CET Discovery Day
St Ives – Athena Discovery
February 2014
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In particular, the forward looking statements in this document include among others those relating to the Damang Exploration Target Statement; the Far Southeast Exploration Target Statement; commodity prices; demand for gold and other metals and minerals; interest rate expectations; exploration and production costs; levels of expected production; Gold Fields’ growth pipeline; levels and expected benefits of current and planned capital expenditures; future reserve, resource and other mineralisation levels; and the extent of cost efficiencies and savings to be achieved. Such forward looking statements involve known and unknown risks, uncertainties and other important factors that could cause the actual results, performance or achievements of the company to be materially different from the future results, performance or achievements expressed or implied by such forward looking statements. Such risks, uncertainties and other important factors include among others: economic, business and political conditions in South Africa, Ghana, Australia, Peru and elsewhere; the ability to achieve anticipated efficiencies and other cost savings in connection with past and future acquisitions, exploration and development activities; decreases in the market price of gold and/or copper; hazards associated with underground and surface gold mining; labour disruptions; availability terms and deployment of capital or credit; changes in government regulations, particularly taxation and environmental regulations; and new legislation affecting mining and mineral rights; changes in exchange rates; currency devaluations; the availability and cost of raw and finished materials; the cost of energy and water; inflation and other macro-economic factors, industrial action, temporary stoppages of mines for safety and unplanned maintenance reasons; and the impact of the AIDS and other occupational health risks experienced by Gold Fields’ employees.

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St Ives

Location

- 60km south of Kalgoorlie
- 1/3 covered by salt lake
- 2/3 covered by lake sediments
St Ives

Summarised History

- Gold first discovered at Red Hill 1897
- Mining intermittent – ceased in 1930s
- WMC discovered Ni in 1966
- Victory Au Mine (re)discovered in 1980
- Junction Au Mine discovered & Mill commissioned in 1986
- Purchased by Gold Fields in 2001
- 4.5Mt/pa Mill commissioned in 2005

Annual Gold Production >400,000oz
Stratigraphy

Felsic to intermediate intrusives

Synvolcanic mafic intrusives (dolerite sills)

Late stage basins <2657 Ma

Black Flag Beds Felsic Sediments 2690-2660 Ma

Mafic - ultramafic sequence 2720-2690 Ma
Alteration

‘Oxidised’ Style

- Narrow structure and alteration footprint

epidote - magnetite
chlorite – carbonate - biotite
albite - sercite - biotite - pyrite
chlorite – carbonate - biotite
epidote - magnetite
Alteration

‘Reduced’ Style

5m@13.2g/t (349.4m) HW extensional vein
chlorite-biotite-carbonate alteration

12.5m@14.5g/t (361.4m)
quartz-carbonate-actinolite-pyrrhotite-vis. Au breccia overprinting ductile shearing

Chlorite-biotite-carbonate alteration

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Gold In Oxide

Supergene Blanket

- Extensive supergene blanket
- Predominantly ‘false’ anomalies

Orange >200ppb Au
Gold In Oxide

Distribution of Deposits

- Intense coherent anomalies may not indicate bedrock structure
- Broad distribution of deposits

Orange >200ppb Au
- Deposit
St Ives Deposits

Size Distribution

12Moz produced from 48 deposits
Exploration

Challenges

- Access onto salt lake
- Hypersaline groundwater
- Lake sediment cover
- Drilling costs increasing
- Technical experience decreasing
- High discovery rate required to replace depletion
- Looking for large deposits
- Dolerites – breaking the cycle
- How to find blind deposits
- Expectation by Gold Fields to convert endowment to reserves
Exploration

Strategy

- Full Field Aircore
  - 640 x 160m spaced program
  - 42 element ICP-MS
  - Spectral logging
  - Lithogeochem
  - Resampling of historic holes

- Stratigraphic Diamond Drilling
  - 2km x 1km diamond holes in areas of poor understanding to build a 3d litho-structural model
  - Sampling of WMC nickel holes (>30km of 4000km of diamond core relogged)
  - Integrate with seismic sections to produce a 3D model
Athena Study Area
Discovery History

1996
- Magnetic Anomaly targeted
- 5 of 6 holes planned drilled
- Eastern aircore hole failed to reach depth
Discovery History

1998

● Diana drilled out

● Hole drilled east of failed hole – Hydro-geochemistry sampling
  - 2m@2.4g/t paleochannel

● Diana Extensions Percussion
  - 2m@0.8g/t shear with chlorite alteration
  - 2m@0.6g/t Pyrite alteration
  - 2m@3.2g/t Dido channel
  - 4m@2.4g/t Athena channel
  - 2m@1.2g/t Athena channel
Discovery History

2002
- DD drilling of Dolerite Magnetic breaks

2004
- St Ives recommences AC drilling
- Horatio targeted on EW thrust
Discovery History

2006

- Argo-Junction identified as a high priority in Full Field Aircore Program
  - Ranked highly against the parameters of the mineralised system model of the time
  - Area of simple interpretation in otherwise complex corridor
  - Incomplete testing of previous targets

- Athena magnetic break targeted
  - 320x160m AC
Athena Datasets

Sub Audio Magnetics (SAM)

200ppb Anomaly for reference

1vd Magnetics

1vd Gravity

Soil Au
June 2006

- Targeted 320x160 AC program
- Dido paleochannel intersected
  - 6m@32.1g/t
- Athena intersected
  - 4m@2.8g/t EOH vein, shear, pyrite
August 2006

- 500x80m AC program drilled as part of Full Field Aircore
- Targeted 80x40m AC follow-up of previous intersections
  - 18m@3.4g/t (36m) Athena
- Additional Dido intersections
  - 4m@30.4g/t Channel
  - 2m@9.9g/t Channel
  - 2m@3.4g/t Oxide
  - 4m@2.8g/t EOH vein, shear, pyrite
October 2006

- RC line (2x80m spaced 200m holes)
- Significant shearing with biotite, chlorite, pyrite and quartz carbonate veining
- Interpreted to have drilled down the structure
December 2006

- Interpreted to have drilled down the structure
- Follow up DD to check dip orientation
- Orientation of the shear foliation confirmed and an 80x40m spaced program proposed
January 2007

- 3 lines of 80x40m spaced RC holes
- 7 holes, 1100m
  - 4m@15.7g/t (156m)
  - 4m@9.4g/t (65m)
  - 6m@6.2g/t (123m)
  - 5m@6.0g/t (85m)
  - 8m@2.9g/t (38m)
  - 7m@2.8g/t (84m)
- Encouraging results lead to extension of the program while rig was still drilling
Alteration

‘Reduced’ Style

5m@13.2g/t (349.4m) HW extensional vein
12.5m@14.5g/t (361.4m) Central Shoot

quartz-carbonate-actinolite-pyrrhotite-vis. Au breccia overprinting ductile shearing
Deposit Size

Athena Area Projects

Contained Metal (koz)

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<td>Ives Reward</td>
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Conclusions

Expanding the Exploration Space at St Ives

- All stratigraphic units have potential
- Comprehensive datasets (esp EOH Geochem, SAM, gravity, detailed magnetics)
- Budget to test the targets effectively
- Support for geological understanding

Athena targets

- Magnetic breaks
- SAM Linears
- Datasets derived from geochemical data (esp. Lithogeochem-further subdivision of the Paringa Basalt)
- Solid structural interpretation
- Hunting upstream for the source of paleochannel gold