

# Panda Hill Niobium Project Tanzania

April 2013

#### **Project Status**

- Panda Hill is an advanced Niobium project that warrants immediate commencement of feasibility work
- The Project has been tied up with a sole private owner since late 1990s
- Potential value only recently identified:
  - an initial JORC inferred resource
  - an indicative mine plan; and
  - preliminary cost estimates
- Cradle intends to immediately commence a scoping study for a 2 Mtpa Niobium operation
- Part of the vend consideration is conditional upon a definitive feasibility study demonstrating an NPV 10 of >US\$400M



## **The Opportunity**

- The Niobium price is ~US\$40,000/t, about five times the Copper price
- Niobium is listed by the USA as a "strategic" and "critical" metal essential to national security due to its lack of substitutes and limited availability
- There are three Niobium producers worldwide, all highly profitable
- No greenfield Niobium projects are under construction or have demonstrated feasibility at current price
- No other undeveloped Niobium deposits with Panda Hill's combination of grade, recovery (simple metallurgy) and open cut (low strip ratio)
- Niobium consumption set to increase substantially over next 20 years

An opportunity to bring on an attractive new project into a profitable niche market



#### **Post Acquisition Capital Structure**

Existing Shares	105,000,000
New Shares <sup>1</sup>	10,000,000
	115,000,000
Market Capitalisation at \$0.20	~\$23M
Performance Shares <sup>2</sup>	50,000,000
Options <sup>3</sup>	24,000,000

Net cash position (post raising) will be ~A\$2.6 million

#### Notes:

- 25 million subject to the completion of a scoping study including metallurgical work and confirmatory drilling resulting in a board decision from independent directors to proceed with the project.
- 25 million subject to completion of a definitive feasibility study on the project which demonstrates an NPV 10 of US\$400 million or greater. There is a pro rata conversion if the NPV 10 is between US\$300 million and US\$400 million.

#### <sup>3</sup> Options in Cradle as follows:

- 13,750,000 listed options exercisable at 20c on or before 24 January 2015
- 10,250,000 unlisted options exercisable at 20c on or before 31 May 2016



<sup>&</sup>lt;sup>1</sup> Cradle intends to offer 10 million shares at 20c to raise \$A2M

<sup>&</sup>lt;sup>2</sup> The Performance Shares are subject to the following milestones:

## **Project Management Team**

Grant Davey
 Managing Director (on completion)

Russell Bradford
 Project Study Consultant

Keith Bowes Project Director

Neil Inwood Resource Geologist

Nick Castleden Exploration Geologist

Craig Burton
 Corporate and Strategy

A strong, capable team with the right experience to drive the feasibility and development work



#### **Niobium and the Future**

- Niobium enables significant cost benefits in construction and machinery manufacture
- \$9 of Nb added to a car:
  - Reduces the weight by 100kg
  - Increases fuel efficiency
  - Decreases greenhouse gases
- 0.022% Nb added to large bridge construction:
  - Reduces weight
  - Saves production costs
- 0.025% Nb was used in the Millau Valley bridge
  - 60% weight saving in steel and concrete
- Nb increases weathering resistance



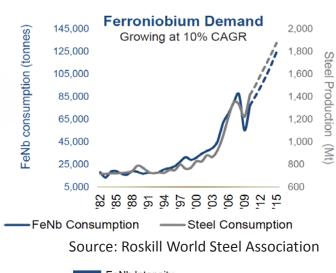


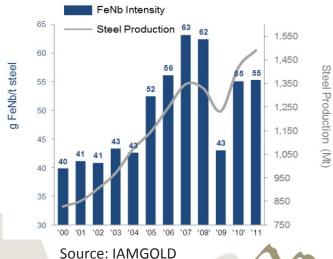
Source: IAMGOLD



#### **Niobium Demand**

- Solid demand growth is expected over the next ten years
- Growth will be due to:
  - General growth in steel volumes
  - Increased Nb concentration in steels
- 20% of steel produced in developed countries is HSLA; compared to only 10% in developing countries
- HSLA in automobiles expected to double by 2020
- HSLA in gas pipelines is a growth application





## **Niobium Supply**

- Three existing producers (CBMM, IAMGOLD, Anglo America)
- No new producers since 1976 (although market has grown substantially)
- No greenfields supply under construction; no new projects with demonstrated feasibility
- Undeveloped Niobium deposits are characterised by low grade, difficult metallurgy and/or high capital costs
- The two leading rare earths projects do not have Niobium credits

Most Niobium deposits discovered in the 1960s No new producers since 1976

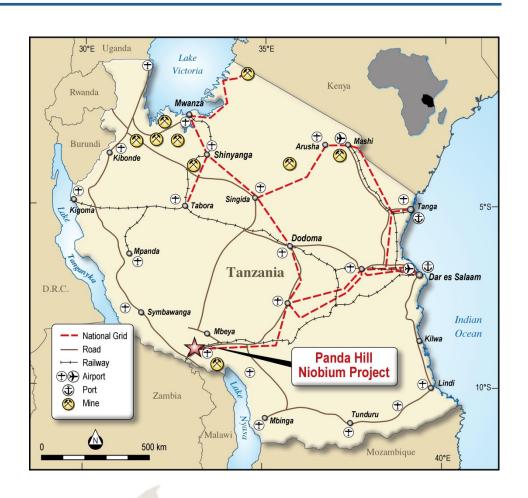


# **Panda Hill Niobium Project**

- Located in Mbeya region,
   Tanzania
- Excellent local infrastructure (grid power, roads, rail)
- 160 holes drilled from 1950 –
   1990s



Panda Hill, Mbeya





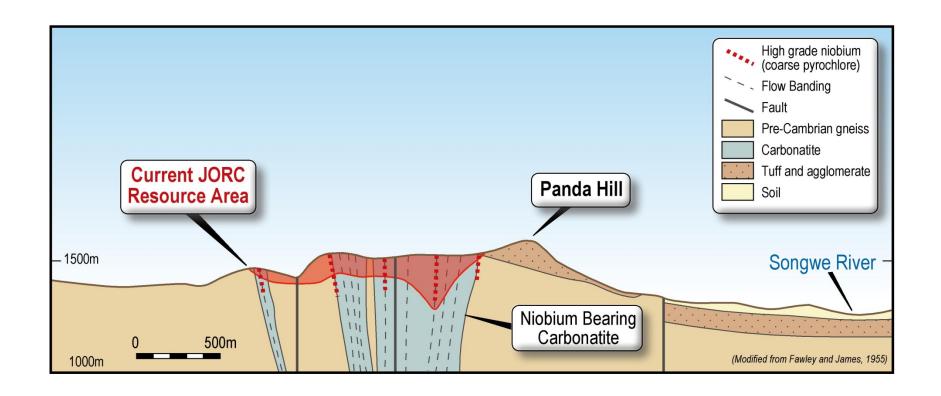
## **Coffey JORC Inferred Resource 2012**

Lower Cut-off Nb <sub>2</sub> O <sub>5</sub> %	Tonnage (Mt)	Grade (Nb <sub>2</sub> O <sub>5</sub> %)	Nb <sub>2</sub> O <sub>5</sub> Content (KT)
0	76.0	0.43	327
0.2	71.6	0.45	322
0.3	56.0	0.50	280
0.4	37.9	0.58	220
0.6	12.7	0.77	98
0.7	6.9	0.87	60

Note: Figures have been rounded. Ordinary kriged estimate using 2m down hole composites. Coffey Mining are the CP for the estimate and classification. Verona Capital are the CP for the database and data quality.



## **Conceptual Cross Section**





## Panda Hill/Niobec Comparison

Panda Hill compares favourably to IAMGOLD's Niobec mine (an existing Niobium producer):

- Niobec 46 Mt at 0.53%  $Nb_2O_5$  underground (mineable)
- Panda Hill 56 Mt at 0.50% Nb<sub>2</sub>O<sub>5</sub> open pit
- Lower mining costs at Panda Hill due to low strip ratio (1:1)
- Processing and other costs are likely to be similar
- In 2012 Niobec's EBITDA was US\$72 million (2 Mtpa throughout)



## **Scoping Study**

Ready to commence scoping study July 2013

- 2 Mtpa operation
- Confirmatory and extensional drilling
- Metallurgical test work
- Capital and operating costs estimates
- Social and environmental plan
- Resource upgrade and mining study

Q1 2014 delivery for US\$1.6 million, drilling to commence July 2013



#### **Extraction Process**

#### Well known, simple extraction process:

- Two stage flotation to produce a concentrate (~55% Nb<sub>2</sub>O<sub>5</sub>)
- Then a converter (mini-roaster) to produce FeNb (~60% Nb)
- The above process is used by all existing Niobium producers
- FeNb is marketed directly to steel mills as a direct feed in the steel alloy process
- Panda Hill ore has simple metallurgy and initial test work is positive (targeting 65%+ recovery vs 58% Niobec recovery)



# **High Level Capital Estimate**

2	<b>Mtpa Operation</b>
	(US\$ millions)

Total	US\$227m
Contingency	20
Prison move	5
Service Infrastructure	20
Mining Fleet	8
Process Plant, Converter	160
Vendor Option	14



#### **Project Ownership Structure**

- Cradle owns 50% of RECB<sup>1</sup>, a special purpose vehicle which owns the Panda Hill Project (comprising three granted Mining Leases).
- Cradle has an option to purchase the remaining 50% of the Project within four years (15 March 2017).
- The Option exercise price is (approx) US\$14 million<sup>2</sup>, of which US\$9 million is payable in cash and US\$5 million in shares or capped royalty. An instalment of US\$500,000 is payable within 2 ½ years.

#### Notes:



<sup>&</sup>lt;sup>1</sup> Assumes an option held by Cradle to increase from 49% to 50% of RECB for US\$30,000 is exercised.

<sup>&</sup>lt;sup>2</sup> The Option exercise price is US\$17.1m less 25% of project expenditure by Cradle during the option period. The estimated likely deduction is ~US\$3.1m.

## **Cradle's Competitive Advantage**

- Niobium is listed as a "strategic" and "critical" metal due to its lack of substitutes and limited availability
- Only 3 Niobium producers worldwide, all highly profitable customers looking for diversification
- No greenfield Niobium projects are under construction or have demonstrated feasibility at current price
- No other undeveloped Niobium deposits with Panda Hill's characteristics
  - √ high grade
  - ✓ excellent recovery (simple metallurgy)
  - ✓ open cut (low strip ratio) lower cash costs
  - ✓ long mine life expected (25+ years)
- Strong board and management
- Scoping study to commence July 2013; anticipated to demonstrate excellent project viability

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The information in this document that relates to Exploration Results is based on information compiled or reviewed by Mr Neil Inwood who is a Fellow of The Australasian Institute of Mining and Metallurgy and a Member of the Australian Institute of Geoscientists. Mr Inwood is a full time employee of the Company. Mr Inwood has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2004 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Inwood consents to the inclusion in this document of the matters based on his information in the form and context in which it appears.

Certain data in the presentation has been sourced from publically available documents. Portions of this data may not have been independently verified.

The competent person for the Resource estimate and classification is Ms Ellen Maidens who is a Member of the Australian Institute of Geoscientists. Ms Maidens is a full time employee of Coffey Mining and has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which she is undertaking to qualify as a Competent Person as defined in the 2004 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Ms Maidens consents to the inclusion in this document of the matters based on his information in the form and context in which it appears.

JORC Disclaimer: Historical grade estimates referred to are not JORC compliant and should only be considered as conceptual in nature. It is uncertain as to whether any future exploration will result in the definition of a Mineral Resource or confirm the presence of economic mineralisation.





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