

18 November 2009

Manager Announcements Company Announcements Office ASX Limited 20 Bridge Street Sydney NSW 2000

Dear Sir,

#### **PRESENTATION**

Attached is a copy of a presentation to the 5<sup>th</sup> International Rare Earth Conference held in Hong Kong.

A copy of this presentation will also be available on the Company's website www.alkane.com.au.

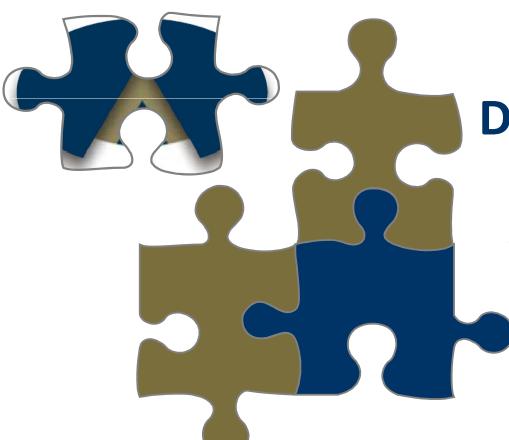
Yours faithfully,

for ALKANE RESOURCES LTD

D I Chalmers

**Managing Director** 

## ...putting the pieces together



# **Dubbo Zirconia Project**

**NSW Australia** 

A strategic supply for the zirconium, niobium and rare earths industries

5<sup>th</sup> International Rare Earth Conference Hong Kong 18 November 2009





## **Corporate Snapshot**

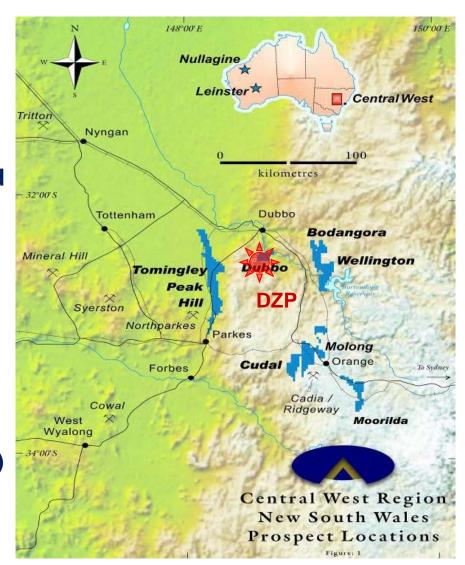


Public company listed on the ASX since 1969 2,700 mostly Australian shareholders

Multi commodity explorer and miner, focussed in the Central West of New South Wales, Australia

Gold production from Peak Hill mine 1996 – 2005. New gold (+1Moz) development planned at Tomingley

Major gold discovery at McPhillamys (+2.5Moz)
- JV with Newmont



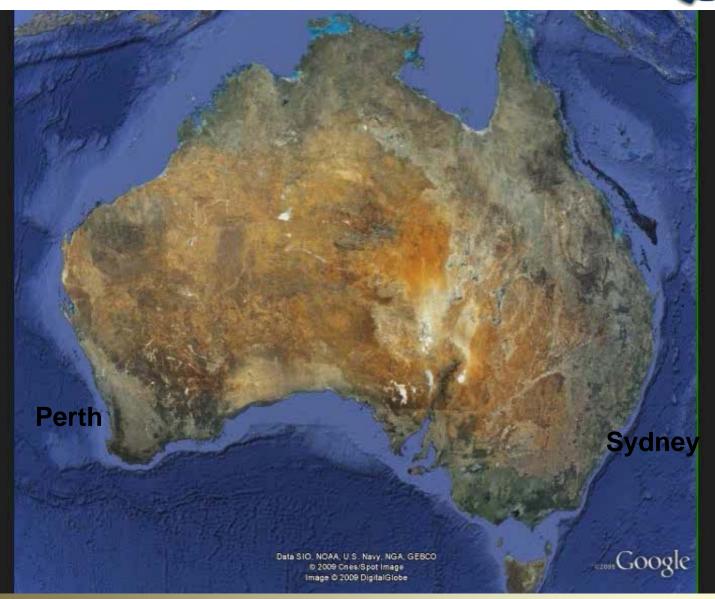






## **DZP Location Movie**







#### **DZP Location**



Dubbo region pop 80,000

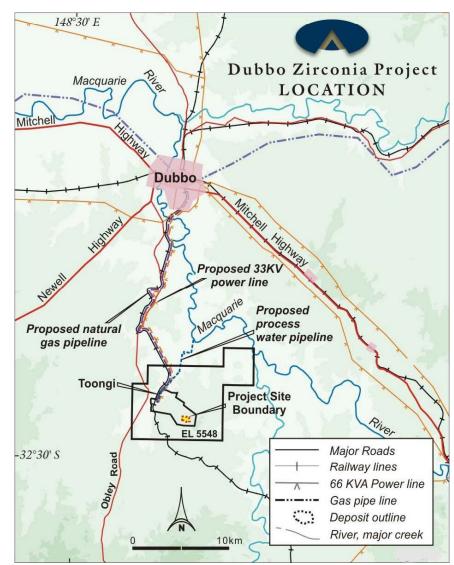
State power grid

State gas grid

**Major mixed agriculture** 

**Transport hub** 

**Substantial light industry** 





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## **DZP Program**



Resource drilling completed 2001. Flow sheet developed 1999 to 2002, with trials to mini pilot plant scale. Detailed feasibility study completed in 2002.

AusIndustry Commercial Ready Grant of A\$3.29M in April 2006 on dollar for dollar basis to complete process optimisations, and construct and operate the Demonstration Pilot Plant (DPP).

Laboratory program commenced at ANSTO Lucas Heights (Australian Nuclear Science and Technology Organisation) July 2006, with Demonstration Pilot Plant commissioned March 2008

Substantial product samples from DPP distributed in second half of 2009

Market update completed late 2007 – strong growth predicted in most products

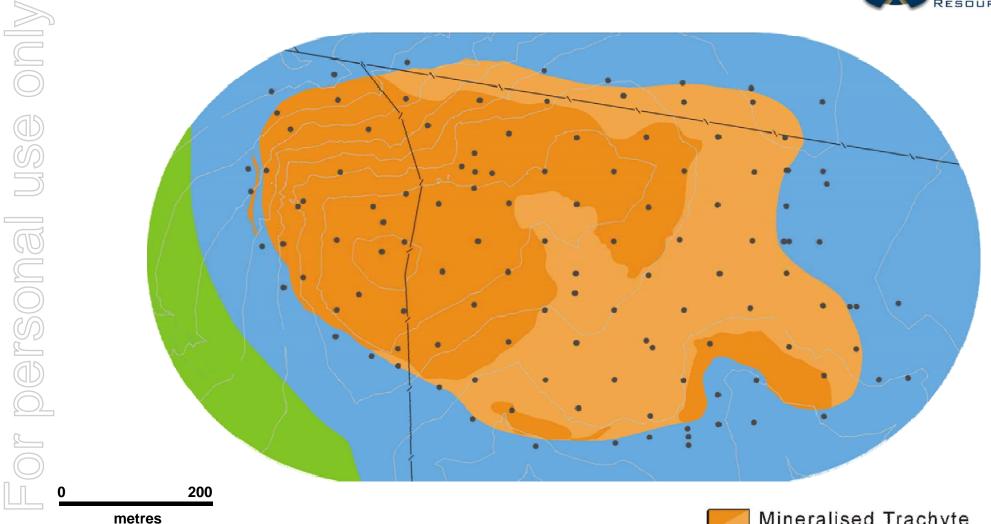
Revise and update the 2002 feasibility study by Q3 2010. DFS managed by Perth based consultants TZ Minerals International Pty Ltd (TZMI).





# **DZP Geology**





Jurassic aged trachyte intrusive



Mineralised Trachyte

Basalt

Napperby Formation

Drill hole collar



#### **DZP Resources**



**Measured Resource** 

0 - 55 metres

35.7 million tonnes grading

1.96% ZrO<sub>2</sub>, 0.04%HfO<sub>2</sub>, 0.46% Nb<sub>2</sub>O<sub>5</sub>,

 $0.03\% \text{ Ta}_2\text{O}_5$ ,  $0.14\% \text{ Y}_2\text{O}_3$ , 0.75% REO

and 0.014% U<sub>3</sub>O<sub>8</sub>

**Inferred Resource** 

55 - 100 metres

37.5 million tonnes at similar grades

**TOTAL** 

73.2 million tonnes

Major world resource of zirconium, hafnium, niobium, tantalum, yttrium and rare earth elements

Although the ore is not classified as a radioactive deposit, it contains 23 million lbs (10,200t) of uranium

Production of uranium is currently prohibited in NSW



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## **Ore Mineralogy**



Zirconium	eudialyte armstrongite	$ZrSiO_4 \pm Ca$ , Y, REE, $H_2O + ?U$	< 2μm - 50μm
Yttrium	yttrium silicates and with Zr	YSiO <sub>4</sub> ± REE, Be, Fe, As, Nb	< 50μm
Niobium/ Tantalum	natroniobite	NaNbO <sub>3</sub> + Ta ? Th also NbFeSiO <sub>4</sub>	< 30μ <b>m</b>
Rare Earths	calcian basnaesite	Ca(REE)(CO <sub>3</sub> )F	< 100μm
	rare ancylite	Sr(REE)(CO <sub>3</sub> )H <sub>2</sub> O	1

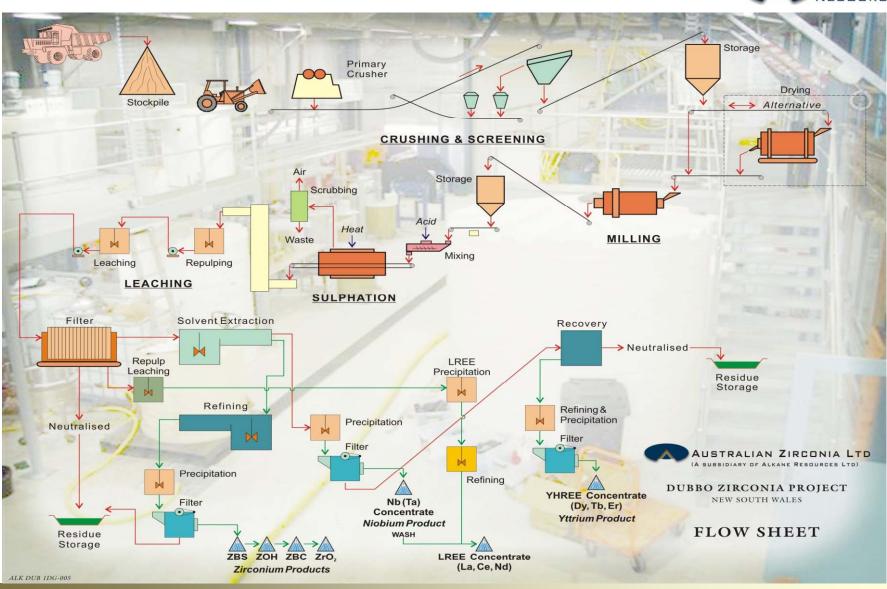
All ore minerals are readily soluble in sulphuric acid, with only very limited disolution of host rock minerals





#### **DZP Flow Sheet**







## **Market Summary**



**Zirconium:** drying agent in paints; primer coat of vehicle metalwork; ceramic

pigments; engineering ceramics; auto catalysts; electronics; solid oxide

fuel cells; fuel rods in nuclear power plants; special alloys and glasses

**Hafnium:** alloys, control rods for nuclear reactors; nextgen **microprocessors** 

Niobium: HSLA steels; special alloys and glasses

**Yttrium:** stabilizer in ceramics; **phosphors** for TV/computer screens; lasers;

and **compact fluoro lights** = energy efficient bulbs

Rare earths: speciality glasses; phosphors; fertilizers; catalysts; lasers; permanent

magnets/rechargeable batteries, particularly for hybrid vehicle motors

Increased demand for many of the metals is driven by environmental legislation to ensure emissions minimisation and energy consumption efficiency

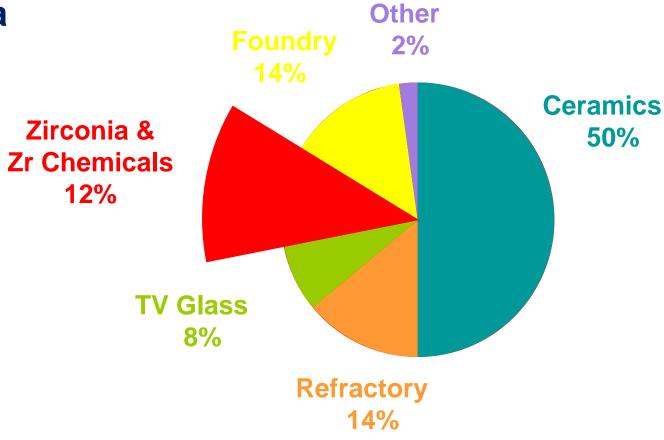


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## **Zircon Usage**





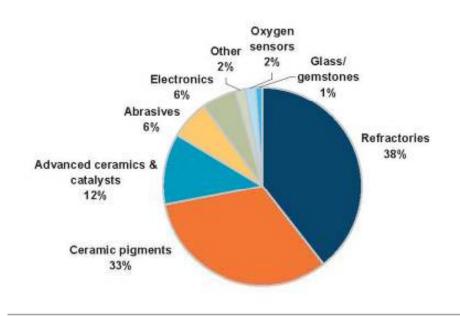




#### **Zirconium Chemicals**



# Current Zirconia Zirconium Chemical Uses



**2007 Consumption 2015 Estimated** 

96,000 tonnes (ZrO<sub>2</sub> units)

150,000 tonnes with industry growth rate of 4.5%pa

High growth areas:

Advanced ceramics and catalysts 13.0%pa

Ceramic pigments 8.0%pa

Zirconium metal for nuclear applications?

Products range from US\$4/kg to US\$20/kg

Metal US\$200/kg

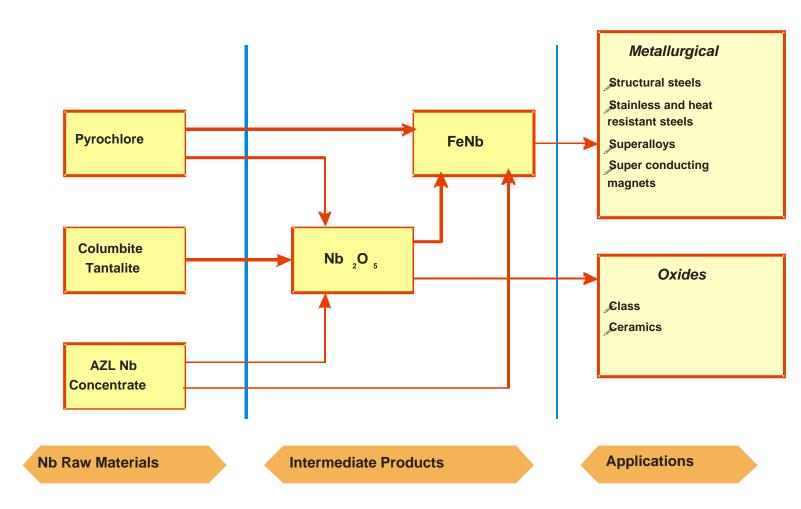




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# **Structure of Niobium Industry**





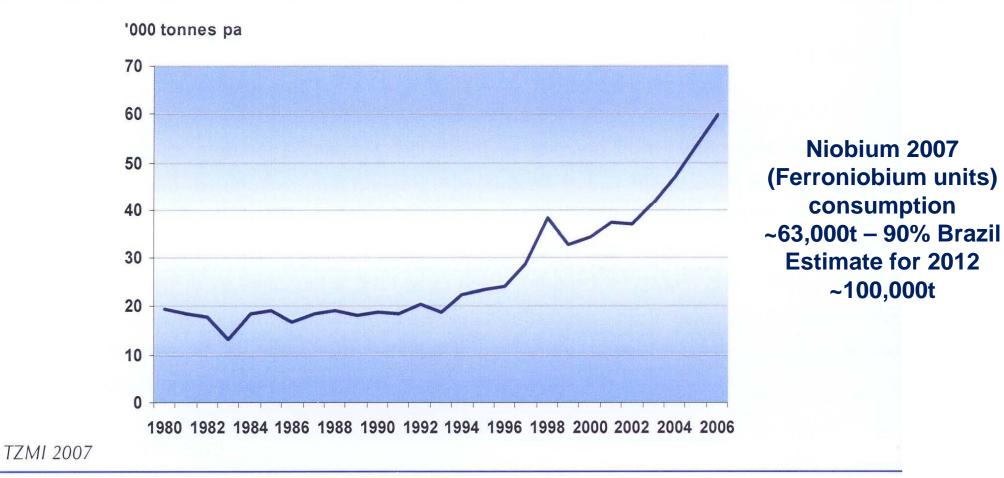
DZP process removes radioactive elements such as uranium and thorium, producing clean concentrate



#### **Niobium Demand**







Ferroniobium price spiralled to US\$60/kg in March 07 and is currently around US\$35 - 40/kg

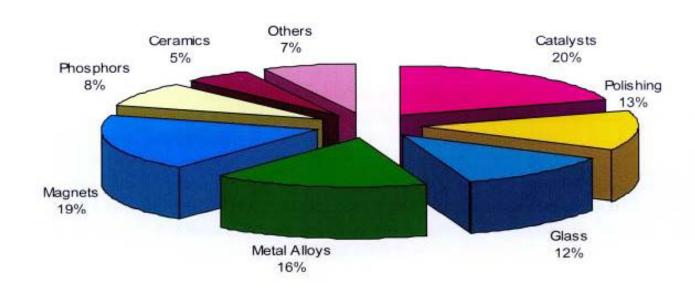
Long term expected to be in US\$25 - \$35/kg



## **Rare Earth Consumption**



World: Estimated rare earths consumption by end-use, 2006



Growth areas are magnets Dy-Tb-Nd-Sm and rechargeable batteries Nd (metal alloys) for electric and hybrid vehicles. Also phosphors Y-Tb-Eu (phosphors forTV, computer, LCD's and energy efficient lighting), and ceramics Y-Tb and catalysts Ce

Total YREE demand 2014 estimated to be 200,000 tonnes

Source: IMCOA



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## **DZP Product Output**



#### Base case models of 200,000 to 500,000 tonnes per year of ore processed

Product	200ktpa	500ktpa
ZBS, ZOH, ZBC, ZrO <sub>2</sub>	9,000tpa (3ktpa ZrO <sub>2</sub> )	22,500tpa (7.5ktpa ZrO <sub>2</sub> )
Nb-Ta concentrate	1,000tpa (0.7ktpa Nb <sub>2</sub> O <sub>5</sub> )	2,500tpa (1.75ktpa Nb <sub>2</sub> O <sub>5</sub> )
LREE concentrate	990tpa (REOs)	2,475tpa (REOs)
YREE concentrate	301tpa (REOs)	753tpa (REOs)

Base case of 200,000 tpa would have an open pitable life of 400 years

<sup>■</sup> ZBS = zirconium basic sulphate; ZOH = zirconium hydroxide; ZBC = zirconium carbonate Equivalent ~99% ZrO<sub>2</sub> + HfO<sub>2</sub>

<sup>■</sup> Nb-Ta concentrate = ~80% Nb<sub>2</sub>O<sub>5</sub>; 1.5% Ta<sub>2</sub>O<sub>5</sub> calcined basis



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## YREE Output at 70% recovery

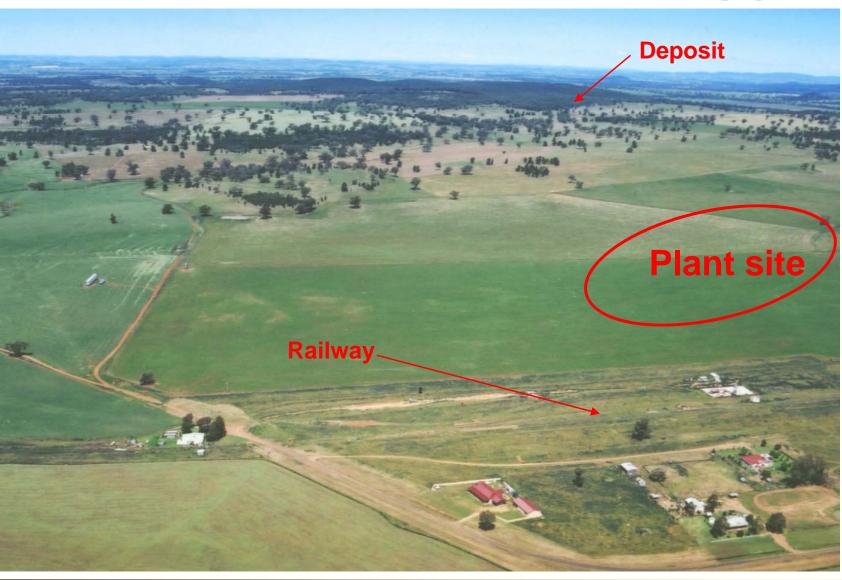


	200kpta	500kpta
La <sub>2</sub> O <sub>3</sub>	252	630
CeO <sub>3</sub>	475	1188
Pr <sub>6</sub> O <sub>11</sub>	52	131
$Nd_2O_3$	182	456
$Sm_2O_3$	28	71
Total LREE	990tpa	2475tpa
Eu <sub>2</sub> O <sub>3</sub>	1	2
$Gd_2O_3$	28	69
Tb <sub>4</sub> O <sub>7</sub>	4	11
$Dy_2O_3$	26	66
$Ho_2O_3$	5	14
Er <sub>2</sub> O <sub>3</sub>	15	37
$Tm_2O_3$	2	5
$Yb_2O_3$	13	32
Lu <sub>2</sub> O <sub>3</sub>	2	5
$Y_2O_3$	204	511
Total YHREE	301tpa	753tpa
Total YREE	1291tpa	3228tpa



## **Project Site**







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#### **Timetable**



Distribution of Zr and Nb products to potential world markets 2H 2009.

Complete DPP with LREE and YHREE recovery, and distribute products Q1 2010.

Complete product Off-take Agreements or Letters of Intent for all products Q1 2010

Review engineering and process with prefeasibility of project economics by end 2009.

Reactivate Definitive Feasibility Study 1H 2010 – scheduled completion Q3 2010.

Decision to develop Q3 – Q4 2010. Production anticipated late 2011 early 2012.

Base case CAPEX estimated at approximately A\$100 - 150 million depending upon throughput.



## **DZP Strategic Significance**



Majority of "downstream" zirconium products are derived from zircon, whose output is governed by ilmenite/rutile from mineral sands mining operations.

China dominates downstream zirconium business at ~90% but feed is zircon.

Niobium production dominated by one company, CBMM in Brazil with 90% of market.

Rare earth and yttrium production dominated by China (95%). DZP offers new source particularly for important Y and HREE.

Production costs are spread across the four metal outputs – zirconium (hafnium), niobium (tantalum), light rare earths and yttrium-heavy rare earths.

Project located in region with very favourable infrastructure and legislative framework, both at a State and Federal level.

The DZP provides an alternative and strategic source for a number of important metals, and is capable of producing for hundreds of years from one ore body.



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## **Demonstration Pilot Plant Movie**





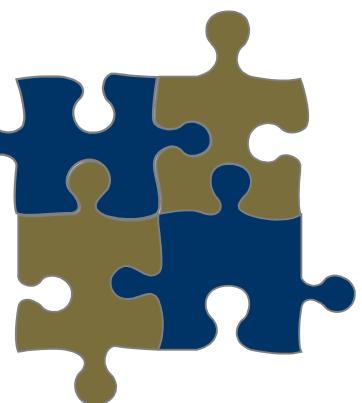


#### **Conclusion**





The pieces are coming together



...a perfect fit



#### **Disclaimer**



#### **Disclaimer**

This presentation contains certain forward looking statements and forecasts, including possible or assumed reserves and resources, production levels and rates, costs, prices, future performance or potential growth of Alkane Resources Ltd, industry growth or other trend projections. Such statements are not a guarantee of future performance and involve unknown risks and uncertainties, as well as other factors which are beyond the control of Alkane Resources Ltd. Actual results and developments may differ materially from those expressed of implied by these forward looking statements depending on a variety of factors. Nothing in this presentation should be construed as either an offer to sell or a solicitation of an offer to buy or sell securities.

#### **Competent Person**

The information in this presentation that relates to mineral exploration, mineral resources and ore reserves is based on information compiled by Mr D I Chalmers, FAusIMM, FAIG, (director of the Company) 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 Competent Person as defined in the 2004 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Ian Chalmers consents to the inclusion in the presentation of the matters based on his information in the form and context in which it appears.