

Harmony Gold Mining Company Limited  
Registration number 1950/038232/06  
Incorporated in the Republic of South Africa  
ISIN: ZAE000015228  
JSE share code: HAR  
("Harmony" and/or "the Company")

### **Golpu feasibility study confirms robust investment case**

- 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

Harmony Gold Mining Company Limited ("Harmony") is pleased to announce the results of the Golpu Stage 1 Feasibility<sup>1</sup> and Stage 2 Prefeasibility studies and declare updated Resources and Reserves for the Golpu project. Both studies have confirmed a robust investment case - one that supports proceeding with the project

"The Golpu porphyry is a world-class resource due to its size, high grades, long-life and low operating costs. The design of the mine allows optionality and flexibility to scale the operation up with a relatively low capital investment in response to increasing commodity prices. Golpu is part of Harmony's future and will create value for our shareholders in the long term", says Harmony chief executive officer, Peter Steenkamp.

The Stage 1 project capital on a 100% basis is estimated at US\$2.6bn, yielding an internal rate of return of 16%. The Stage 1 Feasibility study justifies the development of twin exploration access declines, with two proposed block caves designed to extract approximately 50% of the contained metal (gold and copper) of the Golpu reserve. The approximately 50% remaining reserve is to be extracted by a deeper block cave (BC3) below block cave 2 (Stage 2). The common path mining

and processing infrastructure of Stage 1 will be utilised in support of the development of Stage 2.

Engagement with key stakeholders, including the PNG national government, the Morobe provincial government, landowners and community representatives continues so as to ensure clear alignment on the project objectives.

### **Key findings of the feasibility study<sup>2</sup>**

- 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
- Financial metrics<sup>3</sup> of Stage 1:
  - Net present value (NPV): US\$1.1bn
  - Internal rate of return (IRR): ~16%
  - Maximum negative free cash flow (100% basis): US\$1.8bn
- Stage 1 targets higher-grade sections of the deposit thereby optimising free cash flow.
- The development of the near surface block cave 1 (BC1), as part of Stage 1, affords early cash flow thereby reducing the maximum negative cash outflow
- 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 Golpu Stage 2 Prefeasibility study focused on optimising Stage 1 and then expanding block cave 2 (BC2) throughput before the establishment of a third block cave (BC3) below BC2
- The project is located in close proximity to the City of Lae with established infrastructure such as roads, marine port, airport, and light industry

- Studies conducted by WorleyParsons (South Africa) and other consultants under direct management of the joint venture project team
  - more than 460 000 man hours worked on the latest studies

## **GOLPU STAGE 1 FEASIBILITY STUDY<sup>2</sup>**

Stage 1 of the development of Golpu focuses on the development of two block caves, BC 1 and BC 2 and all associated infrastructure required. A third block cave, BC 3 is contemplated in Stage 2.

Refer to <https://www.harmony.co.za/our-business/exploration/golpu-project> for Schematic 1: Cross section of Golpu porphyry<sup>4</sup> -

### **Summary of key metrics for Stage 1 (100%)<sup>3</sup>**

<b>Area</b>	<b>Measure</b>	<b>Unit</b>	<b>Stage 1 FS</b>
Production	First ore milled <sup>5</sup>	Months from start of earthworks	Month ~60
	Steady-state production <sup>5</sup>	Months from start of earthworks	Month ~90
	Ore mined and milled	Mt	149
	Life of mine	Years	28
	Copper metal produced	Mt Cu	2.2
	Gold metal produced	Moz Au	3.6
	Peak Au production	koz pa	297
	Peak Cu production	kt pa	135
	Au recoveries	%	70
	Cu recoveries	%	94
Capital	Project capital	USD billion	2.6
	Sustaining capital	USD billion	1.6
	Total life of project capital	USD billion	4.2
	Maximum negative cash flow	USD billion	1.8
Production	Total operating cost (real)	USD/t	30.66
	Realisation cost	USD/t	17.61

	Cash cost <sup>6</sup>	USD/lb produced	0.59
	Total sustaining production cost <sup>7</sup>	USD/lb produced	0.89
	Total production cost <sup>8</sup>	USD/lb produced	1.45
Economic Assumptions	Gold price	USD/oz	1200
	Copper price	USD/lb	3.00
	Exchange rates	AUD/USD	0.80
		PGK/USD	2.85
	Discount rate (real)	%	8.50
Stage 1 Outcomes	Net present Value	USD billion	1.1
	Internal rate of return	%	~16

The operating cost estimate covers all the operating expenditure to mine, treat and administer extraction of the orebody, as well as transporting, dewatering and ship-loading of the concentrate at the Port of Lae. Cash cost 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 equals U\$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.

#### **Additional information: BC1 and BC2**

<b>Ore extracted</b>	<b>Metric</b>	<b>2016 Feasibility study</b>
BC1 - tonnes	Mt	8

BC1 - gold grade	g/t	0.99
BC1 - copper grade	%	2.00
BC2 - tonnes	Mt	143
BC2 - gold grade	g/t	1.05
BC2 - copper grade	%	1.54

### **Key milestones<sup>9,10</sup>**

The project will only progress into execution upon the grant of a Special Mining Lease (SML) which will include all necessary permits, approvals and consents required from the Papua New Guinea Government, landowners and other relevant stakeholders. Assuming all such approvals are obtained, the development timeline outlined in the Stage 1 feasibility study is set out below.

**Refer to <https://www.harmony.co.za/our-business/exploration/golpu-project> for Schematic 2: Development timeline**

If signed prior to the grant of a SML, approval will be sought from the Boards of both Wafi Golpu joint venture parties to bring forward the advanced exploration work and earthworks for establishment of the access declines. Advanced exploration via underground access will afford an opportunity to obtain further data at depth and as a result, a revisit of the current proposed Stage 1 base case capital profile, schedule and execution approach.

### **Further work on the Stage 1 Feasibility study**

As planned 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 orebody affording drilling platforms is required in order to verify geotechnical and hydrological interpretations of the orebody at depth

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

Tailings management: Further assessment of tailings disposal options

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 PNG 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

## **Community engagement**

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. In the December 2015 quarter, 90 meetings attracting 2,756 local community participants were held. 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.

## **Capital costs**

Harmony's share (50%) of the estimated capital requirements for Stage 1 from grant of the Special Mining Lease are approximately as follows:

**Refer to <https://www.harmony.co.za/our-business/exploration/golpu-project> for Schematic 3: Harmony's (50%) estimate capital requirements**

## **GOLPU STAGE 2 PREFEASIBILITY STUDY**

The Stage 2 pre-feasibility study was conducted in parallel to the Stage 1 feasibility study. The first step of Stage 2 looked at debottlenecking the 6Mtpa capacity from Stage 1 BC2. 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. (Stage 2-1)

The access declines to the block caves in both the Stage 1 feasibility study and Stage 2 pre-feasibility 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 step for Stage 2 is increasing the mine's production rate. By optimising all existing Stage 1 infrastructure and increasing the size of the underground loader fleet a higher mining production output from BC2 can be achieved, without a significant capital investment. A second process plant with a capacity of 7Mtpa will be constructed to bring total plant capacity to 14mtpa. (Stage 2-2)

The third and final stage investigated by the pre-feasibility study for Stage 2 was to extend the life of the operation with the construction of a third block cave below BC2. Additional capital is required to extend the decline access and conveyor belt system, the ventilation system and establish the associated underground infrastructure (Stage 2-3).

Refer to <https://www.harmony.co.za/our-business/exploration/golpu-project> for Schematic 4: Staged development of Stage 1 and Stage 2

**Prefeasibility Study key metrics for Stage 2 (100%)** <sup>11,12,13</sup>

Description	Unit	Stage 1 FS	Stage 2 PFS 2-1	Stage 2 PFS 2-2	Stage 2 PFS 2-3
<b>Financials</b>					
NPV*	USD M real	1,087	1,240	1,338	1,954
IRR*	%	15.6	16.3	16.8	17.5
Maximum negative cash flow (real)	USD M	1,763	1,763	1,763	1,763
Free Cash Flow Generation*	USD M real p.a. steady state avg	249	298	405	402
<b>Schedule</b>					
Ore throughput*	Mtpa	6	7	14	14
First ore	Date	FY2023	FY2023	FY2023	FY2023
Life of Mine	years	28	25	18	35
<b>Production</b>					
Ore mined*	Mt	149	153	155	379
Cu Grade	%	1.58	1.58	1.57	1.26
Au Grade	g/t	1.06	1.06	1.05	0.91
Cu Recovered*	kt	2,233	2,301	2,306	4,547
Cu Recovered	Ktpa LOM average	80	92	128	130
Au Recovered*	koz	3,573	3,527	3,509	7,058
Au Recovered	koz pa LOM average	128	141	195	202
<b>Capital expenses</b>					
Project capital	USD M real	2,640	2,656	2,656	2,656



Expansion capital	USD M real	-	10	572	1,261
Sustaining and Expansion Capital	USD M real	1,551	1,499	2,175	3,725
<b>Operating expenses</b>					
Total Operating Cost	USD/t ore milled	30.66	28.12	24.16	23.95
Cash Cost	USD/lb Cu real LOM average	0.59	0.55	0.44	0.60

\*Cumulative

## **RESOURCE AND RESERVE UPDATE (100%)**

### *Mineral Resource*

The Golpu Mineral Resource has been updated as at 31 December 2015 to align with the results of Golpu 2015 Stage 1 feasibility study and Stage 2 (Life-of-Mine) prefeasibility study. The key change is the applied cut-off grade that defines the volume with reasonable prospects of eventual economic extraction. The Golpu Mineral Resource is constrained within a marginal breakeven shell using WGJV 2015 gold and copper revenues and the estimated long term cost structure developed in the 2015 Golpu Stage 2 PFS. The December 2014 Mineral Resource was reported within a 0.2% Cu shell representative of the revenue and cost structures of the 2012 Golpu PFS. There has been no additional drilling in 2015 that impacts the Golpu mineralised volume and the underlying geology and grade model is unchanged from that used in the December 2014 Mineral Resource.

See the updated Resource table below:

**Table 1: Current Indicated and Inferred Mineral Resource (100%)**

	Metal >>	Gold		Copper		Silver		Molybdenum	
	tonnes	grade	metal	grade	metal	grade	metal	grade	metal
	Mt	g/t	Moz	%	Mt	g/t	Moz	ppm	kt
Total Mineral Resource	820	0.70	18.6	1.0	8.6	1.3	33.1	90	74
Measured Mineral Resource	-	-	-	-	-	-	-	-	-
Indicated Mineral Resource	690	0.71	15.8	1.1	7.5	1.3	28.5	94	65
Inferred Mineral Resource	140	0.63	2.8	0.85	1.2	1.1	4.6	72	9.7

Rounding in table may cause discrepancies.

**Table 2: Current Mineral Resource compared with previous estimate (100%)**

	Metal >>	Gold		Copper		Silver		Molybdenum	
	tonnes	grade	metal	grade	metal	grade	metal	grade	metal
	Mt	g/t	Moz	%	Mt	g/t	Moz	ppm	kt
Previous Mineral Resource	1 080	0.59	20.2	0.87	9.4	1.09	37.5	94	100
This Mineral Resource	820	0.70	18.6	1.1	8.6	1.3	33.1	90	74

Rounding in table may cause discrepancies

For full details of the Mineral Resource estimation basis refer to the Appendix on the Harmony website at <https://www.harmony.co.za/our-business/exploration/golpu-project>.

## Ore Reserve

The Golpu Reserve is informed by the 2015 Stage 1 feasibility study and prefeasibility study (Stage 2) of the Golpu project.

The updated Reserve is tabled below:

**Table 1 - Current Ore Reserve**

	Ore	Gold		Copper	
	tonnes Mt	grade g/t	metal Moz	grade %	metal Mt
Total Ore Reserve	380	0.91	11.0	1.3%	4.8
Proved Ore Reserve	-	-	-	-	-
Probable Ore Reserve	380	0.91	11.0	1.3%	4.8

The key changes to the December 2015 Ore Reserve relative to the 30 June 2015 Ore Reserve are primarily due to:

- Revised Operating and Sustaining Capital costs following the completion of the Stage 2 prefeasibility Study in December 2015
- Application of updated Modifying Recovery Factors for Mining
- Removal of Silver and Molybdenum from the estimate

**Table 2 - Current Ore Reserve Compared With Previous Estimate (100%)**

	Ore	Gold		Copper		Silver		Molybdenum	
	tonnes Mt	grade g/t	metal Moz	grade %	metal Mt	grade g/t	metal Moz	grade ppm	metal kt
Previous Ore Reserve	450	0.86	12.4	1.2%	5.4	1.4	20	80	36
This Ore Reserve	380	0.91	11.0	1.3%	4.8	-	-	-	-

For full details of the Ore Reserve estimation basis refer to the Appendix on the Harmony website at <https://www.harmony.co.za/our-business/exploration/golpu-project>.

For full details of Harmony's other Resources and Reserves please refer to [www.harmony.co.za](http://www.harmony.co.za).

Harmony updates its full Resources and Reserves statement on 26 October 2016 with the publication of the Integrated Annual Report.

### **PNG tax and project interest**

- Company tax rate is 30%
- Mining royalty 2% of revenue less shipping and refining costs
- Interest withholding tax is 0% (approved resource projects only)
- PNG government retains the right to acquire up to 30% of the project up to the grant of the special mining lease
  - payment based on historical exploration expenditure
  - full equity participant thereafter

### **About the Golpu project**

Harmony and Newcrest Mining Limited each currently own 50% of Golpu through the Wafi-Golpu Joint Venture. The PNG Government retains the right to purchase, for its pro-rata share of historical costs, up to a 30% equity interest in any mineral discovery at Wafi-Golpu, at any time before the commencement of mining. If the PNG Government chooses to take-up its full 30% interest, the interest of each of Newcrest and Harmony will become 35%.

The Golpu deposit is located approximately 65km south-west of Lae in the Morobe Province of PNG which is the second largest city in PNG and will host Golpu's export facilities. The proposed mine site sits at an elevation of approximately 400 metres 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.

## Location of Wafi-Golpu

Refer to <https://www.harmony.co.za/our-business/exploration/golpu-project> for Schematic 5: Map of Papua New Guinea

### Footnotes in support of press release:

<sup>1</sup> Full feasibility study level is considered to be at  $\pm 15\%$  accuracy.

<sup>2</sup> Findings are subject to the further feasibility work described above to be undertaken.

<sup>3</sup> As timing for finalisation of PMDA is uncertain, valuation outcomes are shown at the time of commencement of earthworks for the access declines. Costs are based on 2016 real estimates. Neither the costs nor cost escalation impacts prior to commencement of earthworks are included in the valuation outcomes. All numbers are based on information derived from work undertaken for the Stage 1 feasibility study and are subject to completion of the further feasibility study work, investment approval, receipt of all necessary permits and approvals and market and operating conditions and engineering. Refer to the statement on last page in relation to forward looking statements. All figures are at 100% ownership unless otherwise stated.

<sup>4</sup> Cave wireframes are a representation of the shape of economic draw of mixed cave material from the Mineral Resource and not a cave excavation shape

<sup>5</sup> Subject to Advanced Exploration Work.

<sup>6</sup> Includes gold credit and realisation costs

<sup>7</sup> Cash cost including sustaining capital

<sup>8</sup> Includes construction capital, sustaining capital and gold credits

<sup>9</sup> Timeline is indicative to prefeasibility study level

<sup>10</sup> Concentrator expected to achieve 3Mtpa approximately three months after BC1 first production then expanded at later date to accommodate production from BC2 at 6mMpa

<sup>11</sup> Costs are based on 2016 real estimates. All numbers are based on information derived from work undertaken for the Stage 1 feasibility study and are subject to completion of feasibility work, investment approval, receipt of all necessary permits and approvals and changes to market and operating conditions and engineering. Refer to the statement on last page in relation to forward looking statements.

<sup>12</sup> As timing for finalisation of a PMDA is uncertain valuation outcomes are shown at the time of the grant of the SML. Costs are based on 2016 real estimates. Neither the costs nor cost escalation impacts prior to commencement of earthworks are included in the valuation outcomes.

<sup>13</sup> All prefeasibility study outcomes are shown on a Life of Mine basis and are inclusive of Stage 1.

## **FORWARD-LOOKING STATEMENTS**

### **PRIVATE SECURITIES LITIGATION REFORM ACT**

#### **Safe Harbour Statement**

*This report contains forward-looking statements within the meaning of the safe harbor 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 preceded 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 labor 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.*

### **Competent Person's Statement**

The information in this presentation that relates to the Golpu Mineral Resources is based on information compiled by Mr Paul Dunham. Mr Dunham is Principal Geologist, Ore Deposit Knowledge for Newcrest Mining Limited. He is a full-time employee of Newcrest Mining Limited. Newcrest is Harmony's 50/50 Joint Venture Partner in the Wafi Golpu Joint Venture.

The information in this presentation that relates to the Golpu Ore Reserves is based on information compiled by Mr Pasqualino Manca. Mr Manca is the Area Manager Mining - Golpu Project Feasibility Study and a full-time employee of Newcrest Mining Limited.

Both are Members of The Australasian Institute of Mining and Metallurgy and both have sufficient experience which is relevant to the styles of mineralisation and types of deposits under consideration and to the activity which they are undertaking to qualify as a Competent Persons as defined in the JORC Code and SAMREC. Mr Dunham and Mr Manca consent to the inclusion in this presentation of the matters based on the information in the form and context in which it appears including sampling, analytical and test data underlying the results

Mr Gregory Job, BSc, MSc, who has 27 years' relevant experience and a member of the Australian Institute of Mining and Metallurgy (AusIMM), is Harmony's competent person for Papua New Guinea.

Mr Jaco Boshoff, BSc (Hons), MSc, MBA, Pr. Sci. Nat, MSAIMM, MGSSA is Harmony's lead competent person. Mr Boshoff who has 20 years' relevant experience, is registered with the South African Council for Natural Scientific Professions (SACNASP) and is a member of the South African Institute of Mining and Metallurgy (SAIMM).

**Please refer to our website at <https://www.harmony.co.za/our-business/exploration/golpu-project> for the appendix, the presentation and a video in support of this release.**

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