



# Market Release

## Newcrest Mining Limited

16 August 2010

### **Mineral Resource & Ore Reserve Explanatory Notes 2010**

These notes provide additional information in support of the 2010 Resources and Reserves Statement released 16 August, 2010.

Key points are:

- Group Mineral Resources in contained gold and copper terms have increased since 2009 by 3.6Moz and 2.88Mt respectively, net of mining depletion.
- Group Ore Reserves in contained gold and copper terms have increased since 2009 by 4.5Moz and 3.21Mt respectively net of mining depletion.
- Ore Reserves are quoted as a subset of Mineral Resources.
- Independent external and internal reviews were conducted on all estimates.
- Metal price assumptions for all Ore Reserves other than Gosowong Province are US\$750 per ounce of gold (\$650 in 2009), US\$2.00 per pound of copper (\$1.70 in 2009) and US\$11.50 per ounce of silver (\$11.00 in 2009).
- Metal price assumptions for all Mineral Resources other than Gosowong Province are US\$800 per ounce of gold (\$700 in 2009), US\$2.20 per pound of copper (\$2.00 in 2009) and US\$13.00 per ounce of silver (unchanged from 2009).
- Metal price assumptions for the Gosowong Province Mineral Resources and Ore Reserves are US\$1,000 per ounce of gold reflecting the adoption of a short term price outlook for these shorter life orebodies
- For both Ore Reserves and Mineral Resources with an Australian cost base, a USD to AUD exchange rate assumption of 0.75 for metal price conversion was applied (unchanged from 2009).
- Where appropriate, Mineral Resources are constrained spatially either within a notional US\$1000 per ounce of gold and US\$4.00 per pound of copper pit shell, or within an underground mining shape based on a marginal cut-off.
- Mineral Resources and Ore Reserves for Wafi-Golpu and Nambonga assets in PNG are based on a Competent Persons statement provided on behalf of the Morobe Mining Joint Venture (MMJV) by our 50% partners Harmony Gold Mining Company Limited. Metal prices assumptions used by the MMJV for Ore Reserve estimates are the same as those applied to the other Newcrest deposits. Further details on MMJV Mineral Resources and Ore Reserves are available on the Harmony website [www.harmony.co.za](http://www.harmony.co.za).

## 1. CADIA PROVINCE (NSW)

The 100% Newcrest owned Cadia Valley Operations are located south of Orange in the central west of New South Wales. Mining commenced in 1998 with a large-scale open pit at Cadia Hill, followed by development of a bulk tonnage underground mine at Ridgeway. The Cadia East deposit is being developed as a large underground mining operation. The porphyry-related deposits within Cadia Valley host gold and copper. Minor molybdenum and silver mineralisation is also present. Metal is produced either in a copper concentrate containing elevated gold values or as gold doré. Concentrate is piped to a filter plant at the nearby town of Blayney before transport by rail to Port Kembla for export to international customers.

The Cadia Valley Mineral Resources and Ore Reserves are reported and/or based on an estimated 'Value' that incorporates the forecast revenue streams from both recoverable gold and copper and the realisation costs (concentrate transport, smelting and refining).

### 1.1 Cadia Hill Open Pit

The Cadia Hill Gold Mine has been in production since June 1998 as a large open pit. The mine supplies the adjacent concentrator with approximately 17Mt of ore annually. Mining is on 15m benches using conventional drill, blast, shovel and truck methods. The concentrator recovers copper and gold using flotation to produce a copper concentrate containing elevated gold credits. Gravity separation is also used to recover gold to produce gold doré.

#### Mineral Resource

Cadia Hill is a porphyry related sheeted vein deposit hosted by Ordovician intrusive with minor volcanic rocks. The 2010 Mineral Resource estimate is based on the existing 2009 model. The 2009 model was based on extensive diamond drilling (on a notional 50 by 50 metre grid) as well as substantial grade control and mapping data accumulated over twelve years of mine production. Grade was estimated via a combination of Multiple Indicator Kriging and Ordinary Kriging.

The Mineral Resource is reported based on a notional US\$1000 per ounce for gold and US\$4.00 per pound copper pit shell and long term mining cost assumptions. Material changes during the year include the increase in metal price assumptions and mining depletion. The net result is a decrease in contained metal in Mineral Resources of 0.45Moz of gold and 22kt of copper.

#### Ore Reserve

The 2010 Mineral Resource model provides the basis for the June 2010 Ore Reserve estimate.

The Ore Reserves are defined by a block value cut-off approach using industry standard pit optimisation software to determine the ultimate pit limits. A series of staged pits within the ultimate pit are designed and scheduled to enhance the net present value of the operation. The current mine design involves a total of four cutbacks designed over the life of the mine. Currently, mining occurs in Cutback 3 while Cutback 4 is planned to be mined in the future.

Material changes to the Ore Reserve estimate include mining depletion, metal price increases, operating cost reviews and realisation cost changes. The net result is a decrease in contained metal in Ore Reserves of 0.43Moz of gold and 34kt of copper.

## 1.2 Cadia Extended

The Cadia Extended gold/copper mineralisation is located on the north-west limits of the Cadia Hill Mine and has similar characteristics as a large low grade porphyry style deposit. An Ore Reserve was mined by open pit methods from 2003 followed by back-filling of the pit during 2006/07. The remaining deposit, located partly beneath the backfilled pit, is considered to have bulk underground mining potential.

### Mineral Resource

Mineralisation comprises a combination of vein controlled and disseminated gold, copper and molybdenum. It is focused in a corridor of increased alteration, structural deformation and quartz veining within a large monzonite body and adjacent to a contact with Ordovician volcanics. A series of high grade pegmatite structures also exist in the monzonite body but only one of these was sufficiently drilled to be modelled and included in this resource.

The resource is based on an update to the previously reported 2009 model including an increase in metal price assumptions.

The resource is constrained within an outline that approximates the degree of selectivity afforded by a block cave mining method. The conceptual block cave has increased since last year with the inclusion of some material classified as Inferred Resource. The re-estimation has resulted in a net increase in contained metal in Mineral Resources of 0.26Moz of gold and 49kt of copper. No changes were made to resource categories.

### Ore Reserve

No Ore Reserve has been established for Cadia Extended.

## 1.3 Cadia Stockpiles

Stockpiles are reported with the Cadia Hill Mineral Resource and Ore Reserve and consist of ore mined from Cadia Hill and previously mined from the Cadia Extended pit inventory. The grades are based on grade control data, which determines grade and other rock characteristics. The stockpiles are reported as both a Measured Resource and Proved Reserve. The current mine plan reclaims most of the economic stockpiled material.

## 1.4 Ridgeway Underground

The upper part of the Ridgeway deposit has been mined using sub-level cave (SLC) extraction. Construction of a block cave mine located below the existing SLC mine to extract a lower part of the deposit is largely complete and full ramp-up is in progress. The transition between mine extraction methods was completed towards the end of 2009-10. Assessment of a second block cave lift located below Lift 1 is underway. Ridgeway supplies approximately 6 million tonnes of gold-copper ore annually to the concentrator. Copper and gold are recovered using flotation to produce a copper concentrate containing elevated gold credits. Gravity separation is also used to recover gold to produce gold doré.

## Mineral Resource

The Ridgeway Mineral Resource model was updated in 2010 including an increase in metal price assumptions. The geological model for major lithological and structural boundaries is constructed based on drill-hole data and knowledge gained from underground exposure and previous mining. Gold and copper grade, mineralized quartz content and copper mineralogy are used to control grade interpolation in the estimate. The grades for each domain were interpolated separately using Ordinary Kriging.

In line with the previous estimate, the 2010 Mineral Resource is reported within an economic outline which reflects a conceptual block cave shell. Additional material impacts on the estimate include; the depletion of the model from mining the SLC and development and mining of the block cave Lift 1. The net result is a decrease in contained metal in Mineral Resources of 0.13Moz of gold and 10kt of copper.

## Ore Reserve

The Ore Reserve for Ridgeway is based on the 2010 Mineral Resource model. During the year, mining of the Sub Level Cave was completed and the entire Ridgeway Ore Reserve is now based on Block Cave Lifts 1 and 2.

The ore selection process involves evaluating draw columns within the block cave layout to identify the optimal trade off between economics and the geotechnical and mining parameters. Standard industry cave modelling software is used to generate the Ore Reserve estimate for Block Cave Lifts 1 and 2. It utilises 10m x 10m x 10m regularised blocks within the orebody to enable a representation of the dynamics of flow within the block cave draw columns.

Material changes from the June 2009 Ore Reserve are depletion from mining activities during the period (including the completion of SLC mining), revision of the remnant grade in the SLC taking into account final mining strategies and changes in the footprint of the Block Cave levels due to metal price assumptions. The net result is a decrease in contained metal in Ore Reserves of 0.02Moz of gold. Copper remained unchanged.

### 1.5 Cadia East Underground

Cadia East is a substantial low grade, porphyry related gold and copper deposit that is located immediately east of and separated from Cadia Hill by a major thrust fault (The Gibb Fault). The mineralisation is hosted within the Late Ordovician Forest Reefs Volcanics and monzonite intrusives. To date, the known mineralized system (defined by a 0.1% Cu shell) extends approximately 2.5 kilometres east-west, 0.7 kilometres north-south and 1.8 kilometres vertically. The deposit does not outcrop as it is overlain by between 80 and 200 metres of post mineralisation sandstones and shales.

The mineralisation can be divided into two broad overlapping zones; an upper, copper-rich, disseminated zone and, a deeper gold-rich sheeted vein zone proximal to the main monzonite bodies. The upper, copper-rich portion of the deposit is stratigraphically controlled within a volcaniclastic unit. Sulphide mineralisation is predominantly chalcopyrite, with lesser bornite and pyrite. Gold grade increases as disseminated chalcopyrite levels decrease and disseminated and vein bornite levels increase. The deeper gold-rich zone is centred on a core of steeply dipping sheeted quartz-calcite-bornite-chalcopyrite veins. The highest gold grades are associated with bornite-rich veins. Molybdenite forms a mineralised blanket above and to the east of the higher grade gold envelope.

A Feasibility Study for the planned mine based on bulk underground extraction utilising panel caving methods was completed during the last financial year. Production from the deposit has not taken place, although an exploration decline has been developed which recovered a bulk sample and included a diamond drill level drive with approximately 900 metres of ore exposures across strike.

The Cadia East Mineral Resource was estimated in May 2009 following a large drilling campaign. The resource estimate is informed by approximately 315 kilometres of diamond drilling from 443 surface holes and 58 underground holes completed since project inception. The limits of the mineralisation have not been completely defined. The deposit is open along strike and at depth to the West. No additional drill holes have been completed since May 2009.

## **Mineral Resource**

The Cadia East Mineral Resource is reported within an economic outline from a value model consistent with the proposed bulk underground mining method. The value model is based on a net smelter return (NSR) estimate for each block which is estimated based on a recoverable payable basis, taking gold, copper, silver, and molybdenum, metallurgical recoveries, metal prices and realisation costs into account. In places, the value shell has been expanded to encompass the conceptual cave limits for each lift. The entire content inside the value shell is reported as Mineral Resource. Mineral Resource categorisation is based on an assessment of grade and geological continuity and data coverage inside the value shell. The NSR value used to generate the Mineral Resource shell is based on inputs from pre-feasibility level mining studies and the selection of a panel caving methodology.

The model has been estimated by Ordinary Kriging within a series of geological and grade constrained domains for gold, copper and molybdenum. The classification of the Mineral Resource is based upon a combination of the density of drilling and geological continuity of domains for gold and copper. The approximate drill density of the Indicated Resource is 80 metres on 50 metre spaced sections along strike. No additional resource drilling has been conducted at Cadia East since 2009.

The Mineral Resource estimate for Cadia East is unchanged this year. Recent studies have shown that the Mineral Resource estimate is insensitive to the new metal price assumptions.

## **Ore Reserve**

The May 2009 Cadia East Mineral Resource block model has been used to update the Ore Reserve estimate. This model has remained unchanged for the 2010 process. The Cadia East Ore Reserve is reported using a value cut-off cost based on the 2010 Feasibility Study cost inputs and the latest metal price assumptions.

The net result is an increase of contained metal in Ore Reserves of 2.0Moz of gold and 251kt of copper compared to 2009.

Material differences between the 2009 and 2010 Ore Reserves relate to the application of higher metal price assumptions, revised mining costs as determined by the Feasibility Study, a change in mining lift elevations and an increase in mining lift heights.

Production tonnes and grades have been estimates using standard industry cave modelling software. All material in the Cadia East Ore Reserve is categorised as Probable.

## 1.6 Big Cadia

Big Cadia is centered on an area of shallow historic workings located north of the Cadia Hill open pit and east of the Ridgeway Mine cave zone. The mineralisation is skarn style (altered calcareous sediments adjacent to porphyry systems) and has been evaluated as a gold and copper bearing Mineral Resource for future development by open pit mining with ore supplying the Cadia processing facilities. The resource outcrops and comprises an oxide lens and a deeper sulphide body down to approximately 400 metres below surface.

### Mineral Resource

The Big Cadia metal inventory is estimated from drill data obtained by Newcrest Mining Ltd and previous explorers. This year, the integrity of the historical data has been thoroughly tested and validated by extensive drilling (totalling 80 diamond drill holes). This infill and confirmation data has increased the confidence in the Mineral Resource estimate and as such it has been upgraded to Indicated. The Big Cadia Mineral Resource is reported on an estimated 'Value' basis. The Mineral Resource is constrained within a notional US\$1000/oz Au and \$4/lb Cu pit shell. Material changes to the resource estimate have resulted from additional drilling and the application of higher metal prices. This has resulted in an increase in contained metal in the Mineral Resource of 0.06Moz of gold and 6kt of copper.

### Ore Reserve

No Ore Reserve has been established for Big Cadia.

## 2. TELFER PROVINCE (WA)

The 100% Newcrest owned Telfer Gold Mine is located within the Great Sandy Desert of Western Australia, approximately 485km by road south-east of Port Hedland and 680 km north-east of Newman. Gold and copper mineralisation in the Telfer Province is largely structurally controlled reefs, veins and stockwork hosted by sedimentary rocks of Proterozoic age. Deep weathering depleted the copper in the upper parts of the deposits allowing initial gold production between 1977 and 2000 to be processed using gravity and cyanide leaching processes. Ore processing facilities now exploit the large gold and copper sulphide Mineral Resources using flotation to produce a copper concentrate containing elevated gold levels. Gravity and leaching circuits are used to produce a gold doré. Concentrate is exported to customers via Port Hedland. A major tungsten, zinc, copper, lead deposit at O'Callaghans has also been added to the Telfer Ore Reserve assets this year. All Mineral Resources are within current mining leases.

### 2.1 Main Dome Open Pit

The Main Dome deposit is the largest in the Telfer area and occurs as a series of stacked stratabound reefs and discordant stockwork within a folded dome structure in the host sediments. The deposit has been mined by both open pit and selective underground mining in the past. Currently, stockwork mineralisation and remnants of reefs form historical underground workings are being mined by large scale selective open pit methods.

## Mineral Resource

As in previous reports, the Mineral Resource is reported on a 'value' basis incorporating forecast revenue streams from both gold and copper and reflecting the cost structure anticipated from long term planning models. The Mineral Resource is constrained within conceptual shell limits. The 2010 Mineral Resource is estimated from the same grade model as that used for the 2009 report. Input data is obtained from surface reverse circulation (RC) drilling, surface and underground bulk sampling, development mapping and sampling and diamond drilling (in areas beyond the limitations of RC drilling methods). Grades of gold, copper, cyanide soluble copper, sulphur and other minor elements have been analysed using either in-house or commercial assay laboratories. The Mineral Resource model was produced from a combination of estimations for reef and stockwork models with interpolation by Ordinary Kriging.

Material changes for the estimate include an increase in metal prices and mining depletion for the past year.

The net effect on contained metal in Mineral Resource compared to 2009 for Telfer Main Dome, including stockpiles, has been a decrease of 0.40Moz of gold and 1kt of copper.

## Ore Reserve

The Mineral Resource used to generate the Main Dome Ore Reserve is derived from the re-blocked Mineral Resource model described above. The resource model is re-blocked to reflect the selectivity of the mining process for both bulk and selective mining activities in the pit. The Mineral Resource has not changed from the model used for the 2009 Ore Reserve estimate. Open pit mining is by conventional excavator and truck methods. Processing and recovery rates reflect current performance from the Telfer concentrator.

The Main Dome Ore Reserve estimate is defined within an existing final pit design based on detailed geotechnical assessment and practical mining considerations as depleted at 30th June 2010. Final pit designs and interim cutbacks have been developed from pit optimisation shells. The Main Dome pit optimisation has not been updated for the 2010 Ore Reserve estimate. The Ore Reserves are defined using a block value cut-off approach.

Material impacts on the Ore Reserve estimate include metal price increases within the existing pit design and mining depletion over the past year. The net result is a decrease in contained metal in Ore Reserves of 0.57Moz of gold and 13kt of copper compared to the 2009 estimate.

### 2.2 West Dome Open Pit

The West Dome deposit is located 2 kilometres northwest of the Main Dome deposit and is a continuation of the folded sedimentary sequence in a second sub-parallel structure. Mineralisation style is similar to Main Dome but with a lower overall grade. The historical pits at West Dome remain inactive. There is no history of underground mining at West Dome.

## Mineral Resource

The West Dome Open Pit Mineral Resource is centred on identified mineralisation beneath the historical West Dome pits. The Mineral Resource is based on large scale open pit mining methods delivering to the current flotation; gravity and dump leach circuits as used for the

adjacent Main Dome open pit operation. As in previous reports, the Mineral Resource is reported on a 'value' basis incorporating forecast revenue streams from both gold and copper and reflecting the cost structure anticipated from long term planning models. The Mineral Resource is constrained within conceptual pit shell limits.

The 2010 Mineral Resource is estimated from the same grade model as that used for the 2009 report. The West Dome Mineral Resource is based on sample data from surface reverse circulation and diamond drilling (in areas beyond the limitations of RC drilling methods). The grades of gold, copper, cyanide soluble copper, sulphur and other minor elements were analysed using either in-house or commercial assay laboratories. The Mineral Resource model was produced from a combination of estimations for reef and stockwork models with grade interpolation by Ordinary Kriging.

The contained metal in the West Dome Mineral Resource has increased by 0.17Moz of gold and 12kt of copper. This is due to increased metal prices used in cut-off calculations between the 2009 and 2010 statements.

### **Ore Reserve**

The Mineral Resource grade model used to generate the 2010 estimate has not changed from that used for the 2009 estimate. The West Dome Ore Reserve estimate is based on the assumption of extraction by means of conventional open pit bulk mining methods. Processing rates and recovery assumptions for West Dome are the same as those assumed for the Main Dome Open Pit Ore Reserve estimate. The Ore Reserves are defined by a block value cut-off approach using industry standard pit optimisation software.

No mining has taken place in the West Dome Open pit during the year. The only material change to the estimate was due to increased metal prices within the existing final pit design. The West Dome pit optimisation has not been updated for the 2010 Ore Reserve estimate. The net result is an increase in contained metal by 0.06Moz of gold and 6kt of copper compared to the 2009 estimate.

### **2.3 Telfer Underground**

The Telfer Underground assets include the operating sub-level cave (SLC) mine beneath the Main Dome open pit and planned operations for selective high grade reef mining to the west and east of the SLC. Mineralisation styles are similar to elsewhere in the Telfer system, with gold and copper mineralisation occurring in stratabound reefs, cross cutting veins and stockwork zones around the reefs. The deposits are centred on the hinge zone of the Main Dome anticline at depth below the Main Dome open pit. The SLC zone will interact with the pit in the mine plan. The SLC operation currently supplies approximately 6.0 million tonnes of ore per year to the processing facility. The M50 reef is an area of small scale selective underground mining located at a higher level to the east of the SLC whilst the as yet un-mined Western Flanks deposit is a series of high grade veins and a reef horizon located immediately to the west of the SLC.

### **Mineral Resource**

The Telfer SLC Mineral Resource is based on sample data from surface and underground diamond and reverse circulation drilling, bulk sampling, development mapping and sampling. Systematic quality control is applied to all data produced, from the point of collection through to

validation, after which it is stored in a comprehensive relational database. All sampling protocols are derived from both ore heterogeneity and geostatistical studies. The grades of gold, copper, cyanide soluble copper, sulphur and other minor elements were analysed using either in-house or commercial assay laboratories.

The grade model used for the 2010 SLC Mineral Resource is the same as that reported in 2009. The SLC Mineral Resource is reported in its entirety within the Mineral Resource SLC design reflecting the non-selective nature of the mining method. The estimate includes both in-situ material and broken stocks inside the cave. The broken stocks are reported as the in-situ metal inventory before mining less the ore mined based on the Telfer Underground Ore Reserve extraction parameters.

Three material changes have been applied to the 2010 statement of SLC Mineral Resource compared with the 2009 estimates.

1. Re-design of the Mineral Resource SLC cave limits reflecting increased revenue from revised gold and copper prices.
2. Expansion of the mineralised area above the active cave that will be extractable as the SLC footprint continues to be developed.
3. Depletions from mine production for the period.

The Mineral Resource includes both in-situ material within the resource design outline and broken but not yet extracted material within the current cave. No surface stockpiles are included in the resource.

The net result is a decrease in contained metal in Telfer Deeps SLC Mineral Resource of 0.18Moz of gold and 6kt of copper.

The Telfer Deeps – External to the SLC Resource incorporates the Western Flanks deposit and the M50 reef underground mining area. These deposits are high grade reefs and/or veins not included within the bulk underground mining operation (SLC).

In a study completed in 2004, the Western Flanks Mineral Resource was evaluated to assess potential economic mineralisation to the west of the SLC. No additional sampling or resource updates have been carried out since the Western Flanks resource was defined in 2005 and no mining has been carried out to date.

Two material changes to the Telfer Deeps External to SLC Mineral Resource have been applied to the 2010 Mineral Resource compared to 2009:

1. Depletion due to mine production from the M50 reef area
2. Transfer from Western Flanks to the SLC of material now within the expanded SLC column (due to increased metal prices applied when estimating and reporting Newcrest Mineral Resources).

The net result is a decrease in contained metal in Mineral Resources outside of the SLC by 0.03Moz ounces of gold and 1kt of copper as compared to the 2009 estimate.

## **Ore Reserve**

The predominant mining method for extraction of the Telfer Underground Mineral Resource is Sub Level Cave (SLC). In the Western Flanks area, it is proposed that mining will comprise room and pillar mining and up-hole stoping methods. The M50 Reef was re-accessed in July 2009 and long-hole open stope mining has continued since that time.

The net change to contained metal in the Telfer Underground Ore Reserve estimate is a decrease of 0.34Moz of gold and 21kt of copper, principally due to mining depletion during the year.

### **2.4 Vertical Stockwork Corridor (VSC)**

The Vertical Stockwork Corridor (VSC) deposit lies directly below the existing Telfer Deeps Underground Sub Level Cave (SLC). The resource has been expanded as a result of additional drilling completed since 2009; no mining has occurred to date in the VSC.

#### **Mineral Resource**

The VSC Mineral Resource is based on sample data from surface and underground diamond drilling, together with knowledge gained from bulk sampling, development mapping and sampling within the Telfer Deeps Mineral Resource which lies directly above. Grades are estimated using Ordinary Kriging, inside geological domains.

The VSC Mineral Resource is classified as Inferred as the current wide drill spacing is insufficient to verify grade continuity associated with the current geological model. A program of work including additional drilling and decline development is ongoing.

Material changes in the resource since 2009 are a result of additional drilling and a better informed geological interpretation; the contained metal in the Mineral Resource has increased by 0.23Moz of gold and 42kt of copper.

#### **Ore Reserve**

No Ore Reserve has been established for the VSC.

### **2.5 Telfer Satellite Deposits**

#### **Mineral Resource**

The Telfer Satellite Resources comprise resource estimates for the Backdoor West, Dolphy and Big Tree deposits. These Resources represent potential additional ore feed to the current operation and/or satellite dump leach extraction with final metal recovery at the current processing facilities. All Telfer satellites are located approximately 30km from the Telfer Gold Mine.

The Mineral Resources are estimated within geological constraints by Ordinary Kriging and in all cases the 2010 Mineral Resource is the same as that reported for 2009. No mining has been conducted in any of the Telfer satellite deposits.

## Ore Reserve

No Ore Reserves have been established for the Telfer satellite deposits.

### 2.6 O'Callaghans

The O'Callaghans poly-metallic deposit is located approximately 10 km south of Telfer Gold Mine. Mineralisation containing economic quantities of tungsten, copper, zinc and lead has been identified approximately 300m below surface as a sub-horizontal layer of poly-metallic skarn (altered limestone) mineralisation up to 60m thick on the contact between a large granitic intrusion and overlying limestones. Molybdenum and silver are present but are not currently considered economically significant; gold is not present in potentially economic amounts.

Following a major resource definition program and study of the deposit during 2009/10, the first Ore Reserve has been established. Development plans are based on decline access to an underground operation. Ore may be processed through the existing Telfer processing facility with minor modifications.

#### Mineral Resource

The O'Callaghans deposit has now been drill intersected with 184 holes, including wedge holes, for a total of approximately 71,700m. Typical drilling configuration was reverse circulation pre-collars and diamond core through the mineralisation. Average hole spacing through the main ore zone is approximately 100m x 100m. A 200m x 200m test area in the centre of the mineralisation was drilled at 50m x 50m intervals to evaluate short distance grade continuity. The margins of the deposit have now been defined over the majority of the area.

The continued drill evaluation has enabled an updated estimation of the Mineral Resource. The increased confidence in the grade continuity of the mineralisation supports an Indicated Resource classification for the majority of the deposit for the first time. Industry standard quality assurance has been applied to drill assays including submission of standards and 'blind' sample re-assaying. Interpretation of the geological framework with grade estimation by Ordinary Kriging was used to estimate the metal inventory. All knowledge of the O'Callaghans deposit to date is from drill core sampling only.

The Mineral Resource comprises the in-situ inventory of the main mineralised horizon where drill hole spacing is sufficient to permit Indicated or Inferred classification. No grade or economic value cut-off has been applied to this volume with the exception of minimum mining height of 5m.

As a result of the major drill programme and updated geological model, the 2010 Mineral Resource has increased by 89kt of tungsten trioxide (WO<sub>3</sub>) metal and 66kt of copper metal compared to the 2009 estimate. Recognition of a separate, higher grade but spatially restricted volume has decreased the estimated contained zinc and lead metal.

#### Ore Reserve

The O'Callaghans Ore Reserve is being reported for the first time. The Ore Reserve is estimated on a value basis using metal prices of US\$2.00 per pound of copper, US\$9.00 per pound of tungsten, US\$0.65 per pound of lead and US\$0.80 per pound of zinc. The estimate is based on stoping with fill using Telfer's established underground mining capability. Mining methodology is based on substantially limiting subsidence of the overlying limestone. Costs have been estimated using Telfer's established performance with additional costs for the new fill and processing work elements.

Ore can be readily conveyed to the surface, then overland to the existing Telfer plant. Processing recovery estimates are based on laboratory testwork considering the current process plant can be readily modified to enable recovery of the zinc, copper, lead and tungsten components.

The inclusion of O'Callaghans in the 2010 Reserve adds 0.14Mt of copper to the Telfer Province total.

### **3. GOSOWONG PROVINCE (INDONESIA)**

Gosowong is located on the island of Halmahera in North Maluku Province in the eastern part of the Republic of Indonesia. Gosowong is owned and operated by PT Nusa Halmahera Minerals (PT NHM), an incorporated joint venture between Newcrest Singapore Holdings Ltd<sup>1</sup> (82.5%) and PT Aneka Tambang (17.5%). Tenure over all Gosowong deposits is covered by a 6th generation Contract of Work No.B.143/PRES/3/1997.

For the purpose of reporting Mineral Resources and Ore Reserves, Newcrest is reporting 100% of the assets. Actual metal production is marketed by PT Nusa Halmahera Minerals and the owners receive a return through a distribution of profits through dividends.

High grade mineralisation within the Gosowong gold field is associated with low sulphidation epithermal vein deposits. The ore shoots are narrow and approximately planar although irregular and complex at a local scale. The deposits are relatively moderate to low in dip, averaging around 40-50 degrees in the Kencana – Gosowong structural corridor and sub-vertical in the Toguraci corridor. Silver to gold ratio in the ore is approximately 1:1.

Gosowong has been in production since 1999 and to date has yielded more than 2.8Moz of Au from three deposits (Gosowong, Toguraci and Kencana). Both open pit and underground mining methods have been utilised with current mining via underground only (K1, K2 and K-Link).

The Gosowong Mineral Resource is a combination of resources estimated for the Kencana ore-bodies (K1, K2 and K-link), Toguraci ore-bodies (Damar, Yahut, Midas, Wulan and Kayu Manis), Gosowong Open Pit, Gosowong Tailings, and Stockpiles. The net change in contained metal in the Mineral Resource is 0.04Moz of gold net of mining dilution.

#### **3.1 Kencana**

The Kencana mineralised system is a complex intersecting network of structures consisting of well developed epithermal vein zones (K1 and K2) and link structures. The (K1) Kencana deposit was discovered in 2002 and gold production commenced in early 2006.

Since June 2009, production has been mainly from the Kencana K2 and K-Link systems as well as from the K1 ore-body. Mining is either by the underhand cut and fill method with cemented paste fill or long hole open stoping (limited to K1 at depth and K-link).

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<sup>1</sup> Newcrest Singapore Holdings is a wholly owned subsidiary of Newcrest Mining Limited.

## Mineral Resource

The Mineral Resources at Kencana have been updated to account for the recent mine production and grade control drilling data (since June 30, 2009). As a result of this additional information and the impact of mining depletion during the year, the grade has been reduced in some areas of the K1, K2 and K-Link.

The K1 mineralised and stockwork zones have been estimated using Ordinary Kriging and a traditional 3D block modelling methodology. Separate estimates were completed for above and below 4,900mRL. Additional estimation constraints were applied to the high grade K1 Northern Deeps zone.

K2 and K-Link have been estimated using a simulation approach. Geostatistical simulation techniques have been applied in an attempt to model and quantify geological and grade variability based on the experience from mining the K1 orebody.

Since June 2009, Au metal contained in the K1 Mineral Resource has decreased by approximately 33% and the K2 and K-Link combined resource has decreased by approximately 12% in tonnage and 27% in Au metal. The variances have been attributed to mining depletion of higher grade material plus model adjustments and depletion. All K1 material is classified as Indicated given the small scale geometrical complexity evident in the lodes. The K2 ore-body and K-Link are also classified as Indicated. Continued development of the K-Link ore-body and further grade control drilling has resulted in a modified boundary position being geologically identified; effectively transferring a volume of material previously interpreted as forming part of K-Link to K2. For effective mine planning and reporting, the K2 and K-Link ore-bodies are grouped and depleted as a single entity.

## Ore Reserve

A full update of the 3D mine design for Kencana was prepared using standard industry mine planning software during 2009/10. The mine design and Ore Reserves are based on cut-off grades calculated using currently approved cost inputs and the latest metal price assumptions. The dominant mining method at Kencana is underhand cut-and-fill with cemented paste backfill in order to maximise recovery of the high grade orebodies in relatively poor ground conditions. During 2009/10, six longhole stopes were successfully extracted in areas of better ground conditions and suitable orebody geometry. This has led to an increase in longhole stoping planned for future mining in K1 and K-Link. Longhole stopes account for around 33% of the total designed ore tonnage within the Kencana Ore Reserve estimate. The net decrease in contained metal in the Kencana Ore Reserve is 0.63Moz of gold and 0.28Moz of silver, due to a combination of updated Mineral Resource models and mining depletion.

### 3.2 Toguraci

Open pit mining commenced on the Damar vein at Toguraci in October 2003, subsequently extending to the T-Fault, Midas, and Jembatan veins and later to the Damar and Kayu Manis veins. Open pit mining at Toguraci concluded in October 2006.

This year a maiden Mineral Resource and Ore Reserve based on an underground mining strategy is being reported for Toguraci.

Of the five resource shoots, two are newly discovered; Damar North (an extension of the main Damar shoot) and Yahut. The new resources are in separate shoots (within the same host structure and/or along extensions to the same host structures), below and along strike (north and south) of the previously mined Toguraci shoots. The new shoots are of similar size and grade.

### **Mineral Resource**

The epithermal vein structures at Toguraci are relatively narrow with horizontal widths typically ranging between 0.1m and 5m. A 3D simulation approach has been adopted for the estimation of the epithermal vein structures.

This is the first year Mineral Resources have been reported for the proposed Toguraci underground mine. The Toguraci Mineral Resource includes estimates for five shoots; Damar, Yahut, Midas, Wulan and Kayu Manis. Significant drilling throughout 2009 and 2010 has improved the geological understanding resulting in an Indicated and Inferred Resource containing 0.69Moz of gold and 1.8Moz of silver.

### **Ore Reserve**

The Toguraci Ore Reserve is being reported for the first time. The planned mining method for the Toguraci underground is longhole stoping, using 20m sub levels for all orebodies, except for Yahut, which assumes a 15m sublevel interval. A minimum mining width of 1.5m has been assumed with dilution ranging from 20% to 55% depending on the orebody width. The mine design and Ore Reserves are based on cut-off grades calculated using currently approved cost inputs and the latest metal price assumptions.

The inclusion of Toguraci in the 2010 Reserve has added 0.50Moz of gold and 1.3Moz of silver to the 2010 Gosowong Province Ore Reserves.

### **3.3 Gosowong Open Pit**

The Gosowong deposit was discovered in May of 1994. Open pit mine construction began in 1998, with a total production of 0.77Moz of gold between 1999 and 2002.

### **Mineral Resource**

The Gosowong Mineral Resource is located in the walls of the Gosowong Open Pit, approximately 1km from the processing plant. A Feasibility Study has been completed into the extraction of this resource and project work has commenced in preparation for mining to begin during the coming financial year.

The Mineral Resource estimate for Gosowong was last updated in January 2008, to include additional drilling data. The Mineral Resource is estimated to contain 0.12Moz gold and 0.38Moz of silver.

## Ore Reserve

Completion of the Gosowong Open Pit Cutback Feasibility Study during 2010 has provided the basis for an updated Ore Reserve estimate.

Mining of the Gosowong pit will comprise a single stage cutback of the existing pit using conventional truck and shovel methods on a similar scale to previous operations at Gosowong and Toguraci.

The 2010 Ore Reserve has increased contained gold by 0.03Moz, due to the updated pit design and increased metal prices.

### 3.4 Gosowong Tailings Re-treatment

A portion of economic grade tailings deposited into the Gosowong tails dam during the initial processing of the high grade portion of the Kencana deposit have been classified as an Indicated Resource and an Ore Reserve. This is based on plans for extraction and re-treatment of this material through the upgraded Gosowong plant. The recent addition of a tertiary grinding circuit enables significant improvements in gold recovery from a finer leach feed.

The Ore Reserves estimate is supported by a recent tailings re-treatment study and auger sampling program to confirm the spatial location and grade of the target material. Costs have been estimated on the basis of current performance with planned extraction from the Tailings Storage Facility by excavator and truck methods. Mining recovery and dilution parameters have been applied to reflect expected operating conditions. Metallurgical recovery parameters are based on current plant performance.

## 4. CRACOW GOLD MINE (QLD)

Cracow is a joint venture between Newcrest Operations Limited (70%) and Sedimentary Holdings Ltd (a subsidiary of Catalpa Resources Limited) (30%).

Gold mineralisation at Cracow occurs in steeply dipping low sulphidation epithermal fissure quartz veins hosted by andesitic volcanics and volcanoclastic sediments of the Camboon Volcanics. The tenor of the gold grade is high (~10g/t Au) and is associated with silver (typically Au:Ag ratios of 1-3:1 for the bonanza grade events).

Discovery of the early Permian aged epithermal veins has contributed 1.6 million ounces to the mineral endowment of the Cracow Goldfield since Newcrest's involvement. This combined with historical production of 0.9 million ounces takes the total endowment of the field to over 2.5 million ounces.

The Cracow orebodies are accessed from a decline and mined via open stoping with concurrent waste backfilling.

There are several shoots which comprise the Mineral Resource and Ore Reserve inventory at Cracow. The shoots are in various phases of mining from early development and stoping (Kilkenny, Phoenix, Sovereign and Klondyke North) through to nearing completion (Royal and Crown). Roses Pride is to be accessed from a separate portal to the current operations.

## Mineral Resource

The Cracow Mineral Resource is a combination of resources estimated at the Royal, Crown, Klondyke North, Sovereign, Empire, Roses Pride, Kilkenny (including Tipperary) and Phoenix ore shoots.

The Mineral Resource estimates for Cracow are based on data collected from surface diamond drilling, resource definition (pattern) drilling and underground grade control, comprising in-drive diamond drilling, face sampling and mapping.

This year, the Crown, Klondyke North, Sovereign, Roses Pride, Kilkenny and Tipperary models have been updated. There is no change to the Royal or Empire models from last year. The Phoenix shoot has been added this year. The majority of the Mineral Resources have been estimated using 3D Ordinary Kriging. The exceptions include; Royal and Crown (which are estimated using a combination of 2D and 3D methods) and Empire (which is estimated using 3D Inverse Distance Squared). Both Kilkenny and Roses Pride are now estimated using Ordinary Kriging following the addition of drilling and grade control data since 2009. Topcuts (different per shoot) have been applied to reduce risk metal. In all cases, top-cuts have been applied to the composited data.

The resources have been classified as Measured, Indicated and Inferred after consideration of (some or all of) geological and grade continuity, drill spacing, the extents of the Mine Development (availability of mapping and grade control data) and the estimation confidence (as measured by estimation from first or second pass neighbourhoods).

Since June 2009, the Cracow Mineral Resources (including depletion) have increased by 0.12Moz gold (Newcrest's 70% interest). The material changes to the Mineral Resources include mining depletion (at Royal, Crown, Klondyke North and Sovereign), remodelling (Sovereign, Klondyke North, Kilkenny and Tipperary) and additions (at Phoenix and Roses Pride).

The Cracow stockpile material is classified as Measured Mineral Resource and Proved Ore Reserve.

## Ore Reserve

The Mineral Resource models were converted to Ore Reserves through a process involving re-blocking to the height of the ore drives and stopes with a strike length of 12.5m along the drive. Dilution and ore loss parameters have been maintained in accordance with the June 2009 Ore Reserve.

The Royal Ore Reserve has had no further work done on it this year - changes in the estimate represent mining depletion only.

The Crown, Klondyke North and Sovereign ore-bodies have been remodelled with the latest available information. The changes in the Ore Reserve estimation represent changes to the block models and mining depletion.

The Kilkenny Ore Reserve is new. The Ore Reserve estimate was prepared using Cracow standard parameters for dilution and recovery, with the exception of the overbreak allowance which has been increased to 600mm to allow for ground conditions.

The Roses Pride Ore Reserve is also new and is to be accessed from a separate portal to existing operations. Surface works can commence once environmental clearance is received. The Ore Reserve was created using Cracow standard parameters for dilution and recovery, with the exception of the 2220 level which is to be mined below old workings.

The Phoenix Ore Reserve is new. The Ore Reserve estimate was prepared using Cracow standard parameters for dilution and recovery.

Mining depletion comprises mining from the Royal, Crown, Sovereign and Klondyke North ore-bodies. Additional material was mined during the reporting period from the Kilkenny and Phoenix ore-bodies, which were not included in the previous year's Ore Reserve estimates.

The Cracow Ore Reserve remained unchanged from 2009 with additions to the Ore Reserve replacing mining depletion.

## **5. NAMOSI (FIJI)**

The Namosi Project is located in the south-eastern part of Viti Levu, the main island of the Republic of Fiji, 30km west-northwest of the Fijian capital city of Suva. Newcrest entered into the Namosi Joint Venture (NJV) in 2007 and now holds a 69.94% interest in the joint venture and is manager of the project activities.

The known porphyry-style copper-gold systems in Fiji occur mainly in the southeast of Viti Levu. These are the Namosi deposits associated with diorite porphyry and quartz diorite porphyry including the Waisoi, Wainabama and Waivaka districts.

This year, the Namosi Project includes Mineral Resource estimates for Waisoi and Wainaulo (contained in the Waivaka district). This is the first Mineral Resource reported for the Wainaulo deposit. The Mineral Resources are reported using marginal copper cut-off grades which differ for each deposit. The gold grades are reported conditional to the recovered copper grades.

This year, the Namosi Project reports a maiden Ore Reserve for Waisoi. The Ore Reserve is based on extraction of the Waisoi deposit via two open pits; Waisoi East and Waisoi West.

### **5.1 Waisoi**

Copper mineralisation was first discovered in the Waisoi area in the late 1960's followed by progressive exploration by several companies and subsequent work by the NJV.

The Waisoi porphyry Cu-Au-Mo mineralisation occurs within a sequence of Tertiary volcanics and porphyritic intrusive rocks located within the main volcanic island of the Fiji Islands group. The mineralisation at Waisoi occurs as disseminations, fracture fill and vein fill. Chalcopyrite and bornite are the dominant copper sulphide minerals, although covellite, digenite and chalcocite have also been observed. The approximate extents of the system (at 0.1% Cu) are 2.7km E-W, 1.6km N-S and ~1000m vertically. The deposit includes two broad overlapping zones; Waisoi East and Waisoi West.

The Waisoi deposit is currently the subject of pre-feasibility level studies. Studies to date have determined that the Waisoi ore body will be extracted by conventional open pit mining and processed by conventional flotation methods. In June 2009, NML reported an initial Mineral

Resources estimate for Waisoi. This year, NML is reporting an updated Mineral Resource along with an initial Ore Reserve.

## **Mineral Resource**

The Waisoi Mineral Resource was re-estimated in May 2010. The model is based on a new 3-dimensional geology model that incorporates interpretations of lithological, structural and mineralisation features which are observed to have an impact on the distribution and/or tenor of mineralisation. The new model incorporates all available drill holes up to the 14th April, 2010 (totalling 270 historic and 36 NJV holes). The integrity of the historical data has been comprehensively checked and as a result no drill data has been removed for estimation. Quality assurance and quality control analysis on the NJV and previous data has encompassed accuracy measures such as certified reference materials, precision measures such as duplicate analyses, as well as blind resubmissions and external laboratory checks. For the resource estimation, all collar and survey data was checked and at least 5% of the assay data was checked against the original data source. No top-cuts were applied.

The model for Waisoi includes grade estimates for Cu, Au, S and Mo. The tonnage and grade estimates for Cu and Au were estimated by Conditional Co-Simulation using the Direct Block Simulation methodology. The tonnage and grade estimates for Mo and S were estimated by Ordinary Kriging. Density values were assigned based on oxidation state and lithology (in that order).

The Mineral Resource is reported using variable cut-off grades inside a maximum undiscounted cash flow pit shell. The resource is classified into Indicated Resource and Inferred Resource based on grade and geological continuity and data coverage.

The Waisoi Mineral Resource has increased by 0.73Moz (69.94%) of gold and 779kt (69.94%) of copper since 2009. The main reasons for this change include the lowering of cut-off grades (as a function of higher metal price assumptions) and the inclusion of additional material in the resource in response to the additional drilling data. A notional US\$1000/oz Au and \$4.00/lb Cu pit shell was used to spatially limit the Mineral Resource.

## **Ore Reserve**

The Waisoi Ore Reserve is being reported for the first time based on pre-Feasibility level studies undertaken during 2009/10. Large scale open pit mining methods will be employed involving conventional truck and shovel equipment with ex-pit crushing and conveying systems to transport material separately to waste storage and processing facilities. Waste rock storage facilities (WRS) will be developed in adjacent valleys. Ore will be processed using a conventional copper flotation circuit in a large scale processing facility constructed at a suitable location approximately 4km from the open pits. Gold and copper will be recovered in a concentrate. Tailings will be deposited into a Tailings Storage Facility formed in conjunction with the WRS facilities. The concentrate is planned to be transported to the Suva Port and loaded onto ships. The project will involve establishment of required infrastructure at the Waisoi site and in Suva.

Ultimate pit limits have been determined by a block value cut-off approach using industry standard pit optimisation software. Cost inputs have been derived from the Pre-Feasibility Study and the latest metal price assumptions have been applied. Two distinct pits (designated East Waisoi and West Waisoi) have been identified within a 2km strike length separated by a ridge of

sub-economic mineralisation. A series of interim pit cutbacks have been designed within the ultimate pit designs. Final pit depths are in the order of 400m below surface. Appropriate geotechnical design criteria have been determined based on investigations to date.

Within the pit designs there is an additional 84Mt (based on 69.94% equity share) grading 0.3% copper and 0.09g/t gold containing 0.29Mt Cu and 0.25Moz Au which is classified as Inferred Mineral Resource. This Inferred Mineral Resource will be tested by further drilling. A small proportion (<10%) of the Ore Reserve falls within a pit increment that is dependent upon the inclusion of Inferred Resources to meet the economic criteria for production. Newcrest has every expectation that the planned further drilling will upgrade these Inferred Resources.

The initial Waisoi Ore Reserve, based on 69.94% equity share, adds 2.5Moz of gold and 2.42Mt of copper to the Group total.

## 5.2 Wainaulo

The Wainaulo deposit lies in the Waivaka Corridor, which is a 5km long east-north-east trending zone of porphyry-related mineralisation. The geology of the Waivaka area comprises a Tertiary sequence of volcanic and volcanoclastic rocks of the Medrausucu Group which is intruded by dioritic porphyry intrusions.

Copper and gold mineralisation is hosted in and adjacent to the porphyry intrusions and is dominated by vein-hosted sulphide mineralisation, and lesser fracture fill and disseminated styles. Bornite and chalcopyrite are the dominant copper sulphides observed in fresh rock. Controls on mineralisation are predominantly proximal porphyry intrusions and preferred structural orientations that parallel the broader corridor.

Wainaulo is currently the subject of a desktop study to evaluate its potential as a bulk underground operation.

### Mineral Resource

The Wainaulo Mineral Resource was estimated in June 2010. The model is based on a new 3-dimensional geology model that incorporates interpretations of lithological, structural and mineralisation features which are observed to have an impact on the distribution and/or tenor of mineralisation. The new model incorporates all available drill holes up to the 19th April, 2010 (totalling 11 recent NJV drill holes and 9 historical drill holes by Nittetsu). The database used for the resource estimation includes a total of approximately 12,700 assayed and 314 density measurements from core samples. The integrity of the historical data has been comprehensively checked and as a result no drill data has been removed for estimation. Quality assurance and quality control analysis on the NJV and previous data has encompassed accuracy measures such as certified reference materials, precision measures such as duplicate analyses, as well as blind resubmissions and external laboratory checks. For the resource estimation, all collar and survey data was checked and at least 5% of the assay data was checked against the original data source.

The resource tonnage and grade was estimated using Ordinary Kriging into 50m x 50m x 45m blocks. Density values were assigned to the block model based on sulphide species domains and oxidation state.

The resource has been classified as Inferred Resource based on an assessment of drill hole spacing, style of mineralisation, mining selectivity and geological and grade continuity.

### **Ore Reserve**

No Ore Reserves have been defined as yet due to the current resource classification.

## **6. MARSDEN (NSW)**

The Marsden copper-gold porphyry deposit is located between the NSW towns of Forbes and West Wyalong approximately 150 kilometers southwest of the Cadia Valley operation. The deposit is centred on porphyry-style gold, copper and molybdenum mineralisation, located beneath 110 metres of cover. No further drilling has been conducted at the deposit since the 2009 estimate however a major concept study was completed. The concept study has enabled a maiden Ore Reserve estimate to be prepared this year.

### **Mineral Resource**

The Marsden Mineral Resource is reported on a 'value' basis (material above zero dollar cut-off) similar to that used for open pit Mineral Resources in Cadia Valley. The value estimation includes long term revenue assumptions and incorporates mining costs based on similarities with Cadia Hill. Allowance has been made for cover stripping, expected mill recoveries and anticipated realisation costs. A notional US\$1000/oz Au and \$4/lb Cu pit shell was used to spatially limit the Mineral Resource. In addition, a volumetric constraint based on drilling density is applied within the pit shell.

Marsden is a body of porphyry-style Cu-Au mineralization in intrusive rocks. The deposit lies about 110m below the surface under un-mineralized riverine clays and sands. There is a thin horizon of oxidized, mineralized intrusive rock at the base of this cover sequence which is not included in the resource, thus the upper surface of the fresh intrusive rock forms the upper boundary of the Mineral Resource. The deposit is terminated on their eastern side and at depth by a major, west-dipping regional fault called the Marsden Thrust, beneath which un-mineralized sediments occur. The northern, western and southern boundaries of the Mineral Resource are defined by the limits of drilling. The deposit has a higher-grade gold and copper core with grades generally decreasing with distance away from this core.

The Mineral Resource is defined by 54 core drill holes (both NQ3 and HQ3) drilled on approximately 100 x 100m and 100 x 50m grid spacing. The Mineral Resource estimate was prepared using Ordinary Kriging.

The application of higher metal prices has had a minor effect on the resource estimate, slightly increasing tonnage and contained metal to the Mineral Resource.

### **Ore Reserve**

The Marsden Ore Reserve is being reported for the first time based on the completion of Concept level studies. The mining method will be open pit, with the ultimate pit limits determined by value using industry standard pit optimisation software. The mining operation will involve pre-stripping of sands and clays that cover the deposit and then conventional truck and excavator mining in the ore bearing zones. Mine operating and cost parameters used as the basis for the estimation originate from the Cadia Hill operation based on Marsden having very

similar scale and material properties. Waste rock is designed to be hauled to waste dumps constructed around the tailings storage facilities, or intermingled with the tailings. Ore treatment design is by conventional copper flotation methods. Tailings will be deposited into a constructed storage facility. The concentrate will be pumped to a rail loading facility.

Capital and operating cost assumptions are based on the assumed availability of existing third party processing facilities in the vicinity of the Marsden deposit or acquisition of a second hand plant. Commercial agreements to access these third party facilities are not currently in place. Newcrest has reasonable expectations that such agreements will be able to be negotiated within the financial parameters assumed for the basis of the Ore Reserve estimate.

The initial Marsden Ore Reserve increases the Newcrest Group total by 0.88Moz of gold and 0.46Mt of copper.

## **7. MOROBE MINING JOINT VENTURE (PAPUA NEW GUINEA)**

Newcrest is in joint venture (50% interest) with Harmony Gold Mining Company Limited (Harmony) to explore, develop and mine deposits located within leases in the Morobe province of Papua New Guinea. This joint venture is known as the Morobe Mining Joint Venture (MMJV). The MMJV operates a gold/silver mine at Hidden Valley, 90 kilometers south southwest of Lae. The MMJV is also conducting a major exploration and resource development project at Wafi – Golpu which is located approximately 70 kilometers northwest of Hidden Valley mine.

Mineral Resource and Ore Reserve estimates for MMJV assets have been prepared on behalf of the joint venture by Competent Persons provided by Harmony and Newcrest or Competent Persons directly employed within the MMJV. Significant changes since 2009 comprise a major resource addition at Golpu and mining depletion at Hidden Valley which is more than offset by resource and reserve additions from further drilling. Details of estimates for Hidden Valley Kaveroi, Hamata, Wafi, Golpu and Nambonga will also appear on the Harmony website [www.harmony.co.za](http://www.harmony.co.za).

The Hidden Valley project comprises separate structurally controlled epithermal stockwork style gold – silver deposits at Hidden Valley Kaveroi and Hamata. The deposits are mostly hosted in granite and some metasediments.

The Wafi-Golpu Project consists of the Golpu Cu-Au-Mo porphyry deposit, Wafi high-sulphidation epithermal Au deposits and the Nambonga Au-Cu porphyry deposit all of which fall within a 2.4 km square surrounding a central diatreme breccia complex.

### **7.1 Hidden Valley**

#### **Mineral Resource**

The Mineral Resource is a combination of resources estimated at the Hidden Valley Kaveroi deposit and the Hamata deposit, and includes broken ore stockpiles. Several changes have been incorporated in this Mineral Resource estimate, the most notable being an updated resource model for the Hidden Valley Kaveroi deposit, informed by updated geological information and interpretation derived from an ongoing resource definition drilling program.

The Mineral Resource for the Hidden Valley Kaveroi deposit has been reported using a value algorithm. The value algorithm takes account of revenue, processing and realisation costs.

The Mineral Resource for the Hamata deposit has been reported using a marginal ore cut-off grade of 0.8g/t Au as was the case with the 2009 reported resource.

A number of changes have been made to the 2010 Mineral Resource estimate as compared with the reported 2009 resource. Key amongst these is:

- Updated resource model for the Hidden Valley Kaveroi deposit, informed by updated geological information and interpretation derived from an ongoing resource definition drilling program.
- Change in the estimation methodology for the Hidden Valley Kaveroi deposit from Multiple Indicator Kriging grade estimation to Bi-Variate Direct Block Simulation grade estimation.
- Application of a value based profit algorithm for the Hidden Valley Kaveroi deposit.
- Minor change in commodity price assumptions.
- Re-optimised pits using the notional spatial constraint at US\$1000/oz gold price.
- Mining depletion to end May 2010, with an estimate of mining depletion for June 2010.

The most significant increases have resulted from the use of an updated Hidden Valley Kaveroi resource model that has been informed by new geological information resulting in a re-classification of the resource. This resource was modelled using a B-Variate Direct Block Simulation grade estimation method based on a selective mining unit (SMU) size of 10mN x 10mE x 6mRL. The drill hole sample composite size used was 4 metre lengths within mineralised domains generated from sectional interpretations.

The Hamata resource was previously estimated using both Ordinary Kriging and Multiple Indicator Kriging grade estimation methods based on a Change of Support correction for a SMU size of 10mN x 10mE x 2.5mRL. The drill hole sample composite size used was 2 metre lengths within mineralised domains generated from sectional interpretations.

Drill hole collars are surveyed after hole completion and down-hole surveys are taken at regular intervals; core orientations are also undertaken where appropriate. Drilling is pre-dominantly diamond core (PQ to NQ size), with sampling of half core. A minor number of RC holes have been drilled and sampled. Gold grade was determined by 30g fire assay and silver grade was determined by AAS. Comprehensive QAQC programs have been conducted on all resources using standards, pills, check samples, and barren flush analysis.

## **Ore Reserve**

The Hidden Valley Mine consists of the Hidden Valley Kaveroi and Hamata open pits located approximately 6km apart in steep, heavily forested, mountainous terrain. Ore processing and tailings storage facilities have been constructed adjacent to the Hamata open pit. Both pits employ conventional truck/excavator mining techniques with nested incremental cutbacks. Ultimate pit limits have been defined using a block value approach with industry standard pit optimisation software.

A 4.5km long overland pipe conveyor transports crushed ore from the Hidden Valley Kaveroi open pit down to the Hamata ore processing facility. The ore processing facility commenced production during 2009/10.

Several changes have been incorporated in this Ore Reserve Estimate, the most significant of these being an updated resource model for the Hidden Valley Kaveroi Pit, removal of a previous constraint relating to designed tailing storage capacity, increase in metal price assumptions, introduction of a value based profit algorithm and mining depletion.

The combined impact of all changes to the estimate is an increase contained metal in Ore Reserves of 0.43Moz (50% Newcrest share) of gold and 9.5Moz (50% Newcrest share) of silver compared to the 2009 estimate.

## 7.2 Wafi

### Mineral Resource

The Wafi deposit is subdivided into four separate moderately dipping gold domains labeled A Zone, B Zone, Link and the Golpu gold cap. Drilling comprises a combination of diamond core (85% of the data) and reverse circulation percussion conducted in a number of campaigns by various tenement holders since 1983. Approximately one third of the drilling is 2003 or later. The quality of the drilling data is to an acceptable standard although of note some near surface core recovery was poor in the highly weathered zone less than 50 metres from surface however the data was retained because no bias is apparent. The gold domains each comprise contiguous better than one gram per tonne material with hard boundaries defining their limits. Gold grades have been estimated using Ordinary Kriging within those domains. Lower grade and more sporadic mineralisation exists beyond the domain limits however this material is currently excluded from the resource estimate and it does not inform the blocks inside the domains. The mineralisation outcrops as oxide parts of some domains and continues at depth in the deepest domain to approximately 350 metres. The fresh zone mineralisation is partly refractory in nature. The resources are restated from the 2009 estimate as no new resource drilling has been conducted. Further details are documented on the Harmony website [www.harmony.co.za](http://www.harmony.co.za).

## 7.3 Golpu

### Mineral Resource

The Golpu Mineral Resource is a combination of resources estimated in the intrusive Golpu porphyry and surrounding stockwork mineralisation in the meta-sedimentary host rock, with an overlying supergene copper zone. The goldcap resource that exists above Golpu is reported separately with the Wafi gold resources. Several changes have been incorporated in this Mineral Resource estimate, the most notable being a significant increase in the size of the porphyry and stockwork zone of the deposit, informed by updated geological information and interpretation derived from an ongoing exploration and resource definition drilling program.

The Mineral Resource for the Golpu deposit has been reported entirely internal to a hard, wireframe boundary at a nominal 0.3% Cu cut-off, with an appropriate Indicated and Inferred classification scheme.

The Golpu resource was estimated using Ordinary Kriging with a parent cell of 40m x 40m x 40m with variable sub-blocking to 10m x 10m x 10m. Cell size was chosen to represent the grade continuity at the current drill spacing, to provide suitable volume resolution of the mineralised lodes and geology and be consistent with the previous estimate. The drill hole sample composite size used was 4 metre lengths within mineralised domains generated from sectional and plan interpretations.

All diamond drill hole collar locations have been surveyed in the Wafi grid and all holes were surveyed. Drilling is pre-dominantly diamond core (PQ to NQ size).

All samples from the Golpu deposit have been routinely analysed for gold, copper, molybdenum, silver lead, zinc and arsenic. QAQC programs have been conducted on the analysis methodology.

The additional drilling data has resulted in an increase to contained metal in the Golpu Mineral Resource of 2.9Moz (50% Newcrest share) of gold and 1.5Mt (50% Newcrest share) of copper since 2009.

### **Ore Reserve**

No Ore Reserves have been established for the Wafi or Nambonga deposits. These deposits are subject of an ongoing study together with Golpu which during the year comprised ongoing metallurgical testwork and mining studies.

The Golpu Ore Reserve is based on a block cave design for the deposit. As most of the Mineral Resource addition achieved to June 2010 has been classified as Inferred Resource, no further Ore Reserve addition has been made at this time. The previous Ore Reserve is documented on the Harmony website [www.harmony.co.za](http://www.harmony.co.za). For these reasons the Golpu Ore Reserve estimate remains unchanged from that reported in 2009.