

# ALKANE RESOURCES LTD

Sydney Mining Club

*Gold producer with world class  
Dubbo Zirconia Project*

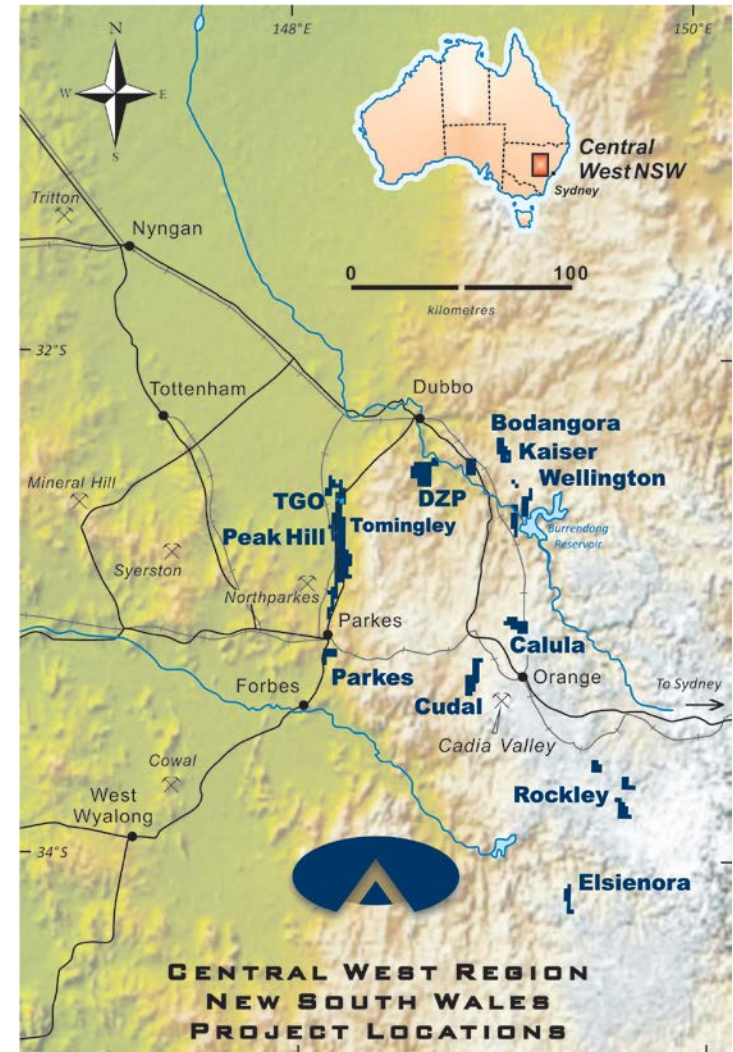


MULTI-COMMODITY MINER EXPLORER

[www.alkane.com.au](http://www.alkane.com.au)

3 July 2014

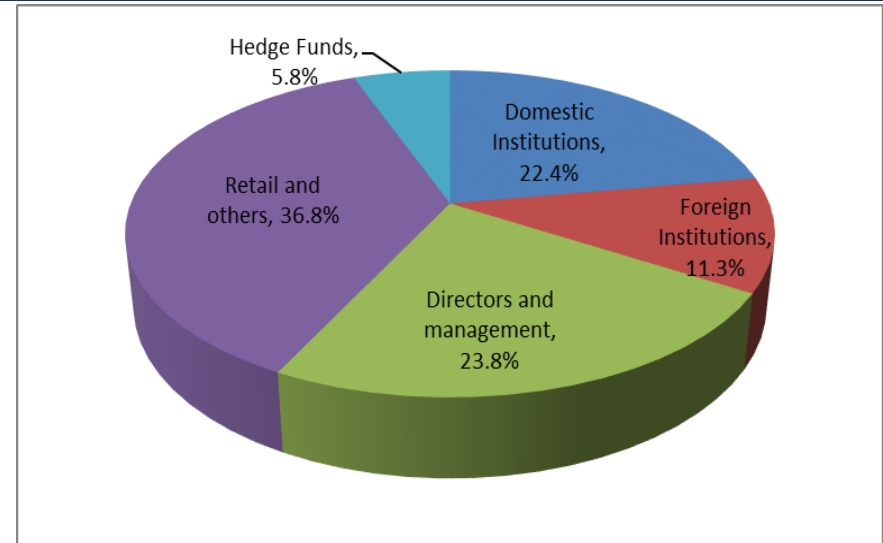
- Listed on ASX since 1969, also listed on OTCQX (US)
- ~6,300 shareholders
- Multi commodity explorer, miner and developer focused on Central West of NSW, Australia
- Active in region for more than 20 years
- Developed Peak Hill Gold Mine in 1996, operated to 2005 being the end of mine life
- Tomingley Gold Project (TGP) construction completed on time/budget, first gold production February 2014
- World-class Dubbo Zirconia Project (DZP) feasibility completed; environmental assessment and financing in progress
- Successful ongoing exploration program to provide a pipeline of development projects



## Financial

- Shares – 412,639,000
- Market Capitalisation – A\$110M (30 June 2014)
- Cash & Investments – A\$18M (31 March 2014)
- Debt – nil
- Share turnover – ~0.2M / day current
- 12 Month Low/High – A\$0.25/\$0.59
- Top 20 – 57%
- Codes – ALK (ASX)  
– ANLKY (OTCQX )

## Equity



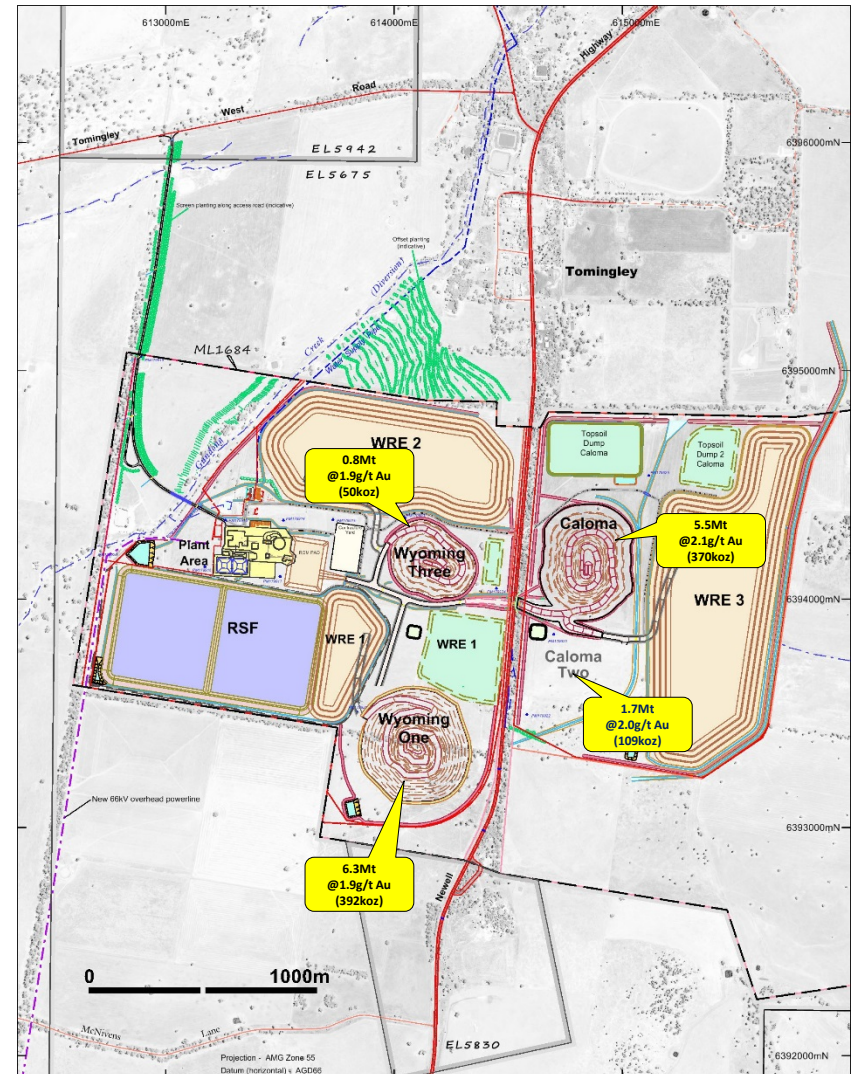
*Major Shareholders: Abbotsleigh (Gandel Metals) – 22%  
Fidelity Group – 10%*

## Strategy

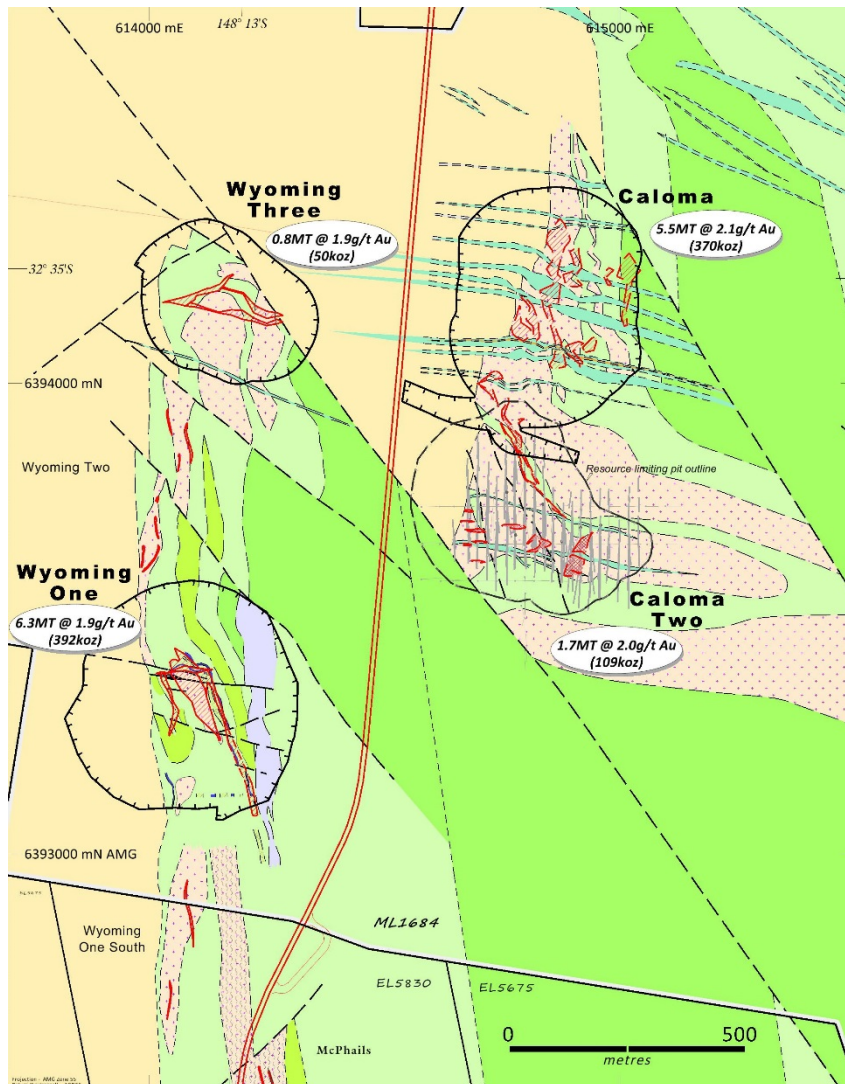
- ✓ Alkane is a multi commodity company totally focussed within the Central West Region of New South Wales
- ✓ Dedicated to multiple cash flow operations and returns to shareholders
- ✓ Maintain strong environmental credentials and community involvement



- Resource – 921,000oz of gold (less mined to date)
- Construction CAPEX – A\$116M
- Mine Method – open cut & underground
- Mine Life – 7.5 years (targeting 10+ years)
- Processing plant throughput – 1.0Mtpa
- 2.00g/t Au and 93% recovery standard CIL
- Gold Production – ~400,000oz over base case life
- Cash operating costs (C3) estimated and averaged over base case life – ~A\$1,000 - \$1,100/oz
- Base case does not include Caloma Two
- Gold production commenced February 2014
  - To 31 May 2014:
    - Produced 14,703oz
    - Processed 260,776t @ 2.23g/t Au
    - Hedge 24,000oz @ A\$1,444/oz
- Ramp up largely completed and plant is operating at design. Mining cost optimization underway.



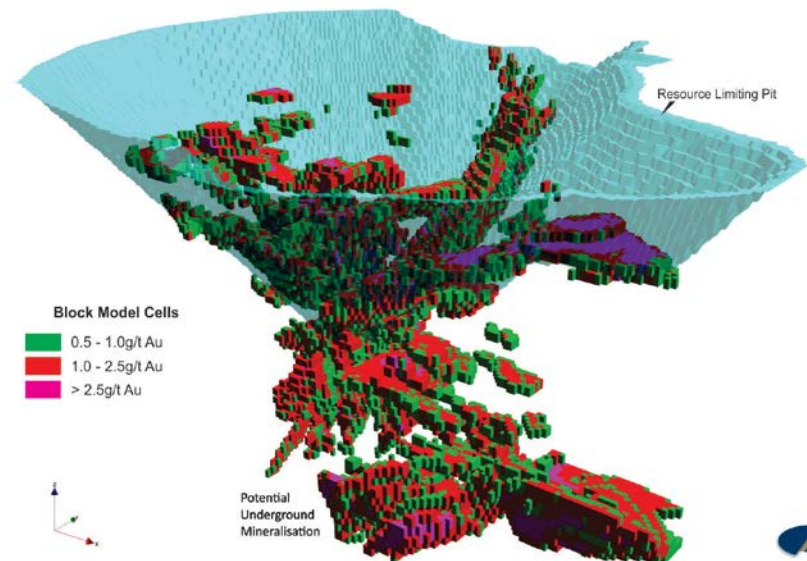
# TGO Resource Expansion



*Additional Resource Potential*

**Caloma Two open pit and underground**  
**Expand Wyoming One underground**  
**Caloma underground**  
**Myalls underground**  
**Wyoming Two and Three underground**  
**McLeans**

## Caloma Two – Geological model







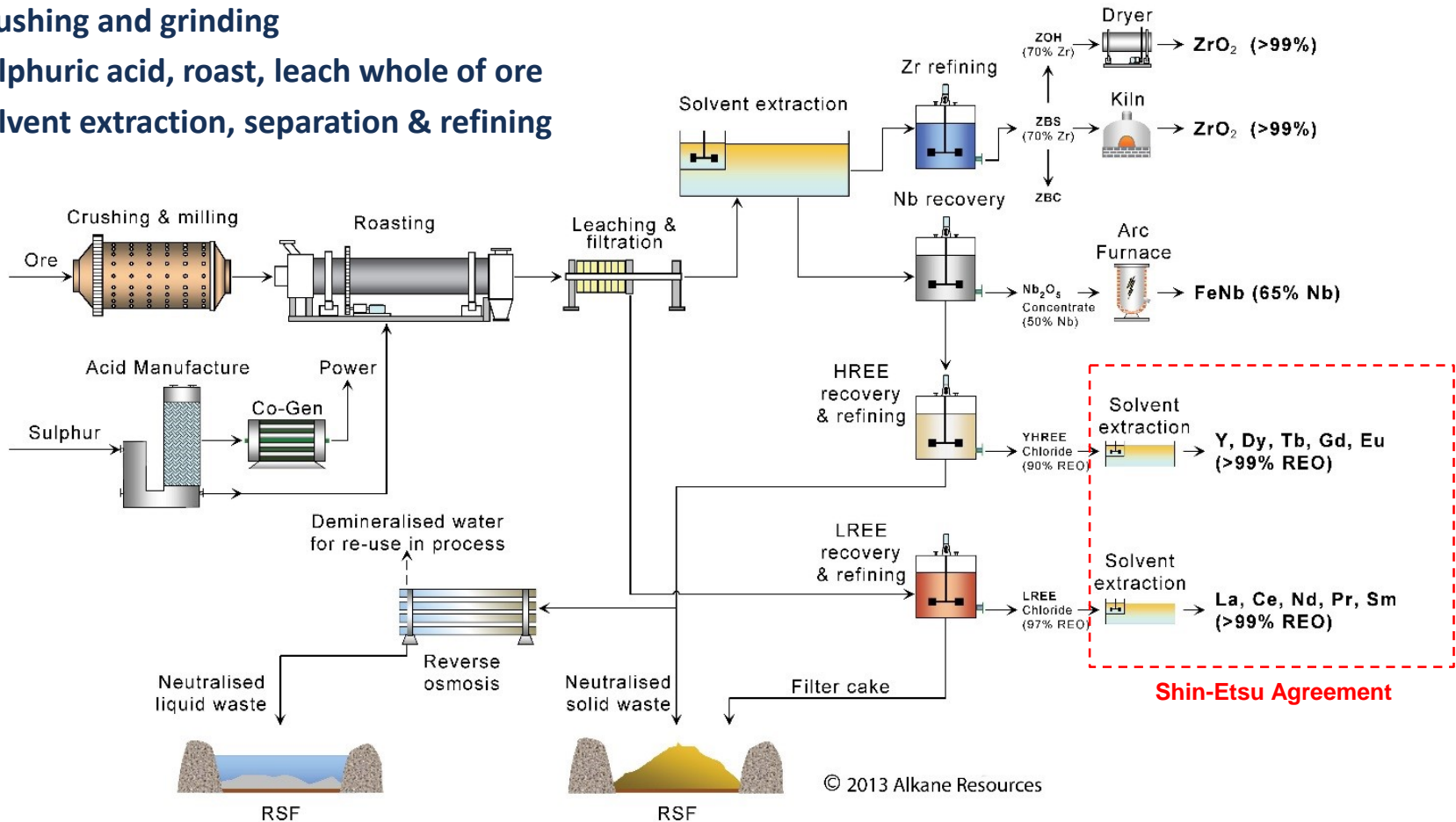
**ALKANE RESOURCES LTD**  
**Tomingley Gold Operations**  
December 2013

- A very large polymetallic resource of the metals zirconium (hafnium), niobium (tantalum), yttrium and rare earths
- Important and strategic metal mix - 25% of rare earth output is in “heavy” group
- Reserve supports 35 year mine life at 1 million tonne ore processing per annum with defined resource potentially supporting a significantly longer operation
- A\$1B project cost including A\$166M contingencies - 95% capex in processing plant, acid plant and infrastructure
- Demonstrated flow sheet with pilot plant and products for market evaluation at ANSTO
- Robust technical and financial feasibility completed April 2013
- Environmental Impact Statement lodged in June 2013 and approval process proceeding
- Strong market interest in products with several MoUs executed
- Growing and diverse markets





- Simple open cut mining operation
- Crushing and grinding
- Sulphuric acid, roast, leach whole of ore
- Solvent extraction, separation & refining



- Except for rare earths, the process produces a suite of products for direct consumption





DPP Filtration, PLS, SX, Zr and Nb recovery



Y and HREE refining and recovery

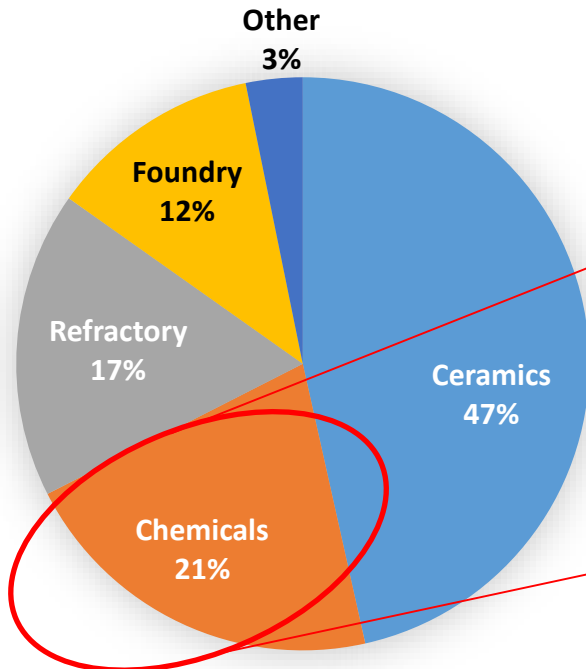


Zirconium refining and precipitation

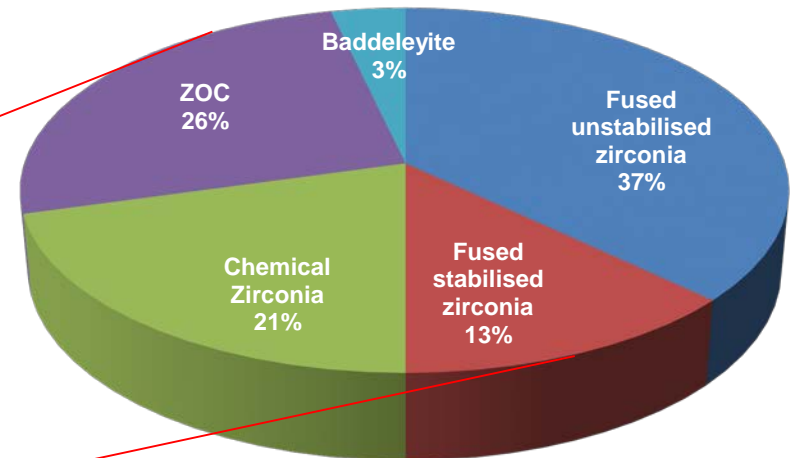


Reverse osmosis and water recycle

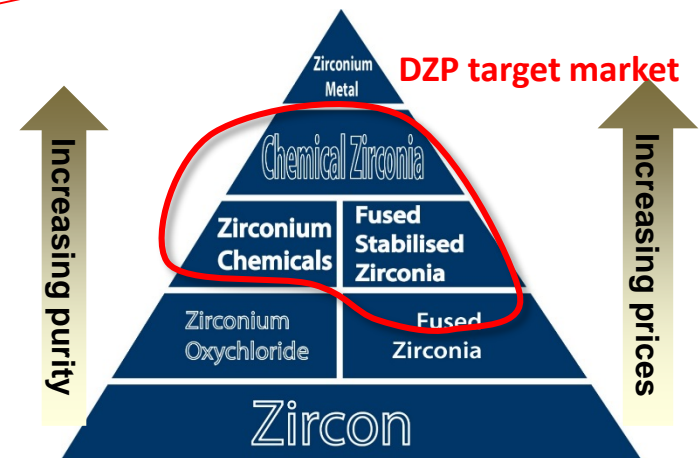
**Zircon Demand by End Use  
(2013 ~ 1 million tonnes)**



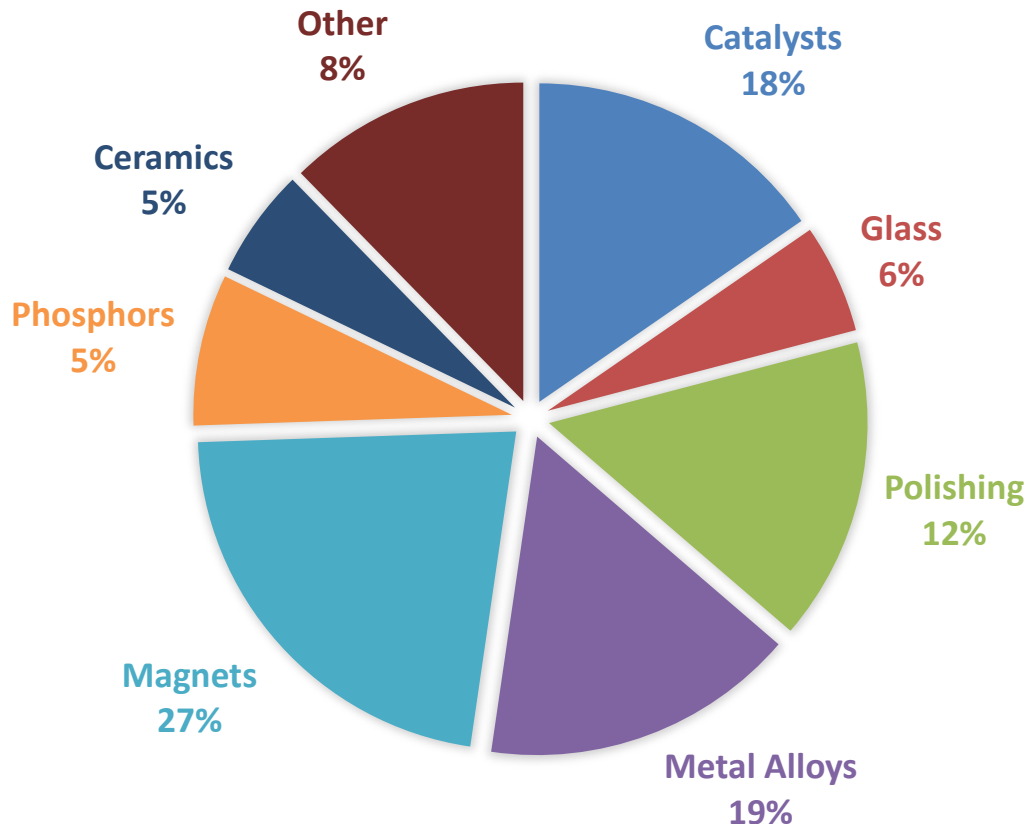
**Zirconium Chemicals Output**



- Global market US\$2-3B
- 2014 consumer zircon inventories running down
- Market expected to stabilise through 2015 - 2016
- CAGR anticipated at 5% - 7% pa



## REE DEMAND 2017

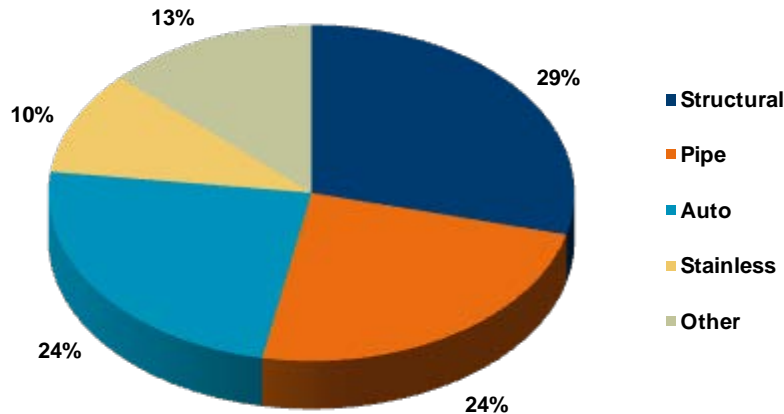


- Total REE consumption 2013 115,000t with annual growth estimated at 5-10% to be 153,000t in 2017
- Global market US\$3-5B
- China produced about 90% of world supply in 2013 and consumed about 65%, with Japan 15% and the US 14%
- The REE industry is “imbalanced” with potential oversupply of light rare earths (Ce & La) and undersupply of heavy rare earths and neodymium
- Nd, Eu, Tb, Dy and Y are considered to be in critical supply through to at least 2020

2020 demand is estimated to be 190,000 tonnes



## Current use of ferro-niobium



- 90% of Nb used in standard grade ferro-niobium for the production of high strength low alloy (HSLA) steels
- Nb HSLA steels are primarily consumed in structural and piping, but the auto industry is becoming an increasing consumer
- World production estimated at 80,000t Nb in 2012. CBMM in Brazil accounts for 85%
- Global market US\$3-4B
- CAGR anticipated at 10% - Demand expected to be driven by greater usage in steels of BRIC producers

## WTO Challenge to Chinese Export Taxes and Quotas??

1. China is intent upon producing the value added product rather than exporting the raw materials
2. As a result China's consumption of REs will rise from 65% to ~80% by 2020
3. If the export tax is removed, it would be replaced by a new or additional mining tax to compensate
4. Environmental compliance costs will impact Chinese RE prices for both lights and heavies
5. Govt approval is required by companies to export REs
6. Current estimated REO capacity ~200,000tpa from 80 processors
7. Operating capacity 100,000 – 125,000tpa 30 - 50 plants (only 28 have export licences)
8. Consolidation of the RE industry to just six companies, all State owned
9. Closure of about 100,000tpa REO capacity by the end of 2014 (27 operations involved)
10. It is not logical to think China will flood the market to "wipe out" western producers
11. Crack down on illegal ionic clay mining is expected to reduce smuggling and heavy RE supply

**Conclusion: Chinese domestic prices will increase**  
**Export prices will increase**

**97% of all zirconium chemicals / fused zirconia are derived from zircon**

- **Availability of premium zircon for fused zirconia**
  - will require ~160-180,000tpa
  - low  $\text{Al}_2\text{O}_3$  with minimal particle size < 45 micron
  - availability of zircon with <300 ppm U+Th
- **Consolidation of Chinese fused and zirconium chemical industry**
  - production is about 75% of total world market
  - imports >95% of the zircon required
- **Oriental Zirconia (largest SOE) is leading consolidation**
  - Bought Zirconium Valley (Shenghua) - ZOC and Zirconia
  - Bought Wengsheng processor of zircon concentrates
  - Ownership of Murray Zircon and Australian Zircon
  - Australian zircon mines to zirconium metal
- **Environmental and OH&S cost pressures**
  - Treatment of high U+Th residues for zirconium chemicals



➤ **Zirconium Materials:**

- Electronics, ceramics, glass, refractories, chemicals, metal, catalysts

➤ **Rare Earth Materials:**

- Electronics, magnets, ceramics, glass, metal alloys, phosphors, catalysts

➤ **Niobium Materials:**

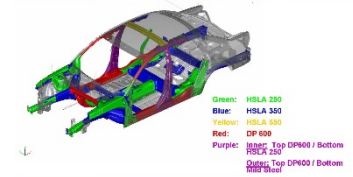
- Special steels, alloys, capacitors, glass, jewellery, coinage, superconducting magnets

Demand for these products are driven by “green” technologies: energy efficiency and alternates, and emissions minimisation

The DZP can provide a long term supply of zirconium chemicals independent of the zircon supply chain, and critical rare earths not reliant on China

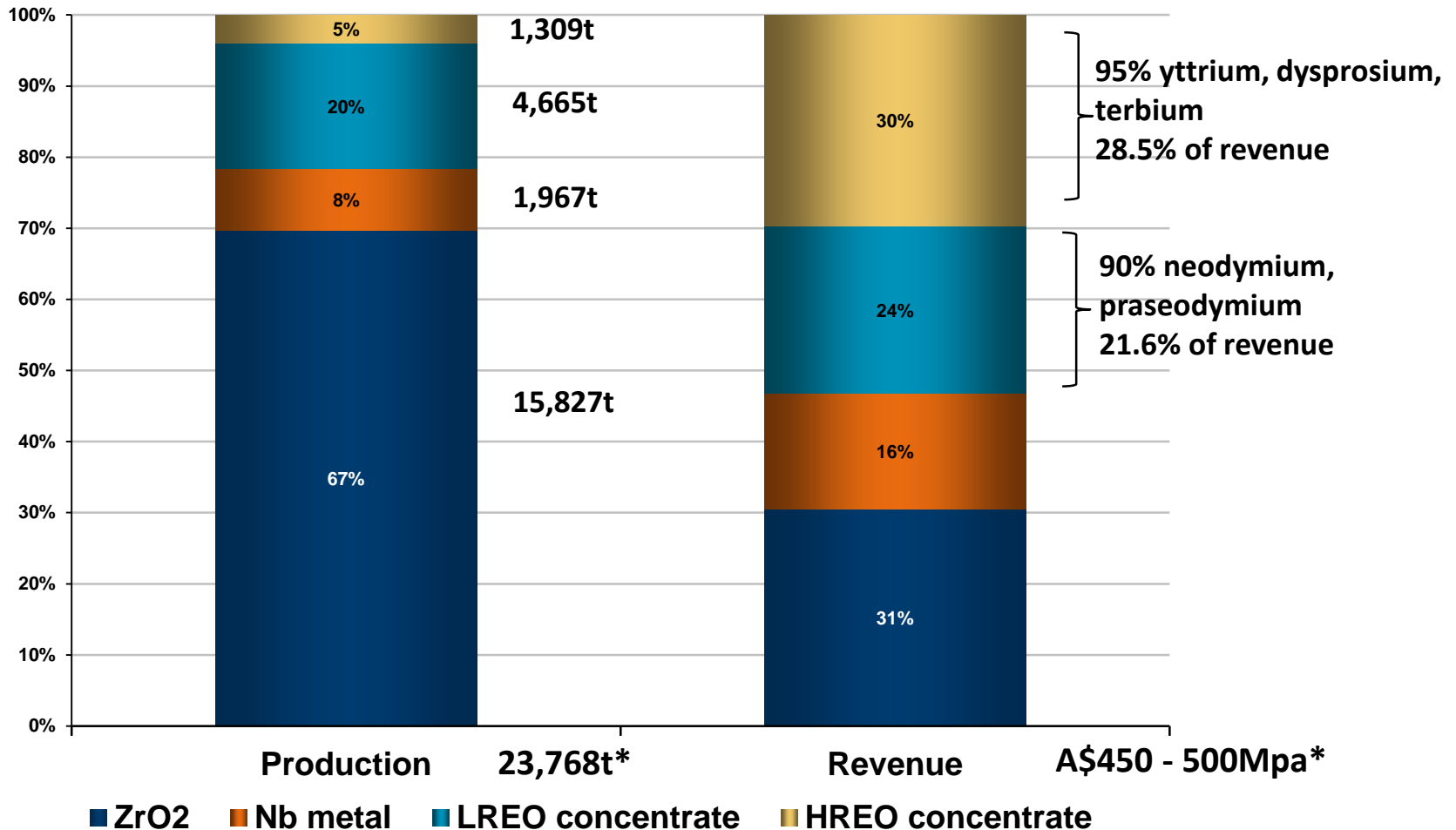


Ford 500



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Michael J. Lee

# DZP Estimated Product Output @ 1Mtpa



Revenue\* based on DFS long term product prices and A\$:US\$0.85. OPEX est A\$200M – A\$220Mpa

## Continuing Product Development for Increased Return

- **Rare Earths:**
  - **MOU with Shin-Etsu Chemical to produce suite of separated rare earth oxides from LREE and HREE chloride concentrates / commercialisation of toll treatment off-take agreement in progress**
  - **Sale of products to other customers excess to Shin-Etsu's requirements**
  - **Further work to improve recoveries proceeding at ANSTO**
- **Niobium:**
  - **Treibacher (Austria) JV to produce FeNb product for direct sale to end users**
- **Zirconium:**
  - **MOU with European manufacturer /trading company to market DZP products in Europe and North America**
  - **Zr development to produce value added zirconium products of variable particle size and quality for different applications:**
    - **Production of yttria stabilised zirconia microsphere grinding media**
    - **Production of PZT – piezoelectric lead zirconate titanate**
    - **Ceramic colours eg yellow using praseodymium**
    - **Glass and steel making refractories**

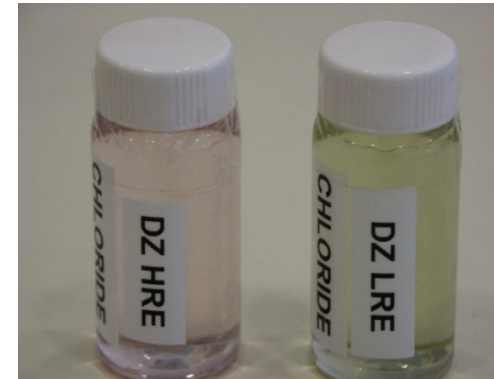


Shin-Etsu Chemical to construct a rare earth magnet manufacturing plant in Hai Phong Province in Vietnam [Shin-Etsu has a market cap of US\$25 billion]

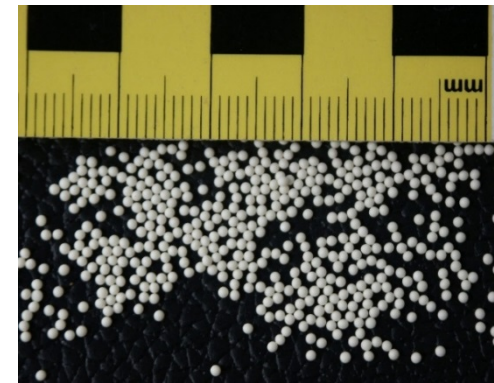
*Aim is to strengthen Shin-Etsu's rare earth magnet supply system through having plural magnet sintering process plants in order to correspond to the expansion of the automobile market*

Rare earth magnets are used in a wide range of applications such as in automobile applications starting with hybrid cars, energy-saving air conditioners, and hard disk drives. Shin-Etsu Chemical will make its supply system for its customers around the world rock solid, and at the same time, we will proactively act to be certain to capture the expected large growth in demand and work to expand our rare earth magnet business.

At a recent presentation to investors in Los Angeles, Rio Tinto Diamonds and Minerals chief executive officer Alan Davies said the company anticipates global  $TiO_2$  feedstock demand will outstrip supply from 2016 with the gap predicted to widen further until 2020. Mr Davies added the company expects zircon demand will outpace supply from 2018, with the gap to widen until 2020. Rio Tinto Iron &



DZP high purity REE chemical concentrate

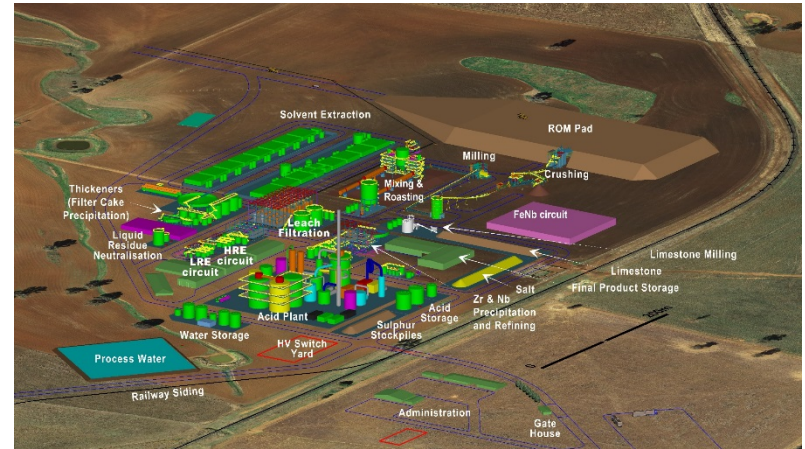


DZP yttria stabilised zirconia microspheres

**“Reports of the demise of these industries have been greatly exaggerated”** (Apologies to Mark Twain)

## ➤ Total Project Capex of \$996m

- Based on April 2013 DFS to +/- 17%
- Includes \$166m contingency
- Includes current FEED program to achieve BFS standard @ +/- 10%



## ➤ Targeted funding sources:

- **Government Assistance Programs/ECA style funding**
  - **Lead Coordinator: Sumitomo Mitsui Banking Corp**
  - Attractive Project:
    - ✓ long life low cost strategic source of critical metals
    - ✓ long term off-take agreements with international companies
- **Sale of Project Level (AZL) Minority Interest(s) (~15%)**
  - **Sale Advisors: Credit Suisse & SMBC**
    - ✓ Strategic interest(s) in long term supply of critical metals
    - ✓ Introduction of cornerstone investor(s)

## • Commercial Bank Debt

- **Advisors: Credit Suisse & SMBC**
- Attractive Project:
  - ✓ strong operating cash flows
  - ✓ diversified revenue stream
  - ✓ new markets will add to project value

## • Equity Capital Markets (Alkane)

- **Advisors: Credit Suisse & Petra Capital**

# DZP Major Milestones

Major Milestones	2014	2015	2016	2017
Finalise Off-take agreements	■ ■ ■ ■	■ ■		
Project Approval Process	■ ■ ■ ?			
Project Financing Program	■ ■ ■ ■	■ ■		
Front End Engineering Design (FEED)	■ ■ ■ ■			
CONSTRUCTION		■ ■ ■ ■ ■ ■ ■	■ ■ ■	
PRODUCTION				■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■

Estimates of times are indicative only and are subject to change.  
 Alkane reserves the right to vary the timetable without notice.



- **Bodangora gold-copper prospect**

- Large monzonite intrusive complex with gold-copper mineralisation
- Similarities to Newcrest's Cadia-Ridgeway gold-copper mine
- Recent drill intercepts at new target (Kaiser)
  - 41m @ 1.15g/t gold and 1.24% copper
  - 8m @ 0.34g/t gold and 1.06% copper

- **Galwadgere gold copper prospect**

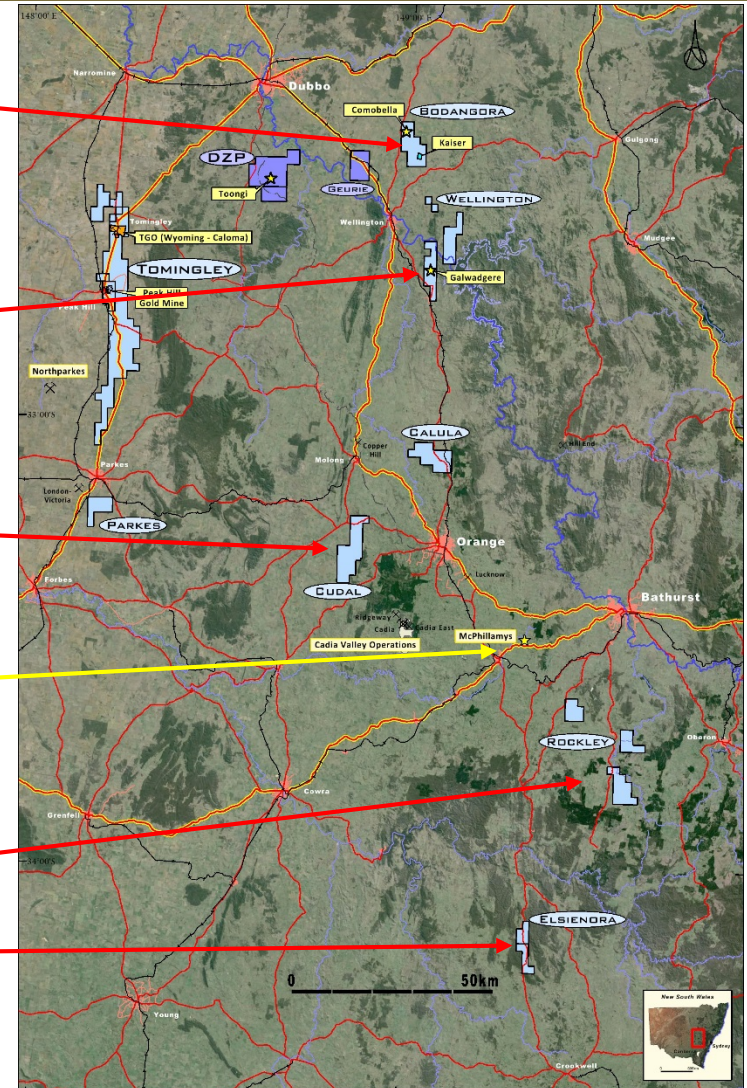
- Small VMS copper-gold deposit
- Drilling continues

- **Cudal gold-zinc prospect**

- Best drill intercept 17m @ 1.2 g/t gold and 2.9% zinc
- Interesting targets, both porphyry style copper-gold and possibly sedimentary replacement (Carlin model)

- **McPhillamys gold project – Regis Resources Ltd**

- Discovered by Alkane in 2005 – JV with Newmont Australia
- 3Moz gold resource identified in 2010 (ALK ASX 5 July 2010)
- Sold to Regis in 2012 for \$150M, Alkane's share \$73.5M
- Modified VMS type gold with minor base metals
- McPhillamys conceptual targets at:
  - Rockley
  - Elsenora





## 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 or 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.

This document has been prepared in accordance with the requirements of Australian securities laws, which may differ from the requirements of United States and other country securities laws. Unless otherwise indicated, all ore reserve and mineral resource estimates included or incorporated by reference in this document have been, and will be, prepared in accordance with the JORC classification system of the Australasian Institute of Mining, and Metallurgy and Australian Institute of Geosciences.

## 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 2012 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.



## Dubbo Zirconia Project – Mineral Resources

Toongi Deposit	Tonnage (Mt)	ZrO <sub>2</sub> (%)	HfO <sub>2</sub> (%)	Nb <sub>2</sub> O <sub>5</sub> (%)	Ta <sub>2</sub> O <sub>5</sub> (%)	Y <sub>2</sub> O <sub>3</sub> (%)	REO (%)
Measured	35.70	1.96	0.04	0.46	0.03	0.14	0.75
Inferred	37.50	1.96	0.04	0.46	0.03	0.14	0.75
<b>Total</b>	<b>73.20</b>	<b>1.96</b>	<b>0.04</b>	<b>0.46</b>	<b>0.03</b>	<b>0.14</b>	<b>0.75</b>

*These Mineral Resources are based upon information compiled by Mr Terry Ransted MAusIMM (Alkane Chief Geologist) who is a competent person as defined in the 2004 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Terry Ransted consents to the inclusion in the report of the matters based on his information in the form and context in which it appears. The full details of methodology were given in the 2004 Annual Report.*

## Dubbo Zirconia Project – Ore Reserves

Toongi Deposit	Tonnage (Mt)	ZrO <sub>2</sub> (%)	HfO <sub>2</sub> (%)	Nb <sub>2</sub> O <sub>5</sub> (%)	Ta <sub>2</sub> O <sub>5</sub> (%)	Y <sub>2</sub> O <sub>3</sub> (%)	REO (%)
Proved	8.07	1.91	0.04	0.46	0.03	0.14	0.75
Probable	27.86	1.93	0.04	0.46	0.03	0.14	0.74
<b>Total</b>	<b>35.93</b>	<b>1.93</b>	<b>0.04</b>	<b>0.46</b>	<b>0.03</b>	<b>0.14</b>	<b>0.74</b>

*These Ore Reserves are based upon information compiled by Mr Terry Ransted MAusIMM (Alkane Chief Geologist) who is a competent person as defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. The reserves were calculated at a 1.5% combined ZrO<sub>2</sub>+Nb<sub>2</sub>O<sub>5</sub>+Y<sub>2</sub>O<sub>3</sub>+REO cut off using costs and revenues defined in the notes in ASX Announcement of 16 November 2011. Terry Ransted consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.*

**Note: ASX announcements 16 November 2011, 11 April 2013 and 30 October 2013 - the Company confirms that all material assumptions and technical parameters underpinning the estimated Mineral Resources and Ore Reserves, and production targets and the forecast financial information as disclosed continue to apply and have not materially changed.**

## Tomingley (TGP) – Mineral Resources

DEPOSIT	MEASURED		INDICATED		INFERRED		TOTAL		
	Tonnage (Mt)	Grade (g/t) Au	Tonnage (Mt)	Grade (g/t) Au	Tonnage (Mt)	Grade (g/t) Au	Tonnage (Mt)	Grade (g/t) Au	Ounces
Wyoming One <sup>2</sup>	2.32	2.2	0.89	2.2	3.12	1.7	6.32	1.9	392,400
Wyoming Three <sup>2</sup>	0.64	2.0	0.06	2.0	0.10	1.3	0.81	1.9	49,900
Caloma <sup>2</sup>	2.69	2.3	0.57	2.1	2.19	1.9	5.45	2.1	369,400
Caloma Two <sup>1</sup>			1.0	2.4	0.7	1.4	1.70	2.0	109,300
<b>Total</b>	<b>5.65</b>	<b>2.2</b>	<b>2.52</b>	<b>2.25</b>	<b>6.11</b>	<b>1.73</b>	<b>14.29</b>	<b>2.0</b>	<b>921,000</b>

<sup>1</sup> These Mineral Resources are based upon information compiled by Mr Richard Lewis FAusIMM (Lewis Mineral Resource Consulting Pty Ltd) who is a Competent Person as defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code). Richard Lewis consents to the inclusion in this report of the matters based on his information in the form and context in which it appears. Full details of methodology were given in the ASX Announcement 12 November 2013

<sup>2</sup> These Mineral Resources are based upon information compiled by Mr Richard Lewis FAusIMM (Lewis Mineral Resource Consulting Pty Ltd) who is a Competent Person as defined in the 2012 Editions of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code). Richard Lewis consents to the inclusion in this report of the matters based on his information in the form and context in which it appears. The details of methodology for estimating these resources was reported 29 March 2012..

## Tomingley (TGP) – Ore Reserves

DEPOSIT	PROVED		PROBABLE		TOTAL		
	Tonnage (t)	Grade (g/t) Au	Tonnage (t)	Grade (g/t) Au	Tonnage (t)	Grade (g/t) Au	Ounces
Wyoming One	1,700,000	1.6	200,000	1.3	1,900,000	1.6	94,500
Wyoming Three	500,000	1.6	0	0.0	500,000	1.6	28,100
Caloma	1,100,000	2.3	100,000	1.7	1,200,000	2.2	86,500
<b>Total</b>	<b>3,300,000</b>	<b>1.8</b>	<b>300,000</b>	<b>1.5</b>	<b>3,600,000</b>	<b>1.8</b>	<b>209,100</b>

These Ore Reserves are based upon information compiled under the guidance of Mr Dean Basile MAusIMM (Mining One Pty Ltd) who is a competent person as defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Dean Basile consents to the inclusion in the report of the matters based on the information in the form and context in which it appears. Full details in ASX Announcement 13 December 2011

**Note:** ASX announcements 13 December 2010, 29 March 2012 and 12 November 2013 - the Company confirms that all material assumptions and technical parameters underpinning the estimated Mineral Resources and Ore Reserves, and production targets and the forecast financial information as disclosed continue to apply and have not materially changed.