

### Recommendation: BUY

**Buy** in anticipation of increased gold resources, progress on two feasibility studies and a stock re-rating as the company progresses from explorer to producer.

#### Investment data

ASX Code	ALK
Share price (15th February 2008)	\$0.345

#### Issued capital

FPO Shares	241.7m	
Unlisted Options	7.55m	
	(ex Sep 2008 @ \$0.25)	3.35m
	(ex Sep 2009 @ \$0.30)	4.20m
Market Cap	(fully diluted)	\$86.0m
Major Shareholders (2 January 2008)		
	Abbotsleigh Pty Ltd	29.1%

#### Indicative valuation

	\$m	\$/share
Tomingley	100.0	0.40
Dubbo Zirconium	71.9	0.29
Exploration	5.0	0.02
Investments	10.7	0.04
Cash (est)	13.0	0.05
<b>Total</b>	<b>200.6</b>	<b>0.80</b>

NPV of projects has been calculated at a discount rate of 7.5% and then further discounted by 20% and 25% for the Tomingley and Dubbo Zirconium projects respectively to allow for development risks/delays.

#### Share price performance



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### Emerging gold and zirconium/niobium/rare earths producer

Alkane Resources Limited (ALK) is a multi commodity explorer with two projects at the feasibility stage and a strong chance of making the transition from explorer to miner by 2009. Recent drilling at the Caloma deposit, which forms part of the company's Tomingley Gold Project in NSW, has confirmed the presence of near-surface, higher grade gold mineralisation which should considerably boost the project economics. The Zirconium Demonstration Plant at ANSTO is expected to confirm the feasibility of the Dubbo Zirconium Project. The net result is that Alkane could have two projects in production by the end of 2011 with combined sales revenue in excess of \$140m.

#### Key Points

- **Additional gold resource at Caloma to enhance existing Wyoming resource**  
 The current gold resource for the Wyoming 1 and 3 deposits at the Tomingley Project is 7.130Mt at a grade of 2.70g/t containing 606,350 ozs gold. However, the expected open pit mining grade of around 2.2g/t gold was thought to be marginal at a gold price of ~A\$650/oz. Current drilling at Caloma suggests grades of +3g/t, with potential open pit tonnage in excess of 2Mt. This, together with the increase in the gold price (currently around US\$900/oz), is likely to significantly improve cash flow in the earlier years and therefore enhance the net present value of the project.
- **Tomingley Gold Project could be in production before the end of 2009**  
 Assuming the project receives the go-ahead in late 2008, gold production could begin before the end of 2009. The company expects to produce around 65,000 ozs gold annually (up to 100,000 ozs per annum in the first two years) from open pit operations for a 5-year period, followed by underground production of a similar magnitude for a further 3-4 years. The initial capital cost is expected to be modest at around \$50m, while operating costs of around \$500/oz are anticipated.
- **Dubbo Zirconium project moving ahead steadily**  
 The feasibility study, which includes the construction and operation of a demonstration pilot plant at ANSTO's facilities at Lucas Heights, is expected to be completed by the end of the March 2009 quarter. Should the project proceed, first production could be expected in the December quarter of 2010. At an initial throughput rate of 200,000tpa, the project should produce annual revenues in excess of \$50m from the sale of zirconium products, a niobium-tantalum concentrate and a yttrium-rare earth concentrate.
- **Compelling valuation**  
 Based purely on the Tomingley Gold Project, investments (BCI Shares) and cash held, Lonsec values the company at \$0.49, a 42% premium to the current share price. Development of the Dubbo Zirconium Project would add between \$0.29 and \$0.96 per share. Assuming a nominal \$5m value for other exploration projects, the valuation range for Alkane is between \$0.80 and \$1.47 per share. For full details of assumptions, see Valuation pg 5.
- **Risks will diminish as development progresses**  
 In addition to commodity price movements, the major risks facing the company are securing suitable offtake agreements for the zirconium project (failure would probably spell the end of the project), accessing project finance (either debt or equity or a combination of the two), project development delays and capital cost over-runs. Some of these, particularly delays and cost over-runs, are partially allowed for in Lonsec's valuation process.
- **Other exploration potential**  
 In addition to its two main projects, the company is actively engaged in a number of exploration prospects. These include the Moorilda-McPhillamys joint venture (Newmont earning 51%), where wide zones of gold mineralisation at grades in excess of 1.5g/t have been intersected and a copper prospect at Galwadgere-Wellington where a small copper resource has been delineated. A moderately refractory sulphide gold-copper resource also exists below the mined-out pit at Peak Hill. The company also has a 15.5% interest in BC Iron Ltd. (ASX:BCI)

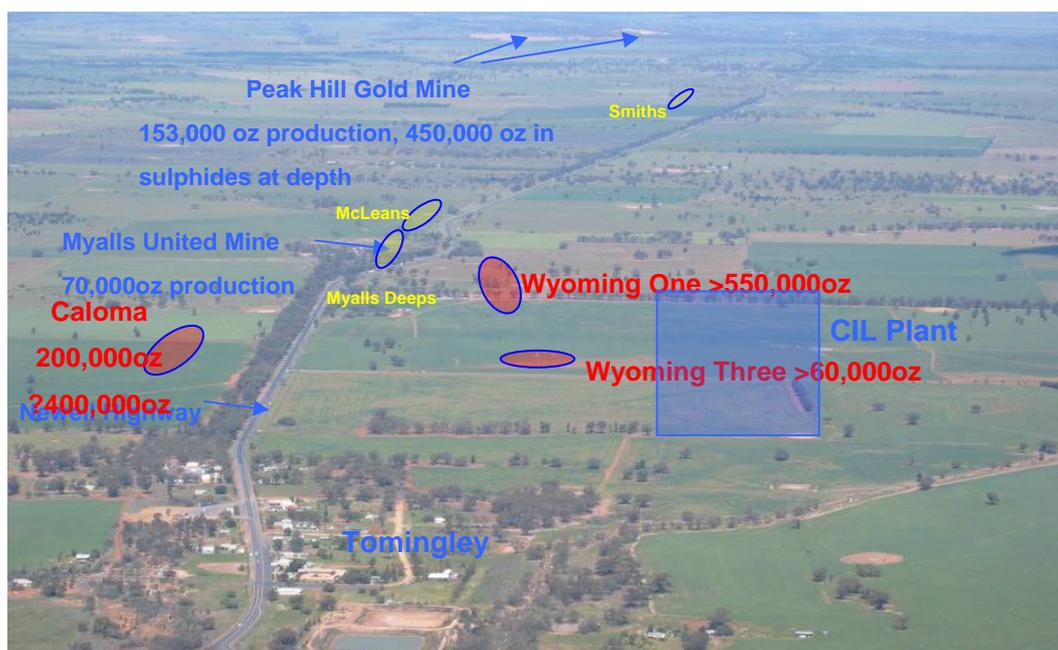
**GOLD – TOMINGLEY GOLD PROJECT**

Alkane has a 100% interest (subject to separate royalty agreements) in the Tomingley Gold Project (TGP) which extends over 60kms from near Parkes in the south, to north of Tomingley in the Central West of New South Wales and covers a narrow sequence of Ordovician volcanic rocks. The Wyoming Prospect, within the TGP, is situated about 14 kilometres north of the Peak Hill Gold Mine which the company successfully operated from 1996 to 2006.

The Wyoming area forms one of a number of prospects and gold occurrences, including Peak Hill, located along this volcanic belt. Gold mineralisation at Wyoming has a close spatial relationship to a feldspar porphyry which intrudes into andesitic volcanoclastic rocks near their western contact with a more pelitic sequence. Mineralisation is associated with extensive alteration and quartz veining of the porphyry and volcanic rocks. Several distinct target areas have been identified to date within a three kilometre corridor extending from McLeans in the south, through Wyoming One to Wyoming Three in the north. A new deposit has recently been discovered at Caloma which is located 500m east of Wyoming Three.

Much of the Wyoming area is covered by transported and unmineralised clay sediments and this has impacted on both the exploration techniques used to locate and define ore bodies, but also on development options and costs. This cover ranges from about 5m to 10m at Wyoming Three and Caloma, to more than 60 metres over Wyoming Two. The major ore body at Wyoming One averages 25m of cover.

**Tomingley Gold Project – South View**



Since 2001, more than 130,000m of drilling has been completed in almost 1,300 holes. Expenditure to date has totalled \$7.5m or approximately \$12 per resource ounce defined.

**Mineral Resources**

Project	Measured			Indicated			Inferred			Cut-off g/t
	Mt	g/t	ozs	Mt	g/t	ozs	Mt	g/t	ozs	
Wyoming One	4.020	2.25	290,803	1.010	2.77	89,948	1.270	4.09	167,000	0.75
Wyoming Three	0.815	2.20	57,646	0.015	2.32	1,119				0.75
<b>Total</b>	<b>4.835</b>	<b>2.24</b>	<b>348,450</b>	<b>1.025</b>	<b>2.76</b>	<b>91,067</b>	<b>1.270</b>	<b>4.09</b>	<b>167,000</b>	

Feasibility studies, which have been ongoing since 2005, have considered various development scenarios/options. Before the discovery of Caloma, conceptual development consisted of two open pit mines, Wyoming One and Wyoming Three, followed by an initial underground operation focussed on

Wyoming One. Ore would be processed through a conventional carbon-in-leach (CIL) plant at a rate of between 0.5Mtpa and 1Mtpa, producing between 35,000 ozs and 70,000 ozs of gold per year for a minimum six year period. The anticipated cost of a 1Mtpa operation was initially expected to be around \$40m, although this is now more likely to be in the order of \$50m.

Alkane has recently appointed Mintrex, the consulting division of Perth engineering group Holtfreeters Pty Ltd, to manage a definitive feasibility study. A program to review all historic data has commenced, and initial conceptual design and layout has been initiated. A full metallurgical test program for Caloma, and follow up to the earlier Wyoming One and Wyoming Three data is being undertaken. Discussions regarding infrastructure issues, including water, power and site access, have been initiated with the appropriate agencies and authorities.

## Caloma

Caloma was discovered early in 2006. Multiple mineralised structures have previously been identified within the Caloma target area. The host is a feldspar porphyry which is 80m to 100m in width and 1,000m in north-south extent. From recent drilling, it has become apparent that most of the mineralised structures within the porphyry have an approximate north-northwest orientation, with a shallow south westerly dip. The structures range in width from a few metres to in excess of 20 metres and appear to extend across the full width of the porphyry. Gold mineralisation has been intersected over the full length of the porphyry. The drilling programme is targeting the area of shallower cover to prove up an open pitable resource as a priority for the feasibility study underway for the development of the Wyoming and Caloma deposits as part of the Tomingley Gold Project.

A 10,000m RC resource definition drilling programme commenced at Caloma in late October and 38 holes (4,378m) had been completed by the end of 2007. Assay results have now been received for 28 of these holes. Only two holes failed to intersect gold mineralisation greater than 0.5g/t. Most holes intersected several mineralised horizons. The initial drilling was focussed on the central zone (200m-300m) because it lies below shallow cover of around 10m compared to 30m in the southern area.

The RC drilling recommenced in mid-January after a Christmas–New Year break. The drilling will include diamond core for geological confirmation and metallurgical samples. As the target size keeps increasing, the drilling programme is to be expanded to 20,000m. A second drill rig is in the process of being sourced.

Lonsec's assessment of the project is detailed under Valuation.

## DUBBO ZIRCONIA PROJECT (DZP)

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The Dubbo Zirconia Project is located 30km south of the regional centre of Dubbo, approximately 400km northwest of Sydney. In addition to zirconium, other elements/metals contained within the deposit are hafnium, niobium, tantalum, yttrium and rare earth elements. The deposit also contains uranium.

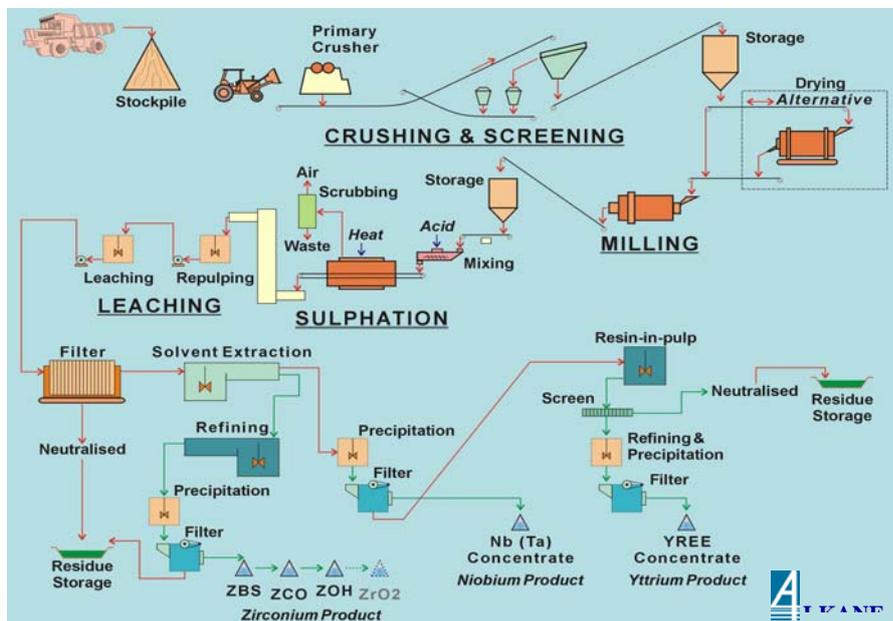
Over a number of years, Alkane has conducted metallurgical testwork and established a flow sheet which suggests that many of the previously-mentioned elements can be recovered. In April 2006, Alkane received a commercial grant totalling \$3.29m on a dollar for dollar basis to enable process optimisation and construction and operation of a Demonstration Pilot Plant.

A feasibility study is currently in progress, which includes the construction and operation of this Demonstration Pilot Plant. Construction of the plant at ANSTO was delayed by late delivery of several key components but is now nearing completion and in early January, the rotary kiln at the front end of the plant, was initially commissioned. It is hoped that the leaching, filtration and solvent extraction circuits will be on stream before the end of February. The plant is designed to process at least 100 tonnes of ore to confirm the flow sheet, provide engineering detail for the feasibility study and produce several tonnes of various products for distribution to potential consumers in 50kg to 100kg parcels. A development commitment is anticipated by the end of 2008.

The ultimate zirconium product suite will largely be determined by customer response to the pilot plant product, but could include zirconium basic sulphate, zirconium hydroxide, zirconium carbonate, calcined zirconia and zirconium and hafnium metal. In addition, a niobium-tantalum concentrate and yttrium-rare earth concentrate (REO) would be produced. There is potential to produce uranium and thorium concentrates, but this is not included in the development plans as the production of uranium is currently prohibited in NSW.

A major market review of the potential output from the DZP was completed by the Project's consultants, TZ Minerals International. The study focussed on the three separate product streams of zirconium, niobium and yttrium-rare earth elements. The study confirmed the recent significant developments in the market for the products had improved the outlook for demand and future pricing. For further details, see Appendix 1.

## DUBBO ZIRCONIA PROJECT PROCESS FLOW SHEET



Source: Alkane

### Dubbo Zirconia Resources

Category	Depth	Tonnes (M)	ZrO <sub>2</sub>	HfO <sub>2</sub>	Y <sub>2</sub> O <sub>3</sub>	Nb <sub>2</sub> O <sub>5</sub>	Ta <sub>2</sub> O <sub>5</sub>	U <sub>3</sub> O <sub>8</sub>	REO
Measured	0-55m	35.7	1.96	0.04	0.14	0.46	0.03	0.014	0.75
Inferred	55-100m	37.5							

(Inferred resources at similar grades to measured resources)

Source: Alkane

### VALUATION

	Tomingley	Zirconium (200,000tpa)	Zirconium (500,000tpa)	Combined (Range)
NPV @ 7.5% (\$m)	124.9	95.9	320.4	220.8-445.3
Discounted at 20%, 25% (\$m)	100.0	71.9	240.3	171.9-340.3
Valuation/Share (\$)	0.40	0.29	0.96	0.69-1.36

NPV is on an ungeared basis, discount of 20% and 25% for Tomingley and Dubbo Zirconium Projects respectively to allow for development risk/delays.

## Tomingley Gold Project - Lonsec Assumptions

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- Completion of resource/reserve estimates, feasibility study, permitting and approvals by the end of the September 2008 quarter
- Construction to be completed by mid-2009, commissioning in September 2009 quarter, full production in December 2009 quarter
- Mineral resource:
  - existing Wyoming – 7.13Mt at 2.7g/t
  - Caloma – 2Mt-3Mt at 3.0g/t
- Ore reserve:
  - Caloma – 2Mt at 3.0g/t
  - Wyoming Open pits – 3Mt at 2.2g/t
  - Wyoming Underground - 2Mt at 4.25g/t
  - Total – 7.2Mt at 3.0g/t
- Throughput:
  - 1.0Mtpa open pit for 5years
  - 0.5Mtpa underground for 4 years
- Head Grade:
  - Caloma open pit – 3.0g/t (two years)
  - Wyoming open pits - 2.2g/t (three years)
  - underground – 4.25g/t (four years)
- Recoveries: 93%-95%
- Operating Costs:
  - Open pit - \$40/t
  - underground - \$70/t
- Capital cost:
  - Initial capex of \$50m
  - ongoing/development capex of \$2m pa (open pit)
  - underground development cost of \$20m (production year 5)
  - ongoing/development capex of \$5m pa (underground)
- Gold Price: US\$800/oz
- US\$/A\$ Exchange Rate:
  - 2009 – 0.80
  - 2010 onwards – 0.75
- No hedging, although part of the first 2-3 years production is likely to be hedged if project financing is adopted

## Dubbo Zirconium Project - Lonsec Assumptions

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- Feasibility study and demonstration plant work to be completed by the end of March quarter 2009. Construction to begin in the second half of 2009, commissioning in September quarter 2010 and production in December quarter 2010.
- Throughput:
  - 200,000tpa (lower)
  - 500,000tpa (upper)
  - Based on measured resources only, the open pit mine life would range from 75 to 187 years; NPV based on 20 years
- Head Grades: As per resource estimate
- Recoveries:
  - Zirconium - 76%
  - Niobium – 65%
  - Yttrium/RE – 68%
- Operating Costs: \$120/t treated
- Capital Costs:
  - \$100m (200,000tpa case)
  - \$180m (500,000tpa case)
  - Maintenance capex of \$2m pa

- Product Pricing (bottom end of range):
  - Zirconium products – US\$4/kg
  - Niobium products – US\$25/kg
  - Yttrium/REO products – US\$10/kg
- US\$/A\$ Exchange Rate:
  - 2009 – 0.80
  - 2010 onwards – 0.75

## OTHER EXPLORATION

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### Orange District Exploration Joint Venture (Newmont Australia earning an initial 51%)

In August 2005, Alkane reached agreement with Newmont Australia Limited to farm in to Alkane's Orange Project which includes the Molong and Moorilda tenements located near the city of Orange and adjacent to Newcrest Mining Ltd's Cadia Valley Operations.

In 2006, a potentially significant gold deposit was discovered at McPhillamys within the Moorilda project. The discovery includes intersections of 123m at 1.96g/t and 77m at 1.65g/t gold within a 300m by 200m mineralised zone in the shape of an elongated football and dipping steeply to the east.

Two deep diamond drill holes have recently been drilled into the central section of the McPhillamys deposit to test the down dip, down plunge extent of the gold and base metal mineralisation. The first of the holes was drilled into the centre of the "football" about 200m vertically below the previous deepest hole. If it intersects economic mineralisation, it will extend the deposit to more than 300m vertical depth and add to the resource potential. The second hole is 150m to the north and is testing the mineralisation at depth, as well as the concept that the ore body had a northerly plunge. Both holes intersected extensive sulphide mineralisation.

Assay results for the first hole have just been released. The results extend the gold mineralisation to a vertical depth of 350m. The hole intercepted almost 350m grading 0.87g/t from 98m which included 225m at 1.11g/t and within this higher grade zone 51m at 1.87g/t, 52m at 1.55g/t and 21.8m at 1.63g/t.

The results confirm that McPhillamys hosts a large gold system but considerable additional work will be necessary to confirm continuity of mineralisation and gold grades.

### Galwadgere/Wellington Project (Alkane 100%)

Alkane has defined a 2Mt deposit grading around 1% copper at Galwadgere within the Wellington Project, which is centred 15km to the southeast of the town of Wellington, southwest of Dubbo. A scoping study indicated positive cash flows, but it was thought that at least another 2Mt were required to generate a favourable return on capital.

### Peak Hill Gold Mine (Alkane 100%)

The open pit mine with heap leach/dump leach recovery operated from 1996 to 2006, producing more than 150,000 ozs gold and generating cash flow of \$15m over its life. Final rehabilitation has been completed. A moderately refractory sulphide gold-copper ore body below the oxide open pit mine remains the subject of ongoing reviews. The mineral resource, at a 0.5g/t gold cut off, is 11.27Mt at 1.29g/t and 0.11% copper containing 467,570 ozs gold. At a 3.0g/t cut off, the resource is 0.81Mt at 4.40g/t containing 114,000 ozs gold. No further work is envisaged until the Tomingley deposit has been development.

### Other Exploration Prospects

These include the early stage Bodangora and Cudal gold-copper prospects (Alkane 100%) which lie between Dubbo and Orange and the Leinster Regional Nickel Joint Venture (Alkane 25%) in Western Australia.

### BC Iron Limited (Alkane 15.5%)

In October 2006, Alkane and its unlisted Joint Venture partner reached agreement with Consolidated Minerals Limited to jointly float a new Company, BC Iron, based on combined tenements covering approximately 1,500 sq km which include a number of paleochannels hosting outcrops of Channel Iron Deposits. BC iron has commenced scoping studies and is in the process of delineating an initial resource estimate.

## APPENDIX 1: DUBBO ZIRCONIUM PRODUCTS

### Zirconium

Current world consumption of zirconium products is about 100,000tpa (ZrO<sub>2</sub> equivalent), roughly split 50% each to fused zirconia and zirconium chemicals. The market is very diverse with applications in electronics, ceramics, catalysts, special alloys and glasses, fuel cells, nuclear power and as environmental stable drying agents.

The overall zirconium (+hafnium) chemical and zirconia industries are showing annual growth rates of 8%, while specific areas of the industry, such as advanced ceramics and catalysts, can be as high as 13% pa. Prices have remained relatively stable after two years of growth and range from around US\$4/kg for basic chemical, through to US\$20/kg for electronic grade zirconia. The expansion of the nuclear power industry will also impact positively on the zirconium and hafnium metal demand. Nuclear grade zirconium metal and hafnium metal are US\$250 and US\$350/kg respectively.

The valuation is based on the production of intermediate quality zirconium chemicals priced at US\$4/kg. Higher quality product would sell at up to US\$10/kg.

### Niobium

The dominant use for niobium is in ferro-niobium for high strength low alloy (HSLA) steels, and hence demand and pricing have been driven by rapid growth in the steel industry in the last five years, particularly in China and India. In 2006/07, consumption was around 80,000 tonnes of Nb<sub>2</sub>O<sub>5</sub> equivalent. Average annual growth for the past four years has been almost 14% and an ongoing growth rate of around 10% is anticipated. During 2007, prices jumped from levels of around US\$18/kg to in excess of US\$60/kg. The current price is US\$55/kg and the longer term price is estimated to range from US\$25/kg to \$37/kg. A price of US\$25/kg has been used in the base case valuation.

### Yttrium and rare earths

Uses of yttrium-rare earths can be broken down into four groups: metallurgical applications (hsla steels, alloys, batteries) which account for 35%; catalyst/chemicals (auto and petroleum, fertilisers) which account for 30%; electronics/magnets (phosphors, permanent magnets, lasers accounting for 20% and glass and ceramics (specialty glasses, stabilized zirconias, pigments) which account for 15% of consumption.

The yttrium and rare earth industry is very diverse and products have multiple uses. As a result, growth rates vary for individual elements. Overall the rare earth industry has a projected five year growth rate of around 12.5% but the use of specific rare earths, such as neodymium and dysprosium, which are used in batteries and permanent magnets, is expected to accelerate as these show increasing demand in the developing hybrid and electric car industry.

China currently produces around 90% of the world's consumption of about 117,000 tonnes (as rare earth oxides) and its decision to both restrict export of raw materials and increase the export tax on those rare earths has resulted in a dramatic increase in pricing and demand outside of China. On the basis of current pricing, Dubbo Zirconia project product ranges from US\$8 to US\$10/kg per contained Y<sub>2</sub>O<sub>3</sub> and US\$11 to US\$14/kg per contained REE's. TZMI indicates that the base value of the yttrium concentrate should be around US\$13/kg and the rare earth concentrate, about US\$8.50/kg.

While the current flow sheet and DPP operation are focussed on the "intermediate" product output, there is considerable scope to produce higher quality zirconium products selling for up to US\$10/kg and the production of selected higher value separated rare earth oxides. The Dubbo ore deposit contains greater than average yttrium, dysprosium and terbium content than other deposits, and ANSTO is currently reviewing processing options to produce a suite of products to include yttrium, neodymium and light rare earths, and dysprosium and heavy rare earths.

**Research Index - Alliance Resources Limited (AGS)**

Date	Analyst	Title/Event
January 2008	Basil Burmeister	Small Resources Review

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