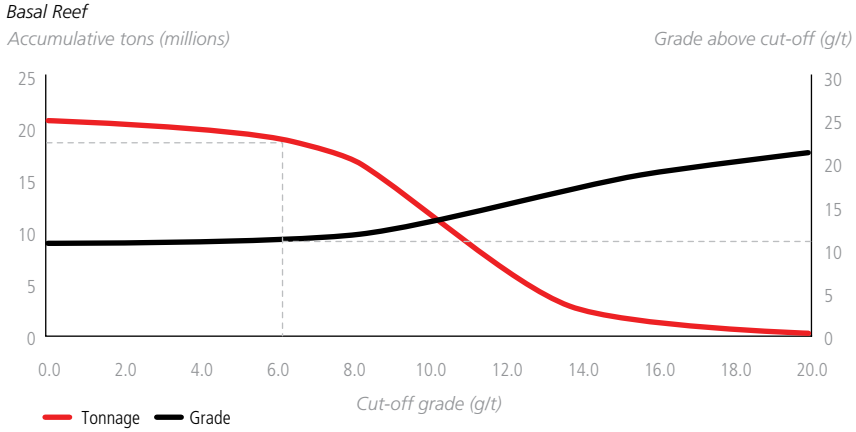
**Gold – Mineral reserves**

| | 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) |
| Phakisa | 5.6 | 6.56 | 37 | 1 185 | 1.9 | 7.17 | 14 | 437 | 7.5 | 6.72 | 50 | 1 622 |

**Uranium – Mineral resources**

| | Measured resources | | | | Indicated resources | | | | Inferred resources | | | | Total mineral resources | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Tonnes | | $U_3O_8$ | $U_3O_8$ | Tonnes | | $U_3O_8$ | $U_3O_8$ | Tonnes | | $U_3O_8$ | $U_3O_8$ | Tonnes | | $U_3O_8$ | $U_3O_8$ |
| | (Mt) | (kg/t) | (Mkg) | (Mlb) | (Mt) | (kg/t) | (Mkg) | (Mlb) | (Mt) | (kg/t) | (Mkg) | (Mlb) | (Mt) | (kg/t) | (Mkg) | (Mlb) |
| Phakisa | 7.9 | 0.20 | 1 571 | 3 | 11.2 | 0.20 | 2 238 | 5 | 23.1 | 0.11 | 2 494 | 5 | 42.2 | 0.15 | 6 304 | 14 |

**Phakisa: Measured and indicated resource grade-tonnage curve**



# RESOURCES AND RESERVES BY OPERATION
## SOUTH AFRICA – FREE STATE OPERATIONS CONTINUED

### BAMBANANI

**Gold – Mineral resources**

| | 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 | 1.1 | 15.10 | 16 | 523 | – | – | – | – | – | – | – | – | 1.1 | 15.10 | 16 | 523 |

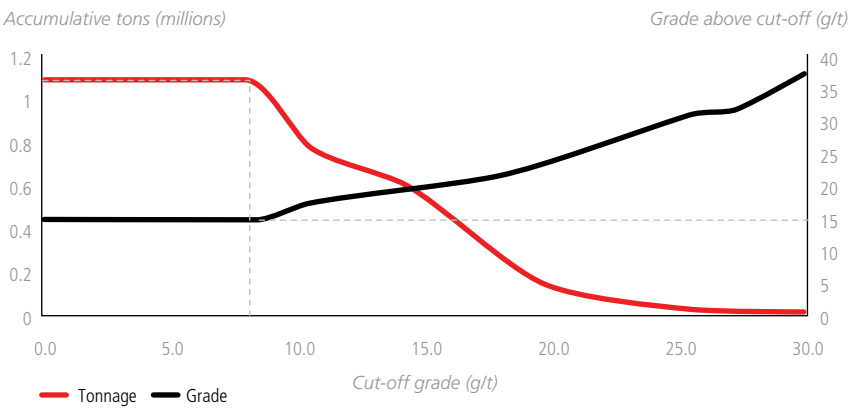
**Modifying factors**

| | MCF (%) | SW (cm) | MW (cm) | PRF (%) |
|---|---|---|---|---|
| Bambanani | 96 | 180 | 222 | 96 |

**Gold – Mineral reserves**

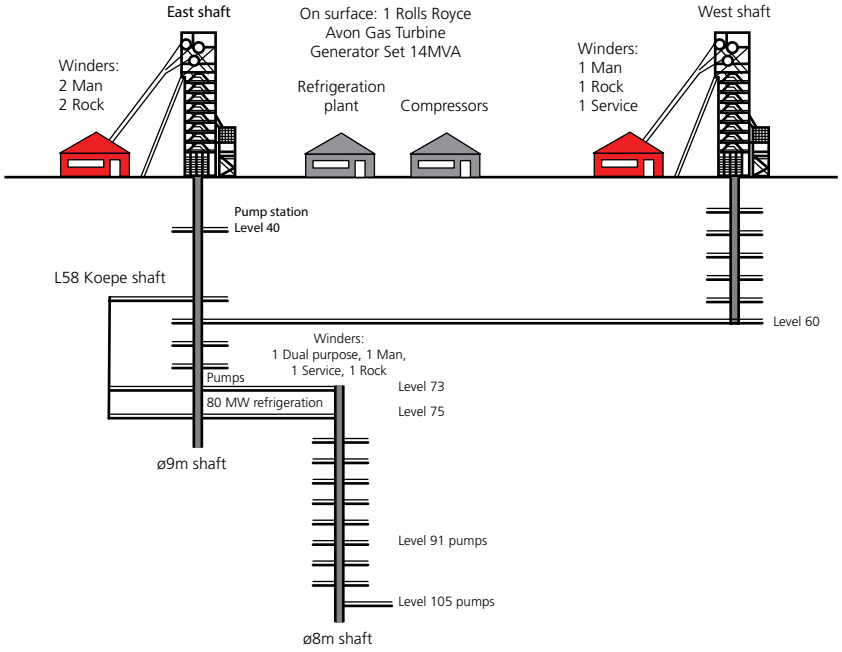
| | Proved reserves | | | | Probable reserves | | | | Total mineral reserves | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Tonnes | Gold | | | Tonnes | Gold | | | Tonnes | Gold | | |
| | (Mt) | (g/t) | (000kg) | (000oz) | (Mt) | (g/t) | (000kg) | (000oz) | (Mt) | (g/t) | (000kg) | (000oz) |
| Bambanani | 1.3 | 11.08 | 14 | 449 | – | – | – | – | 1.3 | 11.08 | 14 | 449 |

**Bambanani: Measured and indicated resource grade-tonnage curve**



# RESOURCES AND RESERVES BY OPERATION
## SOUTH AFRICA – FREE STATE OPERATIONS CONTINUED

### Bambanani East: Schematic of shaft and mining layout




**BAMBANANI**
**BASAL REEF**

**LEGEND**

- Mining right
- Shaft position
- Infrastructure
- Fault zones
- Abandoned pillars
- Dykes
- Mined out

**Mineral Resources**

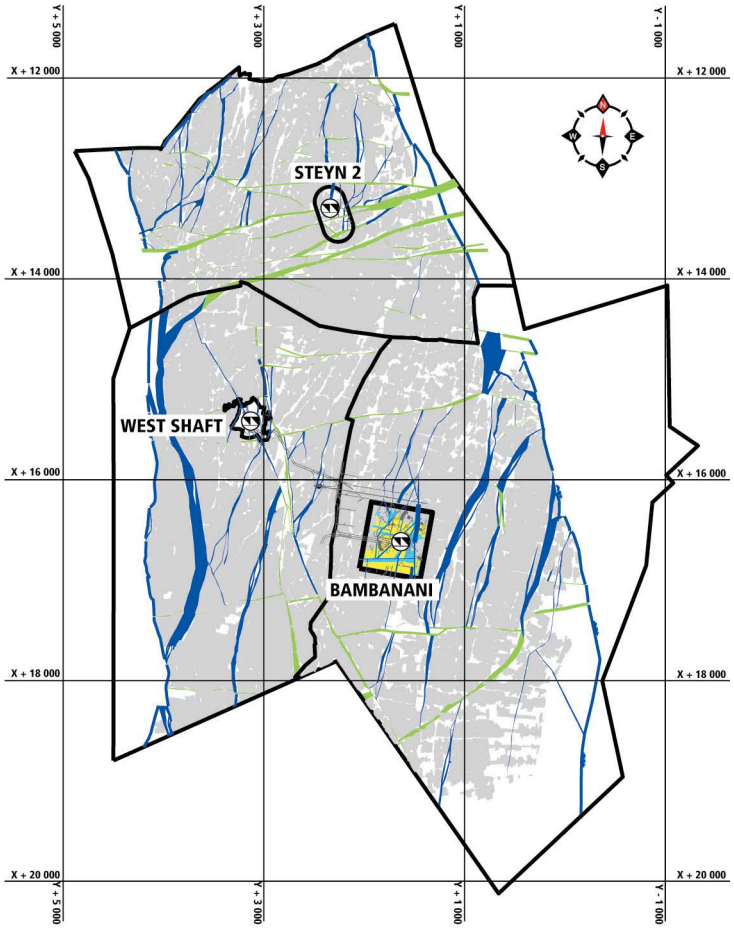
- Measured
- Indicated
- Inferred

**Mineral Reserves**

- Proved and probable

0 500 1 000
Metres

Co-ordinate system Lo. 27°
Constants: Y = +17 678.241m
X = +3 086 102.792m
Latitude: 28°2' 28.24"S
Longitude: 26°48' 9.13"E



# RESOURCES AND RESERVES BY OPERATION
## SOUTH AFRICA – FREE STATE OPERATIONS CONTINUED

### UNISEL

#### Gold – Mineral resources

| | 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 | 1.3 | 6.65 | 9 | 287 | 1.8 | 6.67 | 12 | 390 | – | – | – | – | 3.2 | 6.66 | 21 | 677 |

#### Modifying factors

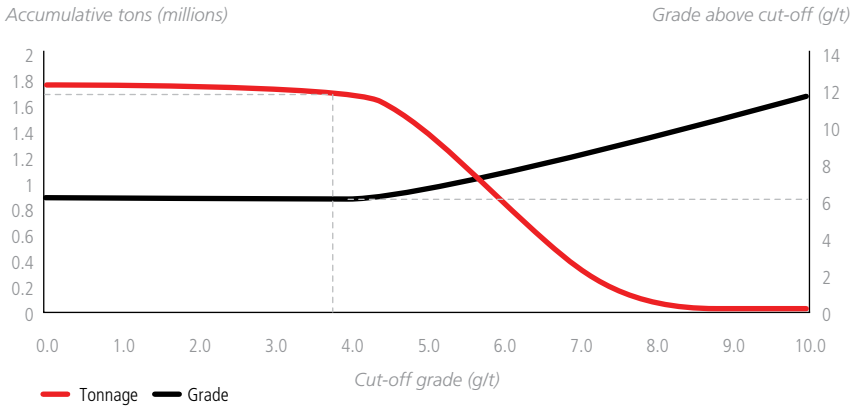
| | MCF (%) | SW (cm) | MW (cm) | PRF (%) |
|---|---|---|---|---|
| Unisel | 75 | 190 | 215 | 96 |

#### Gold – Mineral reserves

| | 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 | 1.2 | 4.18 | 5 | 167 | 1.3 | 4.35 | 6 | 180 | 2.5 | 4.27 | 11 | 348 |

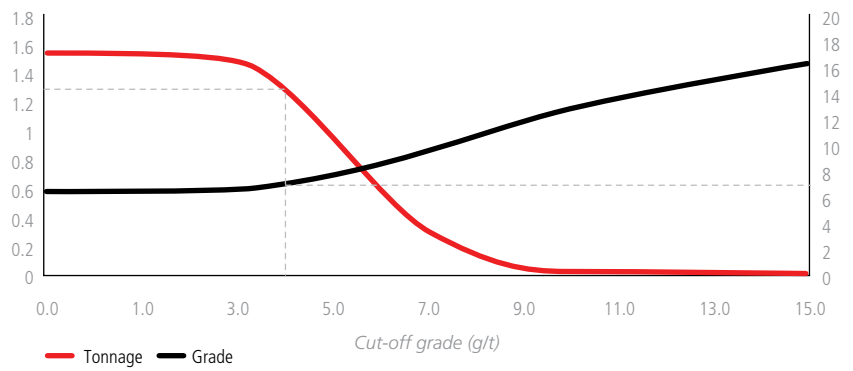
**Unisel: Measured and indicated resource grade-tonnage curve**

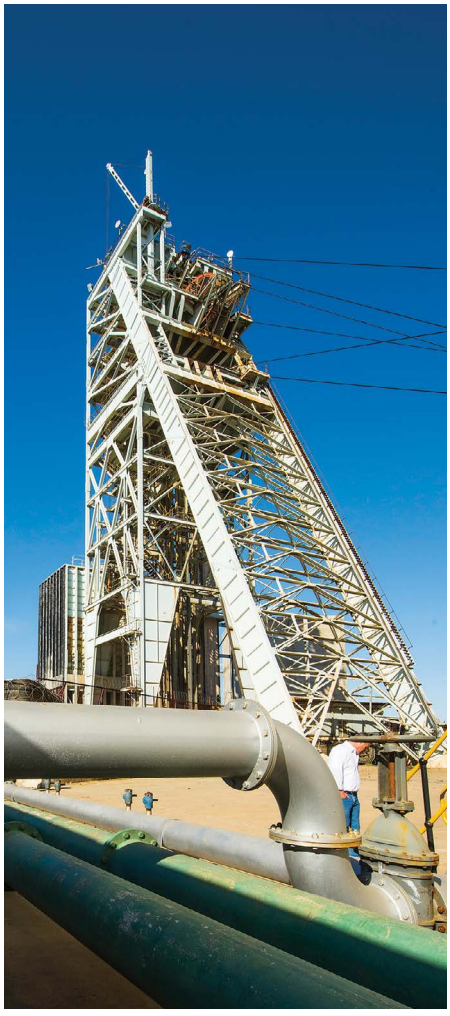
*Leader Reef*




**Unisel: Measured and indicated resource grade-tonnage curve**

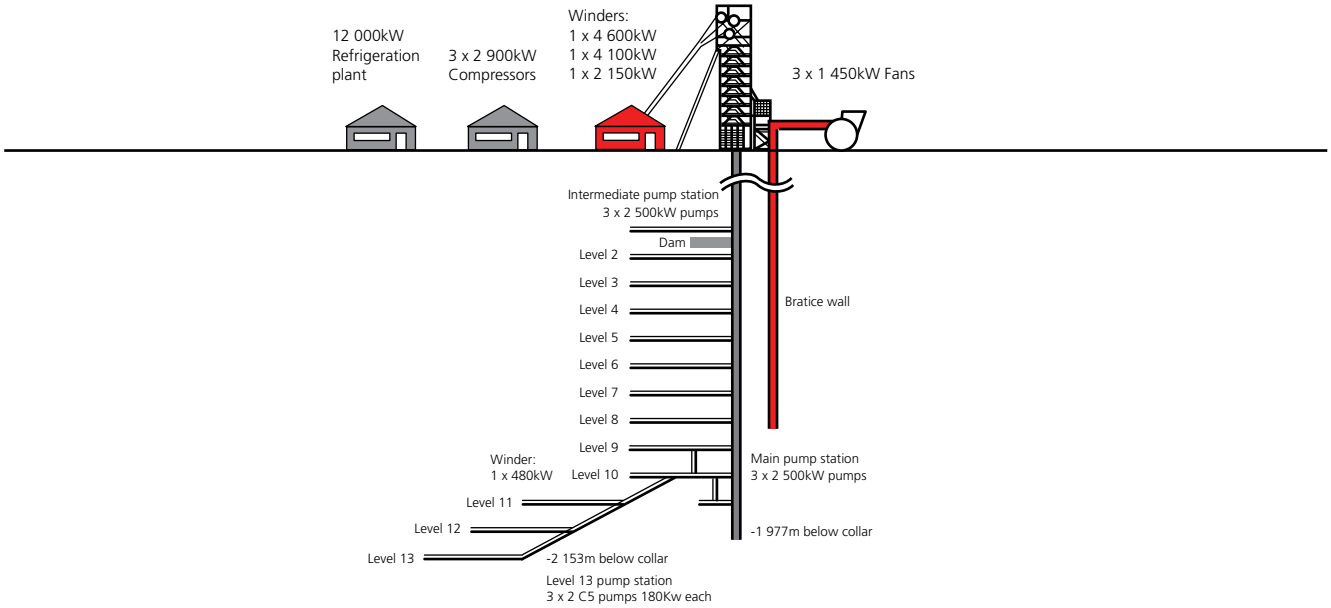
*Basal Reef*



# RESOURCES AND RESERVES BY OPERATION
## SOUTH AFRICA – FREE STATE OPERATIONS CONTINUED

### Unisel: Schematic of shaft and mining layout




**UNISEL**
**BASAL REEF**

**LEGEND**

- Mining right
- Shaft position
- Fault zones
- Dykes
- Basal sub-outcrop on Leader Reef
- Waste on contact
- Mined out

**Mineral Resources**

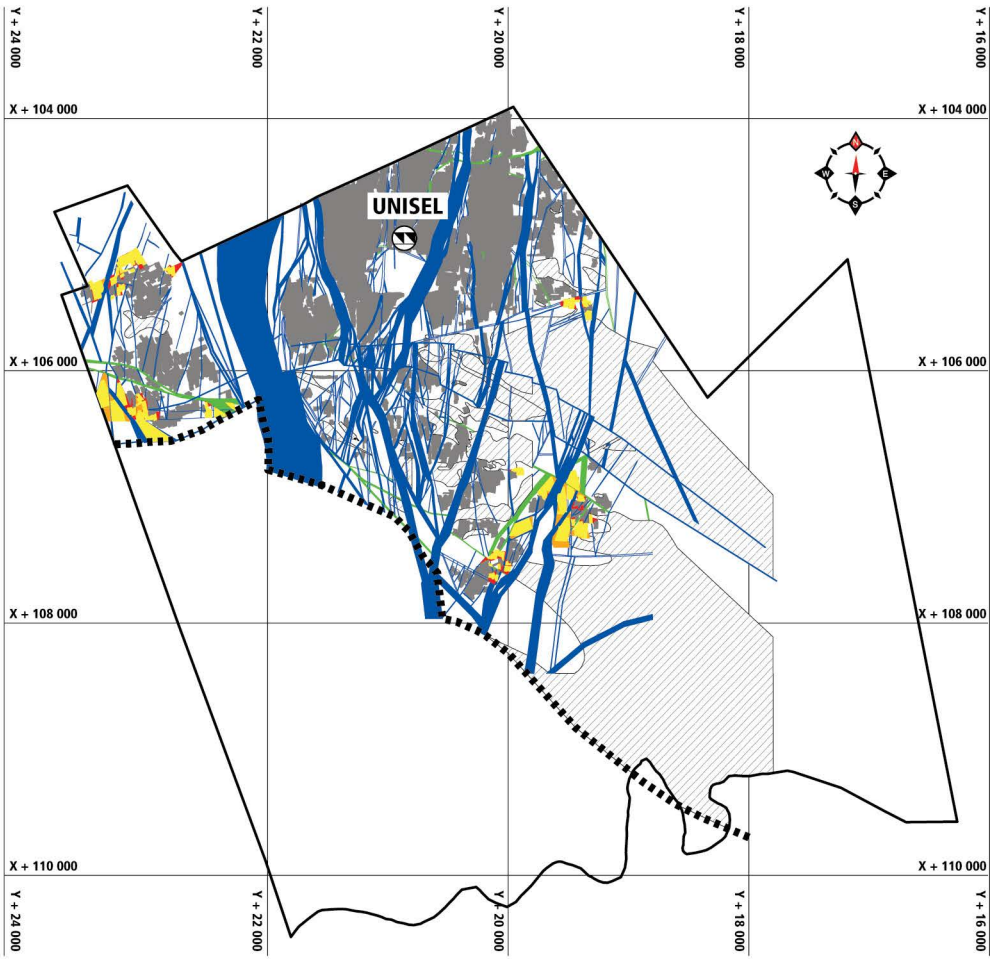
- Measured
- Indicated
- Inferred

**Mineral Reserves**

- Proved and probable

0 500 1 000
Metres

Co-ordinate system Lo. 27°
Constants: Y = 0.00
X = +3 000 000
Latitude: 28°3' 49.85"S
Longitude: 26°47' 11.43"E



# RESOURCES AND RESERVES BY OPERATION
## SOUTH AFRICA – FREE STATE OPERATIONS CONTINUED

### Masimong

#### Gold – Mineral resources

| | 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 | 6.40 | 15 | 490 | 0.9 | 4.59 | 4 | 130 | 0.5 | 6.26 | 3 | 92 | 3.7 | 5.95 | 22 | 711 |

#### Modifying factors

| | MCF (%) | SW (cm) | MW (cm) | PRF (%) |
|---|---|---|---|---|
| Masimong | 66 | 136 | 154 | 96 |

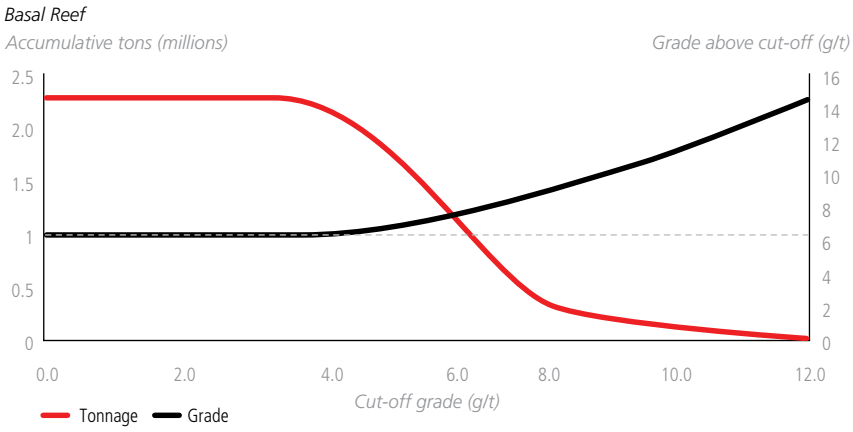
#### Gold – Mineral reserves

| | 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 | 1.5 | 4.05 | 6 | 193 | 0.2 | 3.82 | 1 | 30 | 1.7 | 4.02 | 7 | 223 |

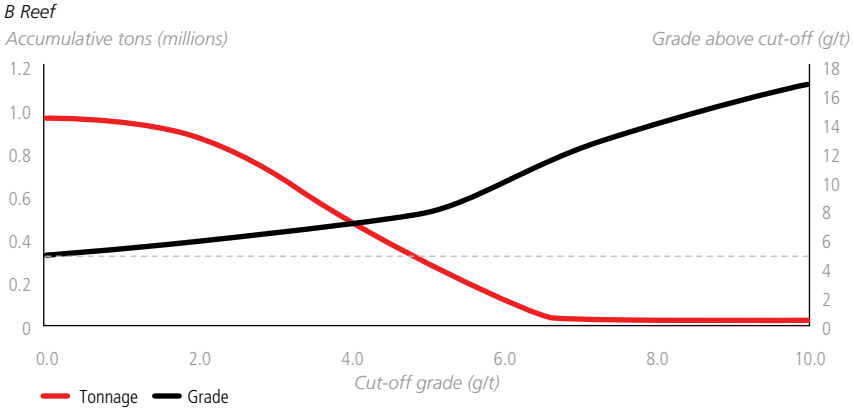
#### Uranium – Mineral resources

| | Measured resources | | | | Indicated resources | | | | Inferred resources | | | | Total mineral resources | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Tonnes | | $U_3O_8$ | $U_3O_8$ | Tonnes | | $U_3O_8$ | $U_3O_8$ | Tonnes | | $U_3O_8$ | $U_3O_8$ | Tonnes | | $U_3O_8$ | $U_3O_8$ |
| | (Mt) | (kg/t) | (Mkg) | (Mlb) | (Mt) | (kg/t) | (Mkg) | (Mlb) | (Mt) | (kg/t) | (Mkg) | (Mlb) | (Mt) | (kg/t) | (Mkg) | (Mlb) |
| Masimong | – | – | – | – | 2.9 | 0.20 | 578 | 1 | 0.8 | 0.14 | 114 | 0 | 3.7 | 0.19 | 693 | 2 |

**Masimong: Measured and indicated resource grade-tonnage curve**

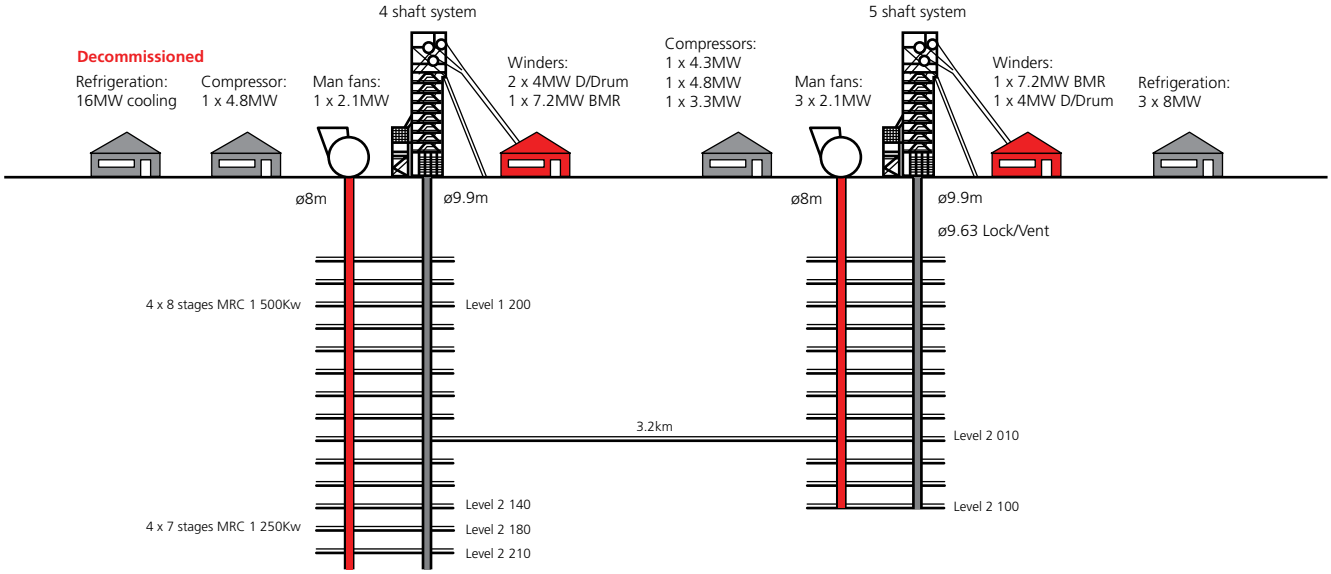



**Masimong: Measured and indicated resource grade-tonnage curve**




# RESOURCES AND RESERVES BY OPERATION
## SOUTH AFRICA – FREE STATE OPERATIONS CONTINUED

### Masimong: Schematic of shaft and mining layout




**MASIMONG**
**BASAL REEF**

**LEGEND**

- Mining right
- Shaft position
- Basal reef sub-outcrop on Leader Reef
- Inter-mine boundary
- Fault zones
- Dykes
- Infrastructure
- Mined out

**Mineral Resources**

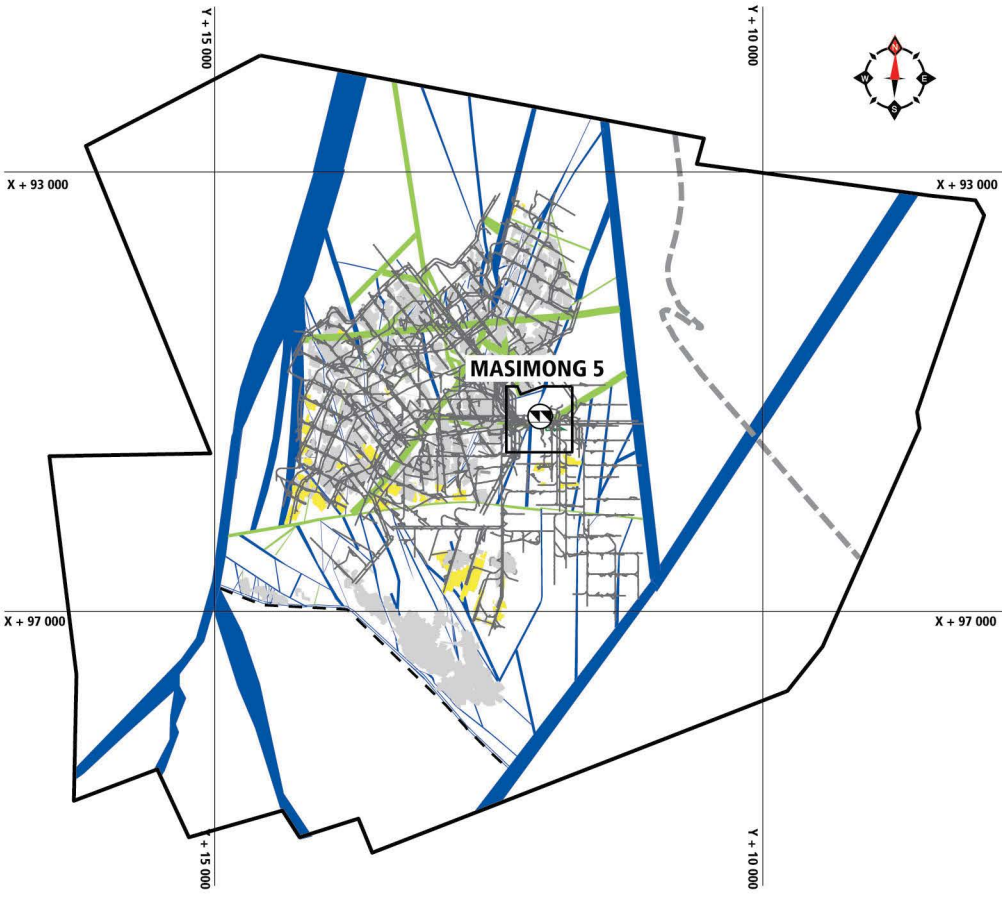
- Measured
- Indicated
- Inferred

**Mineral Reserves**

- Proved and probable

0 500 1 000
Metres

Co-ordinate system Lo. 27°
Constants: Y = 0.00
X = +3 000 000.00
Latitude: 27°58' 23.93"S
Longitude: 26°52' 39.41"E



# RESOURCES AND RESERVES BY OPERATION
## SOUTH AFRICA – FREE STATE OPERATIONS CONTINUED

### JOEL

**Gold – Mineral resources**

| | 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 | 5.7 | 7.07 | 40 | 1 284 | 7.6 | 5.72 | 43 | 1 396 | 1.0 | 5.47 | 5 | 177 | 14.3 | 6.23 | 89 | 2 856 |

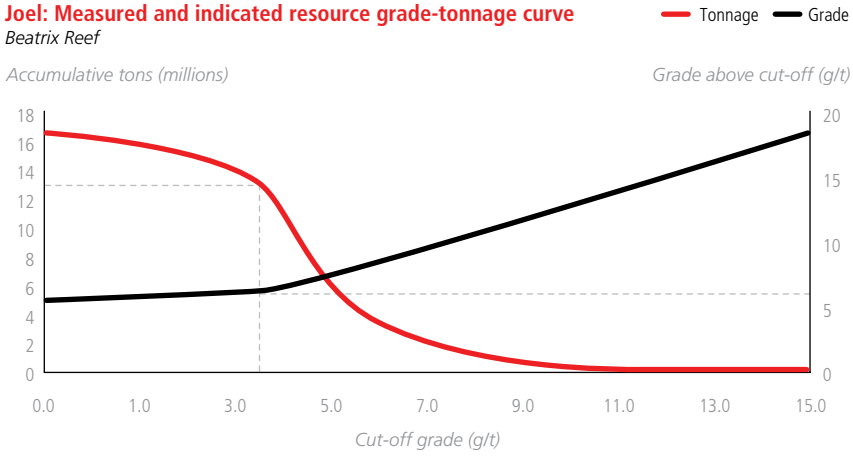
**Modifying factors**

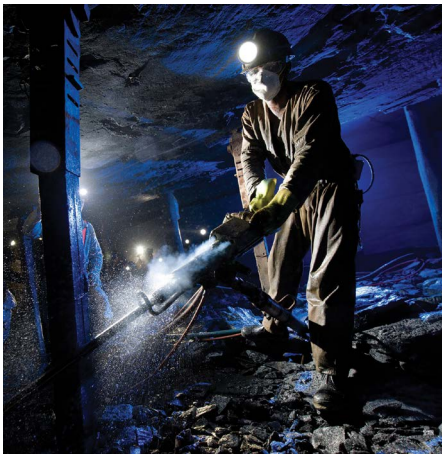
| | MCF (%) | SW (cm) | MW (cm) | PRF (%) |
|---|---|---|---|---|
| Joel | 84 | 161 | 194 | 95 |

**Gold – Mineral reserves**

| | 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 | 2.6 | 5.26 | 14 | 435 | 3.0 | 4.61 | 14 | 440 | 5.5 | 4.91 | 27 | 875 |

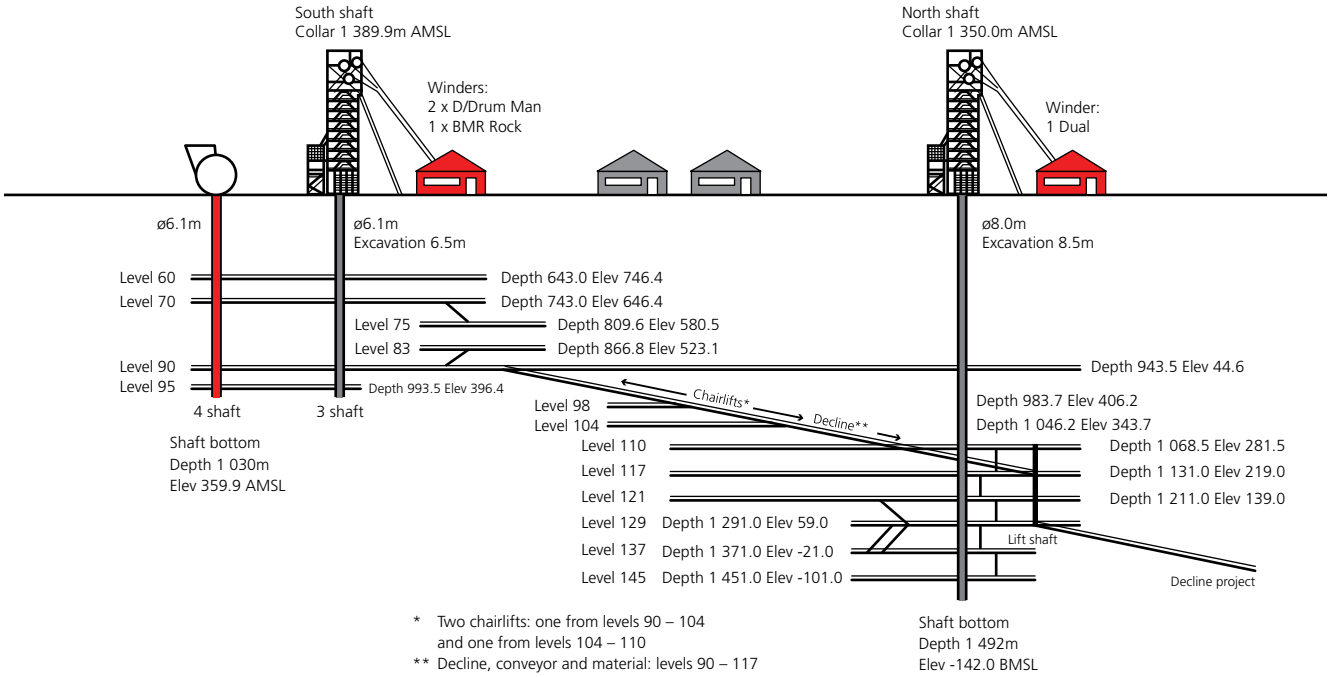
**Joel: Measured and indicated resource grade-tonnage curve**
*Beatrix Reef*



# RESOURCES AND RESERVES BY OPERATION
## SOUTH AFRICA – FREE STATE OPERATIONS CONTINUED

### Joel: Schematic of shaft and mining layout




* Two chairlifts: one from levels 90 – 104 and one from levels 104 – 110
** Decline, conveyor and material: levels 90 – 117

**JOEL**
**BEATRIX REEF**

**LEGEND**

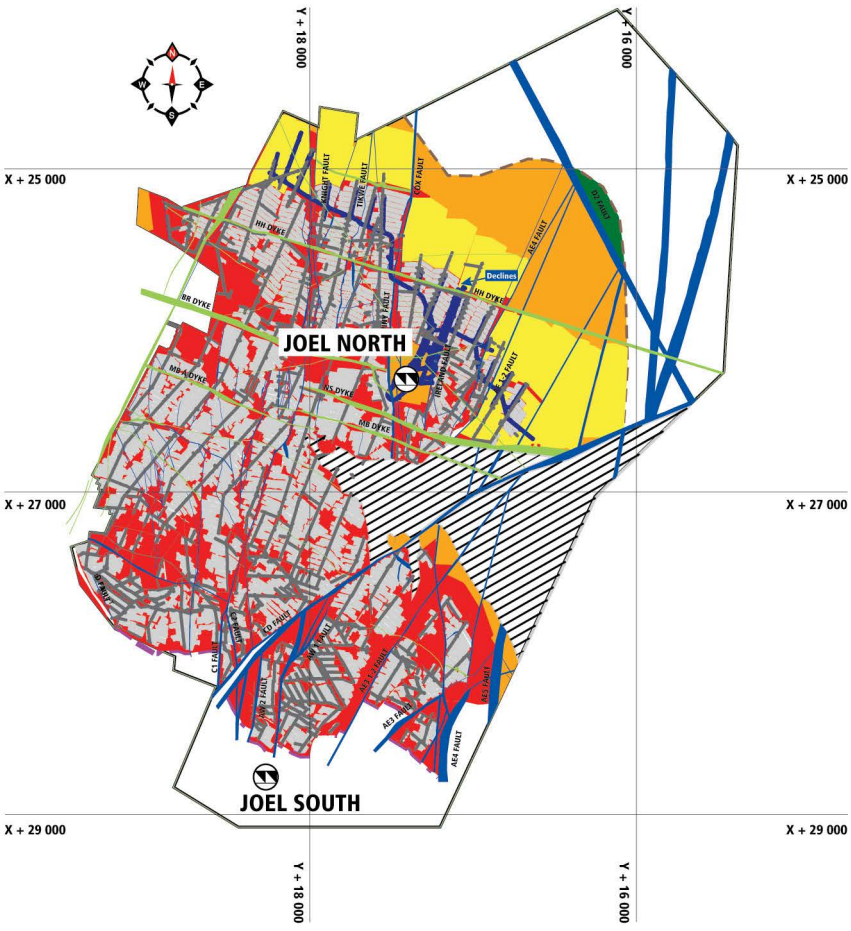
- Mining right
- Shaft position
- Klippan erosion channel
- Fault zones
- Dykes
- Beatrix sub-outcrop against Karoo Supergroup
- Beatrix sub-outcrop on VS5
- 129 level development indicating declines
- Infrastructure
- Mined out

**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

# RESOURCES AND RESERVES BY OPERATION
## SOUTH AFRICA – FREE STATE OPERATIONS CONTINUED

### SURFACE SOURCES

#### Gold – Mineral resources

| | 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) |
| Free State (Phoenix) | 79.8 | 0.28 | 22 | 712 | – | – | – | – | – | – | – | – | 79.8 | 0.28 | 22 | 712 |
| Free State (St Helena) | 258.7 | 0.27 | 69 | 2 230 | – | – | – | – | – | – | – | – | 258.7 | 0.27 | 69 | 2 230 |
| Free State (Central Plant) | – | – | – | – | 66.4 | 0.26 | 17 | 551 | – | – | – | – | 66.4 | 0.26 | 17 | 551 |
| Free State (other): Waste rock dumps | – | – | – | – | 3.9 | 0.51 | 2 | 65 | 22.3 | 0.41 | 9 | 291 | 26.3 | 0.42 | 11 | 356 |
| Tailings | – | – | – | – | 576.4 | 0.22 | 128 | 4 123 | 15.5 | 0.19 | 3 | 94 | 591.9 | 0.22 | 131 | 4 217 |
| **Grand total** | **338.5** | **0.27** | **92** | **2 942** | **646.7** | **0.23** | **147** | **4 738** | **37.8** | **0.32** | **12** | **386** | **1 023.1** | **0.25** | **251** | **8 066** |

#### Modifying factors

| | MCF (%) | PRF (%) |
|---|---|---|
| Free State (Phoenix) | 100 | 45 |
| Free State (St Helena) | 100 | 45 |
| Free State (other) | 100 | 52 |

#### Gold – Mineral reserves

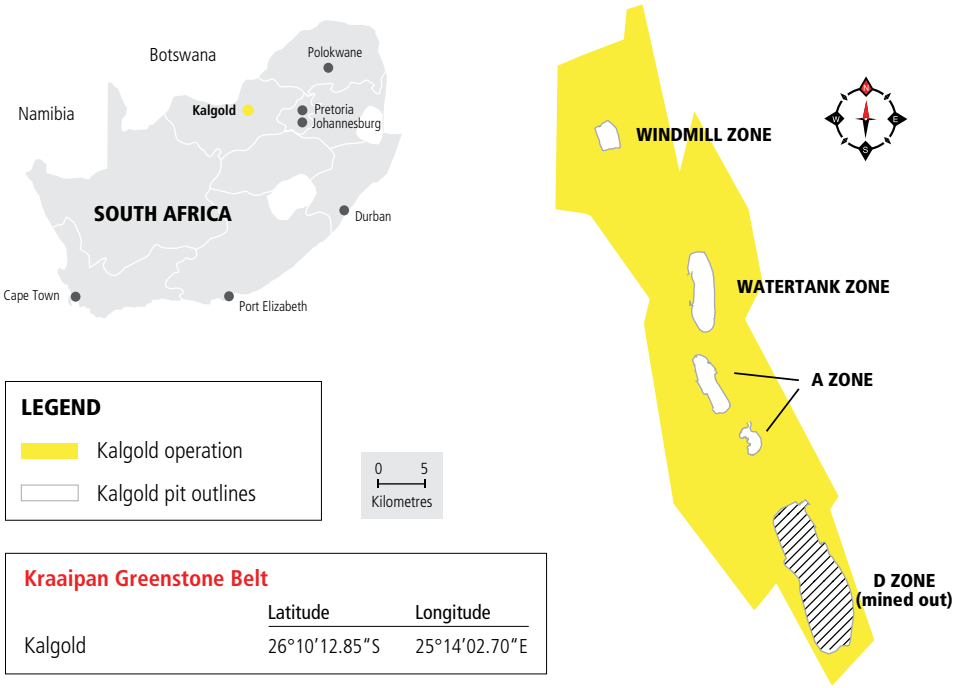
| | Proved reserves | | | | Probable reserves | | | | Total mineral reserves | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Tonnes | | Gold | | Tonnes | | Gold | | Tonnes | | Gold | |
| | (Mt) | (g/t) | (000kg) | (000oz) | (Mt) | (g/t) | (000kg) | (000oz) | (Mt) | (g/t) | (000kg) | (000oz) |
| Free State (Phoenix) | 79.8 | 0.28 | 22 | 712 | – | – | – | – | 79.8 | 0.28 | 22 | 712 |
| Free State (St Helena) | 175.9 | 0.27 | 47 | 1 507 | – | – | – | – | 175.9 | 0.27 | 47 | 1 507 |
| Free State (Central Plant) | – | – | – | – | 66.4 | 0.26 | 17 | 551 | 66.4 | 0.26 | 17 | 551 |
| Free State (other): Waste rock dumps | – | – | – | – | 3.9 | 0.51 | 2 | 65 | 3.9 | 0.51 | 2 | 65 |
| Tailings | – | – | – | – | 496.7 | 0.23 | 114 | 3 661 | 496.7 | 0.23 | 114 | 3 661 |
| **Grand total** | **255.7** | **0.27** | **69** | **2 219** | **567.0** | **0.23** | **133** | **4 276** | **822.7** | **0.25** | **202** | **6 495** |

#### Uranium – Mineral resources

| | Measured resources | | | | Indicated resources | | | | Inferred resources | | | | Total mineral resources | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Tonnes | | $U_3O_8$ | $U_3O_8$ | Tonnes | | $U_3O_8$ | $U_3O_8$ | Tonnes | | $U_3O_8$ | $U_3O_8$ | Tonnes | | $U_3O_8$ | $U_3O_8$ |
| | (Mt) | (kg/t) | (Mkg) | (Mlb) | (Mt) | (kg/t) | (Mkg) | (Mlb) | (Mt) | (kg/t) | (Mkg) | (Mlb) | (Mt) | (kg/t) | (Mkg) | (Mlb) |
| Total | – | – | – | – | 176.7 | 0.10 | 17 584 | 39 | – | – | – | – | 176.7 | 0.10 | 17 584 | 39 |
| **Grand total** | **–** | **–** | **–** | **–** | **176.7** | **0.10** | **17 584** | **39** | **–** | **–** | **–** | **–** | **176.7** | **0.10** | **17 584** | **39** |

# RESOURCES AND RESERVES BY OPERATION
# SOUTH AFRICA – KALGOLD

## LOCATION OF KALGOLD SURFACE OPERATION




| Kraaipan Greenstone Belt | Latitude | Longitude |
|---|---|---|
| Kalgold | 26°10'12.85"S | 25°14'02.70"E |

## KRAAIPAN GREENSTONE BELT – KALGOLD

### LOCATION

Kalgold mine is located 55km southwest of Mafikeng between Mareetsane and Stella along the Mafikeng-Vryburg road (R49) in the North West Province of South Africa.

Several lode gold deposits exist within the Kalgold mineral lease area. The ore bodies are typical banded iron formation-hosted greenstone gold deposits. These ore bodies include the A-Zone, A-Zone West, Watertank and Windmill. These ore bodies and mining methods are unique amongst Harmony's South African operations hence sampling methods, cut-off calculations, ore resource estimation and reporting are carried out and presented differently to the other operations.

### NATURE OF OPERATION

A total of 71 843m of exploration and evaluation drilling has been undertaken to date within the Mineral Lease area and on surrounding properties. The D-Zone and A-Zone have been proven and several prospective zones that warrant further investigation were identified.

The A-Zone occurs to the north of the D-Zone at a similar stratigraphic position. It is a composite deposit consisting of a number of mineralised cherty, banded iron formation units that are inter-bedded with schist and shale. The A-Zone has an overall strike of 850m and comprises individual zones of mineralisation which are steeply dipping and have strike lengths from 20m to 500m. Reef widths range between 15m to 70m. A total of 232 reverse circulation percussion boreholes representing a combined depth of 12 700m have been drilled into the A-Zone. Six diamond boreholes (1 310m) were also drilled.

The A-Zone West is situated in the footwall of the A-Zone ore body. The ore bodies 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 thinning to 5m in the north. A total of 172 reverse circulation boreholes were drilled along section lines spaced 25m apart. A total of 6 450m were drilled.

The Watertank is a long, narrow deposit hosted by cherty banded iron formation which has a similar stratigraphic position to the D-Zone and the A-Zone. The host rock banded iron formation is steeply dipping and has a strike length of 950m and an average width of 45m. The mineralised D-Zone within this unit ranges between 2m and 12m in width. A total of 168 boreholes representing 10 969m of drilling have been completed on section lines spaced at 25m to 50m intervals.

# RESOURCES AND RESERVES BY OPERATION
## SOUTH AFRICA – KALGOLD CONTINUED

The Windmill deposit is the smallest of the Goldridge ore bodies, 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 in 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. A total 8 800m of drilling has been completed along lines spaced 50m apart.

### REGIONAL GEOLOGICAL SETTING

The Kraaipan Greenstone Belt forms part of the Kaapvaal Craton. It is overlain by late Archaean Ventersdorp lavas and tertiary sediments.

The Kraaipan Group consists of three formations, which are 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 northsouth. 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 eastwest 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 area are sparse and generally restricted to the 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 are generally comprised of 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 ore body 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 that are interbedded with schist, shale and greywacke. Banded iron formations consists of rhythmically banded chemical sediments comprising alternating light and dark laminae, which vary from 10mm to 50mm in thickness.

The branded iron formations are oxidised to a depth of about 40m 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 formations 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 PROCESS

#### Geological model

Geological modelling has been completed using Datamine™ software. Drill holes and blastholes have been surveyed and utilised to construct a series of westeast sections from north to south through the various pit areas. The A-Zone and Water Tank 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, blasthole information and geological mapping within the pit and updated regularly as new information becomes available.

# RESOURCES AND RESERVES BY OPERATION
## SOUTH AFRICA – KALGOLD CONTINUED

### AGGREGATE RESOURCE

The waste rock that is stripped to expose the ore is a possible resource for the aggregate market. The waste rock mainly consists out of low pressure meta-sediments (shales) and smaller quantities of sedimentary rocks with grain sizes that vary from silt stone to conglomerate. The resource of the combined waste rock dumps is 80.2Mt and an additional 82.2Mt of waste rock is planned to be mined in the life-of-mine plan. Test work done on the waste rock indicates that it might be suitable for the manufacturing of road building material and cement. The waste rock dumps are situated close to the gold processing plant with access to basic utilities.

### KALGOLD

#### Gold – Mineral resources

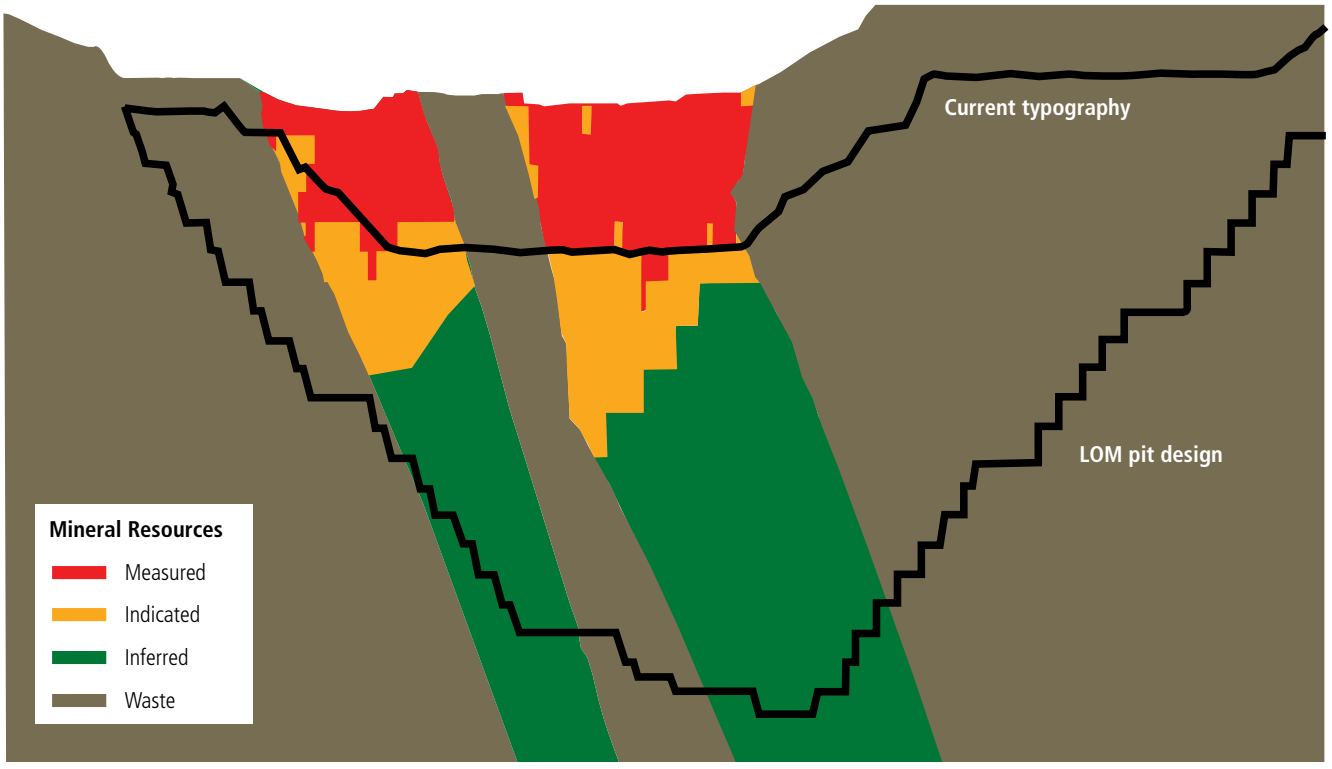
| | Measured resources | | | | Indicated resources | | | | Inferred resources | | | | Total mineral resources | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Tonnes | Gold | | | Tonnes | Gold | | | Tonnes | Gold | | | Tonnes | Gold | | |
| | (Mt) | (g/t) | (000kg) | (000oz) | (Mt) | (g/t) | (000kg) | (000oz) | (Mt) | (g/t) | (000kg) | (000oz) | (Mt) | (g/t) | (000kg) | (000oz) |
| Kalgold open pit | 7.7 | 0.82 | 6 | 203 | 17.3 | 0.95 | 16 | 528 | 13.4 | 1.08 | 14 | 464 | 38.3 | 0.97 | 37 | 1 195 |
| Kalgold tailings dam | – | – | – | | – | – | – | – | 23.8 | 0.26 | 6 | 201 | 23.8 | 0.26 | 6 | 201 |
| **Total Kalgold** | **7.7** | | **6** | **203** | **17.3** | | **16** | **528** | **37.2** | **0.56** | **21** | **666** | **62.2** | **0.70** | **43** | **1 397** |

#### Modifying factors

| | MCF (%) | Dilution (%) | PRF (%) |
|---|---|---|---|
| Kalgold open pit | 100 | 3.5 | 85 |

#### Gold – Mineral reserves

| | 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) |
| Kalgold open pit | 5.3 | 0.97 | 5 | 165 | 12.3 | 1.12 | 14 | 444 | 17.6 | 1.07 | 19 | 608 |

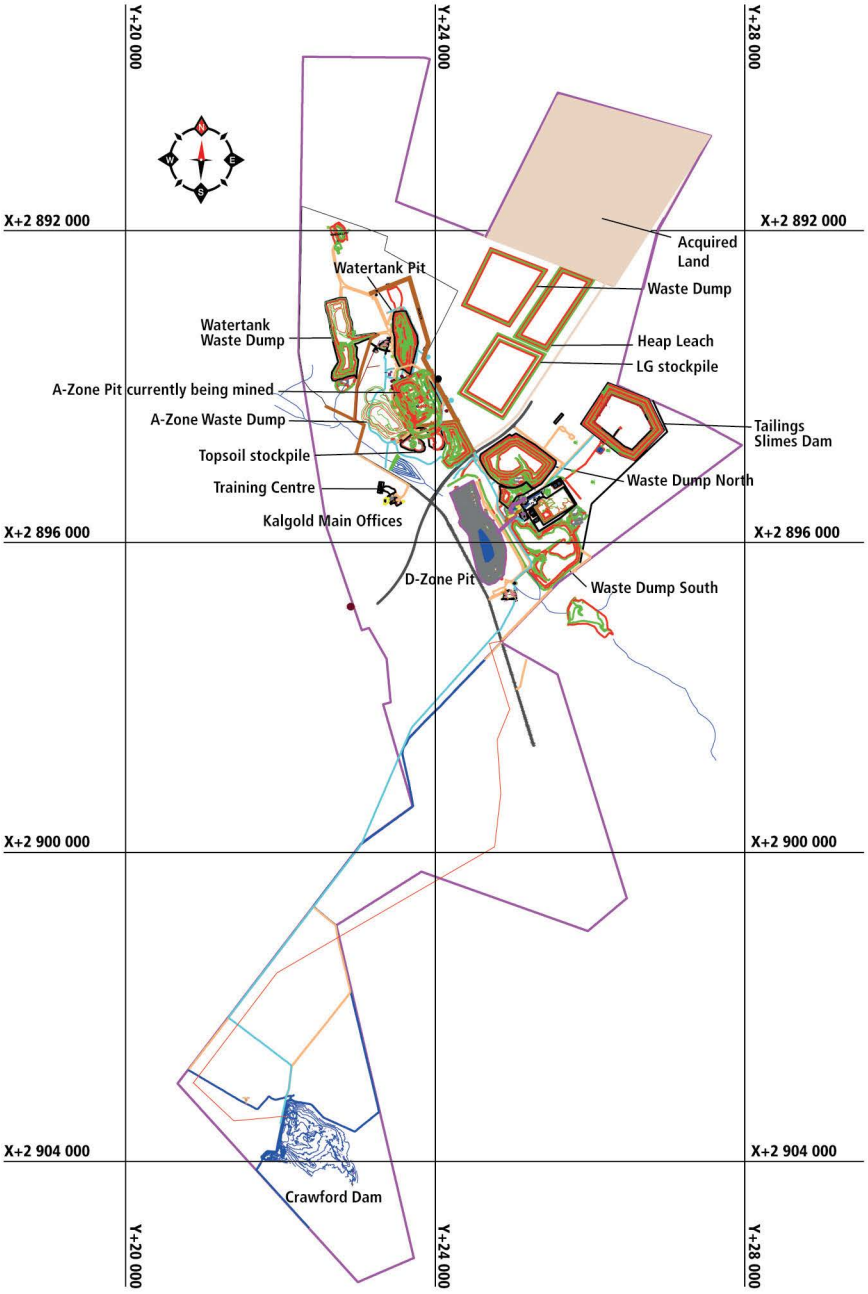


# RESOURCES AND RESERVES BY OPERATION
## SOUTH AFRICA – KALGOLD CONTINUED

**KALGOLD OPERATIONS**
**KRAAIPAN GREENSTONE BELT**

**LEGEND**

- New waste dump
- Existing waste dump
- Mining lease area boundary
- Kalgold office structures
- Existing mining pit – A Zone pit
- National/regional roads
- Mine access roads
- Newly acquired land




0 400 800
Metres

Co-ordinate system Lo. 27°
Latitude: 26°10' 12.85"S
Longitude: 25°14' 02.70"E

# RESOURCES AND RESERVES BY OPERATION
# PAPUA NEW GUINEA

In Papua New Guinea, Harmony holds a 50% interest in the Morobe Mining Joint Ventures which includes Hidden Valley, Wafi, Golpu and Nambonga in the Morobe Province and a 100% interest in Kili Teke in the Hela Province.

The operations and 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. The belt is host to several world-class deposits and continues to grow in endowment with recent discoveries and resource expansions at Wafi-Golpu, Frieda River and Yandera.

## HIDDEN VALLEY OPERATIONS

### LOCATION

The Hidden Valley Gold 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 is the nearest maritime port in the region, and is connected to Bulolo by a tarred two-lane main road. The operation is a 50:50 joint venture between Harmony Gold Mining Company (through Morobe Consolidated Goldfields (MCG)) and Newcrest Mining Limited (through Newcrest Papua New Guinea 1 Limited).

### NATURE OF OPERATIONS

The Hidden Valley mine consists of the Hidden Valley-Kaveroi (HVK) and Hamata open pits located approximately 6km apart, and an ore processing facility in steep, heavily forested, mountainous terrain. Both pits employ conventional truck/excavator mining techniques with nested incremental cutbacks.

The Hidden Valley-Kaveroi pit is the larger pit supplying the majority of the ore and is located 6km from the processing plant. The mine employs 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 flitches of 2m x 9m flitches.

In terms of operational design, waste is to be disposed of in engineered valley fill waste dumps, with toes keyed in using competent non-acid producing rock.

Crushed ore is conveyed from the Hidden Valley pit via a 4.5km 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 nominally treat 4.2Mtpa of gold-bearing ore through a conventional semi-autogenous grinding mill, gravity, float, Merrill Crowe (for silver) and carbon-in-leach (for gold) circuit. Gold doré bars are produced on site and shipped to a refinery. The tailings are disposed of in a terrestrial tailings storage facility located to the southwest of the process plant. Construction of the tailings storage facility dam-wall is on-going and largely constitutes placement of suitable material for each zone of the tailings storage facility and sourced from mining in the Hamata pit. The processing inventory in this ore reserve estimate is constrained by the capacity of the tailings storage facility. Any mine expansion over the existing reserve will require an expansion of the existing tailings storage facility or construction of an additional facility.

The Hidden Valley mine operates in accordance with a Memorandum of Agreement with local landowners and government, which sets out a preference for employment of landowners and local residents ahead of those from other provinces and offshore employees when qualifications are equivalent.

### REGIONAL 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.

# RESOURCES AND RESERVES BY OPERATION

## PAPUA NEW GUINEA CONTINUED

Both the Hidden Valley and the Hamata models have been estimated using a localised multiple indicator Kriged method 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 selective mining unit sized blocks for mine planning purposes. A revised model is used for the Hidden Valley deposit. This has been reviewed by SRK Consulting. Checks against historical production indicate that both these models are robust when appropriate modifying factors are applied. In Hidden Valley's case, a 10% discount on the grade is applied.

Mineral resources and mineral reserves detailed in the following tables.

### HIDDEN VALLEY AND HAMATA (Harmony Newcrest Joint Venture 100% portion)

#### Gold – Mineral resources

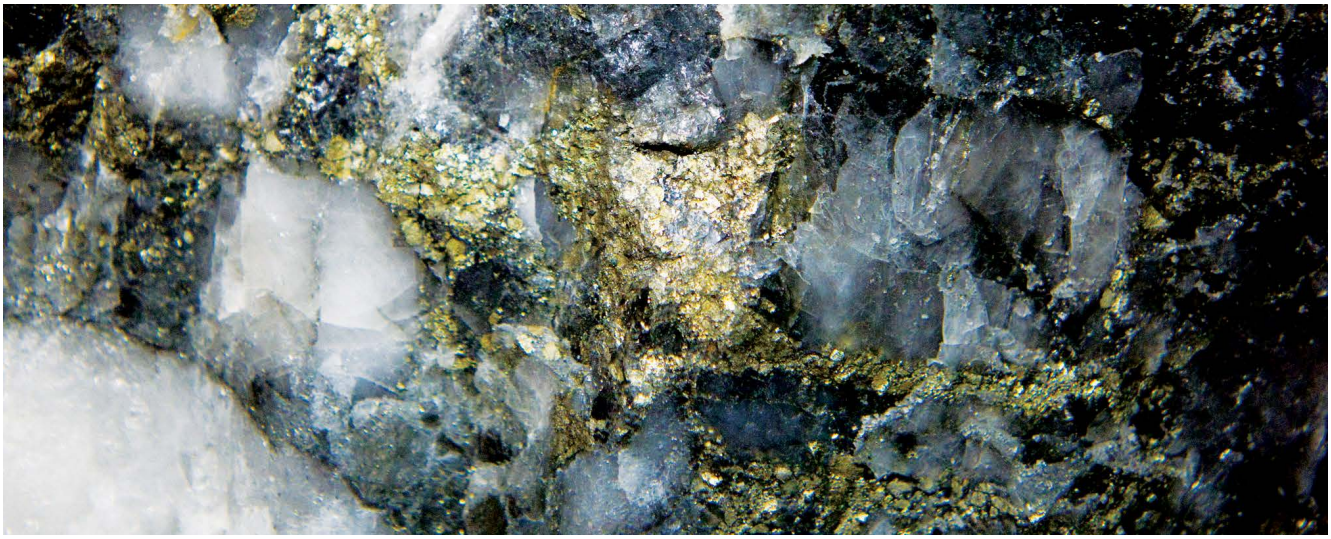
| | Measured resources | | | | Indicated resources | | | | Inferred resources | | | | Total mineral resources | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Tonnes | Gold | | | Tonnes | Gold | | | Tonnes | Gold | | | Tonnes | Gold | | |
| | (Mt) | (g/t) | (000kg) | (000oz) | (Mt) | (g/t) | (000kg) | (000oz) | (Mt) | (g/t) | (000kg) | (000oz) | (Mt) | (g/t) | (000kg) | (000oz) |
| Hidden Valley | 2.6 | 1.09 | 3 | 89 | 69.9 | 1.60 | 112 | 3 591 | 2.1 | 1.24 | 3 | 82 | 74.5 | 1.57 | 117 | 3 763 |
| Hamata | 0.1 | 1.06 | 0.1 | 4 | 2.9 | 2.16 | 6 | 204 | 0.2 | 1.79 | 0 | 11 | 3.2 | 2.10 | 7 | 219 |
| **Grand total** | **2.7** | **1.09** | **3** | **94** | **72.8** | **1.62** | **118** | **3 795** | **2.3** | **1.28** | **3** | **93** | **77.8** | **1.59** | **124** | **3 982** |

#### Modifying factors

| | MCF (%) | Dilution (%) | PRF (%) |
|---|---|---|---|
| Hidden Valley | 100 | 90 | 88 |
| Hamata | 100 | 90 | 88 |

#### Gold – Mineral reserves

| | 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 | 2.6 | 1.09 | 3 | 89 | 22.9 | 1.62 | 37 | 1 198 | 25.5 | 1.57 | 40 | 1 287 |
| Hamata | 0.1 | 1.06 | 0 | 4 | 2.0 | 2.23 | 4 | 144 | 2.1 | 2.16 | 5 | 148 |
| **Grand total** | **2.7** | **1.09** | **3** | **94** | **24.9** | **1.67** | **42** | **1 342** | **27.6** | **1.62** | **45** | **1 436** |



# RESOURCES AND RESERVES BY OPERATION

## PAPUA NEW GUINEA CONTINUED

### Silver – Mineral resources

| | Measured resources | | | | Indicated resources | | | | Inferred resources | | | | Total mineral resources | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Tonnes (Mt) | Ag (g/t) | Ag (000kg) | Ag (000oz) | Tonnes (Mt) | Ag (g/t) | Ag (000kg) | Ag (000oz) | Tonnes (Mt) | Ag (g/t) | Ag (000kg) | Ag (000oz) | Tonnes (Mt) | Ag (g/t) | Ag (000kg) | Ag (000oz) |
| Hidden Valley | 2.6 | 21.5 | 55 | 1 764 | 69.9 | 30.7 | 2 148 | 69 053 | 2.1 | 31.7 | 66 | 2 114 | 74.5 | 30.4 | 2 268 | 72 932 |

### Silver – Mineral resources as gold equivalents

| | Measured (000oz) | Indicated (000oz) | Inferred (000oz) | Total (000oz) |
|---|---|---|---|---|
| Hidden Valley | 23 | 900 | 28 | 951 |

### Modifying factors

| | MCF (%) | Dilution (%) | PRF (%) |
|---|---|---|---|
| Hidden Valley | 95 | 6 | 61 |

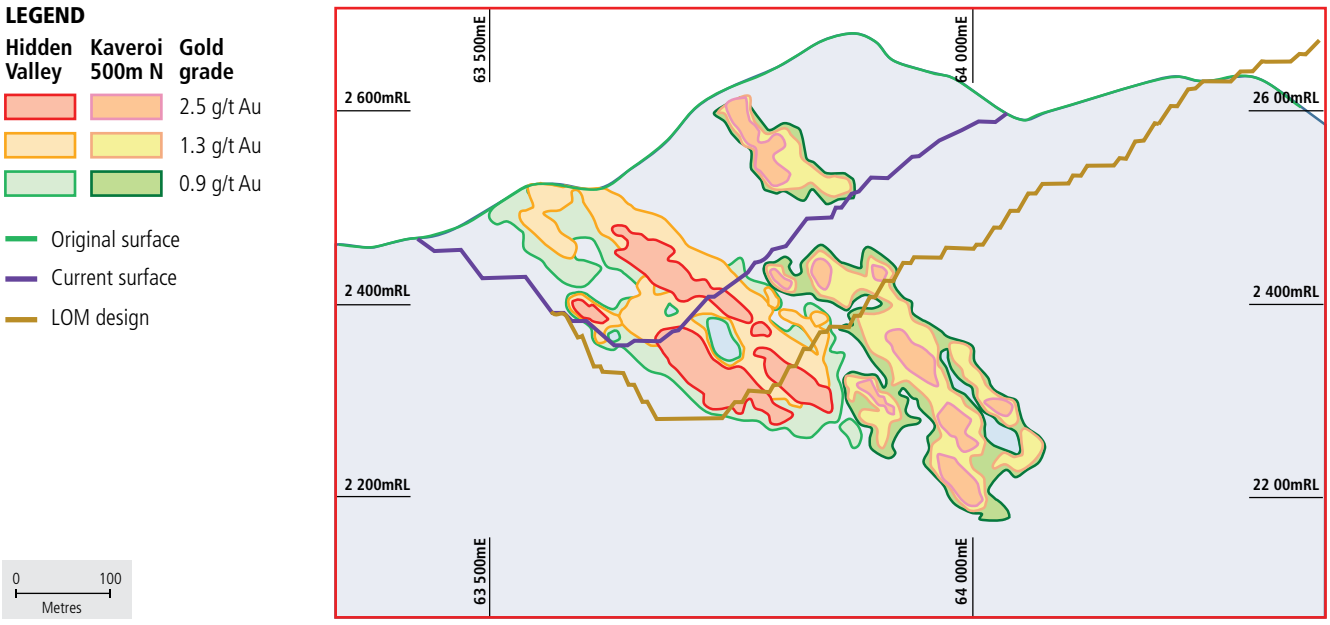
### Silver – Mineral reserves

| | Proved reserves | | | | Probable reserves | | | | Total mineral reserves | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Tonnes (Mt) | Ag (g/t) | Ag (000kg) | Ag (000oz) | Tonnes (Mt) | Ag (g/t) | Ag (000kg) | Ag (000oz) | Tonnes (Mt) | Ag (g/t) | Ag (000kg) | Ag (000oz) |
| Hidden Valley | 2.6 | 21.5 | 55 | 1 764 | 22.9 | 34.7 | 796 | 25 578 | 25.5 | 33.4 | 850 | 27 342 |

### Silver – Mineral reserves as gold equivalents

| | Proved (000oz) | Probable (000oz) | Total (000oz) |
|---|---|---|---|
| Hidden Valley | 23 | 334 | 357 |

### Hidden Valley Section 75 225mN



# RESOURCES AND RESERVES BY OPERATION
# PAPUA NEW GUINEA CONTINUED

## GOLPU, WAFI AND NAMBONGA

### LOCATION

The Golpu, Wafi and Nambonga deposits are located in eastern Papua New Guinea, approximately 60km southwest of Lae in the Morobe Province. Access to the project from Lae is via a combination of sealed and unsealed roads with a travel time of 4 hours. The operation is a 50:50 joint venture between Harmony Gold Mining Limited (Wafi Mining Limited) and Newcrest Mining Limited (Newcrest Papua New Guinea 2 Limited).

### NATURE OF OPERATIONS

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 this time, several companies have completed exploration and resource definition drilling programmes with associated mine development studies.

The operations are in advanced exploration and project studies phase. Golpu, the most advanced is currently busy with the feasibility study for stage 1 and the prefeasibility study for stage 2. No mining has occurred in the project area.

## REGIONAL GEOLOGY

### GOLPU

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 greater than 2 000m depth. 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.

The Golpu mineral resource has been updated as at 31 December 2015 to align with the results of Golpu 2015 stage 1 feasibility and stage 2 (life-of-mine) prefeasibility studies. The key change is the applied cut-off grade that defines the volume with reasonable prospects of eventual economic extraction. 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 2015 Golpu stage 2 prefeasibility study. The December 2014 Mineral Resource was reported within a 0.2% copper shell representative of the revenue and cost structures of the 2012 Golpu prefeasibility study. There was no additional drilling in 2015 that impacted the Golpu mineralised volume and the underlying geology and grade model is unchanged from that used in the December 2014 Mineral Resource.

For more information on Golpu, please refer to *page 14* of the Projects and Exploration section of this report.

### GOLPU RESERVE

The Golpu reserve was updated with the completion of feasibility of stage 1 and prefeasibility of stage 2. The reserve estimate is based on the assumption that block cave mining method will be used and mine during a stage 1 and stage 2.

The key changes to the updated reserve relative to the 30 June 2016 reserve are primarily due to:

- Revised operating and sustaining capital costs
- Application of updated modifying factors for mining
- Revised mine extraction model
- Removal of silver and molybdenum from the estimate

# RESOURCES AND RESERVES BY OPERATION
## PAPUA NEW GUINEA CONTINUED

### WAFI RESOURCE

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 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 reserve is declared and no mining has been undertaken in the project area to date.

### NAMBONGA RESOURCE

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 (eastwest), 400m (northsouth) and 1 000m vertically.

The Nambonga resource model 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 and no mining has been undertaken in the project area to date.

## GOLPU FEASIBILITY PROJECT

### A SCALABLE DEVELOPMENT PATH WITH A BUSINESS CASE SUPPORTED BY HIGH GRADES, LOW CAPITAL, AND ROBUST RETURNS

The conclusion of the stage 1 feasibility[1] for Golpu and stage 2 prefeasibility study in December 2015, with a media release to the market on 15 February 2016, represents a major project milestone for FY16. Refer to "Wafi Golpu – a robust investment case" on *page 14* of this report.

Key objectives of the feasibility study included:

- High grades, early cash flow
- Staged development with future optionality and flexibility
- Robust returns
- Lowest quartile costs for copper
- Significant attributable annual production for Harmony at approximately 500 000 gold equivalent ounces per year during peak production

Both studies have confirmed a robust investment case – one that supports proceeding with the project. Golpu is a spectacular ore body and a significant value accretive game changer for Harmony.

### OVERVIEW

Golpu is located in the Morobe Province of Papua New Guinea and ranks as one of the world's largest undeveloped copper-gold deposits. In February 2016, the board approved the feasibility study for stage 1 of mine development at the project and the prefeasibility of stage 2.

The key highlights of the feasibility study[2] include:

- Low operating costs will withstand low commodity price cycles and will benefit from high returns in higher commodity price cycles
- The updated Ore Reserve as at 31 December 2015, is estimated to contain 5.5 million ounces of gold and 2.4 million tonnes of copper (Harmony's 50% interest)
- Project de-risked, with no significant deviation from the stage 1 prefeasibility study economic outcomes and technical recommendations
- Golpu is amenable to "staged development"
  - allows for optimising the capital efficiency
  - progressively de-risks the project prior to further investments

# RESOURCES AND RESERVES BY OPERATION
## PAPUA NEW GUINEA CONTINUED

### GEOLOGY AND RESOURCE MODELLING

Golpu ranks as a world-class copper-gold porphyry in terms of its size and grade. Knowledge of the 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 resource will continue to grow at depth as a better understanding is gained of the nature and extent of the mineralised systems.

The Golpu June 2016 mineral resource is estimated as 823.8Mt at 1.05% Cu, 0.70g/t Au, 1.25g/t Ag and 90ppm Mo. Contained metal is estimated to be 18.6Moz Au and 8.6Mt Cu. The mineral resource is reported within a 0.2% Cu cut-off constraining shell within the primary sulphide mineralisation and above 4100mRL.

## WAFI (HARMONY NEWCREST JOINT VENTURE 100% PORTION)

### Gold – Mineral resources

| | 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 | – | – | – | – | 113.5 | 1.72 | 196 | 6 292 | 22.7 | 1.30 | 30 | 950 | 136.1 | 1.65 | 225 | 7 242 |

## GOLPU

### Gold – Mineral resources

| | 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 | – | – | – | – | 688.0 | 0.71 | 492 | 15 811 | 135.8 | 0.63 | 86 | 2 754 | 823.8 | 0.70 | 577 | 18 565 |

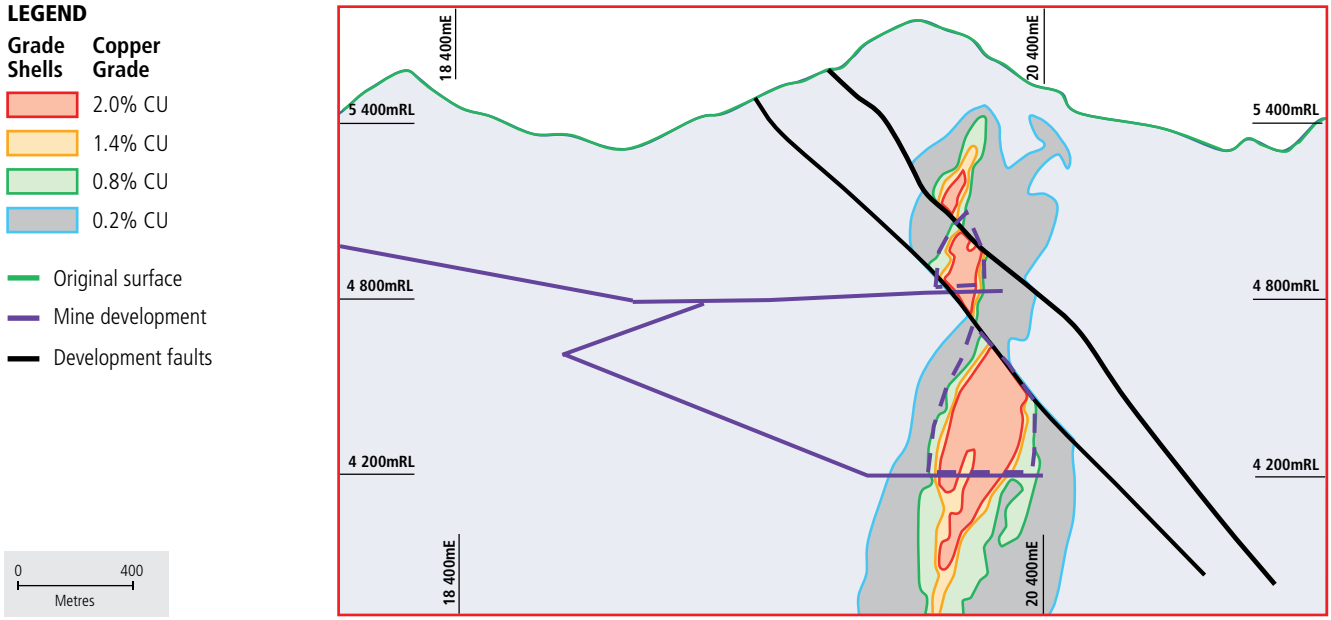
### Modifying factors

| | MCF (%) | Dilution (%) | PRF (%) |
|---|---|---|---|
| Golpu | 100 | 0 | 61 |

### Gold – Mineral reserves

| | 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 | – | – | – | – | 379.1 | 0.91 | 343 | 11 043 | 379.1 | 0.91 | 343 | 11 043 |

### Golpu Section 721 060mN



# RESOURCES AND RESERVES BY OPERATION

## PAPUA NEW GUINEA CONTINUED

### Silver – Mineral resources

| | Measured resources | | | | Indicated resources | | | | Inferred resources | | | | Total mineral resources | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Tonnes (Mt) | (g/t) | Ag (000kg) | Ag (000oz) | Tonnes (Mt) | (g/t) | Ag (000kg) | Ag (000oz) | Tonnes (Mt) | (g/t) | Ag (000kg) | Ag (000oz) | Tonnes (Mt) | (g/t) | Ag (000kg) | Ag (000oz) |
| Golpu | – | – | – | – | 688.0 | 1.3 | 886 | 28 494 | 135.8 | 1.1 | 144 | 4 643 | 823.8 | 1.3 | 1 031 | 33 138 |

### Copper – Mineral resources

| | Measured resources | | | | Indicated resources | | | | Inferred resources | | | | Total mineral resources | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Tonnes (Mt) | % | Cu (Mkg) | Cu (Mlb) | Tonnes (Mt) | % | Cu (Mkg) | Cu (Mlb) | Tonnes (Mt) | % | Cu (Mkg) | Cu (Mlb) | Tonnes (Mt) | % | Cu (Mkg) | Cu (Mlb) |
| Golpu | – | – | – | – | 688.0 | 1.09 | 7 468 | 16 464 | 135.8 | 0.85 | 1 154 | 2 545 | 823.8 | 1.05 | 8 622 | 19 009 |

### Copper – Mineral resources as gold equivalents

| | Measured | Indicated | Inferred | Total |
|---|---|---|---|---|
| | (000oz) | (000oz) | (000oz) | (000oz) |
| Golpu | – | 42 937 | 6 638 | 49 575 |

### Modifying factors

| | MCF (%) | Dilution (%) | PRF (%) |
|---|---|---|---|
| Golpu | 100 | 0 | 92 |

### Copper – Mineral reserves

| | Proved reserves | | | | Probable reserves | | | | Total mineral reserves | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Tonnes (Mt) | % | Cu (Mkg) | Cu (Mlb) | Tonnes (Mt) | % | Cu (Mkg) | Cu (Mlb) | Tonnes (Mt) | % | Cu (Mkg) | Cu (Mlb) |
| Golpu | – | – | – | – | 379.1 | 1.26 | 4 780 | 10 538 | 379.1 | 1.26 | 4 780 | 10 538 |

### Copper – Mineral reserves as gold equivalents

| | Proved | Probable | Total |
|---|---|---|---|
| | (000oz) | (000oz) | (000oz) |
| Golpu | – | 27 481 | 27 481 |

### Molybdenum – Mineral resources

| | Measured resources | | | | Indicated resources | | | | Inferred resources | | | | Total mineral resources | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Tonnes (Mt) | (ppm) | Mo (Mkg) | Mo (Mlb) | Tonnes (Mt) | (ppm) | Mo (Mkg) | Mo (Mlb) | Tonnes (Mt) | (ppm) | Mo (Mkg) | Mo (Mlb) | Tonnes (Mt) | (ppm) | Mo (Mkg) | Mo (Mlb) |
| Golpu | – | – | – | – | 688.0 | 94 | 65 | 142 | 135.8 | 72 | 10 | 21 | 823.8 | 90 | 74 | 164 |

# RESOURCES AND RESERVES BY OPERATION
## PAPUA NEW GUINEA CONTINUED

### NAMBONGA (HARMONY NEWCREST JOINT VENTURE 100% PORTION)

**Gold – Mineral resources**

| | 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 | – | – | – | – | – | – | – | – | 39.8 | 0.79 | 31 | 1 011 | 39.8 | 0.79 | 31 | 1 011 |

**Silver – Mineral resources**

| | Measured resources | | | | Indicated resources | | | | Inferred resources | | | | Total mineral resources | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Tonnes | | Ag | Ag | Tonnes | | Ag | Ag | Tonnes | | Ag | Ag | Tonnes | | Ag | Ag |
| | (Mt) | (g/t) | (000kg) | (000oz) | (Mt) | (g/t) | (000kg) | (000oz) | (Mt) | (g/t) | (000kg) | (000oz) | (Mt) | (g/t) | (000kg) | (000oz) |
| Nambonga | – | – | – | – | – | – | – | – | 39.8 | 2.9 | 114 | 3 672 | 39.8 | 2.9 | 114 | 3 672 |

**Copper – Mineral resources**

| | Measured resources | | | | Indicated resources | | | | Inferred resources | | | | Total mineral resources | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Tonnes | | Cu | Cu | Tonnes | | Cu | Cu | Tonnes | | Cu | Cu | Tonnes | | Cu | Cu |
| | (Mt) | % | (Mkg) | (Mlb) | (Mt) | % | (Mkg) | (Mlb) | (Mt) | % | (Mkg) | (Mlb) | (Mt) | % | (Mkg) | (Mlb) |
| Nambonga | – | – | – | – | – | – | – | – | 39.8 | 0.21 | 84 | 184 | 39.8 | 0.21 | 84 | 184 |

**Copper – Mineral resources as gold equivalents**

| | Measured | Indicated | Inferred | Total |
|---|---|---|---|---|
| | (000oz) | (000oz) | (000oz) | (000oz) |
| Nambonga | – | – | 481 | 481 |

# RESOURCES AND RESERVES BY OPERATION

## PAPUA NEW GUINEA CONTINUED

### KILI TEKE

**Gold – Mineral resources**

| | 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 | – | – | – | – | – | – | – | – | 221.5 | 0.25 | 54 | 1 751 | 221.5 | 0.25 | 54 | 1 751 |

**Copper – Mineral resources**

| | Measured resources | | | | Indicated resources | | | | Inferred resources | | | | Total mineral resources | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Tonnes | | Cu | Cu | Tonnes | | Cu | Cu | Tonnes | | Cu | Cu | Tonnes | | Cu | Cu |
| | (Mt) | % | (Mkg) | (Mlb) | (Mt) | % | (Mkg) | (Mlb) | (Mt) | % | (Mkg) | (Mlb) | (Mt) | % | (Mkg) | (Mlb) |
| Kili Teke | – | – | – | – | – | – | – | – | 221.5 | 0.35 | 782 | 1 723 | 221.5 | 0.35 | 782 | 1 723 |

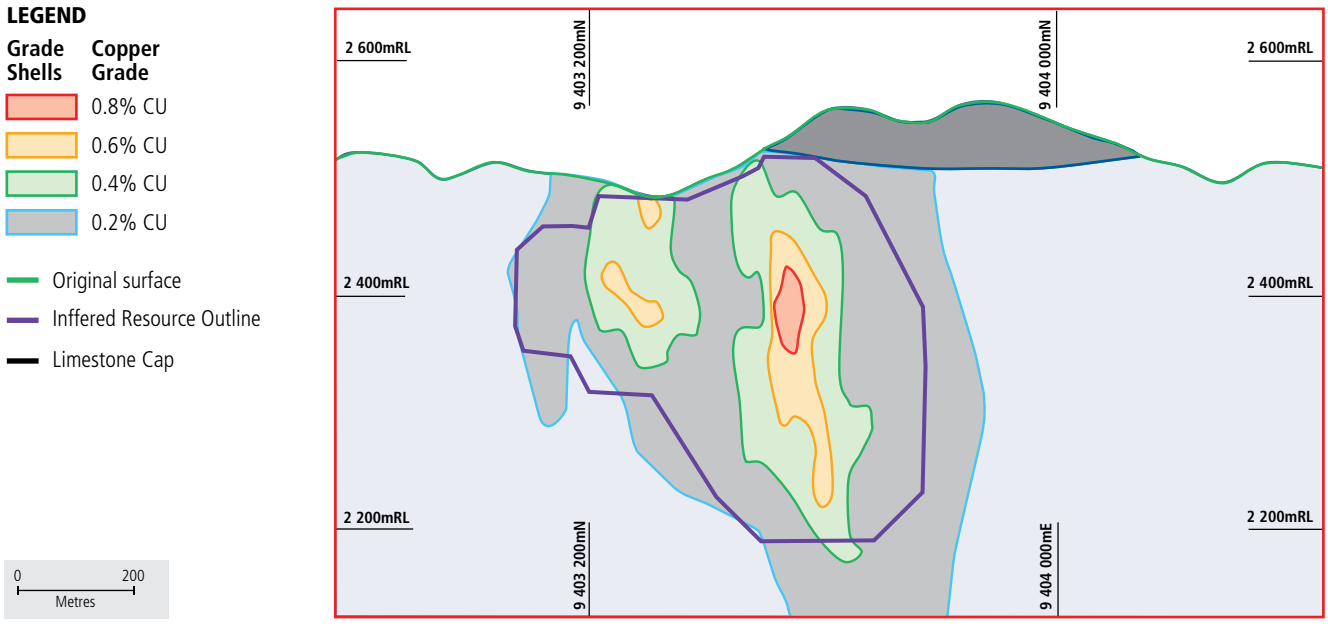
**Molybdenum – Mineral resources**

| | 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 | – | – | – | – | – | – | – | – | 221.5 | 170 | 38 | 83 | 221.5 | 170 | 38 | 83 |

**Copper – Mineral resources as gold equivalents**

| | Measured | Indicated | Inferred | Total |
|---|---|---|---|---|
| | (000oz) | (000oz) | (000oz) | (000oz) |
| Kili Teke | – | – | 4 494 | 4 494 |

### Kili Teke Section 688 790mN



# RESOURCES AND RESERVES BY OPERATION
## PAPUA NEW GUINEA CONTINUED

**Total mineral resources: Gold and gold equivalents***

| | Measured | Indicated | Inferred | Total |
|---|---|---|---|---|
| | (000oz) | (000oz) | (000oz) | (000oz) |
| Gold | 94 | 25 898 | 8 311 | 34 302 |
| Silver | 23 | 900 | 28 | 951 |
| Copper | – | 42 937 | 16 106 | 59 043 |
| **Grand total** | **116** | **69 736** | **24 444** | **94 296** |

**Total mineral reserves: Gold and gold equivalents***

| | Proved | Probable | Total |
|---|---|---|---|
| | (000oz) | (000oz) | (000oz) |
| Gold | 94 | 12 385 | 12 479 |
| Silver | 23 | 334 | 357 |
| Copper | – | 27 481 | 27 481 |
| **Grand total** | **117** | **40 200** | **40 317** |

Mineral resources and mineral reserves detailed in the following tables represent Harmony's 50% (Kili Teke 100%) attributable gold equivalent mineral resources and mineral reserves in Papua New Guinea.

**Mineral resources – gold equivalents***

| | Tonnes | Gold | Gold |
|---|---|---|---|
| | (Mt) | (000kg) | (000oz) |
| Measured | 1 | 2 | 58 |
| Indicated | 437 | 1 085 | 34 868 |
| Inferred | 322 | 380 | 12 222 |
| **Total** | **760** | **1 466** | **47 148** |

**Mineral reserves – gold equivalents***

| | Tonnes | Gold | Gold |
|---|---|---|---|
| | (Mt) | (000kg) | (000oz) |
| Proved | 1 | 2 | 58 |
| Probable | 202 | 625 | 20 100 |
| **Total** | **203** | **627** | **20 159** |

**Gold equivalent ounces are calculated assuming a US$1 150/oz Au, US$3.00/lb cu and US$15.00/oz Ag with 100% recovery for all metals.*

# MATERIAL RISKS

Material risks which may impact the reserves and resource statement are as follows:

| Operation | Significant risks | Remedial action |
|---|---|---|
| Bambanani | • Seismicity | • Control of mining sequence and appropriate support systems |
| | • Rate of rising water in the sub-shaft | • Installation of submersible pump |
| Doornkop | • Unexpected geological features | • Extensive exploration drilling from underground platforms and seismic survey |
| Kusasalethu | • Seismicity | • Control of mining sequence and appropriate support systems |
| | • Water build up at Deelkraal | • De-watering of the Deelkraal area |
| | • Backfill plant efficiency | • Re-commission module no 3 of backfill plant |
| Masimong | • Grade of the ore body | • Exploration for higher grade B Reef channels |
| Phakisa | • Logistics | • Upgrade of koepe rock winder and rail-veyor™ |
| Joel | • Flooding of 145 level (shaft bottom) | • Installation of second submersible pump as a standby |
| | • Water and gas intersections in decline development | • Additional drilling in front of decline development |
| Tshepong | • Complexity of ore body | • Extensive exploration drilling |
| | • Ventilating of decline area | • Holing to Phakisa on 69 level and installation of booster fans |
| Target 1 | • Grade dilution from waste/backfill in the massive stopes | • Reduce pillar mining between mined out areas |
| | • Ventilation | • Optimise ventilation and cooling capability |
| Unisel | • Scaling of shaft ore pass system | • Ore pass system to be kept full to reduce scaling |
| | • Aged shaft infrastructure and equipment | • Preventative maintenance schedules and repairs |
| Kalgold | • Slope failure | • Pre-split blasting to protect high walls |
| Hidden Valley | • Overland conveyor system | • Manage ore blending into crusher and increased sensors on conveyor |
| Golpu | • Project execution | • World class projects team appointed |

# HARMONY 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.

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.

# HARMONY STANDARD FOR SAMREC COMPLIANCE REPORTING CONTINUED

### 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.

## REPORTING CODE

Harmony uses the South African Code for the Reporting of Exploration Results, SAMREC, which sets out the internationally recognised procedures and standards for reporting mineral resources and ore/mineral reserves in South Africa. This code was developed by the South African Institute of Mining and Metallurgy and is the recommended guideline for reserve and resource reporting for companies listed on the JSE Limited. Harmony's reporting of its Australian and Papua New Guinea mineral resources and mineral reserves also complies with the Australian Code for the JORC of the Australian Institute of Mining and Metallurgy. This code is materially the same as SAMREC. In reporting reserves, distinct cognisance has also been taken of Industry Guide 7 of the United States Securities Exchange Commission.

### DEFINITIONS AS PER THE SAMREC CODE

#### Mineral resources

A mineral resource is a concentration (or occurrence) of material of economic interest in or on the earth's crust in such form, quality and quantity that there are reasonable and realistic prospects for eventual economic extraction. The location, quantity, grade, continuity and other geological characteristics of a mineral resource are known, estimated from specific geological evidence and knowledge, or interpreted from a well-constrained and portrayed geological model.

Mineral resources are sub-divided in order of increasing confidence in respect of geoscientific evidence into inferred, indicated and measured categories.

An inferred mineral resource is that part of a mineral resource for which tonnage, grade and mineral content can be estimated with a low level of confidence. It is inferred from geological evidence and sampling, and assumed, but not verified geologically and/or through analysis of grade continuity. It is based on information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that may be limited in scope or of uncertain quality and reliability.

An indicated mineral resource is that part of a mineral resource for which tonnage, densities, shape, physical characteristics, grade and mineral content can be estimated with a reasonable level of confidence. It is based on exploration, sampling and testing of information from material gathered from locations such as outcrops, trenches, pits, workings and drill holes. The locations are too widely or inappropriately spaced to confirm geological and/or grade continuity but are spaced closely enough for continuity to be assumed.

A measured mineral resource is that part of a mineral resource for which tonnage, densities, shape, physical characteristics, grade and mineral content can be estimated with a high level of confidence. It is based on detailed and reliable information from exploration, sampling and testing of material from locations such as outcrops, trenches, pits, workings and drill holes. The locations are spaced closely enough to confirm geological and grade continuity.

#### Mineral reserves

A mineral reserve is the economically mineable material derived from a measured and/or indicated mineral resource. It includes diluting and contaminating materials and allows for losses that are expected to occur when the material is mined. Appropriate assessments to a minimum of a prefeasibility study for a project, and a life-of-mine plan for an operation, must have been completed, including consideration of, and modification by, realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors (the modifying factors). Such modifying factors must be disclosed.

# HARMONY STANDARD FOR SAMREC COMPLIANCE REPORTING CONTINUED

A probable mineral reserve is the economically mineable material derived from a measured and/or indicated mineral resource. It is estimated with a lower level of confidence than a proved mineral reserve. It includes diluting and contaminating materials and allows for losses that are expected to occur when the material is mined. Appropriate assessments to a minimum of a prefeasibility study for a project, and a life-of-mine plan for an operation, must have been carried out, including consideration of, and modification by, realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors. Such modifying factors must be disclosed.

A proved mineral reserve is the economically mineable material derived from a measured mineral resource. It is estimated with a high level of confidence. It includes diluting and contaminating materials and allows for losses that are expected to occur when the material is mined. Appropriate assessments to a minimum of a prefeasibility study for a project, and a life-of-mine plan for an operation, must have been carried out, including consideration of, and modification by, realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors. Such modifying factors must be disclosed.

## HARMONY REPORTING IN COMPLIANCE WITH SAMREC

To meet SAMREC's requirements that the 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 R575 000/kg to derive a cut-off 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 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 ore body 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 R475 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.

# GLOSSARY OF TERMS

| Term | Definition |
|---|---|
| **Acidic** | Descriptor for silica rich igneous rocks (containing greater than 65% silica) such as rhyolite or granite. |
| **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 ore bodies 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 ore body. |
| **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 ore body, may also refer to a link between different drives. |
| **Country rocks** | The surrounding "host" rocks into which an igneous intrusion or ore body is emplaced. |
| **Cut-off grade** | The lowest grade of copper or gold ore that is considered economic to mine. |
| **Datamine™** | Software |
| **Decline** | A tunnel below the horizontal that allows access to the ore body. |
| **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. |
| **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. |

| Term | Definition |
|---|---|
| **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. |
| **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. |

# GLOSSARY OF TERMS CONTINUED

| Term | Definition |
|---|---|
| **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. |
| **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. |
| **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. |

| Term | Definition |
|---|---|
| **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. |
| **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 ore body, 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, also |
| **spelled silicious.** | |
| **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 ore body, 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

## PRIVATE SECURITIES LITIGATION REFORM ACT

### SAFE HARBOUR STATEMENT

This report contains forward-looking statements within the meaning of the safe harbour provided by Section 21E of the Securities Exchange Act of 1934, as amended, and Section 27A of the Securities Act of 1933, as amended, 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 include all statements other than statements of historical fact, including, without limitation, any statements proceeded by, followed by, or that include the words "targets", "believes", "expects", "aims" "intends" "will", "may", "anticipates", "would", "should", "could", "estimates", "forecast", "predict", "continue" or similar expressions or the negative thereof.

These forward-looking statements, including, among others, those relating to our future business prospects, revenues and income, wherever they may occur in this report and the exhibits to this report, are essentially 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 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 gold and other metals prices, estimates of future gold and other metals production and sales, estimates of future cash costs, estimates of future cash flows, and the sensitivity of cash flows to the gold and other metals prices, statements regarding future debt repayments, estimates of future capital expenditures, the success of our business strategy, development activities and other initiatives, 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, fluctuations in the market price of gold, the occurrence of hazards associated with underground and surface gold mining, the occurrence of labour disruptions, power cost increases as well as power stoppages, fluctuations and usage constraints, supply chain shortages and increases in the prices of production imports, availability, terms and deployment of capital, changes in government regulation, particularly mining rights and environmental regulation, fluctuations in exchange rates, the adequacy of the group's insurance coverage and socio-economic or political instability in South Africa and Papua New Guinea and other countries in which we operate.

For a more detailed discussion of such risks and other factors (such as availability of credit or other sources of financing), see the company's latest Integrated Annual Report on Form 20-F which is on file with the Securities and Exchange Commission, as well as the Company's other Securities and Exchange Commission filings. The company undertakes 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.

# 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

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FFT De Buck*^ (lead independent director)
JM Motloba*^ (deputy chairman)
PW Steenkamp (chief executive officer)
F Abbott (financial director)
JA Chissano*[1]^
KV Dicks*^
Dr DSS Lushaba*^
CE Markus*^
HE Mashego**
M Msimang*^
KT Nondumo*^
VP Pillay*^
JL Wetton*^
AJ Wilkens*

* *Non-executive*
** *Executive*
^ *Independent*
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Berlin Stock Exchange: HAM1
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