

# MUNGA RIVER LTD (MRL) KUPUYAPA MINING LTD (KML)

#### MT HAGEN PROJECT PRESENTATION

- 100 % NATIONALLY OWNED
- PORPHYRY COPPER GOLD
- EPITHERMAL GOLD

POTENTIALLY THE NEXT EMERGING PORPHYRY COPPER GOLD DISCOVERY



8m @ 0.82% Cu

1m @ 1.66 % Cu

1m @ 1.37 % Cu

#### **PROJECT LOCATED WITHIN FERTILE MINERAL CORRIDOR**



#### **Presentation Outline**

- Location & Access
- □ History
- □ Geology
- Structural Focus
- □ Geophysics
- □ Prospects
- □ Final Remarks

#### **Access and Tenement Status**



#### EL1611 – Kupuyapa Mining Ltd

- Granted on 28<sup>th</sup> November 2008
- 30 sub blocks 103.2 km2
- Extension application lodged



EL2511 – Munga River Ltd

- Granted on 12th September 2017
- 30 sub-blocks, 103.2 km2
- Expiry date 11<sup>th</sup> September 2025

- Located 30km northeast of Mt Hagen
- Two separate tenements but contiguous, 60 sub-blocks in total, 206.4 square kilometers.
- Helicopter takes under 15 minutes from Mt Hagen airport to reach furthest prospect
- All weather sealed road to Kotna and two dirt four-wheel drive tracks runs through tenement area
- Access road to seaport of Lae
- One hour flight from Port Moresby

#### **EXPLORATION HISTORY & CURRENT EXPLORATION WORK**

#### □ 1960s BMR - regional mapping, Kennecott

- □ 1970s to 1990s US Steal, Esso Resources, City Resources
- stream sediment,
- float sampling
- few ridge and spur soil

□ 2006-2009 – GEOMAP -stream sediment geochem -Furgo airborne geophysics

- □ Harmony Gold Exploration Sept 2009 July 2013
- 1,905 rock samples
- 5262 ridge and spur soils
- 12,881.9m of drill core from 26 drill hole
- Airborne geophysics
- Exited Mt Hagen in July 2013
- 2014 to 2023 EL1611 Pagl and Mt Maragubi Porphyry Cu-Au & Gantz Epithermal Au-Ag were discovered
- **324** samples collected from both trenches and outcrops and few floats
- □ Newly discovered outcrops located 1-2km away from historical drilled areas



## GEOLOGY (After Regional Geology 1:250,000 Ramu Sheet)

- **Overlying Upper Triassic Kana Volcanic and Lower to Upper Jurassic Sediments**
- **Low angle north dipping thrusted faulting.**
- □ Intruded by Mid-Upper Miocene to Pliocene Intrusions (Kimil Diorites)
- **NW-SE trending regional arc parallel faults Bismarck, Muglpin, Gantz Kurunga faults**
- **Cut by SE dipping transfer faults Pugl & Pagl faults**



#### **KEY UPSIDE FEATURES**

- **Within Fertile Mineral Belt**
- Mid-upper Miocene to Pliocene Magmatism
- NW-SW Arc Parallel structural setting
- NE-SW Arc Normal transfer faulting
- □ Hosts world class porphyry Cu-Au and epithermal gold deposits
- **Can not go wrong with right and favorable local structural focus**

#### Locally Comparable Structural Focus



- **General Focus is one of the key factors that tap and localize major deposits**
- □ Mt Hagen project structural settings is potentially comparable to Frieda River deposit (PNG) and Lepanto deposit (Philippines)
- **D** Pugl & Polpana Fault Zones Arc Normal Transfer Fault



- Doughnut shaped TMI magnetic feature, bounded with Bismarck and Muglpin faults
- Anomalous copper geochemistry on peripheral mag high rim
- Magnetite oxidation –strong specular hematite-hematite evident on surface outcrops

## **Porphyry Cu- Potential**



- □ >50% of 824 rock chip samples collected return anomalous copper assay results above 500 ppm Cu (> 0.05 % Cu)
- □ 21.48 % of rock chips samples >3,000 ppm Cu (> 0.30 % Cu)
- $\square$  6.43 % of rock chip samples range between ~0.20 % to 0.3% Cu
- □ 13.1 % of rock chip samples > 0.1% Cu to 0.2 % Cu
- □ 41.01% of 824 rock samples collected return >0.10% Cu

#### Rock Chip Geochemistry – Molybdenum Assay Results (ppm)



#### Rock Chip Geochemistry – Zinc Assay Results (ppm)



- Anomalous zinc values are usually peripheral to central copper zones
- Observed to be more associated with phyllic argillic alteration zones

#### MARAGUBI PROJECT



- Three major Prospects Maragubi/Maragubi West, Rank and Epinpikta
- All porphyry Cu-Mo-Au-Ag
- Defined by outcrop, alteration and mineralization
- Located 2 -3km away from historical drilled tested area
- More exploration work carried out over Maragubi Prospect

#### Mt Maragubi West Prospect



- **500m x 400m area (open) in all directions at 2400m asl (close to peak of mountain)**
- Phyllic-argillic alteration with both supergene/hypogene copper, molybdenum, zinc mineralization
- Two types of potassic alteration, early K-feldspar-biotite-pyrite trace cpy followed by late secondary biotite-magnetite-epidote-chlorite-k-spar-albite with pervasive chalcopyrite, bornite, pyrrhotite, lesser pyrite
- Country rocks with strong amorphous silica replacement, alteration/mineralization of volcanics and sediments

#### MARAGUBI WEST PROSPECT-TRENCHES 1,2,3 7,8 & 9 (RL2400m)



- **Trench 1- Over 80m continuously pervasively disseminated mineralization**
- □ Trench 2, 8, 9 country rock replacement alteration/mineralization caused by magmatic/hydrothermal –potassic alteration
- □ High tenor copper geochemistry

## MARAGUBI PROSPECT – POLPANA RIDGE FAULT ZONE – STOCK WORK VEIN BRECCIA

**RL2000m** 



## **PONLPANA FAULT ZONE – SE DIPPING STRUCTURE**











Maragubi Prospect – at RL1700m



S15024 to S15026 3m @ 0.025 g/t Au, 0.52 % Cu, 80.66 ppm Mo (including 1m @ 0.027 g/t Au, 0.70 % Cu, 116 S15113 -1m @ 0.082 g/t Au, 0.735 %



- Potassic alteration 0
- Granular quartz vein jog cut by late chlorite-magnetite-copper sulphide (cpy, bn) 0

## Bornite, Chalcopyrite, pyrite, Magnetite (RL1700m)







S15466- OC @ 12.7 % Cu, 0.31 g/t Au, 57.6 g/t Ag, 33.3 ppm Mo



 With depth increase high temperature quartz vein with magnetite-epidote-chalcopyrite,bornite and pyrite and higher copper grades

#### PUGL RIVER FAULT ZONE - Mt Hagen NE-SW TRANSFER STRUCTURE



## Maragubi Prospect Bornite, Chalcopyrite, pyrite







S15104 –OC @ 55.9 g/t Au, 0.97 % Cu, 11,0 g/t Ag, 14 ppm Mo (RL2300m)



5m @ 0.4% Cu, 0.018 g/t Au. 0.6 g/t Ag, (RL2000m)

## MARAGUBI PROSPECT HYPOTHETICAL CROSS SECTION



- Hypothetical Cross Section A-B looking NW cuts through Maragubi West, Bugl and Rank Prospect
- SE dipping Pugl Fault Zone (dip into the hill)
- SE dipping Polpana Fault Zone (dip into the hill)
- SW side hanging wall shattering/fracturing thereby enhance favorable porosity and permeability for mineral impregnated magmatic/hydrothermal fluid up flow
- Mixing with meteoric water cause precipitation and mineral deposition
- Intense surface alteration and mineralization confirmed by high tenor geochemistry and porphyry copper style alteration vectors
- 1.0km by 1.5km surface anomaly with potential depth over 0.5km and SG @ 2.5 g/cm3
- o 1000 x 1500m x 500m x 2.5 = 1,875Mt @ 0.4% CuEq may give 7.5 Mt Cu

## BUGL PROSPECT – TRENCH 1 & 2 (RL1600m)



- □ Hematite, magnetite, chlorite, epidote, chalcopyrite more than pyrite
- □ Interstitial/disseminated type mineralization
- □ Strong oxidation
- □ 1km by 1km area



## RANK PROSPECT OUTCROPS -RL1300m-RL1200m)



litc Alteration

Jilim Creek

Sample # S15325 1m @ 1.06 % Cu, 0.5 ppm Mo, <0.005 g/t Au, 6.2 g/t Ag

Scale: 1:10,000

**Basement Intrusion ?** 

Sample # S15482 1m @ 1.37 % Cu, 0.9 ppm Mo, 0.032 g/t Au, 17.4 g/t Ag

1.79

OUTCROP GEOCHEM Cu - ppm

metres

#### **RANK PROSPECT – Mineralization hosted by volcanic rocks**



#### Rank Prospect Grid Soil Geochemistry – Cu ppm



## Epinpikta Prospect – Argillic/Phyllic - Vughy Silica-Chalcocite-Chalcopyrite-Molybdenum



# 2m @ 0.48 % Cu, 121.5 ppm Mo, 2.9 g/t Ag, 0.023 g/t Au

#### High sulphidation Signature Vector? 3km by 1km surface dimension









# **Argillic Alteration – Vughy Silica – Chalcopyrite-Chalcocite-Pyrite**



## Epinpikta Prospect – Specular Hematite-Massive Chalcopyrite









0.87 % Cu, 0.062 g/t Au, 20.3 g/t Ag, 4.5 ppm Mo



S15283 – 13.5 % Cu, 0.13g/t Au, 22.2 g/t Ag. 27.3 ppm Mo

## PAGL PORPHYRY – HIGH LEVEL PORPHYRY IN OUTCROP



50m @ 0.30 g/t Au, 0.155% Cu, including 10m @ 0.47 g/t Au, 0.361 % Cu (phyllic altered microdiorite porphyry)



2m @ 0.37 g/t Au, 2.3 g/t Ag, 0.84 % Cu, 11 ppm Mo,



S14957 -1m @ 0.34 g/t Au, 0.15 % Cu, 59 ppm Mo S14958 – 1m @ 0.029 g/t Au, 0.18 % Cu, 30 ppm Mo S14959 – 1 m @ 0.12 g/t Au, 0.07 % Cu, 138 ppm Mo



- Advanced argillic, Argillic, Phyllic alteration
- High level porphyry exposed in outcrop
- NW dipping major Pagl Fault Zone
- o Crackle breccia in Gn diorite with breccia matrix from late magmatic fluid source
- 1km by 1km prospect dimension (open)

## **Epithermal Gold**



- Artisanal workings both at Kurunga and Gantz prospects
- Main NW-SE Structure with NE-SW spay faults.
- Epithermal high-grade gold associated with high arsenic
- Bonanza gold assays from outcrops
- Upside potential for exploration

## Kurunga - Artisanal Workings











S15493 – 79.8 g/t Au S15494 – 39,8 g/t Au S15492 – 10 g/t Au S15495 -13. 1 g/t Au

# **Gantz Propsect - Epithermal Gold Prospect**





S15511-0.8m @ 28 g/t Au





S15500 1m @ 138 g/t Au



S15513 – 2m @ 9.4 g/t Au

S15526 – 1m @ 11.5 g/t Au

## **CONCLUSION/REMARKS**

- □ Strategically located within fertile porphyry copper gold corridor
- □ Favorable Structural Focus
- Newly discovered mineralized outcrops show pervasive alteration and mineralization with high tenor geochemistry.
- Bonanza Epithermal gold targets
- Exceptionally excellent access Infrastructure.
- **Conducive and strong community support**

## **Take Home! Mt Hagen Project**

- Surface with big thick smoke with lots of sparks on surface
- □ Fire and Amber source remains untested
- Drilling is next best option

