

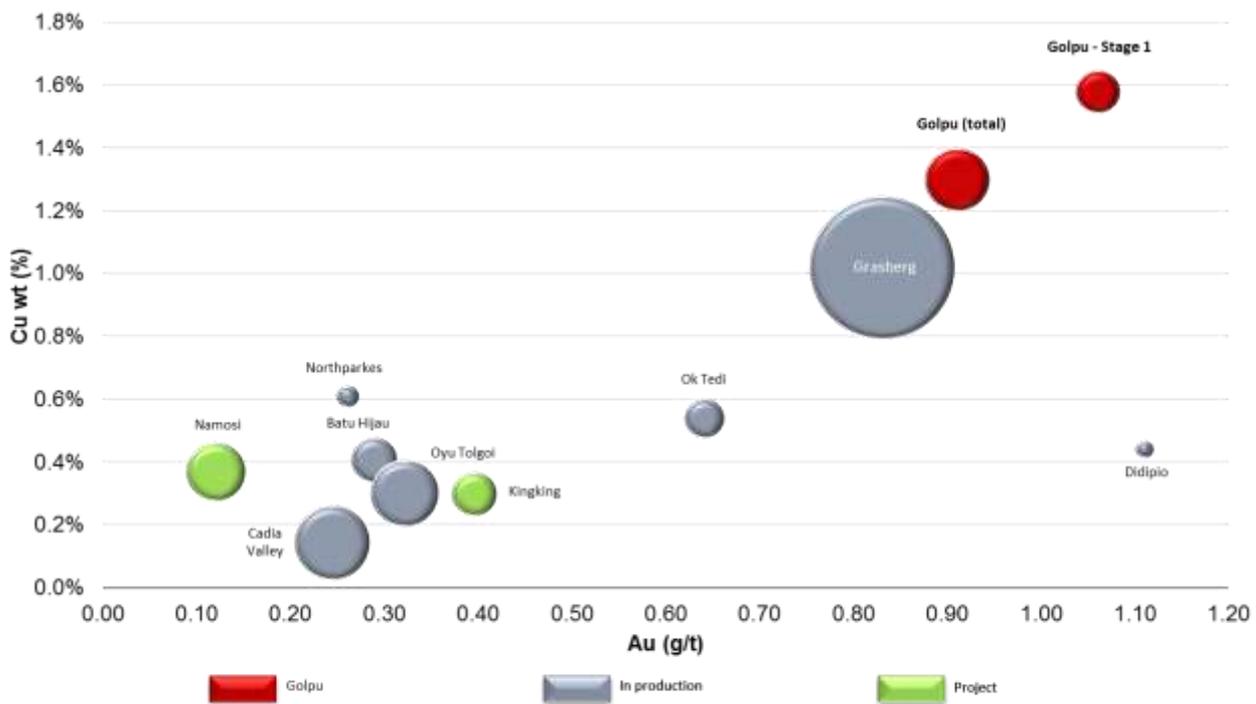
Q&A on Golpu Stage 1 feasibility study and Stage 2 prefeasibility study

Where is Golpu and who owns the project?

Golpu is situated in the Morobe Province of the Independent State of Papua New Guinea (PNG). The Golpu project is jointly owned by wholly-owned subsidiaries of Harmony Gold Mining Company Limited (Harmony) and Newcrest Mining Limited (Newcrest) in a 50/50 unincorporated joint venture. The PNG Government has the right at any time prior to commencement of mining to purchase up to 30% equitable interest in the project

How does Golpu compare to other copper-gold porphyries?

Golpu is amongst the best South East Asian copper gold porphyries, evaluated by reference to copper and gold reserve grades (see the graph below):



Source: Rothschild
Reserve grade depicted in graph with bubble size represents equivalent resource

What was the purpose of the Feasibility Studies?

The prefeasibility study released in December 2014 confirmed the viability of the project and the purpose of the recently completed Stage 1 feasibility study was to increase the confidence levels in the recommended development proposal through further engineering and risk mitigation, enabling the owners' boards to assess the project economics and consider whether to take the project to its next development phase, namely permitting.

Why did you decide to announce the feasibility studies now – the project seems to be so far in the future?

The Stage 1 feasibility study constitutes an important milestone in the life of the project, inasmuch as it identifies a clear pathway to the staged development of a mine and takes the project further up the value curve by adding close to US\$1 billion to its net present value as part of the stage 2 pre-feasibility study outcomes. A feasibility study level of confidence is required in support of owner decision making and in support of project permitting.

The asset is important to Harmony's future – as it will add approximately 500 000* gold equivalent ounces to our annual production at peak production and will be one of the lowest cost copper-gold producers once it is in production. It also forms an important part of Harmony's reserves and replaces some of the South African reserve profile in the future once those operations reach the end of their economic life

**Estimated on Harmony's 50% interest*

Who prepared the feasibility studies?

The Stage 1 Feasibility study and the Stage 2 Prefeasibility study were prepared by the joint venture project team, WorleyParsons and a number of independent specialists. More than 460 000 man-hours were spent on drafting, discussing and analysing these study results. The study outcomes and recommendations made were also independently scrutinised by a review team of owners' representatives having expertise in related fields, as well as the boards of both joint venture partners.

As is typical of all deep underground developments, underground access to the ore body is required to confirm some of the study outcomes.

Were any block cave specialists part of the study discussions?

Newcrest's Cadia mining team, based in Orange, was responsible for the project's mine design, reporting into the project management structure. They will also assist with the future optimisation work. The team has much relevant project and mining experience, having just commissioned Newcrest's flagship Cadia project.

How would you summarise the outcomes of the studies?

The Stage 1 feasibility study outcomes confirm that stage one is an economically robust initial development with a significant mine life that establishes a beachhead in support of future expansion. The Stage 2 prefeasibility study outcomes - which underpin our new Golpu reserve - indicate that the total asset has a net present value of approximately US\$2 billion with an internal rate of return of 17.5%, on a 100% basis.

What were the major differences between the Stage 1 feasibility study and the preceding prefeasibility studies?

The economic outcomes of the studies are similar. Slightly lower commodity prices were assumed with the biggest changes being the lower estimated cash costs and total operating costs, as well as a delay in the project schedule and slightly higher capital requirement. Construction capital and sustaining capital increased mostly due to increased cost for the tailings storage facility.

The time schedule was impacted by the fact that the study assumes that on-the-ground activity will only start after the grant of a special mining lease, whereas the preceding prefeasibility study assumed that work on the access declines would be undertaken as a component of project exploration under a pre-mining development agreement. Decline and underground development rates have also been slightly reduced. This has resulted in a net impact of 2 to 3 years on the project schedule compared to the pre-feasibility study.

Why is a staged approach followed?

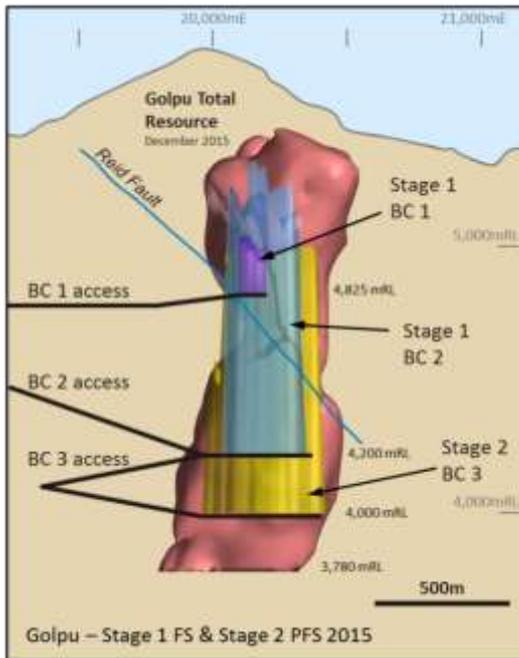
The adoption of a staged approach has multiple benefits, both technically (as it affords low cost, low risk development and early production), and financially (as the project generates early cash flows which contributes towards reducing the maximum negative cash flow exposure and the stage 1 mine - once built - will be a very low-cost producer generating strong cash flows throughout the commodity cycle).

In addition, , since Golpu will be built in stages and the mining (block caving) is initially focussed on the high grade portions, there is a lot of future optionality and flexibility for expansion as and when commodity prices increase.

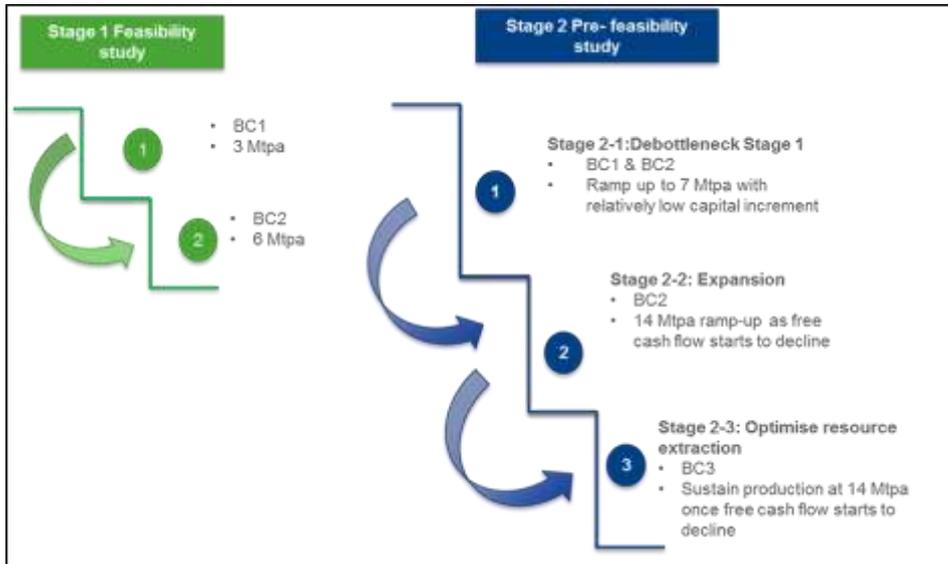
How do the studies envisage that Golpu will be developed?

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.

Stage 2 contemplates a third block cave, BC 3 and associated infrastructure required , in addition to expansion of the mining and processing rate.



A staged development approach will be used, which is summarised as follows:



Stage 1: depicted in green, the first phase in the development strategy of the project, focuses on the establishment of a high grade start-up mine comprising two separate block caves. Stage 1 ramps up from an initial 3 million tonnes per annum (Mt) from BC1 to a steady-state production level of 6Mt per annum from BC2, and continues for approximately 28 years, mining 149Mt of the Golpu ore reserve.

Stage 1 involves the construction of an advanced undercut block cave mine, with ore extraction achieved via the mining of two block caves, BC 1 and BC2. Orebody access and material handling will be via twin declines and ventilation through a vertical shaft with a series of strip and lined shafts below BC1.

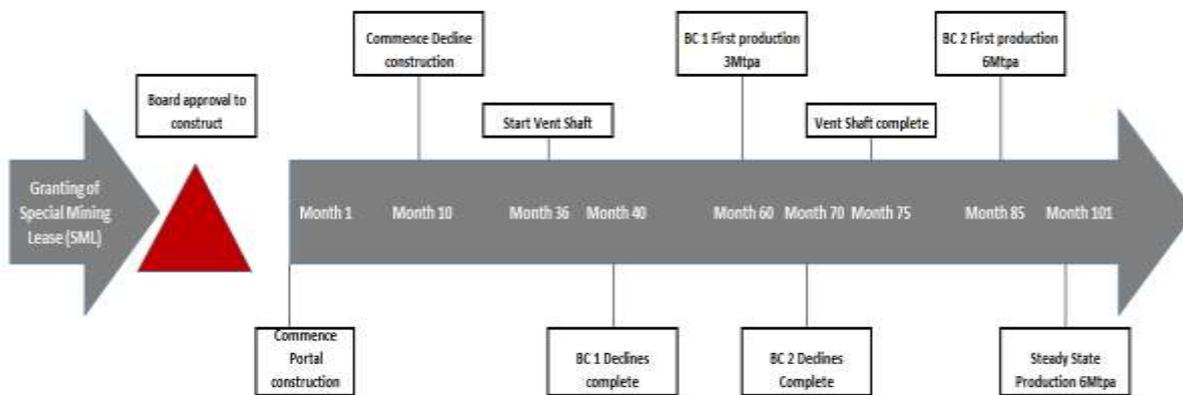
Initial activities will focus on two key critical path activities those being the construction of the mine portal terrace and high wall which required in support of the twin declines. The development of the twin declines will commence once the construction of the mine portal terrace and high wall has been completed.

Stage 2: depicted in blue, represents a future option of development in which Stage 1 is expanded to a larger volume mining operation in two steps, namely the debottlenecking of primarily the process plant, followed by increasing the BC2 production rate to 14Mt per annum.

The debottlenecking of the mining infrastructure is done to accommodate an increase in production from 6Mt per annum to 7Mt per annum with only minor changes in the infrastructure contemplated in stage 1. The phase (expansion) increases production from 7Mt per annum to 14Mt per annum by doubling the processing capacity by installing a second 7 Mt per annum process plant.

A third step, being the establishment of BC3, focuses on sustaining production at 14Mt per annum over the life of mine. This last phase targets a third and larger block cave, BC 3, with a 14 Mt production rate and will require an additional ventilation shaft, as well as additional decline development for access and material handling.

What is the timing of the project?



The development schedule in the Stage 1 study assumes that the Owners will obtain a Special Mining Lease and associated required environmental and other permits by July 2018, which is when the project will go into its execution (construction) phase.

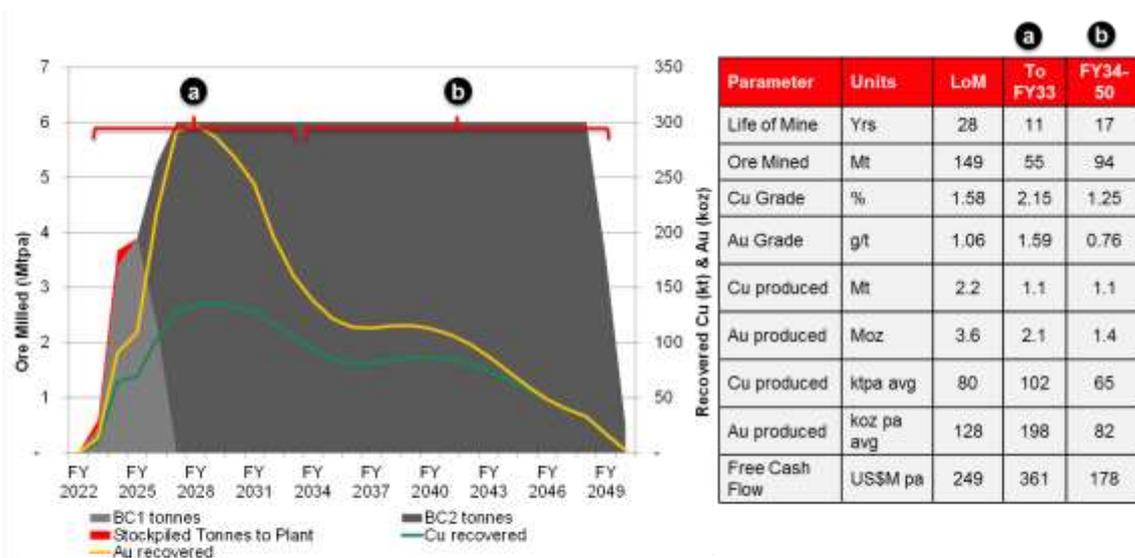
Two years have been allowed for the permitting process, commencing from the date of submission of the special mining lease application. (This is guided by the Hidden Valley mine permitting timeline, although no Mining Development Contract was required in that instance). Based on the above schedule, BC 1 will be in steady state production during FY24, with BC2 reaching steady state production by FY27.

Discussions are underway with the PNG government to expedite the project schedule and permitting process.

Which economic assumptions were used for the Stage 1 feasibility study?

Economic assumptions	Metric	2016 Feasibility study
Gold price	US\$/oz	1 200
Copper price	US\$/lb	3.0
Exchange rate	AU\$/US\$	0.80
	PGK/US\$	2.85
Discount rate (real)	%	8.5

What will stage 1’s production profile be (on a 100% basis)?



All numbers reflected on a 100% basis

The Stage 1 production profile reveals two distinct phases. The first phase is the start-up mine in the high grade porphyry, and the second phase starts when mining progressively incorporates more metasedimentary ore. It is the ability to exploit this high-grade material early in the mine life which allows significant upfront metal production and strong free cash flows.

Mining starts in BC 1, which mines approximately 8 million tonnes of ore at 1 g/t gold and 2% copper for 4 years at a peak rate of 3 Mt per annum. BC 2 then mines approximately 140 Mt of ore at 1.g/t gold and 1.6% copper for the remainder of stage 1.

What is the financial outcome of the Stage 1 feasibility study?

The Stage 1 feasibility study results (on a 100% basis) confirm the attractive nature of the project.

Production highlights	Metric	2016 Feasibility study
Maximum negative free cash flow	US\$bn	1.8
IRR	US\$ % real	16
NPV	US\$bn real	1.1
Total project capital	US\$bn	2.6
Sustaining capital (post steady state production)	US\$bn	1.6
Cash cost	US\$/lb	0.59
Total sustaining production cost (cash cost + sustaining capital included)	US\$/lb	0.89
Total production cost (cash cost + project and sustaining capital)	US\$/lb	1.45

Positive project returns are underpinned by a lowest quartile cost base which will underpin strong operating cash flows, with significant free cash flow being generated. The study assumes that the special mining licence will be obtained by July 2018 and therefore valuation calculations are made from that date.

The majority of project capital is spent on: decline development, cave establishment, ventilation shaft and related underground mining expenditure, amounting to approximately US\$ 1.1 bn of total project capital of US\$2.6bn. Approximately US\$510m is spent on regional infrastructure, which includes the construction of a new access road, bridges, accommodation camp, Lae port facilities and filtration plant as well as the initial tailings storage facility (TSF) construction cost. Other major components of project capital consist of the process plant and related infrastructure, amounting to US\$ 215m and project delivery costs of US\$237m.

Sustaining capital may appear large for a block caving operation, but includes over US\$1.1bn of ongoing TSF expenses over the life of the project, with the TSF being built in stages.

The total sustaining production cost of US\$0.89 per pound is very attractive, even in the current depressed copper market it will provide a significant free cash flow margin.

What is included in the operating cost?

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. It does not take into account gold production credits.

Cash cost per pound and total production costs per pound include treatment and refining charges, freight to end customers, royalties and mining levies.

Total production cost includes sustaining, construction capital costs and gold production credits. The realisation cost estimate in the financial model equals US\$17.61/t, which 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.

What is the purpose of the Stage 2 Prefeasibility Study?

The purpose of the Stage 2 prefeasibility study was to evaluate options to optimise the project (Stage 1) business case utilising the existing dataset and assuming common path access to BC1, with future expansion paid from existing project cash flows. It also targets the remaining parts of the resource not extracted in stage 1.

By applying a debottlenecking process, production is increased from 6Mt per annum to 7Mt per annum (Step 1) followed by expansion thereafter from 7Mt per annum to 14Mt per annum (Step 2), with the final step extending the mine life with the inclusion of BC3 whilst sustaining the 14Mt per annum production rate.

What are the results of the Stage 2 prefeasibility study (on 100% basis)?

Parameter	Units	Stage 2-1 (7 Mtpa)	Stage 2-2 (14Mtpa)	Stage2-3 (BC 3)
Key Financial Metrics				
NPV	US\$bn real	1.2	1.3	2.0
IRR	US\$ % real	16.3	16.8	17.5
Operating cost	US\$/t ore LoM	28.12	24.16	23.95
Project (expansion) capital spend	US\$M real	10	572	1,261
Sustaining and expansion capital	US\$M real	1,499	2,175	3,725
Cash cost (incl gold credit)	US\$/lb real LoM	0.55	0.44	0.60
Total production cost (cash cost + project and sustaining capital)	US\$/lb real LoM	1.37	1.39	1.23

All numbers reflected on a 100% basis, using same economic assumptions as Stage 1
 NPV: Net present value
 IRR: Internal rate of return
 LoM: Life of Mine

The Stage 2 prefeasibility study results confirm the attractive nature of the expanded Life of Mine project approach, principally the high absolute value-add (NPV) and return on investment (IRR). The expansion capital for the upgrading the process plant to 7Mt per annum consists mainly of an additional regrind mill and some float cells.

For the expansion to 14Mt per annum incremental capital of US\$572m is spent on a new 7Mt per annum process plant, upgrading the LHD fleet to 20t units, improvements to material handling systems and additional fans, upgrades to the refrigeration plant and power infrastructure.

The last stage, developing BC3, requires US\$ 1.3bn in expansion capital. The majority of this is spent on the underground mine development, including access and conveyor declines, an additional ventilation shaft as well as capital to implement a Deep Sea Tailings Placement facility.

(The table above excludes the US\$ 2.6 bn execution capital for stage 1 which underpins all of the various incremental options shown for stage 2).

Has the Golpu reserve been revised?

Yes. The Golpu Reserve is informed by the 2016 prefeasibility study (Stage 2) of the Golpu project.

The updated Reserve is tabled below (100% basis):

Table 1 – Current Ore Reserve

	Ore	Gold		Copper	
	tonnes	grade	metal	grade	metal
	Mt	g/t	Moz	%	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 December 2014 Ore Reserve are primarily due to:

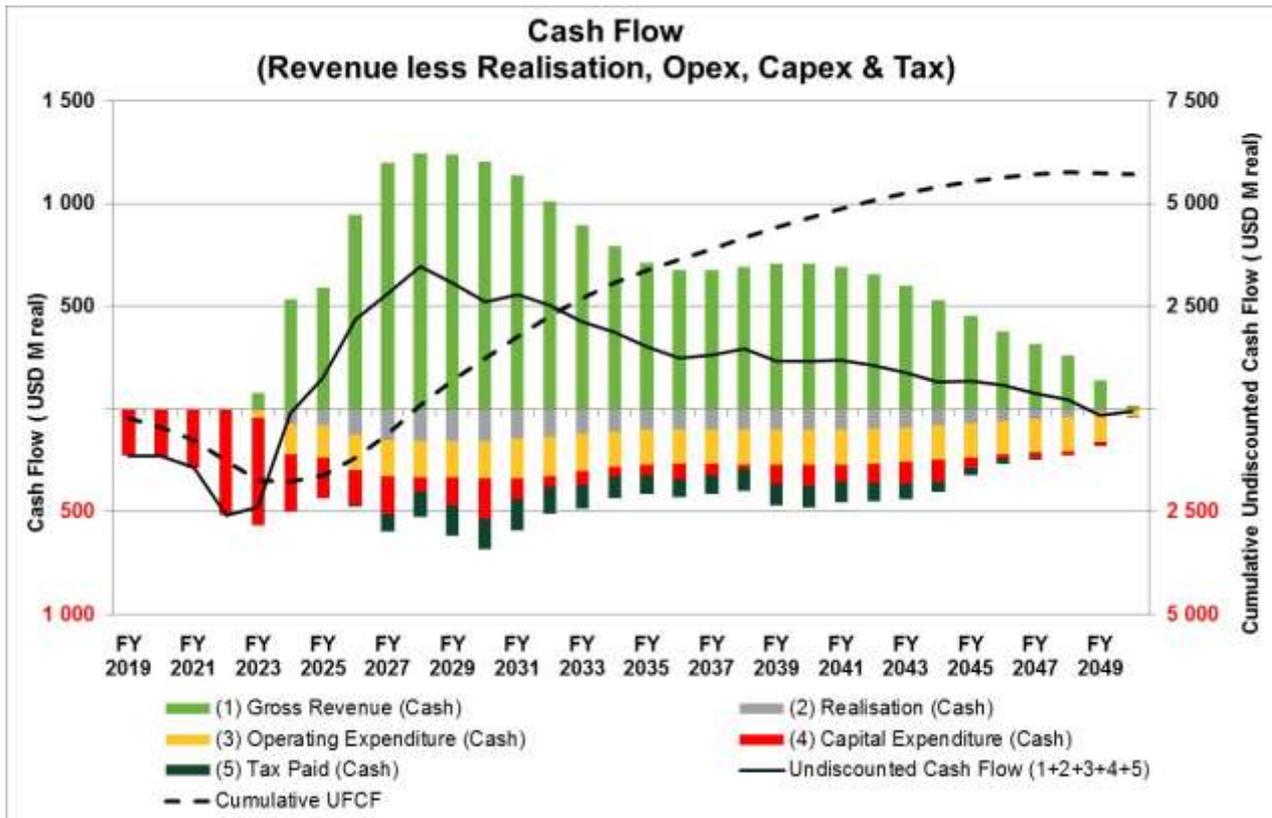
- Revised (higher) operating and sustaining capital costs following the completion of the Stage 2 prefeasibility study in December 2015;
- Application of updated Modifying Recovery Factors for Mining
- Removal of Silver and Molybdenum from the estimate

When will the project start generating net free cash per financial year?

The project is net cash flow positive two years after first production achieved with the assumption that the SML is granted in June 2018.

The graphs below (on 100% basis) illustrates the various cash outflows and inflows of Stage 1 and 2.

Stage 1

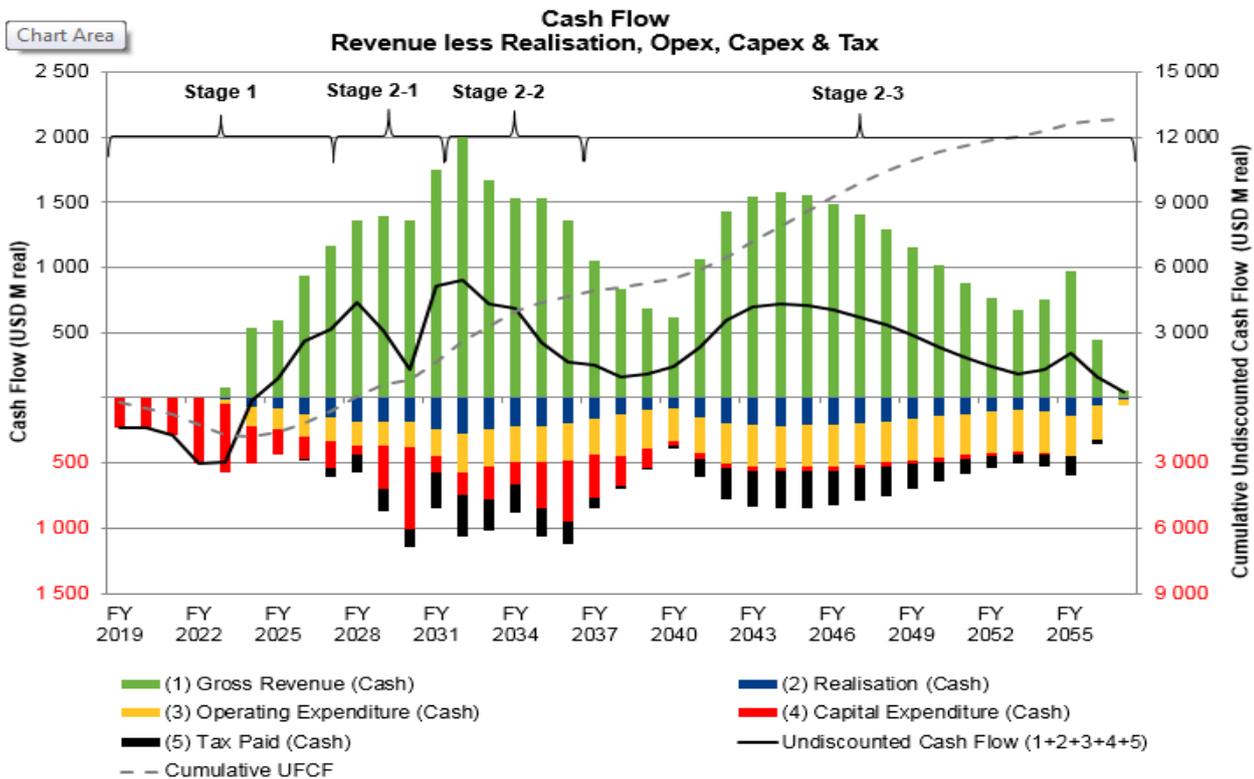


The graph presents net annual unleveraged cashflows (this being positive cashflows after accounting for capital costs, operating costs, realisation costs, taxes and royalties) for stage 1.

Up to FY33 annual net free cashflow averages US\$361 million per year, declining to US\$178 million thereafter. Of note is the particularly attractive annual average net free cashflow of larger than US\$500 million in the period when mining the highest-grade porphyry ore.

Although not separately displayed, BC 1 produces an annual average cash flow margin of approximately US\$200m, while the high grade ore accessed by BC 2 generates in excess of US\$500m margin per annum for at least 6 years.

Stage 2



During steady state the stage 2 mine produces on average an estimated US\$402 million in undiscounted free cash flows per year. To sustain this free cash flow generation for as long as possible the mine's production is ramped up to allow for the declining grade profile in phases, with all expansion funded by project cash flow.

The cashflow reflects ramping up the mine to 7 Mt per annum after payback from stage 1 has been achieved in FY28 as step 1. The 7Mt per annum production rate is maintained for 3 years and thereafter ramped up to 14Mt per annum in FY31, followed by the development of BC 3.

The production gap between FY39 and FY42 is as a result of the risks associated with the interaction between BC2 and BC3. As a result, production in BC 2 ramps down quicker and is unable to supplement the ramp up in production rates from BC 3 to sustain 14 Mt per annum. This production profile will be further optimised during the next phase of study.

What is the current tax regime in PNG?

The PNG company tax rate is 30%, while a mining royalty of 2% is payable and calculated on revenue, less shipping and refining costs, and a mineral production mining levy of 0.25% is calculated on gross revenue before shipping and refining costs have been deducted. Note however that the cash costs and total production costs provided above already include the royalty and levy.

The PNG tax model provides for a deduction of cumulative capital expenditure of up to 25% of the remaining balance of the capitalised expenditure in each year until the final three years of a project's life in which case the balance may be deducted at 33%, 50% and 100% respectively. The deduction of capital expenditure is limited to the lesser of 25% of the remaining balance or the taxable income in a particular year. In addition, where there is a taxable income from a project, exploration expenditure incurred in wholly owned exploration activities within PNG can be offset to the extent of reducing the current year tax liability by 25%.

How will you fund this project?

The quantum of funding required depends on whether or not the PNG Government exercises its buy-in right, and the level of such buy-in (please refer to the schematic below). The PNG government may “elect at any time prior to the commencement of mining, to make a single purchase up to 30% equitable interest” in the project, at a price pro rata to the accumulated exploration expenditure and thereafter to contribute on a pro rata basis, unless otherwise agreed. To date the PNG government has indicated that it intends to take up its full entitlement.

If the PNG government does take up 30% of the project, Harmony will be able to fund its 35% share of the project from internal cash flows. If the State does not take up an interest in the project, Harmony will be able to fund its 50% of the project from internal cash flows, with some external funding required closer to first production.

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

No PNG Government buy-in (Harmony 50%)		PNG Government buy-in (Harmony 35%)	
Year	Project cashflow (incl. capex)	Year	Project cashflow (incl. capex)
	US\$m		US\$m
FY17 and FY18	*	FY17 and FY18	*
FY19	(115)	FY19	37
FY20	(115)	FY20	(81)
FY21	(145)	FY21	(102)
FY22	(260)	FY22	(182)
FY23	(240)	FY23	(168)
Total	(875)	Total	(496)

External funding of US\$250m required

Grant of SML and PNG Government buys 30% for US\$235m

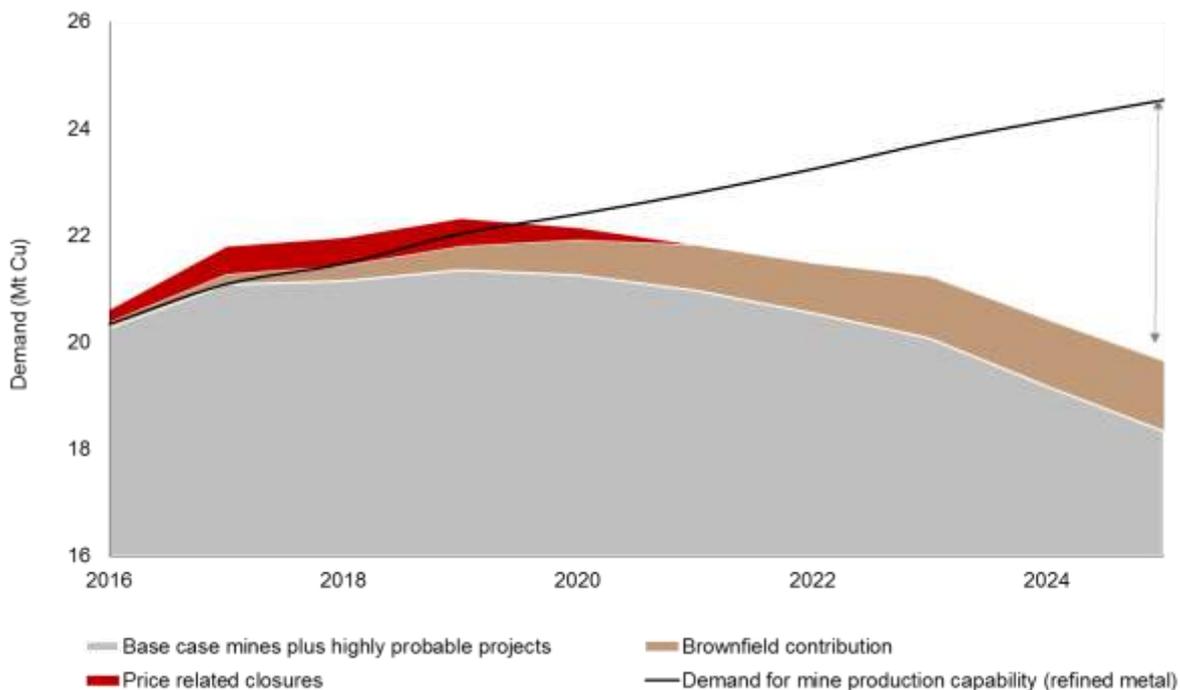
**Insignificant expenditure up to granting of SML
The above funding requirements are based on the project permitting timeline with on the ground activities only commencing post grant of a Special Mining Lease in FY19.*

The FY17 and FY18 outflows assume that the project will be on care and maintenance during the permitting process. During this period expenditure is expected to be less than US\$40m per year (on 100% basis), with limited activities in the country.

Expenditure ramps up post the granting of the Special Mining Lease when the project goes into its execution (construction) phase.

Discussions with the PNG government are ongoing to expedite project permitting and underground data gathering by way of declines – if successful it may bring some capital expenditure forward as well as the currently anticipated first production date.

Do you believe there is a future for copper?

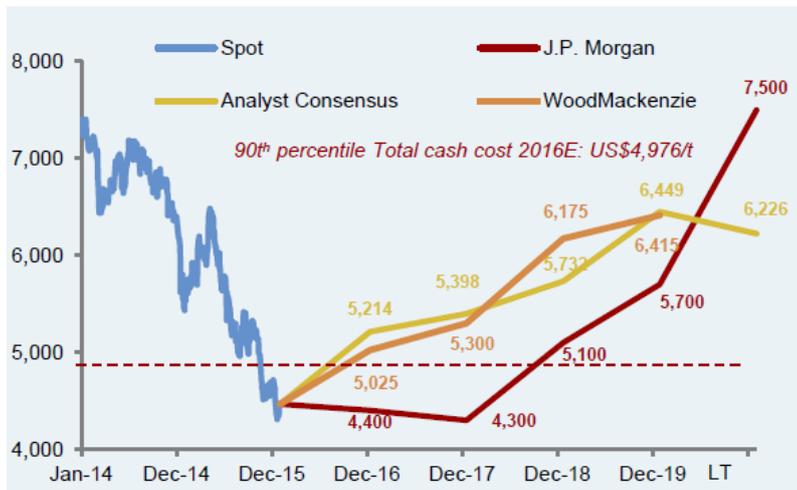


Source: WoodMackenzie

The graph clearly illustrates that Golpu will come into production at a time there is a shortage of copper in the world, and we are of the view that there will be a continuing shortage of copper in the future. This view is underpinned by the consensus views of various analysts – see the second graph below:

Market and sector overview

Copper price forecasts (nominal, US\$/t)



Do you foresee any issues with the pipeline that you are going to use to carry the concentrate from the mine down to the port of Lae?

Various pipeline corridors are being considered to mitigate any potential operating and permitting risks. We believe that these alternate options will de-risk any issues that may arise.

The execution risk seems high. What have you learned from building Hidden Valley?

There are two fundamental differences between these projects - one being the physical location of the deposits, the other being the quality and size of the ore body. Golpu has a very different grade profile compared to that of Hidden Valley, and is also a substantially larger resource with a very long mine life.

The lessons learnt at Hidden Valley (during the construction and operating phase) were all listed, discussed and addressed right from the outset when the prefeasibility study for Stage 1 was prepared. In addition, the benefit of 13 years of practical, on the ground operating and project experience in PNG, which Hidden Valley did not have, was built into the Golpu study outcomes. The project team therefore understood the issues and challenges of building a mine in a tropical environment, with seismic activity and high rainfall. The following matters – as examples – were considered:

- 1 One of the key study outcomes is that Golpu's infrastructure will be on the Watut flood plain, whereas Hidden Valley's infrastructure is spread out on various ridgelines in a very mountainous area. Building your infrastructure platforms on a low lying relatively flat area like the Watut flood plain is less expensive, quicker and easier to construct and thereafter more easily maintained. It also allows you to consolidate your infrastructure footprint which has operating benefits in addition to reduced construction costs.

- 2 The other challenge that impacted on Hidden Valley was logistics. Hidden Valley is 120 km from Lae and we had to construct a 40m road up the mountain side to access the site, with a nearly 1500m change in elevation as part of that. Transportation on this road requires specialized equipment. At Golpu - which is only approximately 70km from Lae - the access road will be constructed on a flat surface, with minimal elevation changes as well as limited curves. One of our key first areas of activity will be to construct the access road.
- 3 At Hidden Valley, being an open pit operation generating significant amounts of waste in addition to ore, engineered waste dumps had to be constructed between the ridge lines of the mountain on which mining took place, which is an expensive undertaking. Competent rock, (which was initially not available, so constraining mining rates for a number of years) was required to construct the toes for these engineered waste dumps, and also to build access ramps to the area in which these dumps toes were built. Haul distances to these engineered waste dumps are significant which results in higher ongoing mining costs. The initial and ongoing construction costs of engineered waste dumps are expensive. Golpu will be an underground block cave mine with very limited waste, which is far easier and cheaper to manage/process. The environmental impact will also be less than at Hidden Valley due to a reduced surface footprint of the mine.
- 4 The overland pipe conveyor at Hidden Valley with its significant elevation changes and twists and turns over very challenging terrain is a one of a kind design and application in PNG, making technical support and maintenance challenging. Golpu's feasibility study provides for a stock-standard basic mine materials handling system with well proven technology.
- 5 We applied a very rigorous project phase methodology at Golpu, more intensive than the process followed at Hidden Valley- stepping through the various project study phases, pre-feasibility, feasibility, with internal milestone reviews, competent external reviews as well as owner reviews. We have also ensured that project and mining professionals with extensive practical experience were part of the project teams.
- 6 Access to a skilled workforce is key to the success of any project. At Hidden Valley, we underestimated the amount of time and the complexity involved in preparing and retaining labour to ensure maximum productivity and efficiencies. As part of developing Golpu, we have taken into account the cost and time involved in developing and educating the work force as part of our operational readiness strategy, and have allowed enough time for us to execute this strategy.

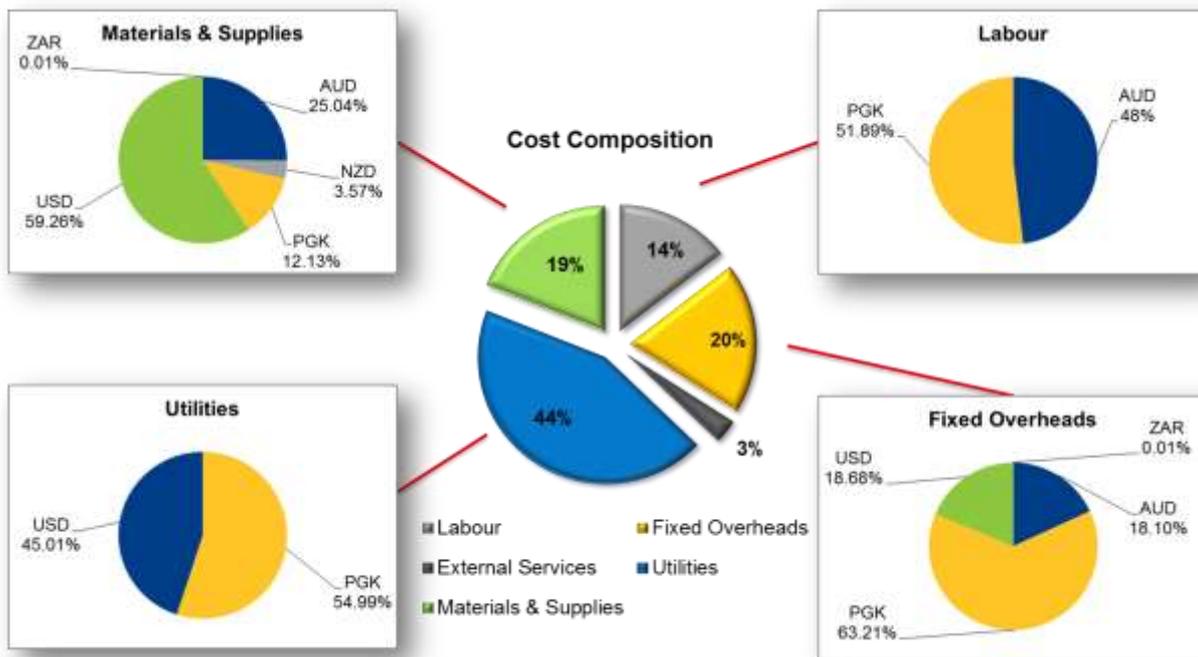
It sounds like the teams have been very thorough in preparing the studies. Is there anything that you are still concerned about?

Further confirmatory work has to be carried out in a number of areas requiring underground access to the orebody. Amongst these elements further geotechnical and hydrological work is required which requires more drilling from underground drill platforms on the decline route.

Why only 6MT at the start?

Further optimisation work will be carried out on mining and processing rates over the next few years, taking into account key project metrics. We believe there is opportunity to improve mining and processing rates without impact significantly on project capital or schedule.

What is the cost split? (labour, etc and exchange rate)?



What are the next steps?

The Special Mining Lease permitting process will be the primary focus of the next phase of the project, which includes engagement with multiple stakeholders including all levels of government. As part of that process, various agreements have to be negotiated, amongst them a Mining Development Contract, a State Equity Acquisition agreement and a Fiscal Stability agreement (each with the State) as well as a Memorandum of Agreement with the local landowners, State and provincial government.

In addition, the joint venture agreement will need to be reviewed to ensure it is appropriate for the development and operational phases of the project.

Is any further work required in respect of the Stage 1 feasibility study?

Yes. Various optimisation studies will be carried out during this permitting phase to further enhance the business case and de-risk the project.

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

Who will operate the mine?

Currently, the project is a 50/50 unincorporated joint venture, under the direct management of a Joint Venture Committee reporting to the owners. The project itself is operated by its contracted operator, Wafi-Golpu Services Limited, which is owned in equal shares by the joint venture participants.

The form, management and operation of the project during the development and operational phases of the project will be the subject of discussion and negotiation between the owners and the State during the permitting phase.

What does the stakeholder engagement involve?

We are committed to close and cooperative engagement with all stakeholders in the project, and in particular with the landowners and communities directly affected by it.

Engagement with project stakeholders is mandated under the Mining Act, and will include our participating in a State-directed Development Forum. 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.

To view the full presentation, press release and video of the outcome of Golpu's 2016 studies, please refer to <https://www.harmony.co.za/our-business/exploration/golpu-project> for more information.