Lihir Gold Mine, Papua New Guinea

1984

2003
Mapping and character sampling

Minifie structure
Lihir
Luise volcano

Side looking radar
and off shore seismic
Mt St Helens

Post-collapse

Pre-collapse
LADOLAM GEOLOGICAL HISTORY

0.9 - 0.34my Porphyry emplacement and associated alteration

Sericite-clay-pyrite (phylllic-argillic)

Chlorite-carbonate (propylitic)

Biotite-K-feldspar anhydrite (potassic)

Slab breccias

high level intrusion

differentiating magmatic source
Porphyry style alteration
Cross section 9390

- Crackle breccia: 1-2 g/t Au
- 2-12 g/t Au
- Pyrite flooding overprints fractures
- Fractured porphyry min. 1-3 g/t Au, 5 g/t at contact
- Shear 12 g/t Au
- Shear 12 g/t Au
- Fracture porphyry min. 1-4 g/t Au
- Quartz vein 12 g/t Au
- Intrusion 1-3 g/t Au

Legend:
- Clay alteration
- Pyrite flooding (epithermal mineralization)
- Anhydrite breccia/potassic alteration
- Intrusion
Stages of alteration and mineralisation

- Porphyry related potassic-propylitic alteration – magnetite, orthoclase, biotite, anhydrite with minor Au (>300 deg C)
- Kfeldspar-pyrite – secondary Kfeldspar -> illite, pyrite-arsenian pyrite with encapsulated Au
- Quartz – chalcedony-pyrite-Au with anomalous Sb and Ba (150-200 deg C)
- Geothermal – continuing advanced argillic-argillic alteration
Minifie Pit

LUISE "CALDERA"
REGIONAL STRUCTURE

0 1km
NS long section

Minifie Drill Sections

South

Drill Section 9300 part only
opal veins overprint K-feldspar
biotite-anhydrite cut by banded chalcedony veins

Drill Section 9500 E part only
rock type change

Drill Section 9775 E part only
top of anhydrite seal
intense quartz veined zone

North
LADOLAM GEOLOGICAL HISTORY

0.35 - 0.15my Mineralization

Minifie Structure

SEE ENLARGEMENT

1000m removed

Sericite-clay-pyrite (phylic-argillic)

Chlorite-carbonate (propylitic)

Biotite-K-feldspar anhydrite (potassic)

Slab breccias

Corbett
Lihir diatreme breccia rocks

Tuff ring
Carbonised wood
Juvanile intrusion clasts
Accretionary lapilli
Lihir - structural control

- Fluidised breccia dyke
- Feeder
- Crackle breccia
- Mosaic breccia
MINIFIE
Drill Section 9500 E
Simplified from LMC data
Lithological control

13.1 g/t Au
Lihir – epithermal event

123 g/t Au
Stages of alteration and mineralisation

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Advanced argillic

Argillic

Smecite overprints potassic alteration
Lihir –
active geothermal

Kapit hot springs
1984

Minifie pit 1999
Lienetz pit 2006
Conclusion - Character sampling
Stages of alteration and mineralisation

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- Geothermal – continuing advanced argillic-argillic alteration
Kfeldspar-arsenian pyrite
13.1 g/t Au
Other vughy
Kfeldspar-pyrite
Conclusions
‘boiling zone’
Conclusions

epithermal event

123 g/t Au
Lihir Gold Mine
Role of carefully selected petrology