ALKANE RESOURCES LTD
ABN 35 000 689 216

# *ASX ANNOUNCMENT 19 SEPTEMBER 2011*

**(ASX : ALK) (OTCQX : ANLKY)**

# DUBBO ZIRCONIA PROJECT DFS DELIVERS VERY ROBUST FINANCIAL RESULTS

- **The DZP base case of 400,000 tonnes per annum DFS results have shown that the project delivers very positive returns**
- **The more likely development of the expanded 1 million tonne per annum project provides a substantial upside to the base case model with a 20 year EBITDA estimated at A$6 billion, an after tax NPV of A$1.2 billion and pre-tax IRR 30.2%**
- **The project has received strong interest for all the product output at the expanded rate and three MOUs have been completed to date, with others in the pipeline**
- **The DZP is a strategic and alternate source of zirconium and heavy rare earth products with a resource capable of very long term supply**
- **Preliminary discussions with financial institutions and potential off-take partners, indicate several project funding options**

**DUBBO ZIRCONIA PROJECT**
**Financial Summary**

| Project Capacity | 400,000 tonnes pa | 1,000,000 tonnes pa |
|---|---|---|
| Capex – Plant[1] | $278M | $543M |
| Infrastructure + Owners | $84M | $165M |
| SUB TOTAL | $362M | $708M |
| EPCM | $36M | $43M |
| Contingency | $72M | $142M |
| TOTAL | $470M | $893M |
| Revenue | $189M | $508M |
| Operating Costs | $97M | $196M |
| EBITDA[2] | $92M | $312M |
| IRR[3] | 16.8% | 30.2% |
| NPV[4] | $181M | $1,207M |

1 - Includes acid plant; 2 - Annual average after ramp up; 3 - 20 year life, pre-tax; 4 - 20 year life after tax

## Corporate Profile

Alkane Board
J S F Dunlop (Chairman)
D I Chalmers (Managing Dir)
A D Lethlean (Director)
I J Gandel (Director)
L A Colless (Joint Secretary)
K E Brown (Joint Secretary)

Contact
Ian Chalmers
Managing Director
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12 month share price range
A$0.60 - $2.73

Market Cap 15 Sept 2011
~A$485 million

ASX Code: **ALK**
269 million shares

OTCQX Code: **ANLKY**
ADR ratio 1:10

30 June 2011 Financial
Cash ~A $18.3 million
**No debt**

Senior Management
Terry Ransted – Chief Geologist
Mike Sutherland – GM NSW
Tony Wright – Commercial Manager
Alister MacDonald – DZP Marketing

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The Dubbo Zirconia Project (DZP) is located 30 kilometres south of the large regional centre of Dubbo in the Central West Region of New South Wales (Figure 1). The DZP is based upon one of the world's largest known in-ground resources of the metals **zirconium, hafnium, niobium, tantalum, yttrium and rare earth elements.** Over several years the Company has developed a flow sheet consisting of sulphuric acid leach followed by solvent extraction recovery and refining to produce several products.

The project is held by **Australian Zirconia Ltd (AZL)**, a wholly owned subsidiary of Alkane Resources Ltd.

Figure 1

A **Demonstration Pilot Plant** (DPP) has been operating at the laboratory facilities of **ANSTO Minerals** at Lucas Heights in the south of Sydney since May 2008 and to date has recovered substantial quantities of zirconium products and niobium concentrate. The DPP has continued to trial engineering and process innovations, and recently has demonstrated recovery of an yttrium rich heavy rare earth concentrate and a light rare earth concentrate.

**TZ Minerals International Pty Ltd (TZMI)** in Perth has managed the program and feasibility study since the inception of the project in 1998.

The **Definitive Feasibility Study (DFS)** has recently been completed and was built on the previous study prepared by SNC Lavalin in 2002. The current study had a base case development of 400,000 tonnes per annum of ore throughput for an initial 20 year period. As the study progressed through 2010 and 2011, market developments for all of the project's proposed product output, enabled an expanded concept of 1,000,000 tonnes per year to be considered.

While the accuracy of the estimations for the base case development is at accepted standards for a definitive study, the expanded concept employed typical 'scaling' factors for the capital cost. While some operating costs are proportional to production, such as reagent consumption, others are unchanged by the scale (labour numbers for example).

The detailed analysis to take the 1,000,000 tonnes per year to feasibility study standard has already commenced and should be completed in the first quarter of 2012. This additional work will not impact on the project timetable as it will proceed in parallel with the Environmental Assessment (EA) and Financing programs. The EA and development approval remains the most difficult schedule to predict, and delays in this process have the capacity to extend the Project's timetable.

## *Geology and Mineral Resources*

The deposit hosting the mineralisation is a sub-volcanic vertical intrusive trachyte body with dimensions of approximately 900 metres by 600 metres. The deposit was drilled in 2000 – 2001 to 55 metres depth to generate a Measured Resource and several holes were completed to 100 metres depth to establish an additional Inferred Resource.

**Table 1. Identified Mineral Resources**

| Toongi Deposit | Tonnage (Mt) | $ZrO_2$ (%) | $HfO_2$ (%) | $Nb_2O_5$ (%) | $Ta_2O_5$ (%) | $Y_2O_3$ (%) | REO (%) |
|---|---|---|---|---|---|---|---|
| Measured | 35.7 | 1.94 | 0.04 | 0.46 | 0.03 | 0.14 | 0.74 |
| Inferred | 37.5 | 1.95 | 0.04 | 0.46 | 0.03 | 0.14 | 0.75 |
| TOTAL | 73.2 | 1.95 | 0.04 | 0.46 | 0.03 | 0.14 | 0.75 |

*These Mineral Resources are based upon information compiled by Mr Terry Ransted MAusIMM (Principal, Multi Metal Consultants Pty Ltd) 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.*

## *Mining and Ore Reserves*

The DZP development is based on a very simple open cut mine plan to extract ore for an initial 20 year at the base case of 400,000 tonnes per annum. The open cut covers an area of approximately 28 ha and a maximum depth of 26 metres below current ground surface.

Mining will entail drill and blast, load, haul and dump of ore to the ROM (run of mine) pad situated approximately three kilometres to the west. Grade control will be based on assay and leachability test results from blast hole drill cuttings.

The deposit remains open at depth and could host significantly greater resources below the level of the currently planned development and is capable of supporting open pit mining in excess of 100 years.

**Table 2. Ore Reserves**

| Toongi Deposit | Tonnage (Mt) | $ZrO_2$ (%) | $HfO_2$ (%) | $Nb_2O_5$ (%) | $Ta_2O_5$ (%) | $Y_2O_3$ (%) | REO (%) |
|---|---|---|---|---|---|---|---|
| **Proved** | **8.07** | **1.91** | **0.04** | **0.46** | **0.03** | **0.14** | **0.75** |

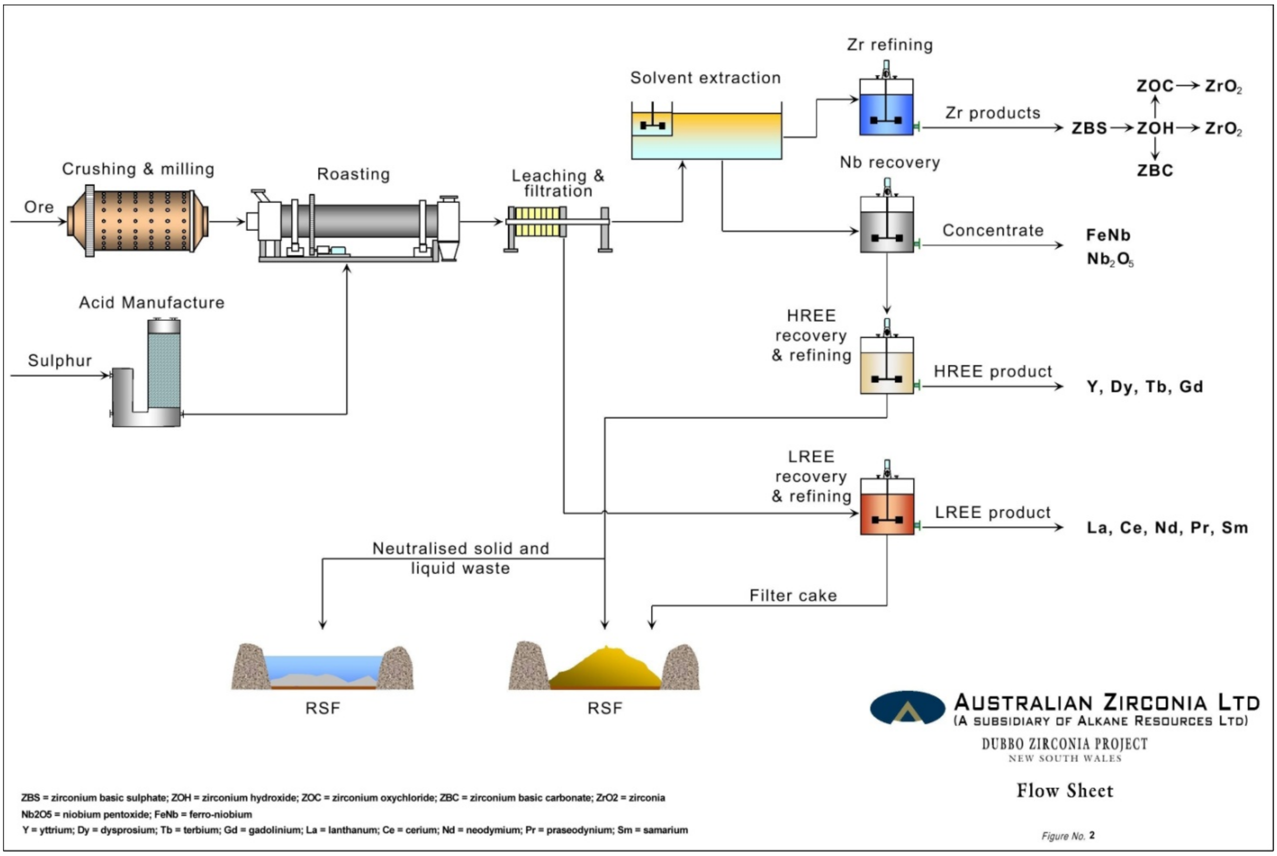
*These Ore Reserves are based upon information compiled by Mr Terry Ransted MAusIMM (Alkane Chief Geologist) who is a competent person as defined in the 2004 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. The reserves were calculated at a nominal 1.0% $ZrO_2$ cut off using costs derived from vendor quotes and revenue documented within this report. 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 ore outcrops at surface, so apart from pit edge batters, there is little waste to be handled, resulting in a waste to ore ratio of 0.14:1. The 1,000,000 tonnes per annum design is in progress and it will also require a simple open pit mine with low waste to ore ratio. It is anticipated that the existing Measured Resource will readily convert to reserves upon scheduling

## *Process*

The flowsheet is a proprietary process developed by AZL (Figure 2) and is based on crushing and grinding of ROM ore feed, followed by a sulphuric acid roast, water leach, solvent extraction recovery and refining to produce high purity zirconium products. Niobium concentrate is recovered from the waste stream of the zirconia extraction and refined using acid leaching.

The process naturally separates the REEs into a dominant light rare earth element suite (LREE) and an yttrium-heavy rare earth element rich suite (HREE) which are recovered as concentrates from two streams. The LREE are washed out of the primary leach residue and reconcentrated by chemical precipitation. The HREE are recovered after the niobium extraction from the main process stream, prior to final neutralisation and residue disposal.



Flow Sheet

Figure No. 2

The primary product output is zirconium basic sulphate (ZBS) which is converted to zirconium hydroxide (ZOH), which can then be used to produce zirconia ($ZrO_2$) and zirconium basic carbonate (ZBC). AZL has entered to two MOU agreements which would use ZOH feed to produce zirconium oxychloride (ZOC), and a third MOU is a general marketing/product development arrangement to supply markets in Europe and North America.

Niobium is recovered as a niobium pentoxide concentrate which can be further refined to produce high purity niobium pentoxide and ferro-niobium (FeNb).

The rare earths are produced as a light rare earth chloride concentrate and a heavy rare earth chloride concentrate, both of which are in a form suitable for further processing into separated individual rare earth products. Anticipated product volumes based upon DPP recovery data are summarised in Table 3.

The process has been successfully trialled by the DPP which has been operating since 2008, confirming the robust nature of the flowsheet. The DPP has also enabled product samples to be distributed globally to many potential customers, which resulted in three MOUs for zirconium output completed to date. MOUs for the niobium and rare earth concentrates are in progress.

**Table 3 Production Output**

| DUBBO ZIRCONIA PROJECT Production Outputs | | |
|---|---|---|
| **Product** | **400,000tpa (Base Case)** | **1,000,000tpa** |
| **ZBS, ZOH, ZOC, $ZrO_2$** | **6,280 tpa $ZrO_2$** | **15,700 tpa $ZrO_2$** |
| **Nb -Ta concentrate** | **1,202 tpa $Nb_2O_5$** | **3,005 tpa $Nb_2O_5$** |
| **LREE concentrate** | **1,215 tpa REO** | **3,050 tpa REOs** |
| **YHREE concentrate** | **390 tpa REO** | **1,120 tpa REOs** |

ZBS = zirconium basic sulphate; ZOH = zirconium hydroxide; ZOC = zirconium oxychloride; $ZrO_2$ = zirconia ; Equivalent ~99% $ZrO_2 + HfO_2$ basis. Nb-Ta concentrate = ~70% $Nb_2O_5$; 1.0% $Ta_2O_5$ calcined basis.
LREE = Lanthanum, cerium, neodymium and praseodymium. YHREE = yttrium, gadolinium, dysprosium and terbium.

**Based upon DPP mass balances, overall recovery from ore to finished products have estimated to be 82% for zirconium 66% for niobium and an average of 45% for REE.**

## *Marketing and Revenue*

### Zirconium (Zr)

Zirconium materials are used for many applications which are constantly being expanded. They are used in every day consumer products such as automotive catalytic converters in vehicle exhaust systems, personal antiperspirants, drying agents in paint, electronic components, engineering ceramics and synthetic diamond through to advanced zirconium metal alloys used in the nuclear power industry.

The DZP zirconium chemicals will either be sold as intermediate products to zirconium producers who will upgrade the products or will be sold directly to end-users. Marketing strategies and plans have been developed for each of these options. An important market development has resulted from MOUs to form joint ventures with existing zirconium chemicals distributors or consumers to convert ZOH into ZOC. ZOC has become the preferred mode of delivery into many downstream uses of zirconia products during the past ten years and AZL will emerge as an important non-Chinese supplier of this material.

The growth profile for zirconia and chemical zirconia has been examined in depth with forecast growth rates for these uses well above global GDP. The research undertaken for these products includes consideration of zircon markets and supply dynamics. This is critical to the DZP as zircon sand represents the dominant underlying supply to the zirconia industry and sharp increases in the price of zircon during the last two to three years have translated into very significant increases in zirconium, zirconia chemicals and intermediate chemical products (see Table 4).

ZOC prices have increased from US$1,400 to US$4,000 per tonne in part on the back of large rises in zircon prices and there have also been increases in the operating costs for the conversion of zircon to ZOC. It is considered unlikely that ZOC prices will ever return to the poor margins pre-dating the zircon price increases. TZMI separately forecasts that zircon sand will remain in tight supply for many years and therefore the impetus to grow zirconia supply from alternatives to zircon remains strong. The weighted average price for zirconia products used for revenue calculations in the DFS is US$10.60 per kilogram of contained ZrO2, which is well below current market prices.

**The DZP will be an important and strategic alternative supplier of zirconium products that is not dependent on supply from the current major source China, and is independent of the zircon supply chain.**

**Table 4 Zirconium Product Pricing**

| PRODUCT | $ZrO_2$ | Q2 2010 US$/T | Q1 2011 US$/T | Q2 2011 US$/T |
|---|---|---|---|---|
| **Zircon (producer/trader)** | **65%** | **$900 -$1,150** | **$1,500 -$2,100** | **$1,700 -$2,750** |
| (100% $ZrO_2$ basis) | 100% | ($1,440 - $1,840) | ($2,400 - $3,360) | ($2,720 - $4,400) |
| **ZOC (zirconium oxychloride)** | **36%** | **$1,350 -$1,450** | **$2,300 -$2,600** | **$3,600 -$4,000** |
| (100% $ZrO_2$ basis) | 100% | ($3,750 - $4,025) | ($6,400 - $7,200) | ($10,000 - $11,111) |
| **ZBS (zirconium basic sulphate)** | **33%** | **$1,770** | **$3,000** | **$6,000** |
| (100% $ZrO_2$ basis) | 100% | **$5,360** | $9,100 | $18,200 |
| **ZBC (zirconium basic carbonate)** | **40%** | **$2,100** | **$3,400** | **$5,400** |
| (100% $ZrO_2$ basis) | 100% | $5,250 | $8,500 | $13,500 |
| **Fused Zirconia** | **98.50%** | **$2,900 -$3,100** | **$4,100 -$4,400** | **$6,000-$7,000** |
| **Chemical Zirconia** | **99.50%** | **$4,200 -$4,400** | **$7,200 -$7,500** | **$10,000-$12,000** |
| **Chemical Zirconia** | **99.90%** | **$5,300 -$5,500** | **$8,500 -$10,500** | **$12,000-$15,000** |

**Niobium (Nb)**

The global steel industry is the main driver for niobium consumption and about 80% of all niobium produced is used in the manufacture of high strength low alloy steels (HSLA). The niobium is added as ferro-niobium (FeNb) which typically contains ~65% niobium. About 75% of HSLA steel is used for structural work (bridge steel, high pressure pipelines) followed by automotive use where the steel can provide weight savings of 10% in a standard vehicle.

The DZP niobium concentrate is an important co-product, accounting for 20% of the Project revenue. While higher prices would be available for a high purity $Nb_2O_5$ product, market advice is that the twin difficulties of achieving the required quality and displacing a significant percentage of the $Nb_2O_5$ market steer AZL away from this strategy. The current acid-leached product containing (calcined basis) 69% $Nb_2O_5$ could be sold for the contained $Nb_2O_5$ value. However, a more certain strategy is to supply the concentrate as feed to the ferro-niobium industry. Medium term ferro-niobium prices are forecast to stabilise at US$45 per kilogram of contained niobium. Importantly ferro-niobium has already been produced as part of the DPP facility at ANSTO and the plan is include this product in the expanded development.

The current price assumed for niobium concentrate is 85% of the equivalent ferro-niobium price, or US$38 per contained kilogram of niobium metal.

**Rare Earths and Yttrium (REE)**

AZL plans to produce two rare earth chloride solution products for direct use in the purification circuits of high value rare earth manufacturers. These products have been developed from DPP process streams and distributed to potential consumers for acceptance testing.

Current demand growth for many of the REE is considerably higher than GDP growth and the relative abundance of sought after REE species in the DZP ore is higher than from current production from China. Chinese dominance in global REE production has taken some critical steps in recent years with the Chinese government imposing quotas on the export of REE products. The strategic importance of REE in growing high-tech markets means that developed economies currently dependent on Chinese REE supply are intent on finding alternative supplies. The interest in AZL's ability to produce REE concentrates for separation at existing non-Chinese refineries remains intense. Numerous visits to the DPP, offers of technical assistance, trials of prototype REE concentrates and discussions of partnerships have featured in the development of the REE product and marketing strategy.

The abundance of each REE in the concentrates and the relative prices assigned to each determines the overall price for the two concentrate products. In the DZP over 70% of the REE product value is found in three elements. Neodymium (31%), yttrium (25%) and dysprosium (15%) are all metals forecast to be increasingly in short supply compared to their demand. Each of these metals finds use in the emerging 'green' technologies delivering renewable energy and substantially reducing energy demand.

A matrix of values based on variable percentages of the market price for the contained individual REE has been assumed for these intermediate concentrates. Values vary between 30% and 70% for each valuable element, depending on the medium term supply/demand outlook, with those in short supply assigned the higher percentages of forecast market price for their respective high purity product.

The resulting price for LREE chloride is anticipated to be US$30 per kg of contained REO and US$68 per kg of contained REO in the HREE chloride solution. These prices are very conservative compared to the average of the 2$^{nd}$ Quarter 2011 market estimates of US$114/kg and US$168/kg for the two concentrates.

**Off-take Agreements**

As advised in ASX Announcements 16 May 2011, 26 July 2011 and 15 August 2011 three Memoranda of Understanding (MOU) have been completed, accounting for 100% of the zirconium output for the 1 million tpa project. An MOU to take all the niobium output is nearing finalisation, and several opportunities for the rare earth concentrates are being discussed. The latter are focussed on either joint venture or toll treatment operations that would enable a suite of separated rare earth products to be recovered and sold to specific customers.

## *Definitive Feasibility Study (DFS)*

The DFS has been prepared by TZ Minerals International Pty Ltd (TZMI) with input from Alkane personnel and specific industry consultants.

TZMI has compiled the information and opinion in the study from a combination of sources. A principal source of information is the September 2002 document prepared by SNC Lavalin Australia (SNC). The current study has been essentially an update of the SNC 2002 report, having regard for recent test work, scale changes, and movements in costs from 2002 up to 2011. The project now also includes recovery of rare earth element (REE) concentrates, and an onsite sulphuric acid plant.

Estimates of operating consumables, utilities and logistics have been drawn from mass and energy balances prepared by TZMI engineers. The prices for consumables and logistics have been compiled by canvassing relevant and competing suppliers where possible. The processing plant flow sheets as modified using results from test work have been used to re-determine process equipment numbers. Vendor supply budgets have been obtained for the key process equipment, and general process equipment has been costed from

TZMI's engineers' database. Estimates of manpower numbers were matched to recent local salary data to establish the overall labour costs. Piping, electrical and instrumentation were factored. Costs were compared to the SNC estimates, having regard for scale and scope changes and specific inflators during the intervening years.

Product volumes have been calculated from recovery data based on results from the DPP. Prices for the suite of products have been supplied by specialist marketing consultants, Technical Ceramic Marketing Services Pty Ltd (TCMS) and the Industrial Mineral Company of Australia Pty Ltd (IMCOA).

**The planned processing facility is a unique development using novel process technology that has been developed for the specific characteristics of the Dubbo orebody**.

## *Capital and Operating Costs*

As described above, capital and operating costs were determined by vendor pricing and TZMI's operating experience. The base case (400,000tpa) is summarised in Table 5 with anticipated revenue for the Project.

**Table 5**

***DZP Base Case Summary***

| | *Qty* | *Units* |
|---|---|---|
| ***Mining*** | | |
| Ore resources | 73 | million tonnes |
| Tonnes per annum | 400,000 | tpa |
| Mine life | >100 | years |
| **Production (average after ramp-up)** | | |
| $ZrO_2$ in intermediates form | 6,280 | tpa |
| Nb metal in concentrate | 840 | tpa |
| LREO in chloride solution | 1,215 | tpa |
| HREO in chloride solution | 390 | tpa |
| **Operating cost* (A$)** | **97.0** | million |
| Mining contract | 3.4 | million |
| Personnel | 24.1 | million |
| Utilities | 4.2 | million |
| Process reagents | 51.1 | million |
| Process & maintenance consumables | 7.6 | million |
| Product transport & contract services | 3.1 | million |
| Administration expenses | 3.6 | million |
| **Revenue (A$ average after ramp-up)**** | **189.4** | million |
| $ZrO_2$ concentrate | 78.0 | million |
| $Nb_2O_5$ concentrate | 37.9 | million |
| LREE concentrate | 42.3 | million |
| HREE concentrate | 31.2 | million |
| **Capital cost estimate (A$)** | **469.8** | million |
| Plant and equipment | 277.9 | million |
| Infrastructure | 50.4 | million |
| Owners costs | 33.4 | million |
| EPCM | 35.6 | million |
| Contingency | 72.4 | million |

** Royalties, depreciation and tax are calculated separately. **Exchange rate average A$0.85 to US$1.00*

## *Financial Analysis*

The financial model has been prepared by TZMI on the following basis:

- The project NPV is after tax and has been calculated over a project life of 20 years based on a discount rate of 8%.
- The capital costs for the project have been estimated using local Australian contractors.
- The capital cost estimate will be distributed over a two year development and construction period.
- All figures are presented in 2011 Australian dollar values. The costs in future years will be presented in 2011 values, carried forward as real costs ('constant' 2011 Australian dollars).
- GST is not included in the operating cost estimates.
- Prices for final products have been derived from marketing investigations undertaken by Alkane Resources' specialist marketing consultants TCMS and IMCOA.
- US$:A$ exchange rate of 0.85 has been assumed for the revenue and operating costs calculations. This exchange rate is consistent with the long term exchange rate forecast by Consensus Economics. TZMI has made provision in the model to examine the sensitivity of the project financial outcome to variation in exchange rates.
- Revenue for the project is calculated based on production output, and conservative and long term sustainable prices have been used for revenue assessment. For the purpose of this financial valuation, all sales revenue is assumed on an FOB basis.
- The financial model assumes a project ramp-up to full capacity over two years.
- The financial model uses specific annual inputs for fundamental variables, such as mine grades. The calculated operating costs and revenue may vary annually and are slightly different to the annual average values presented in *Tables 4 and 5*, which are calculated based on nominal production output and operating costs for a typical year.
- A royalty rate of 4% has been assumed on product sales as advised by Alkane Resources. Royalty charges for the DZP are calculated based on product revenue net of all allowable deductions.
- For the purpose of this financial evaluation, TZMI has adopted a straight line method in calculating the project's asset depreciation. The capital costs will be depreciated over 20 years at 5% per annum.
- A corporate tax rate of 30% is assumed in calculating the project after-tax cash flow.

As a result of the dramatic changes in the market for the DZP's products since the DFS was initiated, TZMI has reviewed the impact of starting the project at 1 million tpa of ore processed. Much of the review has employed typical 'scaling' factors for the capital cost. While some operating costs are proportional to production, such as reagent consumption, others are unchanged by the scale (labour numbers for example).

The headline project attributes at the higher scale are shown in the following Table 6, along with the 400,000tpa results summary for comparison. The increased scale at 1 million tpa has significant financial benefits, given that both operating and capital costs are proportionately lower than the 400,000 tpa case.

In order to gauge the impact of increasing scale to 1 million tonnes of ore processed per year, TZMI also made some projections of current test work initiatives and assumed certain results from these would adjust the process.

Five roaster kilns (two in the base case) have been assumed, otherwise all other process plant has been scaled up for the higher throughput, with anticipated capital cost scale benefits. Minor additions were made to the operating staff numbers. Site infrastructure such as workshops, offices, laboratory and maintenance workshops are assumed to be unchanged by the scale increase.

Most reagent consumption is proportional to the throughput rate of ore and have remained unchanged from the 400,000 tpa case.

**Table 6 Financial Comparison for 20 year project**

| DUBBO ZIRCONIA PROJECT Financial Summary | | |
|---|---|---|
| **Project Capacity** | **400,000 tonnes pa** | **1,000,000 tonnes pa** |
| **Capex – Plant[1]** | **$278M** | **$543M** |
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**1 Includes acid plant; 2 Annual average after ramp up; 3 20 year life pre-tax; 4 20 year after tax;**

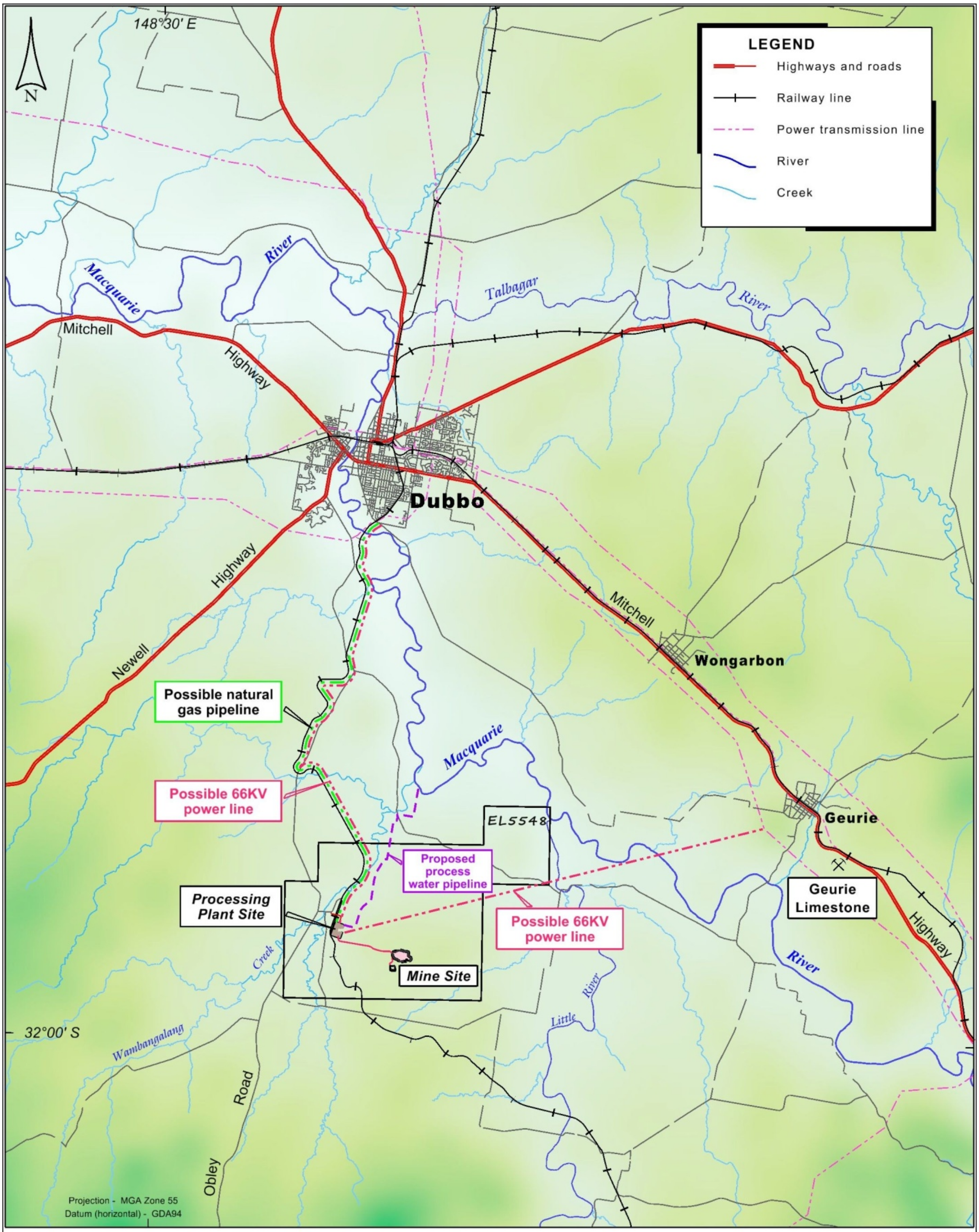
**US$:A$ Exchange rate 0.85**

The EPCM and Contingency costs which are not fixed but were scaled according to industry standards, account for over 20% of the total estimated development capital and may not fully apply.

## *Infrastructure*

The Project is located about 30 kilometres by road south of the large regional centre of Dubbo which has a population of 42,000 and is serviced by sealed regional roads and the currently disused Dubbo to Molong railway (Figure 3). At the expanded production rate, reactivation of the railway from Dubbo to the Toongi site is regarded as a priority.

The region has substantial existing infrastructure including state grid power supply, a natural gas pipeline, high quality water supply and light industrial services. No camp facilities are required and most of the project workforce can be sourced locally, living in their own accommodation and commuting daily to the site.




AUSTRALIAN ZIRCONIA LTD
(A SUBSIDIARY OF ALKANE RESOURCES LTD)

Dubbo Zirconia Project

New South Wales

# Infrastructure

0 10
kilometres

Figure: 3

Plan No.: ALK DUB 1AL-008

## *Project Optimisation and Upside*

As demonstrated, the 1 million tpa project offers significant financial upside and the detailed analysis to take the project to feasibility study standard has commenced and should be completed in the first quarter of 2012. In parallel, process and product development is continuing and several upside scenarios are being advanced. Some of the more interesting developments are:

**Niobium:** The production of ferro-niobium from DZP niobium concentrate has been trialled and a high grade product produced. This product would generate additional income from an incremental cost increase.

**Tantalum:** In the current flow sheet more than 70% of the tantalum precipitates in the primary leach filter (Figure 2). The filter cake contains about 180 - 200ppm $Ta_2O_5$ and at the 1 million tpa throughput rate this hosts a significant potential resource. At 50% recovery, the filter cake could produce 90 -100 tpa (~200,000lbs) of $Ta_2O_5$ which would be worth US$30-40Mpa at current prices.

**Rare earths:** There remains significant potential to improve the rare earth circuit and overall recoveries of individual rare earths within the concentrates. Recent test work has already demonstrated improved heavy rare earth recoveries.

**Water Recycling:** The current DZP flowsheet has a substantial water requirement and a major effort is focussing on water recycling and minimisation of residue storage facilities.

## *Environmental Assessment (EA)*

The DZP will undergo an environmental assessment according to the framework established by the *Environmental Planning and Assessment Amendment (Part 3A Repeal) 2011* and *State Environmental Planning Policy (State and Regional Development) 2011*. The DZP has been categorised as State Significant Development (SSD).

Baseline studies were completed to assess the environmental status as part of the 2002 study and this work is being reviewed and revamped to account for changes in legislation.

The DZP deposit is a weakly radioactive ore and the deportment of radionuclides in the process is very important part of the EA. Significantly the flowsheet does not produce a mineral concentrate and hence the uranium and thorium do not get concentrated at the front end of the process like many rare earth projects. The process is a whole-of-ore acid leach to extract the rare metals and rare earths, and this process also extracts much of the uranium (~100ppm U) and thorium (~400ppm Th) into solution.

Through the flow sheet, uranium and thorium are isolated from the products but remain in solution where they are stabilised and neutralised by limestone within the waste streams. The addition of limestone further dilutes the uranium and thorium so that the average radioactivity in the residue storage facility is less than the ore.

All of the processing is contained within the primary site and no material apart from the inert final products will leave the operations area.

As stated previously, the Project approval process is the most difficult schedule to predict, and delays to this process have the capacity to extend the Project's development timetable beyond what is currently anticipated.

## *Financing Options*

Discussions with various financial institutions have been on-going for some time and several options are available to fund the development. In summary these options are:

- Equity sale of minor interest (<10%) in AZL to strategic stakeholders
- Loan facilities through off-take partners
- Loan facilities from major international government agencies
- Normal commercial debt facility
- Equity funding through Alkane

It is likely that the final result will involve a combination of these options.

## *Development Timetable*

Depending upon suitable financing being secured for the project, the development timetable will be contingent upon achieving project approval from the NSW Minister for Planning and Infrastructure. The final Environmental Assessment (EA) is scheduled to be lodged by the end the March Quarter 2012 and the review and consent process is expected to take approximately 6 months. Total construction time is estimated at 24 months and first commercial production is anticipated by the middle of 2014.

***Competent Person***
*Unless otherwise advised, the information in this report that relates to exploration results, 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 a Competent Person as defined in the 2004 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Mr Chalmers consents to the inclusion in this report of the matters based on his information in the form and context in which it appears.*

**BACKGROUND**

**Alkane** is a multi commodity explorer and miner with its operations focused in the **Central West** of **New South Wales**, about 400 kilometres northwest of Sydney. Over several years, including experience in developing the Peak Hill Gold Mine, Alkane has built a substantial resource base and is proceeding towards several developments.

The **Dubbo Zirconia Project** is based upon a world class resource of the metals zirconium, hafnium, niobium, tantalum, yttrium and rare earth elements. Over several years Alkane has developed a flow sheet which can recover a variety of products which have expanding applications in electronics, ceramics, catalysts, special alloys and glasses, fuel cells, special batteries and permanent magnets, nuclear power and as environmental drying agents. Following a $3.3 million Commercial Ready Grant from AusIndustry in 2006, the feasibility study was reactivated. The study included the construction and operation of a Demonstration Pilot Plant, and a development commitment is anticipated Q4 2011 leading to production possibly early in 2014.

The **Tomingley Gold Project** currently has a **660,000 ounce gold resource** within the **Wyoming and Caloma deposits** (full details are in the 2008 Annual Report and the ASX announcements of 2 October and 16 December 2009). A feasibility study for the development of the project with potential 50,000 to 60,000 ounce per annum production was completed in late 2010 and development financing options are well advanced.

Near **Orange,** the Company has a joint venture (**ODEJV**) with Newmont, one of the world's largest gold miners, which resulted in the discovery in 2006 of a significant gold deposit at **McPhillamys** within the **Moorilda Project**. An initial resource of Indicated plus Inferred resources containing **2.96 million ounces of gold and 60,000 tonnes of copper** has been defined (full details ASX announcement of 5 July 2010)**.** Newmont is proceeding to complete a Bankable Feasibility Study for the development of the deposit.

Elsewhere in the region, at Galwadgere within the Wellington Project, Alkane has defined a 2 million tonne 1.00% copper Indicated Resource (details 2005 Annual Report) which is being reviewed for its development potential. Other advanced exploration projects have produced encouraging drill intercepts and new exploration targets have been identified at several more locations.

In **Western Australia** the Company hold a diluting 23% residual interest in a nickel sulphide joint venture with **Xstrata Nickel (Jubilee)** near **Leinster**.

# Resource Statement September 2011

## Dubbo Zirconia Project

| Toongi Deposit | Tonnage (Mt) | $ZrO_2$ (%) | $HfO_2$ (%) | $Nb_2O_5$ (%) | $Ta_2O_5$ (%) | $Y_2O_3$ (%) | REO (%) | $U_3O_8$ (%) |
|---|---|---|---|---|---|---|---|---|
| **Measured** | **35.7** | 1.94 | 0.04 | 0.46 | 0.03 | 0.14 | 0.74 | 0.014 |
| **Inferred** | **37.5** | 1.95 | 0.04 | 0.46 | 0.03 | 0.14 | 0.75 | 0.014 |
| **TOTAL** | **73.2** | 1.95 | 0.04 | 0.46 | 0.03 | 0.14 | 0.75 | 0.014 |

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## Tomingley Gold Project

| DEPOSIT | MEASURED | | INDICATED | | INFERRED | | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|
| **Top Cut** 2.5x2.5x5.0m model | **Tonnage** (t) | **Grade** (g/t) | **Tonnage** (t) | **Grade** (g/t) | **Tonnage** (t) | **Grade** (g/t) | **Tonnage** (t) | **Grade** (g/t) | **Gold** (koz) |
| **Wyoming One** | 2,227,000 | 2.07 | 882,000 | 2.25 | 3,478,000 | 1.62 | 6,587,000 | 1.86 | 393.2 |
| **Wyoming Three** | 630,000 | 1.87 | 58,000 | 1.73 | 154,000 | 1.25 | 842,000 | 1.75 | 47.3 |
| **Caloma** | 2,047,750 | 2.04 | 440,050 | 1.71 | 1,371,620 | 1.36 | 3,859,420 | 1.76 | 218.5 |
| **Total** | **4,904,750** | **2.03** | **1,380,050** | **2.06** | **5,003,620** | **1.54** | **11,288,420** | **1.82** | **658.9** |

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## Peak Hill Gold Mine

| DEPOSIT | MEASURED | | INDICATED | | INFERRED | | TOTAL | | |
|---|---|---|---|---|---|---|---|---|---|
| **0.5g/t gold cut off** | **Tonnage** (t) | **Grade** (g/t) | **Tonnage** (t) | **Grade** (g/t) | **Tonnage** (t) | **Grade** (g/t) | **Tonnage** (t) | **Grade** (g/t) | **k Ounces** |
| **Proprietary** | | | 9,440,000 | 1.35 | 1,830,000 | 0.98 | 11,270,000 | 1.29 | 467.4 |
| **3.0g/t gold cut off** | **Tonnage** (t) | **Grade** (g/t) | **Tonnage** (t) | **Grade** (g/t) | **Tonnage** (t) | **Grade** (g/t) | **Tonnage** (t) | **Grade** (g/t) | **k Ounces** |
| **Proprietary** | | | | | 810,000 | 4.40 | 810,000 | 4.40 | 114.6 |

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## Wellington – Galwadgere

| DEPOSIT | MEASURED | | | INDICATED | | |
|---|---|---|---|---|---|---|
| **0.5% Cu cut off** | **Tonnage** (t) | **Grade** (% Cu) | **Grade** (g/t) | **Tonnage** (t) | **Grade** (% Cu) | **Grade** (g/t) |
| **Galwadgere** | - | - | | 2,090,000 | 0.99 | 0.3 |

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## Moorilda – McPhillamys (ODEJV)

| DEPOSIT | INDICATED | | | INFERRED | | | TOTAL | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **McPhillamys** 0.3g/t Au cut-off | **Tonnage** (t) | **Grade** (g/t) | **Grade** % Cu | **Tonnage** (t) | **Grade** (g/t) | **Grade** % Cu | **Tonnage** (t) | **Grade** (g/t) | **Grade** % Cu | **k Ounces** gold | **tonnes** copper |
| **Inner Ore Zone** | 51,650,000 | 1.10 | 0.07 | 23,504,000 | 1.19 | 0.07 | 75,154,000 | 1.13 | 0.07 | 2,723.6 | 55,091 |
| **Outer Ore Envelope** | 9,624,000 | 0.44 | 0.04 | 7,167,000 | 0.43 | 0.03 | 16,791,000 | 0.43 | 0.03 | 234.7 | 5,729 |
| **Total** | **61,274,000** | **0.99** | **0.07** | **30,671,000** | **1.01** | **0.06** | **91,945,000** | **1.00** | **0.07** | **2,958.3** | **60,820** |

| DEPOSIT | INDICATED | | | INFERRED | | | TOTAL | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **McPhillamys** 0.5g/t Au cut-off | **Tonnage** (t) | **Grade** (g/t) | **Grade** % Cu | **Tonnage** (t) | **Grade** (g/t) | **Grade** % Cu | **Tonnage** (t) | **Grade** (g/t) | **Grade** % Cu | **k Ounces** gold | **tonnes** copper |
| **Inner Ore Zone** | 41,260,000 | 1.27 | 0.08 | 16,097,000 | 1.57 | 0.09 | 57,357,000 | 1.36 | 0.08 | 2,499.9 | 46,933 |
| **Outer Ore Envelope** | 2,169,000 | 0.69 | 0.03 | 1,338,000 | 0.62 | 0.03 | 3,507,000 | 0.66 | 0.03 | 74.6 | 1,170 |
| **Total** | **43,429,000** | **1.24** | **0.08** | **17,435,000** | **1.50** | **0.08** | **60,864,000** | **1.32** | **0.08** | **2,574.5** | **48,104** |

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