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ASX : ALK  
OTCQX : ANLKY

# *Tomingley Gold Project*

# *Dubbo Zirconia Project*



The new state  
of business

NSW Resources & Energy  
Investment Conference 2015

27-28 July 2015 | InterContinental, Sydney



Mining the metals of the future.

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**

Unless otherwise stated, 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) who 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.

# Alkane Strategy



Focused on NSW Central West



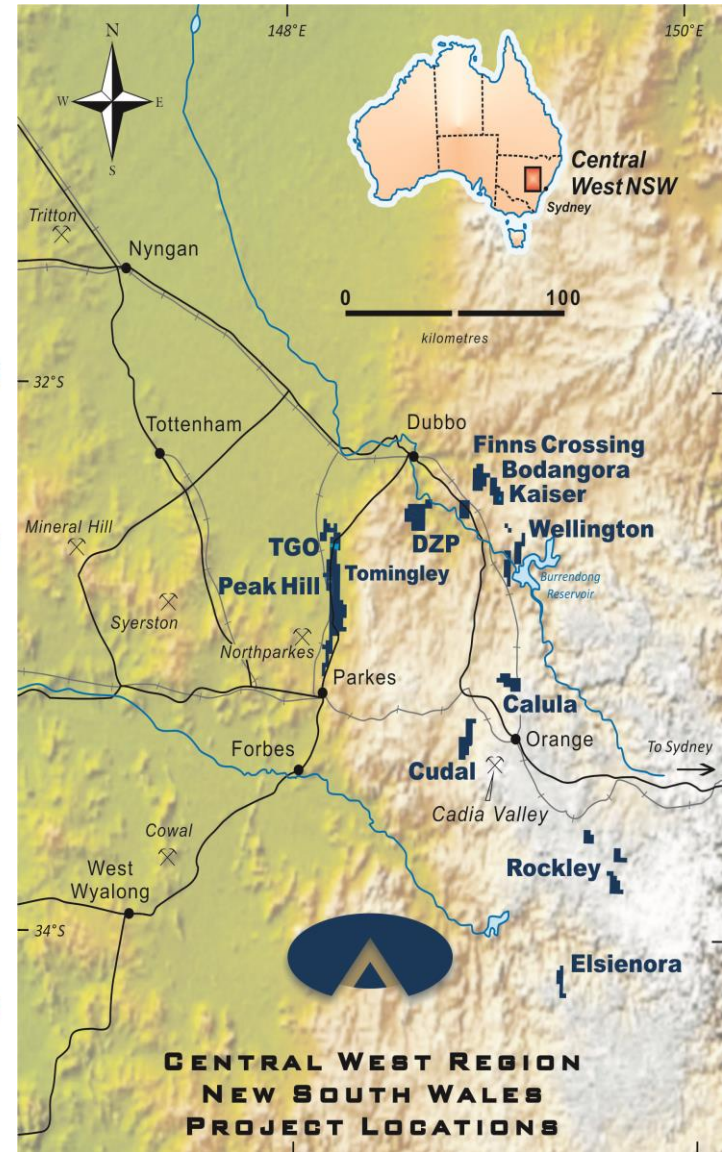
Multi-commodity company



Strategic relationships



Community & environmentally responsible



# Tomingley Gold Operations

- Resource – 830,000oz of gold (30 June 2014)\*
- 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 (AISC) estimated and averaged over base case life – ~A\$1,000 - \$1,100/oz
- Gold production commenced February 2014
- FY15 at 30 June 2015:
  - Produced 69,612oz
  - AISC A\$1,249/oz
  - Revenue A\$101.9M
  - Cash flow A\$23.7M
  - Hedge 24,000oz @ A\$1,577/oz

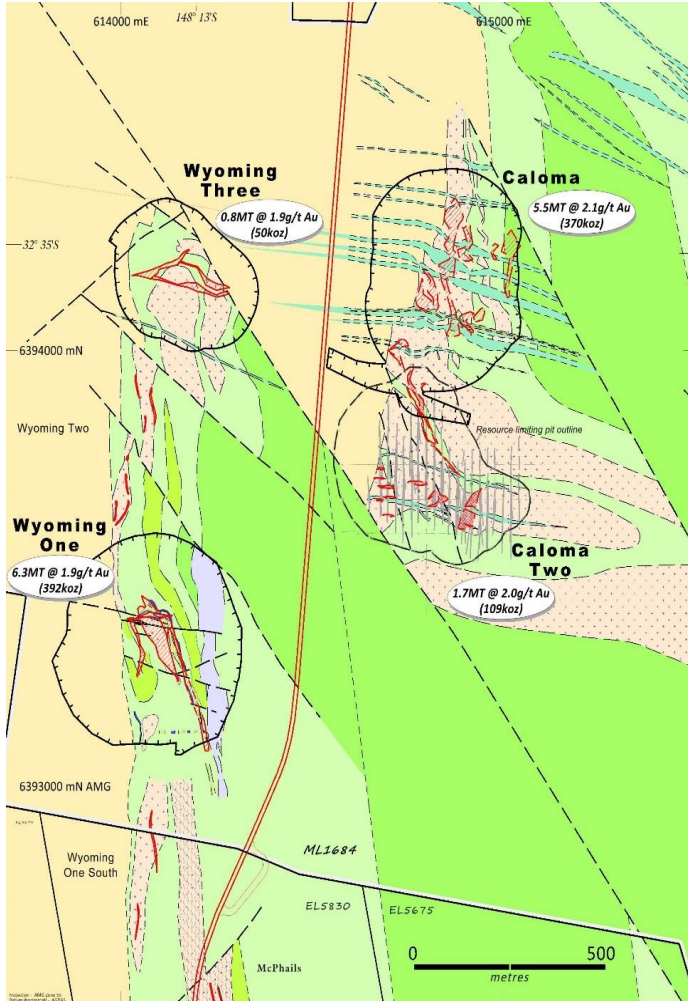




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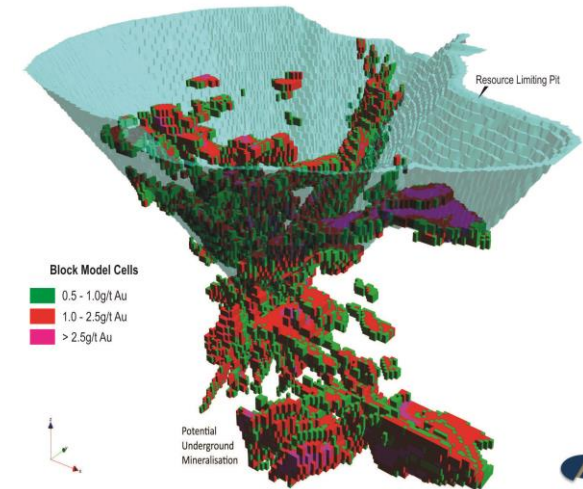
# TGO Resource Expansion

## Caloma Two – Geological model

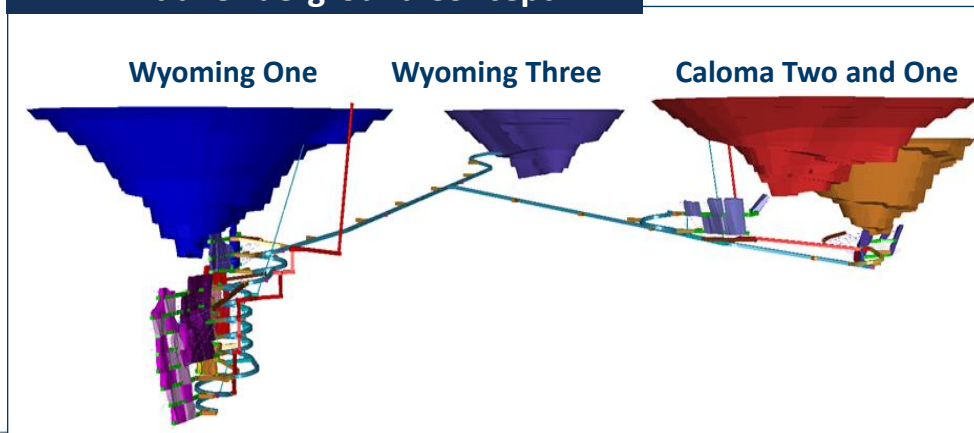


### Additional Resource Potential

- Caloma Two open pit and underground
- Expand Wyoming One underground
- Caloma underground
- Myalls underground (historic 70,000oz)
- Wyoming Two and Three underground
- McLeans



## Initial Underground Concept



# Dubbo Zirconia Project

- A very large polymetallic resource of the metals zirconium, hafnium, niobium (tantalum), yttrium and rare earths.
- Important and strategic metal mix.
- Reserve supports 35 year mine life at 1 million tonne ore processing per annum with defined resource potentially supporting a significantly longer operation\*.
- Demonstrated flow sheet with pilot plant and products for market evaluation at ANSTO.
- Robust technical and financial feasibility completed April 2013. Bankable study nearing completion.
- Environmental Impact Statement lodged in June 2013 – Development approved May 2015.
- Strong market interest in products.

Hydrogen 1 H 1.008																	Helium 2 He 4.0026						
Lithium 3 Li 6.94	Beryllium 4 Be 9.012																	Boron 5 B 10.811	Carbon 6 C 12.011	Nitrogen 7 N 14.007	Oxygen 8 O 15.999	Fluorine 9 F 18.998	Neon 10 Ne 20.180
Sodium 11 Na 22.990	Magnesium 12 Mg 24.305																	Aluminum 13 Al 26.982	Silicon 14 Si 28.085	Phosphorus 15 P 30.974	Sulfur 16 S 32.06	Chlorine 17 Cl 35.45	Argon 18 Ar 39.948
Potassium 19 K 39.098	Calcium 20 Ca 40.078	Scandium 21 Sc 44.956	Titanium 22 Ti 47.867	Vanadium 23 V 50.9415	Chromium 24 Cr 51.996	Manganese 25 Mn 54.938	Iron 26 Fe 55.845	Cobalt 27 Co 58.933	Nickel 28 Ni 58.693	Copper 29 Cu 63.546	Zinc 30 Zn 65.38	Gallium 31 Ga 69.723	Germanium 32 Ge 72.63	Arsenic 33 As 74.922	Selenium 34 Se 78.96	Bromine 35 Br 79.904	Krypton 36 Kr 83.798						
Rubidium 37 Rb 85.468	Strontium 38 Sr 87.62	Yttrium 39 Y 88.906	Zirconium 40 Zr 91.224	Niobium 41 Nb 92.906	Molybdenum 42 Mo 95.95	Technetium 43 Tc 97.91	Ruthenium 44 Ru 101.07	Rhodium 45 Rh 102.91	Palladium 46 Pd 106.42	Silver 47 Ag 107.87	Cadmium 48 Cd 112.41	Indium 49 In 114.82	Tin 50 Sn 118.71	Antimony 51 Sb 121.760	Tellurium 52 Te 127.60	Iodine 53 I 126.90	Xenon 54 Xe 131.29						
Cesium 55 Cs 132.905	Barium 56 Ba 137.327	* 57-70 Lanthanum 57 La 138.905	Hafnium 72 Hf 178.49	Tantalum 73 Ta 180.95	Tungsten 74 W 183.84	Rhenium 75 Re 186.207	Osmium 76 Os 190.23	Iridium 77 Ir 192.227	Platinum 78 Pt 195.08	Gold 79 Au 196.967	Mercury 80 Hg 200.59	Thallium 81 Tl 204.38	Lead 82 Pb 207.2	Bismuth 83 Bi 208.98	Polonium 84 Po 209	Astatine 85 At 210	Radon 86 Rn 222						
Francium 87 Fr 223.02	Radium 88 Ra 226.03	** 89-102 Actinium 89 Ac 227.03	Rutherfordium 104 Rf 261.10	Dubnium 105 Db 268.10	Seaborgium 106 Sg 271.10	Bohrium 107 Bh 272	Hassium 108 Hs 277.10	Mtnerium 109 Mt 278.10	Darmstadtium 110 Ds 281.10	Roentgenium 111 Rg 280.10	Copernicium 112 Cn 285.10	Nihonium 113 Nh 284.10	Flerovium 114 Fl 289	Uunquadium 115 Uu 288.10									

- Alkane
- Light Rare Earths
- Heavy Rare Earths
- Rare Metals

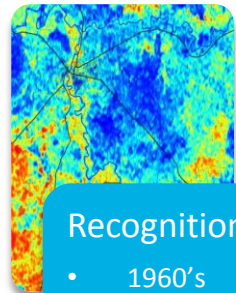
\*Lanthanide series

Lanthanum 57 La 138.91	Cerium 58 Ce 140.12	Praseodymium 59 Pr 140.907	Neodymium 60 Nd 144.242	Promethium 61 Pm 144.91	Samarium 62 Sm 150.36	Europium 63 Eu 151.96	Gadolinium 64 Gd 157.25	Terbium 65 Tb 158.92	Dysprosium 66 Dy 162.50	Holmium 67 Ho 164.93	Erbium 68 Er 167.257	Thulium 69 Tm 168.935	Ytterbium 70 Yb 173.054
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\*\*Actinide series

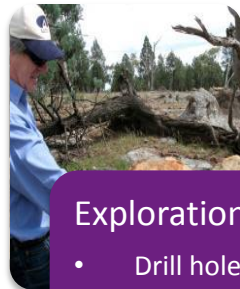
Actinium 89 Ac 227.03	Thorium 90 Th 232.04	Protactinium 91 Pa 231.04	Uranium 92 U 238.03	Neptunium 93 Np 237.05	Plutonium 94 Pu 244.06	Americium 95 Am 243.06	Curium 96 Cm 247.07	Berkelium 97 Bk 247.07	Californium 98 Cf 251.08	Einsteinium 99 Es 252.08	Fermium 100 Fm 257.10	Mendelevium 101 Md 258.10	Nobelium 102 No 259.10
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# DZP Discovery and Development



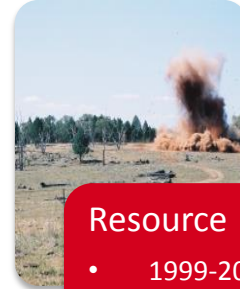
## Recognition

- 1960's
- Initial drilling 1983 for Cu-Au



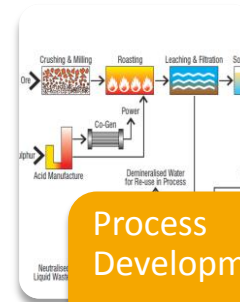
## Exploration

- Drill holes 1990
- Preliminary metallurgical work



## Resource

- 1999-2002
- Mini pilot plant
- Feasibility study



## Process Development

- Metallurgy 2006 - present



## Demonstration Pilot Plant

- 2008-2015 cont
- Proven flowsheet
- DFS → BFS



## EIS

- Lodged June 2013
- Conditional approval Feb 2015
- Approved 29 May 2015



## Offtake

- Treibacher AG for Nb
- Multiple options for zirconium
- Rare earths in progress



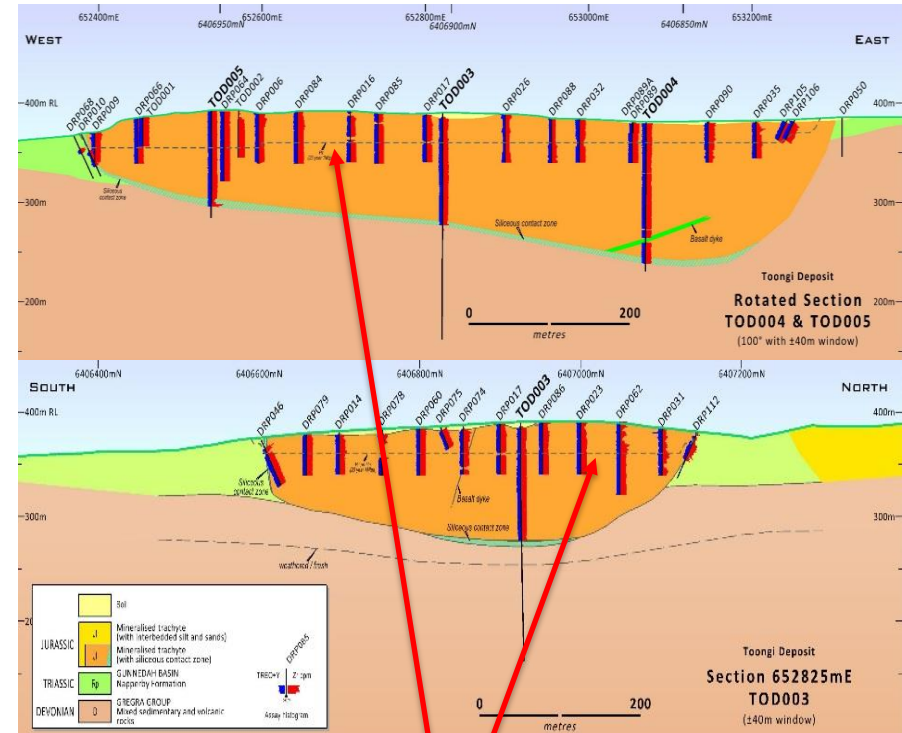
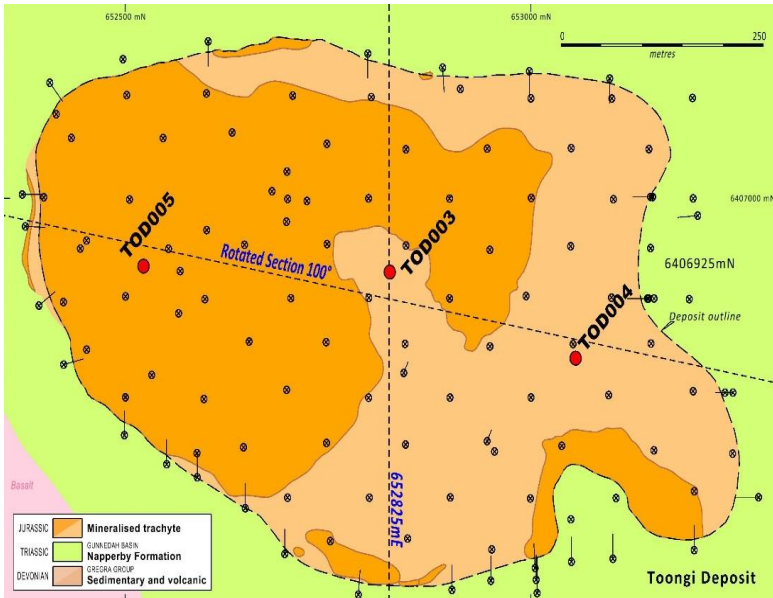
## Next steps...

- Financing
- Construction
- Production



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# Geology and Resources



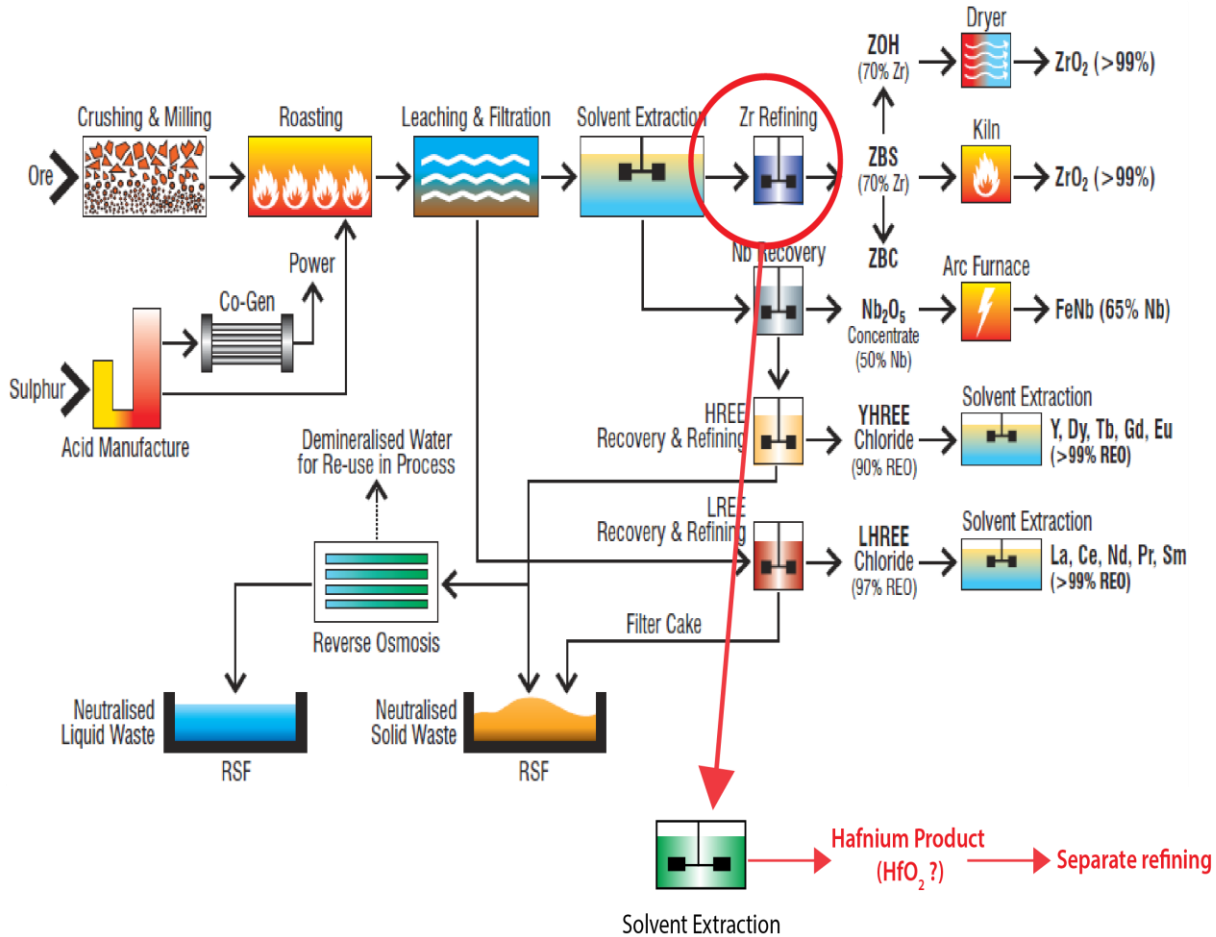
- **Trachyte lava or sub-volcanic intrusive**
- **Largely homogeneous ore body**
- **Ore mineralogy:**
  - eudialyte (“like” Zr silicate +Y and HRE)
  - natroniobite (Nb-Ta)
  - bastnaesite (LRE)
- **All readily soluble in sulphuric acid forms basis of recovery process**

**20 year pit.**  
**Waste to ore 0.2:1.0**

Resources and reserves detailed in slide 20



# Flow Sheet with “new” Hafnium Recovery



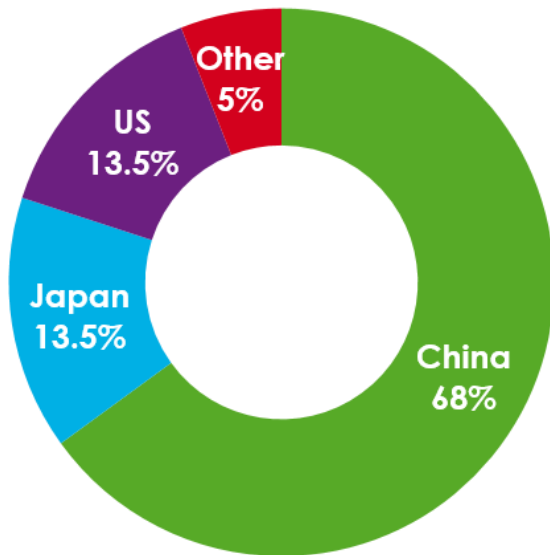
# DZP Product Output

<b>Product Output</b>	Light rare earth chemical concentrate	99% REO	4,665 tpa (LREO units)
	Heavy rare earth chemical concentrate	95% REO	1,309 tpa (HREO units)
	Zirconium as ZBC (carbonate) & zirconia	99% ZrO <sub>2</sub>	15,827 tpa (ZrO <sub>2</sub> units)
	Hafnium as HfO <sub>2</sub> (process being trialed)	Assumed 50% recovery	200 tpa (Hf units)
	Niobium as ferro-niobium	65% Nb	1,967 tpa (Nb units)
	Tantalum (no process to date)	Assumed 50% future output	150 tpa (Ta <sub>2</sub> O <sub>5</sub> units)

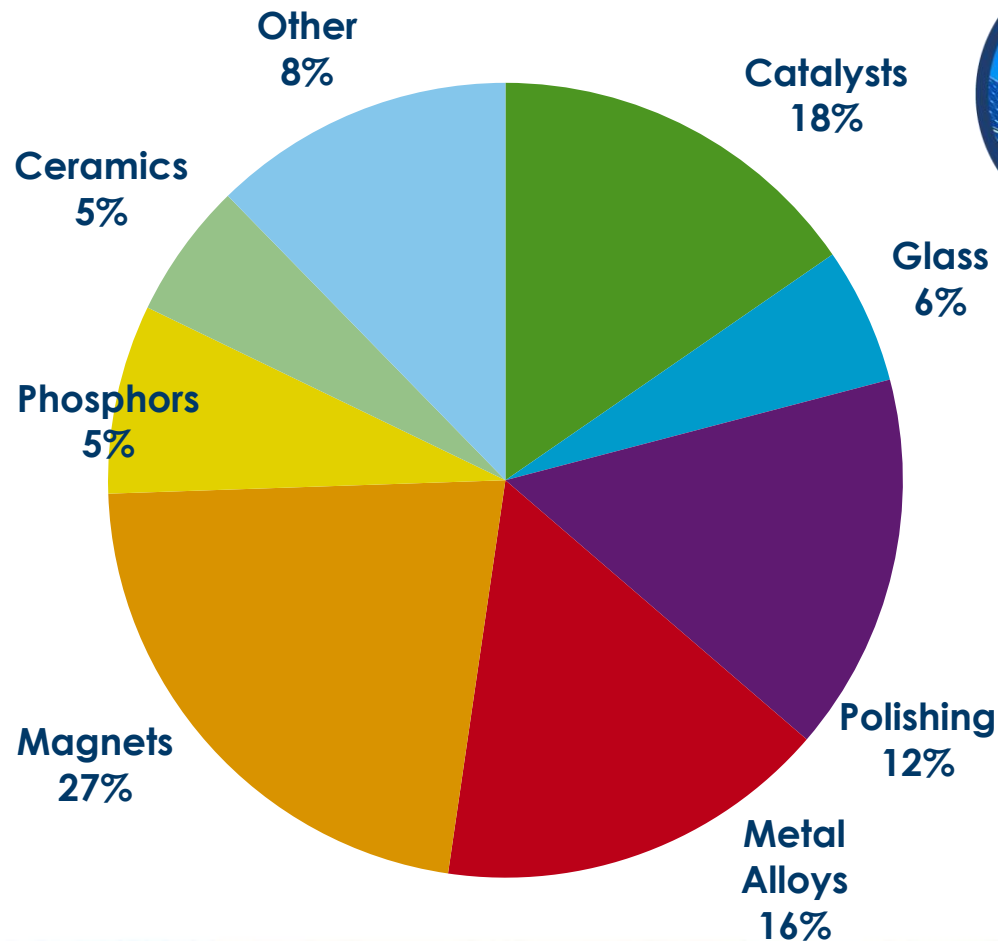
Tonnage based upon recoveries developed from mass balances of the demonstration pilot plant.  
Process optimization to improve recoveries is continuing.

- US\$3-5B Global market
- 136,000t Annual consumption 2014
- 5-10% Annual growth estimates
- 85-90% REE produced by China

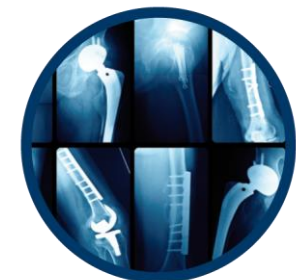
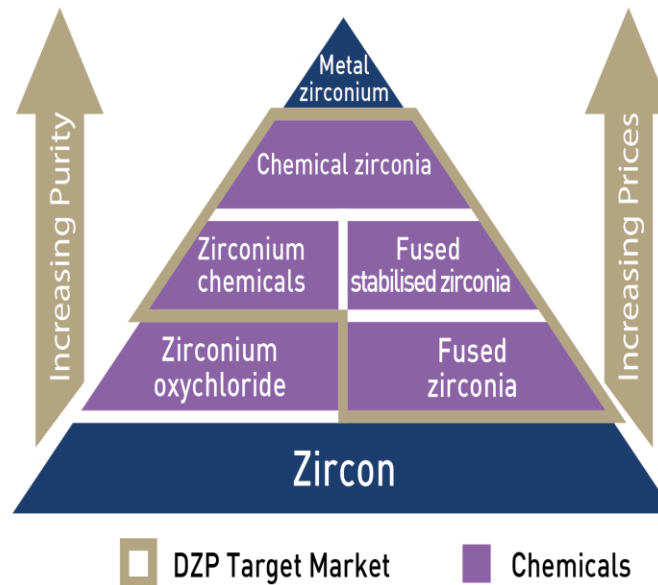
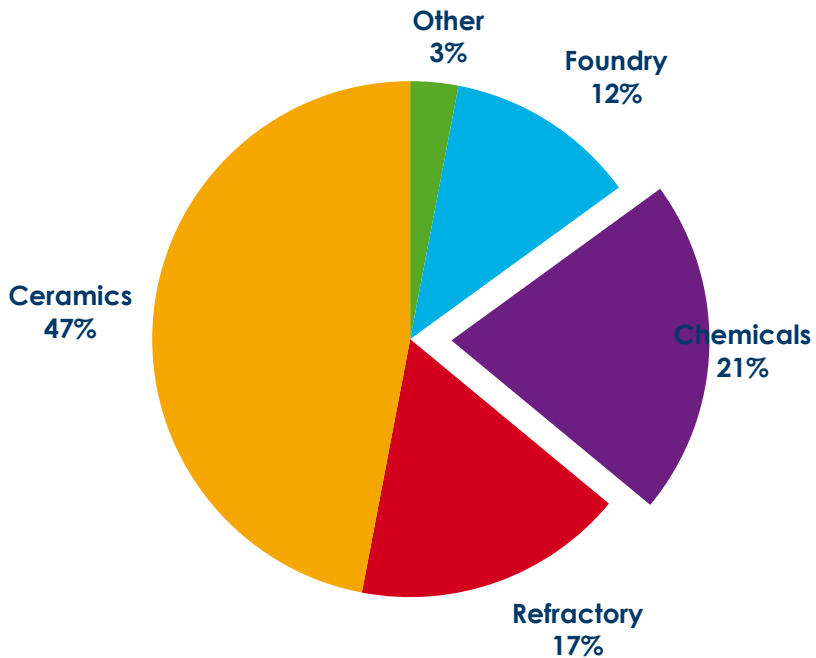
## REE Demand 2014 by Country



## REE Demand 2016 by Application



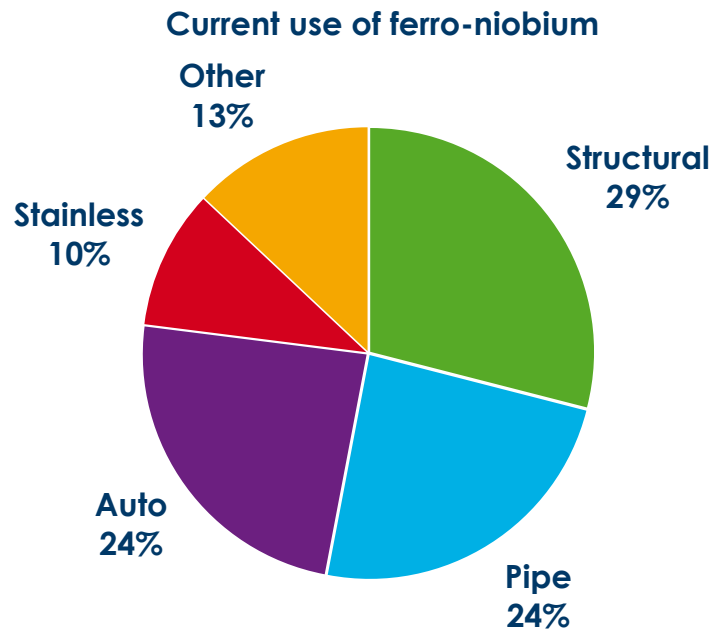
## Zircon Demand by End Use (2014 ~ 1 million tonnes)



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

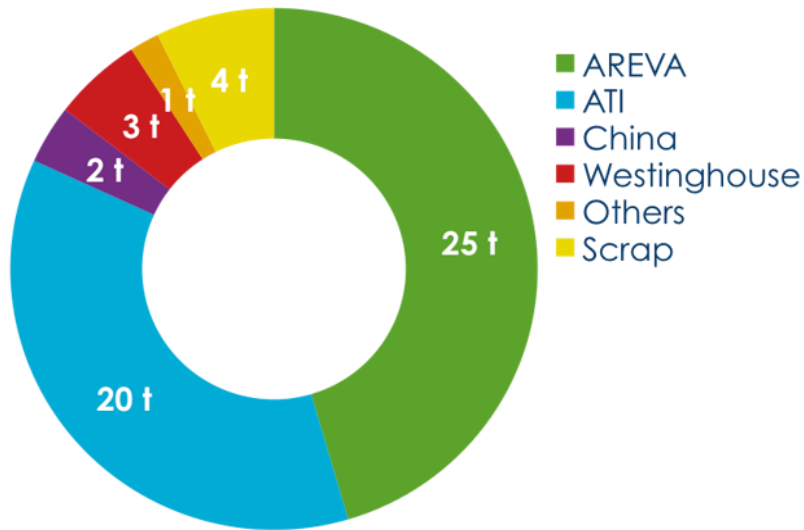
- China dominates downstream zirconium industry (85-90%)

- 90% of Nb used in standard grade ferro-niobium for the production of high strength low alloy (HSLA) steels.
- World production estimated at 80,000t Nb in 2012. CBMM in Brazil accounts for 85%.
- Global market US\$3-4B. Price stability since 2008, including GFC.
- CAGR anticipated at 10%. Demand expected to be driven by greater intensity of use in steels by BRIC producers.

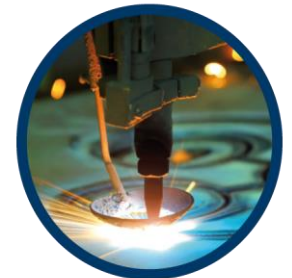
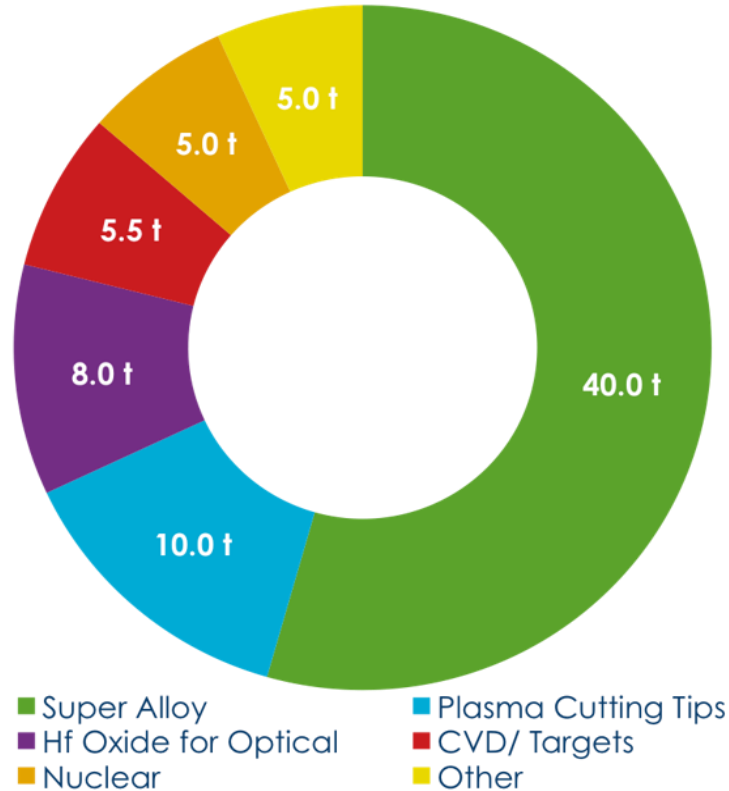


- Super Alloys - 73% of 2015 supply
- By-product from zirconium metal
  - Depends on nuclear industry
- Prices escalating through demand by aerospace industries 2014 into 2015

**Hafnium Supply**  
2015 Estimated 50 - 60 tonnes

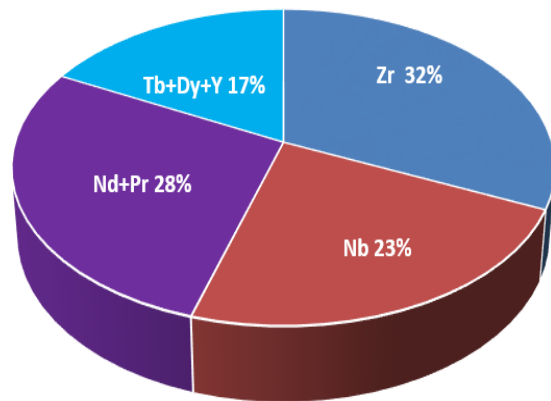


**Hafnium Demand**  
2015 Estimated 70 - 80 tonnes

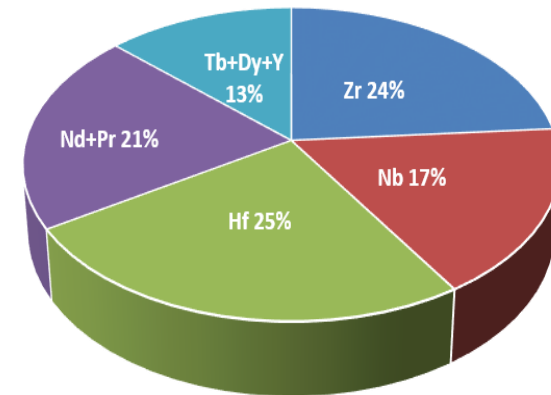


Definitive Feasibility completed April 2013 – BFS with updated capex and opex being compiled. BFS scheduled for completion Q3 2015.

DFS Base Case ~A\$1B capex and 20 year NPV A\$1.2B\*



Zr-Nb-Pr-Nd-Tb-Dy-Y



Zr-Hf-Nb-Pr-Nd-Tb-Dy-Y

Anticipated revenue at current Chinese spot prices ~A\$400 – 450 million, and A\$500 – 550 million with hafnium production.

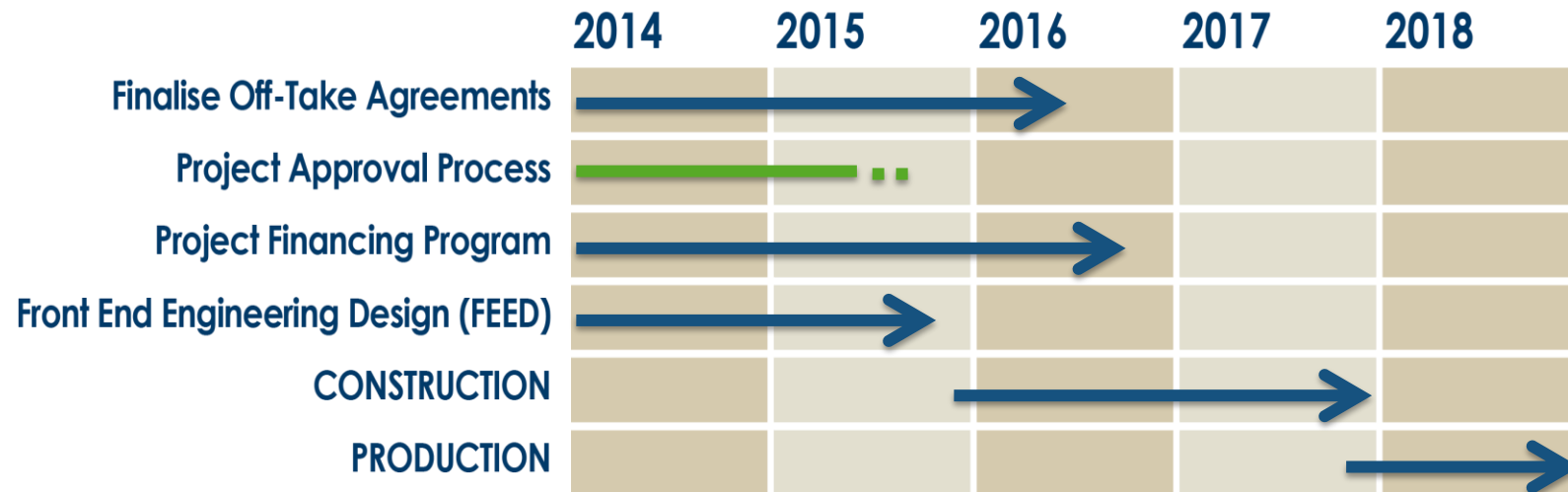
Opex ranges from ~A\$200 – 250 million, including hafnium production.

Rare earth revenues largely derived from Pr, Nd, Tb, Dy and Y (for production of RE magnets and special ceramics)

Investment at Project Level	Government Assistance Programs	Commercial Bank Debt	Equity Capital Markets (ALK)
<ul style="list-style-type: none"> <li>• Strategic Investment(s)</li> <li>• Advisors: SMBC &amp; Credit Suisse</li> <li>• Strategic interest(s) in long term supply of critical metals</li> <li>• Intro of cornerstone investor(s)</li> </ul>	<ul style="list-style-type: none"> <li>• ECA Style Funding</li> <li>• Lead coordinator: Sumitomo Mitsui Banking Corp</li> <li>• Attractive Project               <ul style="list-style-type: none"> <li>• Long life, low cost</li> <li>• Long term off-take-agreements with international companies</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Advisors: SMBC &amp; Credit Suisse</li> <li>• Attractive Project               <ul style="list-style-type: none"> <li>• Strong operating cash flows</li> <li>• Diversified revenue stream</li> <li>• New markets</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Advisors: Credit Suisse &amp; Petra Capital</li> </ul>

- Total project capex ~A\$1B (including A\$166M contingency) based on April 2013 DFS to +/-17%
- Current FEED program to achieve BFS standard @ +/-10%
- Capex, opex and revenue being reviewed
- Multiple off-take discussions and advancing ECA programs





**State approval received 29 May 2015**  
**ML and EPL anticipated by end of September**

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

# Producing the Metals of the Future

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- Internationally strategic DZP with supply of several critical metals from non-Chinese sources
- Diversified DZP output gives robust revenues, even at current Chinese domestic RE and Zr prices
- Full spectrum of rare earth magnet materials – neodymium, praseodymium, dysprosium and terbium produced
- The DZP is very different to Lynas' Mt Weld and Molycorp's Mt Pass pure rare earth (mostly light RE) projects
- Potential to be the world's largest hafnium producer and supply long term stable production and pricing into the expanding aerospace industry
  
- Current operating cost structure very competitive @ US\$7 - \$8/kg of product produced (~A\$10.40)



**TGO CIL Plant**



**DZP Demonstration Pilot Plant**

## 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 2012 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 GOLD PROJECT MINERAL RESOURCES (as at 30 June 2014)									
DEPOSIT	MEASURED		INDICATED		INFERRED		TOTAL		Total Gold (Koz)
	Tonnage (Kt)	Grade (g/t Au)	Tonnage (Kt)	Grade (g/t Au)	Tonnage (Kt)	Grade (g/t Au)	Tonnage (Kt)	Grade (g/t Au)	
<b>Open PitTABLE Resources (cut off 0.50g/t Au)</b>									
Wyoming One	2,171	1.7	442	1.5	735	1.1	3,348	1.6	166.8
Wyoming Three	473	1.8	25	1.5	98	1.1	597	1.6	31.5
Caloma	2,556	2.0	649	1.7	2,464	1.4	5,669	1.7	316.9
Caloma Two	-	-	1,085	2.4	704	1.3	1,789	2.0	112.4
<b>Sub Total</b>	<b>5,200</b>	<b>1.9</b>	<b>2,201</b>	<b>2.0</b>	<b>4,001</b>	<b>1.3</b>	<b>11,402</b>	<b>1.7</b>	<b>627.5</b>
<b>Underground Resources (cut off 1.75g/t Au)</b>									
Wyoming One	229	4.1	296	3.7	869	2.9	1,394	3.3	147.3
Wyoming Three	29	2.6	15	2.4	8	2.5	52	2.5	4.2
Caloma	3	2.1	13	2.3	224	2.5	240	2.4	18.9
Caloma Two	-	-	215	2.7	165	2.5	380	2.6	32.0
<b>Sub Total</b>	<b>261</b>	<b>3.9</b>	<b>539</b>	<b>3.2</b>	<b>1,266</b>	<b>2.8</b>	<b>2,066</b>	<b>3.0</b>	<b>202.4</b>
<b>TOTAL</b>	<b>5,461</b>	<b>2.0</b>	<b>2,740</b>	<b>2.3</b>	<b>5,267</b>	<b>1.7</b>	<b>13,468</b>	<b>1.9</b>	<b>829.8</b>

TOMINGLEY GOLD PROJECT ORE RESERVES (as at 30 June 2014)							
DEPOSIT	PROVED		PROBABLE		TOTAL		Total Gold (Koz)
	Tonnage (Kt)	Grade (g/t Au)	Tonnage (Kt)	Grade (g/t Au)	Tonnage (Kt)	Grade (g/t Au)	
Wyoming One	1,662	1.7	202	1.4	1,864	1.6	98.4
Wyoming Three	379	1.7	10	1.8	389	1.7	21.4
Caloma	1,744	2.2	184	1.7	1,928	2.2	136.0
Caloma Two	-	-	239	3.6	239	3.6	27.4
<b>TOTAL</b>	<b>3,785</b>	<b>1.9</b>	<b>635</b>	<b>2.3</b>	<b>4,420</b>	<b>2.0</b>	<b>283.2</b>
Stockpiles	186	1.9			186	1.9	11.5
<b>TOTAL</b>					<b>4,606</b>	<b>2.0</b>	<b>294.7</b>

Full details are given in the ASX release of 5 September 2014