Hartleys

ALK.asx
Speculative Buy

Gold and Other: Producer/Developer

ALKANE RESOURCES LTD (ALK)

A Tech Miner for the Future

Alkane Resources Ltd (ALK) is a future miner of specialty metals, currently progressing final permitting and bankable feasibility studies on the Dubbo Zirconia Project (DZP) in NSW.

The DZP is considered a world-class asset of strategic value, containing a large polymetallic resource of zirconium, hafnium, niobium and rare earths which can support a long mine-life (+20 years). The metal mix is considered especially important for high-tech and advanced materials manufacturing.

The project is located only 25km from Dubbo, Central West NSW in a region with very good infrastructure (roads, rail, power, gas and potential workforce). The project financials appear robust and highlight potential for significant cash flows (+A$300mpa EBITDA), but the A$1.3b capital cost for construction is not without its substantial funding challenges (key risk) in this current market.

The Company's financing strategy targets a combination of Export Credit Agency (ECA) finance and bank debt, with discussions well advanced. Potential offtake partners for some of the specialty metals are also well progressed and could attract a strategic cornerstone investor (at the project level through the holding company Australian Zirconia Ltd). Alkane is targeting first production in 2018.

Gold producer with a pipeline of exploration opportunities

The Company has a gold production asset, Tomingley Gold Operations (TGO) which is generating solid cash flows. We forecast average production of ~65Kozpa at AISC of A$1,230/oz over a LOM of ~7 years. We assume the current open pit operation transitions to a blended underground/open pit operation from late CY17.

The gold production underpins the current trading range, with generated cash funding the pre-construction activities at the DZP. Alkane is currently trading on a spot gold FY16 EV/EBITDA of 3.2x. Our TGO NPV_8 is ~A$96m, implies 23cps value on an undiluted basis (current ordinary shares). Our 8cps assigned value includes new equity for the DZP project development, which is seen as the key value driver.

Initiate coverage with a Speculative Buy recommendation

We initiate coverage of Alkane Resources with a Speculative Buy recommendation and 12-month price target of 45cps. Our valuation (NAV) and price target assumes the DZP can be funded through development into production. Important near-term milestones such as marketing and offtake agreements, and potential strategic cornerstone investment(s) at the project level are seen as potential precursors to the final funding solution.

Strategic supply of criterial metals

The DZP has the potential to become a strategic supply (non-Chinese source) of specialty metals, providing stable long-term production and cost competitive pricing to expanding zirconium (advanced ceramics) and hafnium (super alloys for the aerospace industries), and rare earth (permanent magnets) markets. The products of the DZP are considered critical on global standards, due to their economic importance and potential for supply risk.

ALK is highly leverage to improved commodity prices and market sentiment. Permitting and funding are seen as the key risks to the DZP development.

	11 Dec 2015
Share Price	$0.235
Valuation	$0.49
Price Target (12 month)	$0.45

Brief Business Description:
Multi-commodity mining and exploration company

Hartleys Brief Investment Conclusion
Currently focused on gold production (TGO), and development of a large zirconium, niobium and rare earths project (DZP). Objective to become a large specialty metals business.

Chairman & MD
John Dunlop (Executive Chairman)
Ian Chalmers (Managing Director)

Top Shareholders

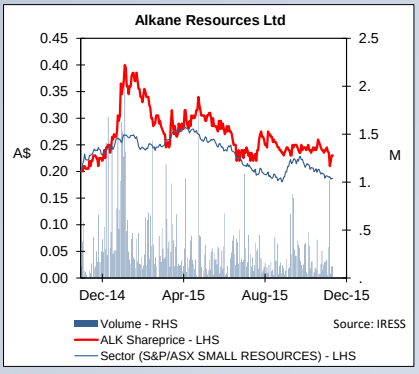
Abbotsleigh Pty Ltd (Ian Gandel)	22.1%
Fidelity International (FIL)	10.0%

Company Address
89 Burswood Road
Burswood WA 6100

Issued Capital	414.2m
- fully diluted	414.2m
Market Cap	A$97.3m
- fully diluted	A$97.3m
Cash (30 Sep 15a)	A$20.8m
Debt (30 Sep 15a)	A$0.0m
EV	A$76.5m
EV/Resource oz (Au)	A$258/oz
EV/Reserve oz (Au)	A$111/oz

Prelim. (A$m)	FY15a	FY16a	FY17a
Prod (koz Au)	70.7	68.1	62.8
Op Cash Flw	28.6	27.5	32.9
Norm NPAT	-4.1	5.3	7.7
CF/Share (cps)	-1.0	1.8	1.2
EPS (cps)	-1.0	1.8	1.2
P/E	-23.8	12.9	19.1

	TGO (Moz)	DZP (Mt)
Reserves	0.30	35.9
Resources	0.69	73.2



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SUMMARY MODEL

Alkane Resources Ltd **Share Price**

ALK **$0.235**

Speculative Buy

Key Market Information	
Share Price	**$0.235**
Market Capitalisation - ordinary	A$97m
Net Debt (cash)	-$20.8m
Market Capitalisation - fully diluted	A$97m
EV	A$76m
Issued Capital	414.2m
Options	0.0
Issued Capital (fully diluted inc. all options)	414.2m
Issued Capital (fully diluted inc. all options and new capital)	1141.1m
Valuation	$0.49
12month price target	**$0.45**

Directors	Company Informati
John Dunlop (Executive Chairman)	89 Burswood Road
David (Ian) Chalmers (Managing Director)	Burswood WA 6100
Ian Gandel (Non-Executive Director)	+61 8 9227 5677
Anthony Lethlean (Non-Executive Director)	+61 8 9227 8178
Karen Brown (Company Secretary)	www.alkane.com.au

Top Shareholders	m shares	%
Abbotsleigh Pty Ltd (Ian Gandel)	91.6	22.1
Fidelity International (FIL)	41.3	10.0

Reserves & Resources							
Reserves - TGO					**Mt**	**g/t Au**	**Koz**
Open Pits					4.4	1.6	235
Underground					0.5	3.7	61.6
Total					**4.9**	**1.9**	**296.6**
Resources - TGO				**LC**	**Mt**	**g/t Au**	**Koz**
Open Pits				0.5g/t Au	10.2	1.7	551.0
Underground				2.5g/t Au	1.0	4.1	136.0
Total					**11.3**	**1.9**	**687.0**
Reserves - DZP	**Mt**	**ZrO2 %**	**HfO2 %**	**Nb2O5 %**	**Ta2O5 %**	**Y2O3 %**	**REO %**
Total	**35.9**	**1.93**	**0.04**	**0.46**	**0.03**	**0.14**	**0.74**
Resources - DZP	**Mt**	**ZrO2 %**	**HfO2 %**	**Nb2O5 %**	**Ta2O5 %**	**Y2O3 %**	**REO %**
Total	**73.2**	**1.96**	**0.04**	**0.46**	**0.03**	**0.14**	**0.75**

P&L	Unit	30 Jun 14	30 Jun 15	30 Jun 16	30 Jun 17	30 Jun 18	30 Jun 19
Net Revenue	**A$m**	**23.7**	**101.9**	**111.5**	**104.3**	**113.4**	**309.9**
Total Costs	**A$m**	**-16.2**	**-83.5**	**-78.6**	**-70.5**	**-81.2**	**-157.0**
EBITDA	A$m	7.6	18.4	32.9	33.8	32.2	152.9
- margin		32%	18%	30%	32%	28%	49%
Depreciation/Amort	A$m	-10.0	-26.7	-25.4	-22.9	-21.7	-64.1
EBIT	**A$m**	**-2.4**	**-8.3**	**7.5**	**11.0**	**10.5**	**88.8**
Net Interest	A$m	1.2	0.2	0.0	0.0	0.0	0.0
Norm. Pre-Tax Profit	**A$m**	**-1.3**	**-8.1**	**7.5**	**11.0**	**10.5**	**88.8**
Reported Tax Expense	A$m	-4.9	4.1	0.0	-1.5	-3.1	-26.6
Normalised NPAT	**A$m**	**-6.2**	**-4.1**	**5.3**	**7.7**	**7.3**	**62.2**
Abnormal Items	A$m	0.0	0.0	2.3	1.8	0.0	0.0
Reported Profit	A$m	-6.2	-4.1	7.5	9.5	7.3	62.2
Minority	A$m	0.0	0.0	0.0	0.0	0.0	0.0
Profit Attrib	**A$m**	**-6.2**	**-4.1**	**7.5**	**9.5**	**7.3**	**62.2**

Balance Sheet	Unit	30 Jun 14	30 Jun 15	30 Jun 16	30 Jun 17	30 Jun 18	30 Jun 19
Cash	**A$m**	**15.6**	**14.8**	**25.5**	**427.4**	**336.6**	**102.6**
Other Current Assets	A$m	25.2	13.5	15.6	14.4	16.0	38.4
Total Current Assets	**A$m**	**40.8**	**28.3**	**41.2**	**441.8**	**352.6**	**141.0**
Property, Plant & Equip.	A$m	100.0	89.8	69.7	552.2	1051.3	1299.3
Exploration	A$m	53.4	65.3	76.8	88.8	100.8	112.8
Investments/other	A$m	6.7	7.6	8.9	11.5	12.6	12.6
Tot Non-Curr. Assets	**A$m**	**160.2**	**162.6**	**155.4**	**652.4**	**1164.6**	**1424.7**
Total Assets	**A$m**	**201.0**	**191.0**	**196.6**	**1094.2**	**1517.3**	**1565.7**
Short Term Borrowings	A$m	-	-	-	-	-	-
Other	A$m	14.7	11.3	8.0	7.3	8.2	14.4
Total Curr. Liabilities	**A$m**	14.7	11.3	8.0	7.3	8.2	14.4
Long Term Borrowings	A$m	-	-	-	413.7	827.4	807.4
Other	A$m	12.0	9.3	9.3	9.3	9.3	9.3
Total Non-Curr. Liabil.	**A$m**	**12.0**	**9.3**	**9.3**	**423.0**	**836.6**	**816.6**
Total Liabilities	**A$m**	**26.8**	**20.5**	**17.2**	**430.3**	**844.8**	**831.1**
Net Assets	**A$m**	**174.2**	**170.5**	**179.3**	**663.9**	**672.4**	**734.6**
Net Debt	A$m	-15.6	-14.8	-25.5	-13.7	490.8	704.8

Cashflow	Unit	30 Jun 14	30 Jun 15	30 Jun 16	30 Jun 17	30 Jun 18	30 Jun 19
Operating Cashflow	A$m	-5.5	28.2	27.5	34.4	31.4	136.8
Income Tax Paid	A$m	0.0	0.0	0.0	-1.5	-3.1	-26.6
Interest & Other	A$m	1.6	0.4	0.0	0.0	0.0	0.0
Operating Activities	**A$m**	-3.9	28.6	27.5	32.9	28.3	110.1
Property, Plant & Equip.	A$m	-81.7	-18.1	-5.3	-505.3	-520.8	-312.1
Exploration and Devel.	A$m	-13.5	-14.5	-11.5	-12.0	-12.0	-12.0
Other	A$m	40.6	3.2	0.0	0.0	0.0	0.0
Investment Activities	**A$m**	**-54.6**	**-29.4**	**-16.8**	**-517.3**	**-532.8**	**-324.1**
Borrowings	A$m	0.0	0.1	0.0	413.7	413.7	-20.0
Equity or "tbc capital"	A$m	9.8	0.0	0.0	472.6	0.0	0.0
Dividends Paid	A$m	0.0	0.0	0.0	0.0	0.0	0.0
Financing Activities	**A$m**	**9.8**	**0.1**	**0.0**	**886.3**	**413.7**	**-20.0**
Net Cashflow	**A$m**	**-48.7**	**-0.7**	**10.7**	**401.9**	**-90.8**	**-234.0**

Shares	Unit	30 Jun 14	30 Jun 15	30 Jun 16	30 Jun 17	30 Jun 18	30 Jun 19
Ordinary Shares - End	m	412.6	414.2	414.2	1121.1	1121.1	1121.1
Ordinary Shares - Weighted	m	392.6	413.4	414.2	767.7	1121.1	1121.1
Diluted Shares - Weighted	m	392.6	413.4	414.2	767.7	1121.1	1121.1

Ratio Analysis	Unit	30 Jun 14	30 Jun 15	30 Jun 16	30 Jun 17	30 Jun 18	30 Jun 19
Cashflow Per Share	A$ cps	-1.0	6.9	6.6	4.3	2.5	9.8
Cashflow Multiple	x	0.0	3.4	3.5	5.5	9.3	2.4
Earnings Per Share	A$ cps	-1.6	-1.0	1.8	1.2	0.7	5.5
EV/EBITDA	x	10.1	4.1	2.3	2.3	2.4	0.5
Price to Earnings Ratio	x	0.0	-23.8	12.9	19.1	36.0	4.2
Dividends Per Share	AUD	-	0.0	0.0	0.0	0.0	0.0
Dividend Yield	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Net Debt / Net Debt + Equity	%	-10%	-10%	-17%	-2%	42%	49%
Interest Cover	X	2.1	54.2	-	-	-	-
Return on Equity	%	na	na	3%	1%	1%	8%

Production Summary - TGO	Unit	Jun 14	Jun 15	Jun 16	Jun 17	Jun 18	Jun 19
Mill Throughput	Mt	0.4	1.1	1.0	1.0	1.0	0.7
Mined grade	g/t	1.9	2.0	2.2	2.1	2.5	3.1
Combined Recovery & Payability	%	75.3%	95.7%	94.7%	93.0%	90.0%	90.0%
Gold Sold	(koz)	16.4	70.7	68.1	62.8	72.0	58.6
Mine Life	yr	7.3	6.3	6.8	5.8	4.8	3.8
Cost per milled tonne	$A/t	82.2	70.4	66.7	59.8	69.8	77.5
EBITDA / tonne milled ore	$A/t	21.1	16.2	32.3	33.8	32.2	235.3
C1: Operating Cash Cost = (a)	$A/oz	1,803	1,135	1,000	952	969	859
(a) + Royalty = (b)	$A/oz	1,893	1,208	1,082	1,037	1,049	936
C2: (a) + depreciation & amortisation = (c)	$A/oz	2,415	1,513	1,373	1,316	1,270	1,218
(a) + actual cash for development = (d)	$A/oz	2,629	1,340	1,169	1,143	1,136	1,064
C3: (c) + Royalty	$A/oz	2,505	1,586	1,455	1,401	1,350	1,295
(d) + Royalty	$A/oz	2,720	1,413	1,251	1,228	1,216	1,141
Total Cash Cost	$A/oz	986	1,181	1,154	1,123	1,128	1,387
All In Sustaining Cost (AISC)	$A/oz	1,984	1,281	1,222	1,185	1,122	1,115

Production Summary - DZP	Unit	Jun 14	Jun 15	Jun 16	Jun 17	Jun 18	Jun 19
Mill Throughput	Mt	-	-	-	-	-	0.38
Mine Life	yr	20.0	20.0	20.0	20.0	20.0	20.0
Zirconium (ZrO2) - payable	Kt	-	-	-	-	-	6.12
Ferro-Niobium (FeNb) - payable	Kt	-	-	-	-	-	0.74
Hafnium (HfO2) - payable	Kt	-	-	-	-	-	0.07
Rare Earths (REO) - payable	Kt	-	-	-	-	-	1.01
Operating costs - combined products	A$/kg	-	-	-	-	-	10.5
Revenue - combined products	A$/kg	-	-	-	-	-	27.9

Price Assumptions	Unit	Jun 14	Jun 15	Jun 16	Jun 17	Jun 18	Jun 19
AUDUSD	A$/US$	0.92	0.81	0.72	0.72	0.75	0.76
Gold - US$	US$/oz	1286	1187	1183	1200	1175	1150
Gold - A$	A$/oz	1393	1473	1642	1661	1577	1508
Zirconia (ZrO2)	US$/kg	-	-	-	-	-	8
Ferro-Niobium (65% Nb)	US$/kg	-	-	-	-	-	38
Hafnium Oxide (95% HfO2)	US$/kg	-	-	-	-	-	500
Rare Earths (REO) - basket	US$/kg	-	-	-	-	-	56

Hedging	Jun 14	Jun 15	Jun 16	Jun 17	Jun 18	Jun 19
Hedges maturing?	No	No	Yes	No	No	No

Sensitivity Analysis	Valuation	FY19 NPAT
Base Case	**0.49**	**62.2**
Spot Prices	0.77	71.3 (14.7%)
Spot USD/AUD 0.73, Gold $1090/oz, ZrO2 $5.0/kg, FeNb $35.0/kg, HfO2 $800/kg, REO $52.0/kg		
AUDUSD +/--10%		47.5 / 84.9 (-23.7% / 36.6%)
Gold +/--10%		68.1 / 61.0 (9.5% / -1.8%)
Production +/--10%		77.7 / 46.7 (24.9% / -24.9%)
Operating Costs +/--10%		55.7 / 69.3 (-10.5% / 11.4%)

Share Price Valuation (NAV)	Risked Est. A$m	Est. A$/share
100% TGO (pre-tax NAV at disc. rate of 8%)	96	0.08
100% DZP (pre-tax NAV at disc. rate of 12%)	723	0.63
Other Exploration	40	0.04
Forwards	0	0.00
Corporate Overheads	-40	-0.03
Net Cash (Debt)	21	0.02
Tax (NPV future liability)	-286	-0.25
Options & Other Equity	0	0.00
Hedging	0	0.00
Total	**554**	**0.49**

Analyst: Mike Millikan
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"tbc capital" could be equity or debt. Our valuation is risk-adjusted for how this may be obtained.

Sources: IRESS, Company Information, Hartleys Research

Last Updated: 11/12/2015

COMPANY OVERVIEW

Alkane Resources Limited ("Alkane", "Company") is a multi-commodity company focused on projects located in the Central West region of NSW.

Alkane listed on the ASX in 1969

The Company listed on the ASX ("ALK") in 1969 and has over the years produced gold from the Peak Hill gold mine (1996 to 2005) and the Tomingley Gold Operations (2014 to current), producing in excess of 260Koz of gold. The Tomingley Gold Operations (TGO) remains in production and has a targeted mine life of ~10 years. We forecast average production of ~65Kozpa at AISC of A$1,230/oz over a LOM of ~7 years. The gold asset underpins the current trading range, with generated cash providing some funds for the ALK's project development pipeline.

All current projects are located in the Central West of NSW

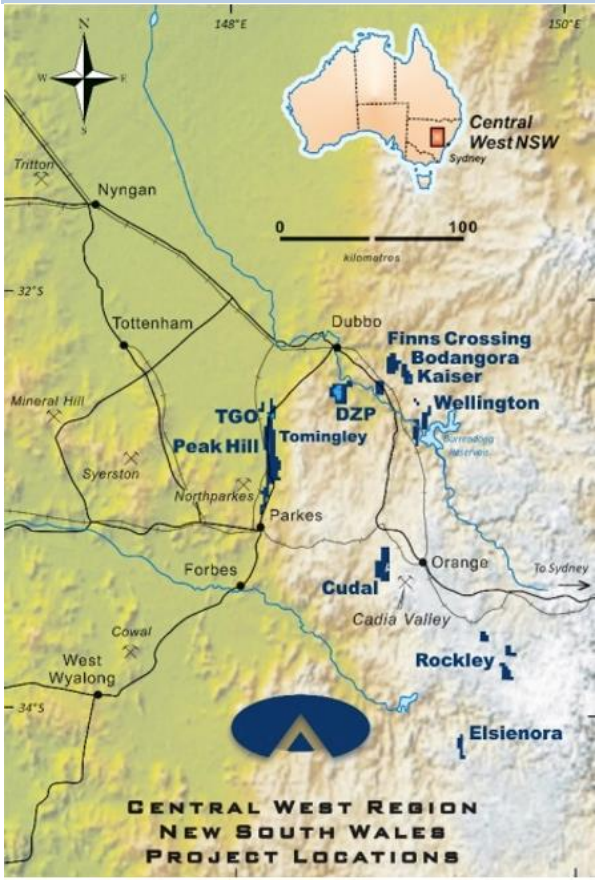
The Company flagship project is the Dubbo Zirconia Project (DZP), which is considered world-class and contains a specialty metals including zirconium hafnium, niobium, and rare earths. The metal mix is considered especially significant for high-tech and advanced materials manufacturing end-users. Feasibility studies into the development of the project highlight potential for significant cash flows (+A$300m EBITDA per annum), but the A$1.3b capital cost for construction is not without its significant funding challenges in this current market. Financing is in progress and once in production will make Alkane a strategic and significant world producer of zirconium, hafnium and rare earth products and is targeting first production in 2018.

The Company mined gold at Peak Hill from 1996 to 2005 and is currently producing gold from the TGO

Near-term catalysts include completion of final permitting (grant of mining lease and environmental protection licence), project equity and offtake discussion and release of a BFS. The Company's cash position is estimated to be ~A$21m.

The DZP is the Company's flagship project

Fig. 1: Project Locations – NSW



Source: Alkane Resources Limited

The DZP is progressing towards completion of permitting, bankable development studies, offtake agreements and financing

DUBBO ZIRCONIA PROJECT (DZP)

Fig. 2: DZP project Snap Shot

DZP	
Interest:	100%
Location:	25km south of Dubbo, NSW
Project stage:	BFS, marketing and offtake, financing
Resource:	73.2Mt @ 1.96% ZrO_2, 0.04% HfO_2, 0.46% Nb_2O_5, 0.03% Ta_2O_5, 0.14% Y_2O_3, 0.75% REO
Reserve:	35.9Mt @ 1.93% ZrO_2, 0.04% HfO_2, 0.46% Nb_2O_5, 0.03% Ta_2O_5, 0.14% Y_2O_3, 0.74% REO
Commodities:	Zirconium (ZrO_2), Hafnium (HfO_2), Niobium (Nb_2O_5), Tantalum (Ta_2O_5), Yttrium (Y_2O_3) and Rare Earths (LREO and HREO)

Source: Alkane Resources Limited

The DZP contains a very large resource of specialty metals (zirconium hafnium, niobium, and rare earths)

Project located ~25km south of Dubbo in the Central West Region of NSW

Background

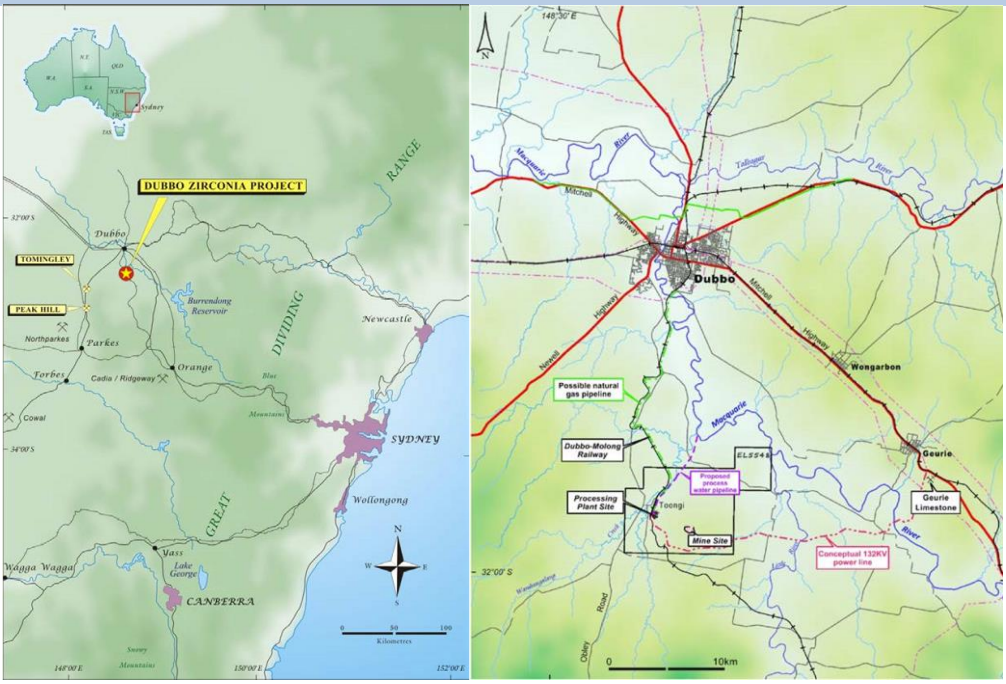
The Dubbo Zirconia Project (DZP) is located 25km south of Dubbo, some 400km northwest of Sydney, NSW. The project area is well located in the Central West Region of NSW which boasts substantial infrastructure (roads, rail, power, gas, light engineering, and potential workforce).

The region boasts very good infrastructure with roads, rail, power, gas, light engineering, and potential workforce

Existing infrastructure will be utilised and upgraded as required

Proposed water pipeline some 8kms from the Macquarie River, connection to grid power and gas pipeline into rail corridor

Fig. 3: DZP Project Location



Source: Alkane Resources Limited

The DZP contains a very large polymetallic resource of the specialty metals including zirconium hafnium, niobium, and rare earths. The metal mix is considered of especially significant for high-tech and advanced materials manufacturing end-users.

The DZP reserve highlights potential for a +35 year mine life, whereas resource highlight potential for +50 years (at an assumed 1Mtpa scaled operation)

The current DZP reserves could support a very long mine life in the order of 35 years (assuming a 1Mtpa scale operation). The larger resource base also provides some confidence that the initial mine life of over 20 years from a single open pit, as considered in the feasibility studies (DFS) is very conservative. The currently defined resource could support an operation with a mine life in excess of 50 years, and as such could provide opportunites to lift production, if and when the specialty metals market can accommodate additional supply.

The Company has been refining and optimising the process flow sheet with a pilot plant in operation since 2008. The pilot plant operation has been providing products to test and evaluate markets and the Company has a JV partnership with Treibacher Industrie AG to produce and market ferro-niobium and is currently finalising a zirconium product marketing agreement for global sales distribution.

FEED study released in August 2015, with Outotec appointed to provide the fixed price EPC

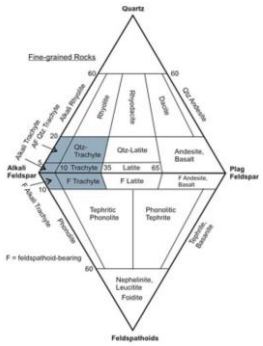
In August 2015, Alkane completed the front end engineering design (FEED) study which re-confirmed the robust technical and financial economics of the DFS (released April 2013). Federal environmental approvals were also received in August, which followed state approvals in May. Outotec (a Finnish engineering firm) were appointed for early contractor involvement in September 2015 to provide a fixed price EPC.

Large and outcropping volcanic intrusive; Simple mine plan

*Definition: a **trachyte** is a fine-grained alkaline igneous rock dominated by feldspar and small amounts of mafic mineral, usually pyroxene, however, hornblende and biotite also occur. Commonly associated with ocean island and continental rift magmatism.*

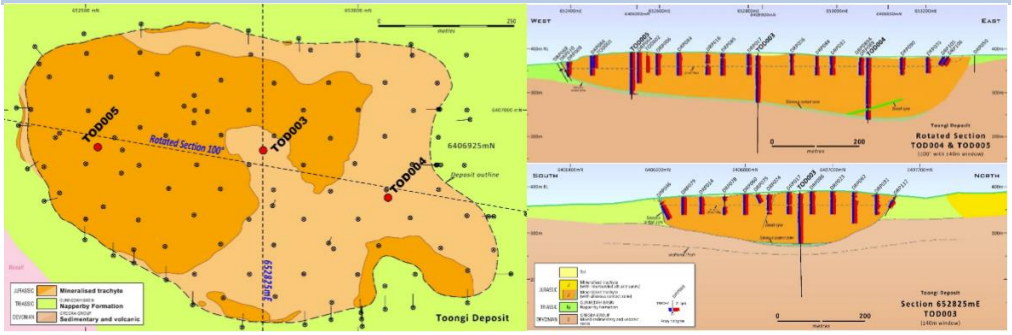
The largely homogeneous Toongi deposit (containing zirconium, niobium, tantalum and rare earths) is hosted by a trachyte[D] lava or subvolcanic intrusive, part of an extensive alkaline volcanic complex (Jurassic aged ~190 million years old) within the Dubbo region. The oval-shape deposit (~900m x ~600m) is exposed at surface and covers a surface area of over 40ha, with a depth extent of over 150m (in parts).

The ore mineralogy is generally very fine grained (most < 20μm), and all minerals are soluble in sulphuric acid with only minor refractory zircon and niobium reported. The orebody is also only weakly radioactive (low levels of uranium and thorium). The Toongi resource has been estimated from a drill spacing of 100m x 50m on a grid pattern, largely to a depth of ~55m with some holes to over 100m depth (confirming ore grades at depth). Approximately 49% (35.7Mt) of the total 73.2Mt resource is classified as Measured, which provides for a high level of confidence in the estimated ore reserves (35.9Mt).



Source: *Imperial College London*

Fig. 4: Toongi Deposit – Plan View (LHS); Sections (RHS)



Source: Alkane Resources Limited

Simple open pit mining with a very low strip ratio of ~0.2:1 (W:O)

The DZP development is based on a simple open cut mine plan which is quarry-like. The open cut covers an area of ~30ha and a depth of ~35 metres below current ground surface. Due to the size of the deposit, only 3.46Mt of waste (very low strip ratio (W:O) of ~0.2) will be removed during the initial 20 year mine life (Base Case). Mining is expected to be drill and blast, and hauled to a nearby ROM pad. The resource is capable of supporting open pit mining well in excess of 50 years.

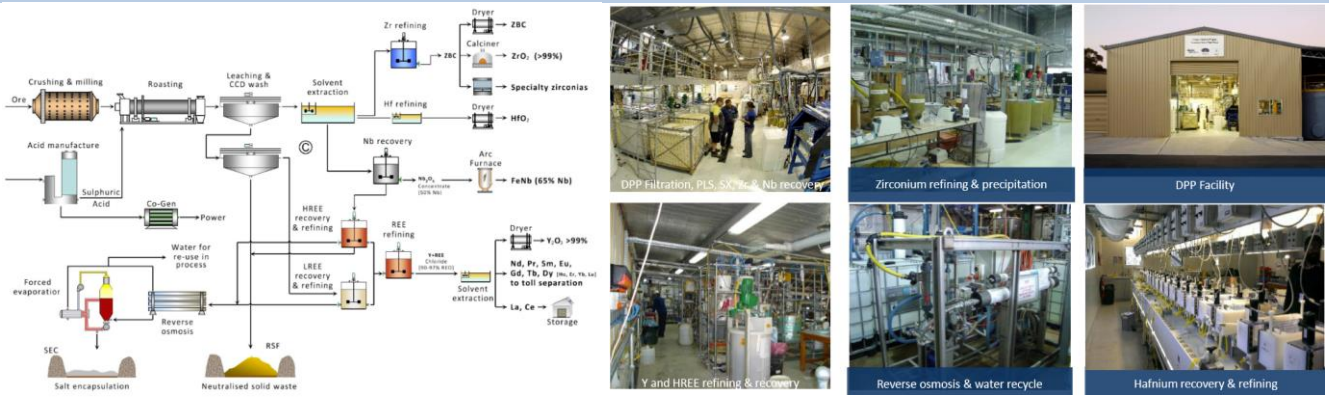
Fine-tuning the flowsheet, added a Hafnium circuit

Over the last 12-months significant improvements and optimisation to the flow-sheet have been made through the collaboration with ANSTO, TZ Minerals International and Hatch

Alkane over many years has developed a processing flow sheet to extract the high value metals from the ore. A pilot plant has been in operation at the Australian Nuclear Science and Technology Organisation (ANSTO) at Lucas Heights since 2008. Recent processing improvements include the addition of a hafnium circuit to refine a hafnium concentrate and further onsite separation of rare earths.

The flowsheet is a proprietary process developed by the Company, based on crushing and grinding, 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, refined using acid leaching and converted to ferro-niobium. 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.

Fig. 5: DZP Processing Flow-sheet (LHS); ANSTO Pilot Plant (RHS)



Source: Alkane Resources Limited

The inclusion of the hafnium circuit in the DZP has added significant value to the project

The addition of the hafnium refining process has little impact on the existing flow sheet, but adds signifiant value, as the hafnium is extracted from the zirconium circuit. Further refinement of the hafnium process is planned for the DecQ with small samples to be analysed and further evaluated.

Recent work has improved the rare earth recoveries by an overall 11.5% and encouragingly the Alkane testwork has seen a 26.7% increase for dysprosium (Dy) recoveries and 7% for neodymium (Nd) recoveries, which are both expected to improve project revenues.

While the flow sheet naturally separates “light” rare earths (La, Ce, Pr, Nd and Sm) from the “heavy” rare earths (Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu and Y) the revised processing plan combines these two streams for initial on-site separation to produce a La-Ce concentrate for storage (or future processing), yttria (Y2O3) for direct sale and a Pr-Lu (95% REO) chemical concentrate for third party toll treatment. This process will facilitate maximum economic benefit, while minimising technical risk.

DZP grant of ML and EPL imminent

Awaiting grant of ML and receipt of the EPL

Alkane received the State development consent for the DZP in late May 2015, followed by Federal environmental approvals in August 2015, marking significant milestones for the project. Outstanding permits include grant of the mining lease (ML) and environmental protection licence (EPL); approvals are expected imminently.

ECI appointed for EPC and funding strategy unchanged

The FEED study (August 2015), re-confirmed robust technical attributes and strong financials for the DZP. The project is capable of generating annual revenues of A$580m with operating costs of A$260m, which equates to impressive A$320mpa EBITDA, based on conservative prices (largely spot prices in July).

The Company is working with an engineering contractor to deliver a fixed cost EPC contract and prepare a BFS for project financing

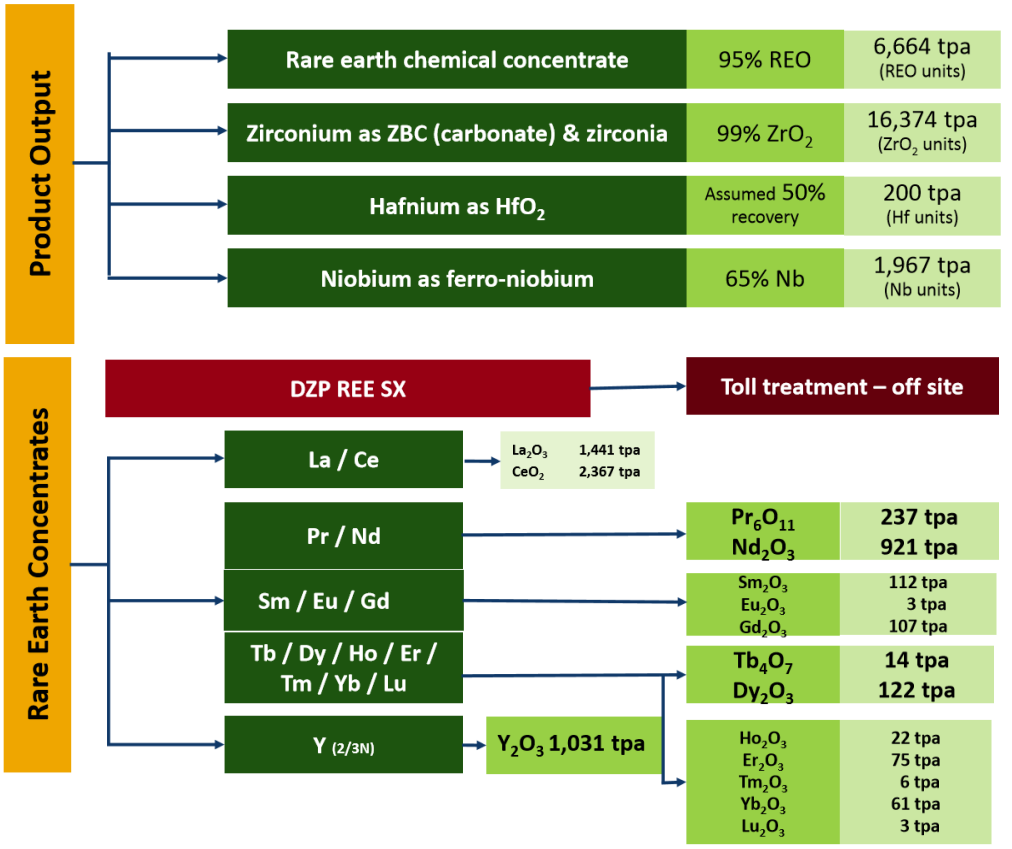
The Company's pre-tax NPV (8% discount rate) is A$1.22b for a 17.5% IRR, over initial mine life of 20 years. The capital estimate for the project remains high at A$1.3b, which includes a A$103m contingency. Clearly funding for the project development remains a key risk, but the Company's financing strategy remains unchanged targeting a combination of strategic investors, Export Credit Agency (ECA) finance and bank debt.

Alkane appointed Outotec (Finnish processing technology supplier) in September 2015, to undertake an early contractor involvement (ECI) process for final design, identify further cost reductions and to produce EPC (fixed price) construction costs. The work is expected to lower the capital costs and aid compilation of the financing package.

The DZP product output is best summarised in Fig. 6, with tonnages based on recoveries from the demonstration (ANSTO) pilot plant.

Fig. 6: DZP Product Output

High value product output



Source: Alkane Resources Limited

Product pricing

The DZP has the ability to provide long-term sustainable supply (non-Chinese) of a diverse range of specialty metals which remains a key drawcard for potential end users. The product diversity and markets could also offer revenue stability. Having operating costs denominated in AUD are also seen as a current advantage, particularly off the expectation that USD should strengthen over time.

Fig. 7: DZP Product Output and Prices

Product	Units	Current Price (US$/kg)		Anticipated 2020	Refined Output	Potential Revenue
		Lower	Upper	US$/kg	tpa	US$m
Lanthum Oxide	La2O3	2	2.5	2	1,369	0.0
Cerium Oxide	CeO2	2	2.5	2	2,249	0.0
Praseodymium	Pr6O11	62	75	80	237	18.9
Neodymium Oxide	Nd2O3	45	50	60	921	55.2
Samarium Oxide	Sm2O3	2.5	3.5	3	112	0.3
Europium Oxide	Eu2O3	235	325	300	3	0.9
Gadolinium Oxide	Gd2O3	15	20	20	107	2.2
Terbium Oxide	Tb4O7	550	650	650	14	9.3
Dysprosium Oxide	Dy2O3	260	310	350	122	42.6
Holmium Oxide	Ho2O3	39	40	22	22	0.9
Erbium Oxide	Er2O3	39	42	75	75	3.0
Thulium Oxide	Tm2O3	na	na	na	6	0.0
Ytterbium Oxide	Yb2O3	29	31	30	61	1.8
Lutetium Oxide	Lu2O3	980	990	990	3	2.8
Yttrium Oxide	Y2O3	6	8	15	1,031	15.5
REO					6,332	**153.3**
ZBC	100% ZrO2	5.25	5.75	6	4,000	24.0
Chemical Zirconia	99.5% ZrO2	5	20	9	12,356	111.2
Zr					16,356	**135.2**
Hafnium Oxide (95% HfO2)	Hf metal	1000	1200	500	200	**100.0**
Ferro-Niobium (65% Nb)	Nb metal	35	40	40	1,967	**78.7**
Total Revenue					**24,855**	**467.2**

Source: Alkane Resources Limited; *prices as at 31 July 2015

TOMINGLEY GOLD PROJECT (TGO)

Fig. 8: Tomingley Gold Project Snap Shot

TGO	
Interest:	100%
Location:	~50km south-west of Dubbo, NSW
Project stage:	Production, Development and Exploration
Resources:	11.3Mt @ 1.9g/t Au for 687Koz Au (OP & UG)
Reserves:	4.4Mt @ 1.6g/t Au for 235Koz (OP)
	0.52Mt @ 3.7g/t Au for 61.6Koz (UG)
Scale:	1.0Mtpa
Mine Life:	~7 years
Production FY16:	65-70Kozpa @ AISC of ~A$1,250/oz
Capex:	~A$20m for UG (Hartleys Est)

Source: Alkane Resources Limited, Hartleys Estimates

Located ~50km south-west of Dubbo

Currently producing from open pits

Current mine life of ~7 years but targeting mine life extensions for +10 years

Background

The Tomingley Gold Project (TGO) is located ~50km south-west of Dubbo, some 450km north-west of Sydney, NSW. The gold mine is 100% ALK owned.

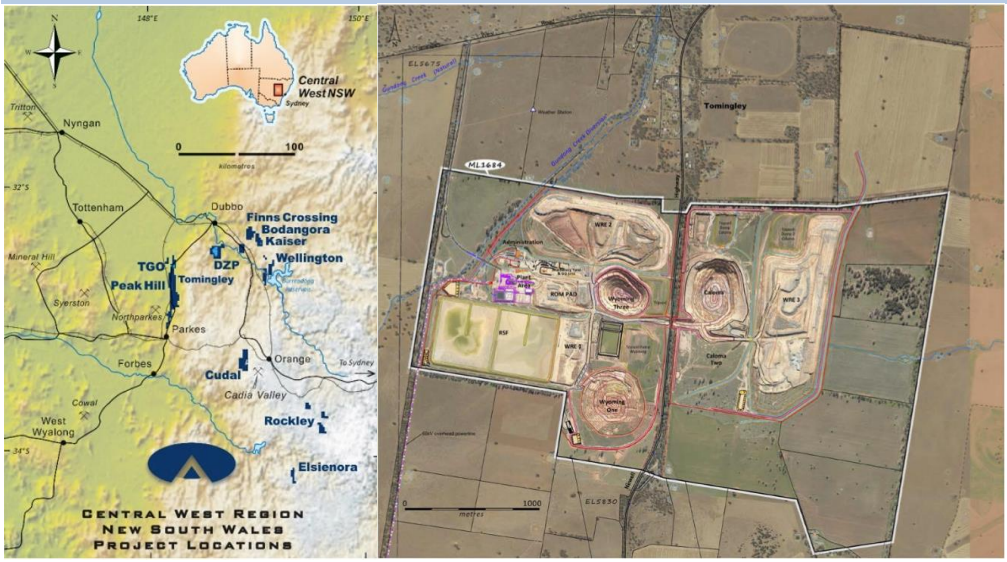
Alkane completed a DFS into the project development in late 2010. Approvals for construction took a considerable time, with the mining lease approval finally received in early 2013. The capital costs for the construction of the gold mine was ~A$115m (slightly under budget), funded without the use of debt through shareholder proceeds and sale of a shareholding in Regis Resources (RRL). First gold was poured in February 2014.

TGO is currently operating at 65-70Kozpa at AISC of ~A$1,250/oz.

The TGO is currently operating at a rate of 65-70Kozpa at AISC of ~A$1,250/oz. Operating cash flow is being re-invested back in to the gold operations and used to fund the pre-construction activities of the DZP.

Operating cash flows is being re-invested back in to the gold operations and used to fund the pre-construction activities of the DZP

Fig. 9: Project Location and Site Layout – NSW



Source: Alkane Resources Limited

Geology

Lode-style gold mineralisation

The TGO covers Ordo-Silurian volcanics and sedimentary rocks with minor intrusives. Significant gold mineralisation throughout project area includes the Wyoming, Caloma gold deposits, the Peak Hill gold mine and the historic Myalls United gold mine.

Significant exploration upside as the deposits remain open at depth

The eastern Lachlan Orogen in southeastern Australia contains major porphyry-epithermal-skarn copper-gold deposits of late Ordovician age. While many small quartz vein hosted or orogenic lode-type gold deposits are known in the region, the discovery of the Wyoming, Caloma gold deposits demonstrate the potential for larger lode-type mineralisation hosted within the same Ordovician volcanic stratigraphy.

Total gold resources for the TGO are 11.3Mt @ 1.9g/t Au for 687Koz Au (open pit and underground resources) and include ore reserves of 4.4Mt @ 1.6g/t Au for 235Koz (open pit) and 0.52Mt @ 3.7g/t Au for 61.6Koz (underground).

Open pits transitioning to blended underground/pits

4 open pits, with underground mines to come on-line

The TGO is based on four gold deposits (Wyoming One, Wyoming Three, Caloma and Caloma Two) located about 14km north of the Alkane's original Peak Hill gold mine (closed in 2005). The Caloma Two resource has been incorporated into the open pit development schedule, and options for commencing underground operations on all resources (starting with Caloma Two and Wyoming One) are being evaluated (PFS work underway).

The TGO CIL plant has throughput capacity of 1Mtpa and comprises a standard two stage crushing, and grinding circuit with gravity/CIL gold recovery. Production levels remain a function of mined grades and througput as gold recoveries are good at +90% (averaging 93%). Recent production performance is summarised below.

Fig. 10:TGO Production Summary

TGO Production		FY14								FY15								FY16	
		DecQ		MarQ	W:O	JunQ	W:O	FY14	W:O	SepQ	W:O	DecQ	W:O	MarQ	W:O	JunQ	W:O	FY15	W:O	SepQ	
Waste Mined	BCM	696,788	W:O	1,906,377	W:O	2,032,519	W:O	4,635,684	W:O	1,653,357	W:O	1,414,557	W:O	1,308,783	W:O	1,353,965	W:O	5,730,661	W:O	1,676,850	**W:O**
Ore Mined	t	-		165,404	11.53	380,146	5.35	545,550	8.50	300,493	5.50	389,242	3.63	308,504	4.24	388,052	3.49	1,386,291	4.13	443,744	**3.78**
Grade	g/t	-		1.3		1.47		1.42		2.03		1.67		1.47		1.5		1.66		1.87	
Ore Milled	t	-		120,270	0.5	238,826	1.0	359,096		296,012	1.2	300,971	1.2	266,913	1.1	276,808	1.1	1,140,704		271,980	1.1
Head Grade	g/t	-		2.32		2.2		2.24		2.47		2.05		1.61		1.88		2.01		2.44	
Recovery	%	-		89.8		92.3		91.4		95.4		94.4		93.1		92		93.9		92.6	
Gold poured	Oz	-		4,363		16,348		20,711		22,362		19,175		13,947		14,128		69,612		19,789	
		-																			
Financials		-																			
Gold	Oz	-		798		15,576		16374		23,734		16,500		16,000		14,500		70,734		21,000	
Ave price	A$/oz	-		1,504		1,419		1,423		1,408		1,426		1,472		1,478		1,441		1,565	
Gold Revenue	A$m	-		1.2		22.1		23.3		33.4		23.5		23.6		21.4		101.9		32.9	
AISC	A$/oz	-		**2806**		**1283**		**1604**		**886**		**1119**		**1552**		**1700**		**1249**		**1234**	
Stockpiles																					
Surface ore	t	0		43,067		185,701		185,701		192,966		301,326		374,224		468,032		468,032		689,601	
Bullion on hand	Oz	0		3,565		5,386		4,386		2,938		5,611		3,553		3,169		3,169		1,951	

Source: Alkane Resources Limited

We model the current open pit operation transitioning to include underground operations, which is based largely on the most recent mine schedule which provides indicative timing for both open pit and underground sequencing (see Fig 12).

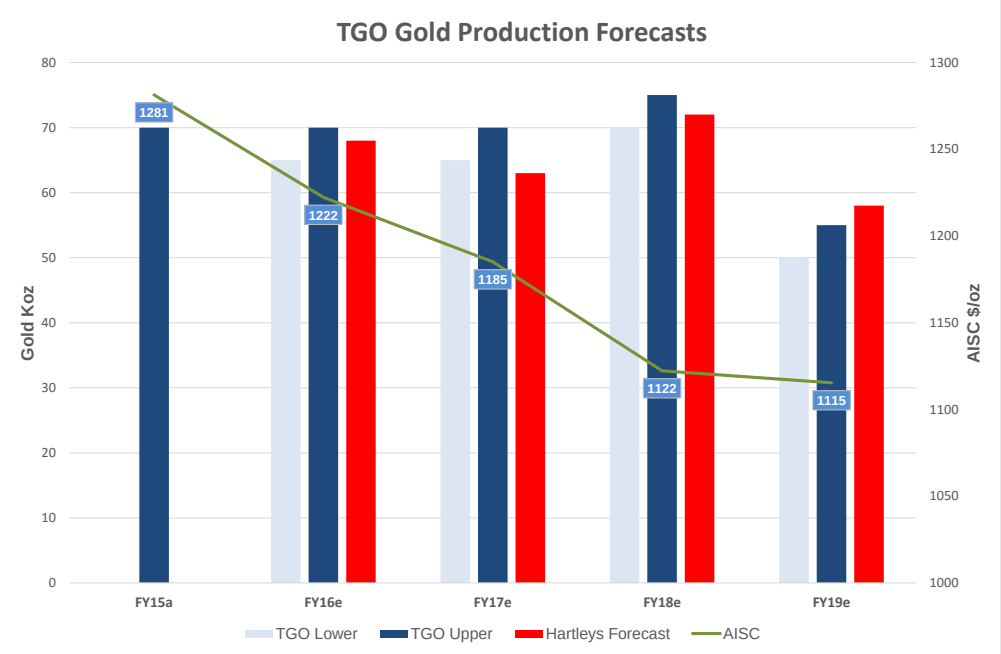
Fig. 11:TGO Plant Site

Source: Alkane Resources Limited

Our modelling includes a capital requirement of A$20m for the initial underground development, which we expect will be staged and funded through current cash and forecast cash-flows. Our production forecasts are largely in-line of recent Company guidance (though subject to change).

Production forecasts are subject to change

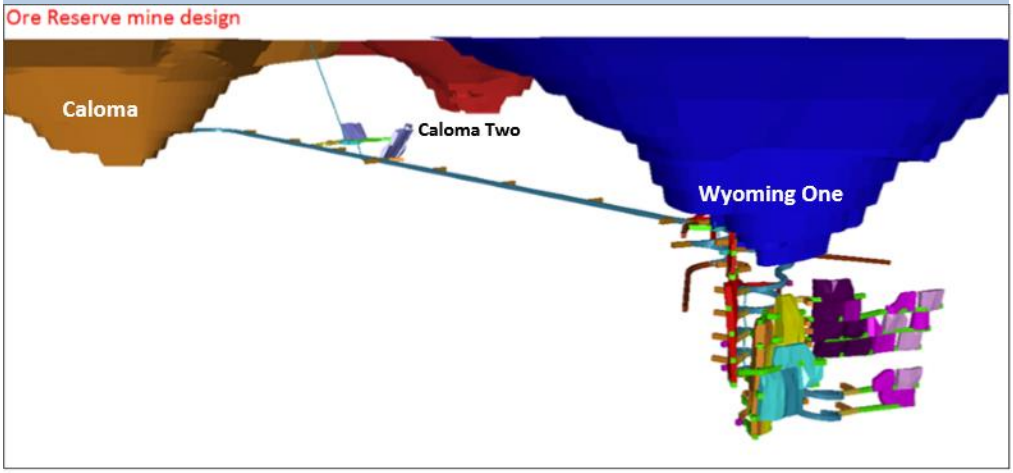
Fig. 12: TGO Gold Production Forecasts



Source: Alkane Resources Limited; Hartleys Estimates

Underground mine expected to use long-hole open stoping and Avoca-type stoping

Fig. 13: TGO Underground Design



UG is likely to be owner-operator at this stage

Source: Alkane Resources Limited

RESERVES AND RESOURCES

Alkane reported updated ore reserves and mineral resources for the TGO as at 30th June 2015, which take into account mine depletion. Maiden underground reserves for Wyoming One and Caloma Two were released 10th December 2015. Potential exists to upgrade the resource categories.

Fig. 14: TGO Reserves – 30 June 2015 (OP) and 10 December 2015 (UG)

Deposit		Proved			Probable			Total		
		Tonnes (Mt)	Grade (g/t Au)	Gold (Koz)	Tonnes (Mt)	Grade (g/t Au	Gold (Koz)	Tonnes (Mt)	Grade (g/t Au	Gold (Koz)
Wyoming One	Open Pit	1.67	1.6	85.7	0.20	1.3	8.4	1.87	1.5	94.0
Wyoming Three	Open Pit	0.17	1.6	8.9	0.01	1.4	0.2	0.18	1.5	9.0
Caloma	Open Pit	1.25	1.9	76.2	0.07	1.5	3.5	1.32	1.8	80.0
Caloma Cut Back	Open Pit	0.22	1.5	10.7	0.07	1.4		0.29	1.4	14.0
Caloma Two	Open Pit	0.00	0	0.0	0.24	3.5	27.3	0.24	3.5	27.0
Wyoming One & Caloma Two	Underground	0.22	4.03	29.0	0.30	3.38	32.6	0.52	3.66	61.6
Stockpiles		0.47	0.8	12.0	0.00	0	0.0	0.47	0.8	12.0
Sub Total		**4.00**	**1.6**	**205.7**	**0.89**	**2.20**	**62.9**	**4.89**	**1.9**	**296.6**

Source: Alkane Resources Ltd

Fig. 15: TGO Resources – 30 June 2015

Deposit	Measured			Indicated			Inferred			Total		
	Tonnes (Mt)	Grade (g/t Au)	Gold (Koz)	Tonnes (Mt)	Grade (g/t Au)	Gold (Koz)	Tonnes (Mt)	Grade (g/t Au)	Gold (Koz)	Tonnes (Mt)	Grade (g/t Au)	Gold (Koz)
Open Pits - lower cut of 0.5g/t Au												
Wyoming One	2.171	1.7	118.7	0.442	1.5	21.3	0.735	1.1	26.0	3.348	1.5	167.0
Wyoming Three	0.206	1.7	11.3	0.122	1.7	6.7	0.002	1.1	0.1	0.33	1.7	18.0
Caloma	2.163	1.8	125.2	0.582	1.7	31.8	2.008	1.5	96.8	4.753	1.7	254.0
Caloma Two	0		0.0	1.085	2.4	83.7	0.704	1.3	29.4	1.789	2	112.0
Sub Total	**4.54**	**1.8**	**262.8**	**2.23**	**2.00**	**143.5**	**3.45**	**1.4**	**155.3**	**10.22**	**1.7**	**551.0**
Underground - lower cut of 2.5g/t Au												
Wyoming One	0.168	4.8	25.9	0.205	4.4	29.0	0.361	4.2	48.8	0.735	4.4	104.0
Wyoming Three	0.012	3.6	1.4	0.02	4.5	2.9	0.025	3.3	2.7	0.057	3.8	7.0
Caloma	0	3.1	0.0	0.004	2.9	0.4	0.081	3.2	8.3	0.084	3.2	9.0
Caloma Two	0		0.0	0.092	3.5	10.4	0.063	3.2	6.5	0.155	3.3	17.0
Sub Total	**0.18**	**4.7**	**27.2**	**0.32**	**4.10**	**42.3**	**0.53**	**3.9**	**66.5**	**1.031**	**4.1**	**136.0**
TOTAL	**4.72**	**1.9**	**288.4**	**2.552**	**2.3**	**188.7**	**3.979**	**1.7**	**217.5**	**11.251**	**1.9**	**687.0**

Source: Alkane Resources Ltd

DZP reserve supports a 35 year mine life

The DZP FEED study provided no material changes to the DZP ore reserves and mineral resources, as announced late August 2015.

Fig. 16: DZP Reserves – 27 August 2015

Toongi Deposit	Tonnes (Mt)	ZrO2 %	HfO2 %	Nb2O5 %	Ta2O5 %	Y2O3 %	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
Total	**35.93**	**1.93**	**0.04**	**0.46**	**0.03**	**0.14**	**0.74**

Source: Alkane Resources Ltd

DZP resource conversion could provide over 50 year mine life (at the current assumed project scale 1Mtpa)

Fig. 17: DZP Resources – 27 August 2015

Toongi Deposit	Tonnes (Mt)	ZrO2 %	HfO2 %	Nb2O5 %	Ta2O5 %	Y2O3 %	REO %
Measured	35.7	1.96	0.04	0.46	0.03	0.14	0.75
Inferred	37.5	1.96	0.04	0.46	0.03	0.14	0.75
Total	**73.2**	**1.96**	**0.04**	**0.46**	**0.03**	**0.14**	**0.75**

Source: Alkane Resources Ltd

KEY SUPPLIERS & CUSTOMERS

ALK engaged engineering consultants Hatch to complete the capital estimate to bring the DZP into production. The Front End Engineering Design (FEED) study, completed to an accuracy of +/- 15% provided capex of ~A$1.3b (includes a contingency).

Key contractors and offtake agreement well advanced

In September 2015, the Company appointed Outotec (processing technology supplier) to undertake an early contractor involvement (ECI) process to further refine the final process design, identify further cost reductions and to produce EPC (fixed price) construction costs.

Now finalising offtake agreements

Alkane works collaboratively with fleet hire equipment provider, Emeco to improve overall mining productivity at the TGO, with work to date providing a 12% increase in payloads and 10% increase in operating efficiencies.

JV with Treibacher to produce and market Fe-Nb

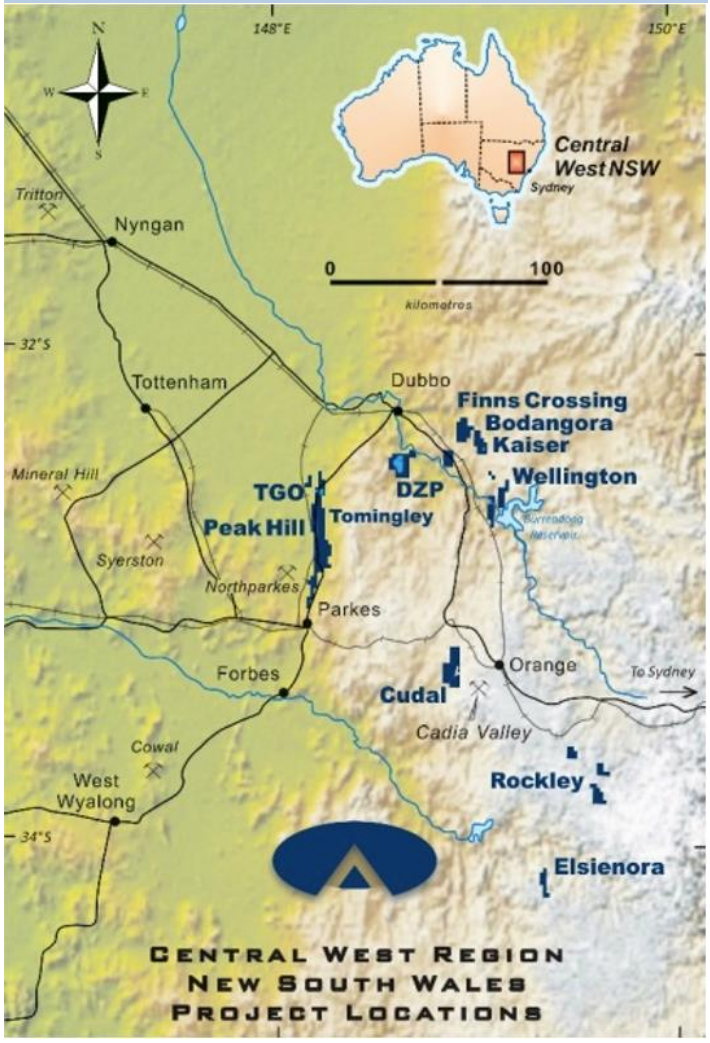
The Company is finalising a zirconium product marketing agreement for global product distribution, and remains well advanced on discussions for further offsite rare earth processing to separate product marketing. Alkane has a JV with Treibacher Industrie AG to produce and market the Ferro-Niobium production from the project.

GEOGRAPHIC EXPOSURE

ALK is currently focused on operations within NSW, Australia.

Key projects located in NSW

Fig. 18: ALK Projects, NSW



Source: Alkane Resources Limited

MARKETS – HIGH-TECH SPECIALTY METALS

Zirconium (Zr)

Zr chemicals have numerous applications including high-tech coatings on jet engines and 3D printing ink

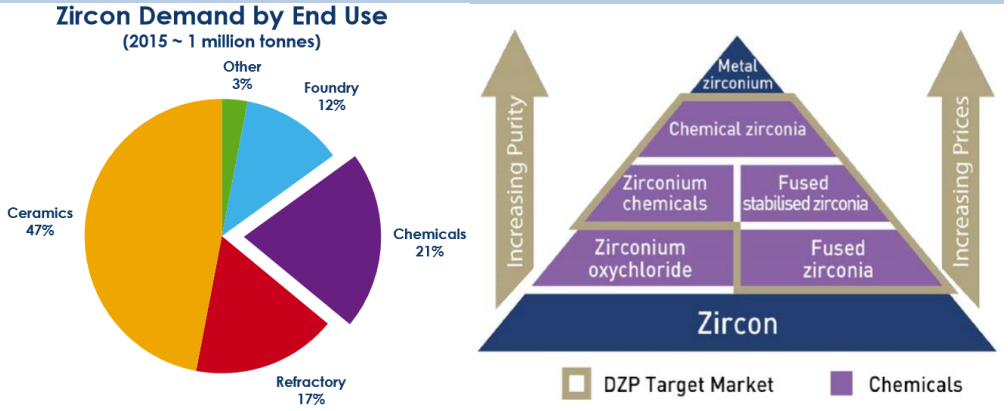
Zirconium is a transitional metal largely derived from the mineral zircon. Zirconium is a hard, grey-white metal with very good corrosion resistance characteristics and as such has a wide range of applications.

Zircon supply by the mineral sands industry is largely controlled by two major producers (Rio Tinto and Iluka Resources) with an estimated 90% of the market supply. End user demand for zircon is estimated to be ~1Mtpa (2015), with the market currently in surplus with producer inventories considered high. The market is expected to stabilise in the next couple of years with a forecast compound annual growth rate (CAGR) of ~5% pa thereafter. The leading producers anticipate the zircon market should move into deficit in 2018, which times well for ALK.

End user demand for zircon is mostly for ceramic use (~50% of the market), with production from the DZP targeting the chemicals application which constituents ~21% of the market. Zirconium materials are classified into three broad categories: fused zirconia, zirconium chemicals and chemical zirconia. China dominates the downstream zirconium industry with an estimated 85-90% control.

Fig. 19: Zircon End Use (LHS); DZP Chemical Market (RHS)

Current world demand for zirconium chemicals and zirconia ~160Ktpa



Source: Alkane Resources Ltd

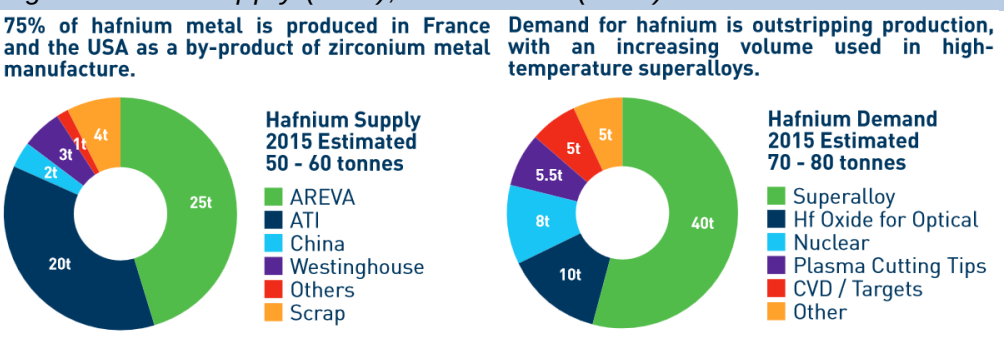
Hafnium (Hf)

Hf has applications in super alloys for the aerospace industry

Hafnium is associated with zirconium, and are nearly identical chemically. Hafnium is a lustrous grey metal that has unique high-temperature properties making it amenable for superalloy application (particularly in the aerospace industry). It is usually traded as hafnium metal in 'crystal bar' form, or as hafnium oxide (HfO_2) or hafnium tetrachloride ($HfCl_4$). At the DZP, the source of hafnium is a hydrous zirconium silicate mineral containing hafnium oxide as opposed to zircon.

At the DZP, the source of hafnium is a hydrous zirconium silicate mineral containing hafnium oxide as opposed to zircon

Fig. 20: Hf Supply (LHS); Hf Demand (RHS)



Source: Alkane Resources Ltd

The demand for a sustainable long-term supply of hafnium is highly sought after

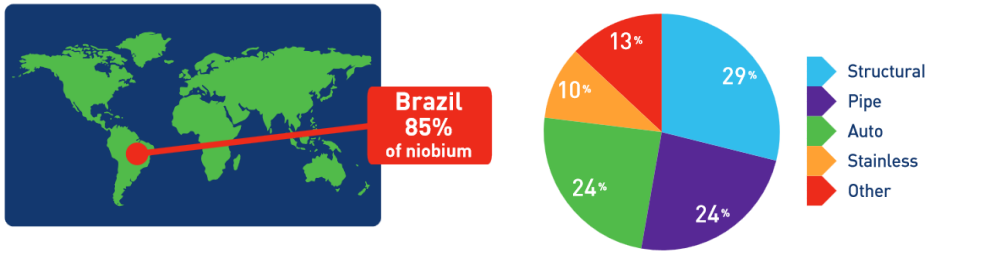
Alkane's successful production of a hafnium concentrate is seen as a significant milestone for the project, and appears well timed as demand for hafnium metal continues to outstrip supply. Marketing efforts to maximize the value of these products produced has already commenced and potentially high-value offtake arrangements could follow. The demand for a sustainable long-term supply of hafnium is highly sought after. Alkane comment that Spot hafnium metal prices have almost doubled in the last 3 years to US$1,500/kg, while long term prices have also increased to ~US$600-800/kg.

Niobium (Nb)

Nb is frequently alloyed with steel because of its strength at high temperatures and lightweight characteristics

The DZP is forecast to produce ferro-niobium. Niobium is a metal with superconductive properties used mostly in alloys and superalloys. The largest application of ferro-niobium is the production of high-strength low alloy (HSLA) steels. Niobium supply is dominated by Brazil, with CBMM accounting for 85% of global supply. The Niobium market is worth ~U$S3-4b, with current pricing reflecting general weak steel demand. Recent prices for ferro-niobium were in the range of US$35-40/kg (niobium content) across markets.

Fig. 21: World Nb Production (LHS); Use of Fe-Nb (RHS)



Material produced	DZP	World market (2017)
Ferroniobium (FeNb)	3,000tpa	90,000tpa

90% of niobium is used in standard grade ferroniobium for the production of advanced high strength steels (AHSS).

Source: Alkane Resources Ltd

Rare Earths (REO)

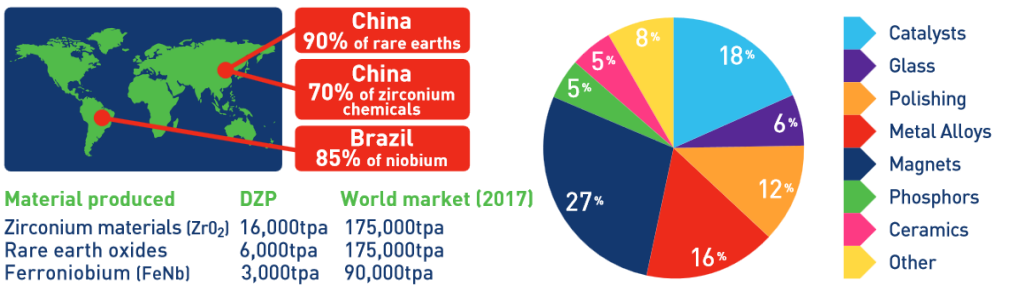
Small but important elements, in batteries, hybrid vehicles and wind turbines

The rare earths industry remains small but is still high value (estimated worth over US$3-5b annually). The separation of individual rare earths requires specialised recovery techniques, and as such it remains a boutique market which is often limited. The market remains fragile and due to its size can at times be over-supplied.

Rare earths (praseodymium, neodymium, dysprosium and mixed praseodymium-neodymium oxide) used in permanent magnet dominant current demand and has forecast growth. Whereas some of the light rare earths (cerium and lanthanum) remain over-supplied with low demand.

China dominates global supply with 85-90% of REE production

Fig. 22: World REE Production (LHS); Use of REE (RHS)



Market growth is anticipated

Material produced	DZP	World market (2017)
Zirconium materials (ZrO_2)	16,000tpa	175,000tpa
Rare earth oxides	6,000tpa	175,000tpa
Ferroniobium (FeNb)	3,000tpa	90,000tpa

Source: Alkane Resources Ltd

DIRECTORS AND KEY MANAGEMENT

Fig. 23: Economic exposure of Board & Management

Economic Exposure of Board and Key management	Position	Ord Shares	Options & Rights	Total	rank
Directors					
John Dunlop	Executive Chairman	936,000	0	936,000	3
David (Ian) Chalmers	Managing Director	2,356,284	2,466,667	4,822,951	2
Ian Gandel	Non-Executive Director	91,557,875	0	91,557,875	1
Anthony Lethlean	Non-Executive Director	433,396	0	433,396	4
Karen Brown	Company Secretary	339,157	0	339,157	5
Total		**95,622,712**	**2,466,667**	**98,089,379**	

Source: Alkane Resources Limited

Directors (as summarised from Alkane website)

The Alkane Board of Directors are experience mining executives

John Dunlop, Non-Executive Chairman

Mr Dunlop is a consultant mining engineer with over 45 years surface and underground mining experience in both Australia and overseas. He is a former director of the Australasian Institute of Mining and Metallurgy (2001 - 2006) and is currently the chairman of MICA (Mineral Industry Consultants Association). Mr Dunlop is non-executive chairman of Alliance Resources Limited (appointed 30 November 1994). Recently, he has also been a non-executive director of Copper Strike Limited (9 November 2009 – 6 June 2014) and a director of Gippsland Limited (1 July 2005 - 12 July 2012). Mr Dunlop is also a certified arbitrator and mineral asset valuer and consults widely overseas. Appointed director and Chairman 3 July 2006.

High level of technical expertise

David (Ian) Chalmers, Managing Director

Mr Chalmers is a geologist and graduate of the Western Australia Institute of Technology (Curtin University) and has a Master of Science degree from the University of Leicester in the United Kingdom. He has worked in the mining and exploration industry for over 40 years, during which time he has had experience in all facets of exploration and mining through feasibility and development to the production phase. Mr Chalmers was Technical Director until his appointment as Managing Director in 2006, overseeing the group's minerals exploration efforts across New South Wales, Western Australia, Indonesia and New Zealand and the development and operations of the Peak Hill Gold Mine (NSW). Since taking on the role as chief executive he has steered the Company through construction and development of the now fully operational Tomingley Gold Operations and to the threshold of development of the world class Dubbo Zirconia Project. Appointed director 10 June 1986, appointed Managing Director 5 October 2006

Ian Gandel is Alkane's largest shareholder with ~22% of the ordinary shares

Ian Gandel, Non-Executive Director

Mr Gandel is a successful Melbourne based businessman with extensive experience in retail management and retail property. He has been a director of the Gandel Retail Trust and has had an involvement in the construction and leasing of Gandel shopping centres. He has previously been involved in the Priceline retail chain and the CEO chain of serviced offices. Through his private investment vehicles, Mr Gandel has been an investor in the mining industry since 1994. Mr Gandel is currently a substantial holder in a number of publicly listed Australian companies and, through his private investment vehicles, now holds and explores tenements in his own right in Victoria, Western Australia and New South Wales. Mr Gandel is also a non-executive director of Alliance Resources Ltd (appointed 15 October 2003), and non-executive chairman of Octagonal Resources Limited (appointed 10 November 2010). Appointed director 24 July 2006.

Australian and internationally-experienced Board

Anthony Lethlean, Non-Executive Director

Mr Lethlean is a geologist with over 10 years' mining experience, including 4 years underground on the Golden Mile in Kalgoorlie. In later years, he has worked as a resources analyst with various stockbrokers and investment banks including CIBC World Markets. He was a founding director of Helmsec Global Capital Limited which seeded, listed and funded a number of companies in a range of commodities. He retired from the group in 2014. He is also a non-executive director of Alliance Resources Ltd (appointed 15 October 2003). Appointed director 30 May 2002.

Karen Brown (Company Secretary)

Ms Brown is an honours graduate in economics from the University of Western Australia and is a director of Mineral Administration Services Pty Ltd which provides company secretarial, accounting, treasury and financial administration services to a number of listed public companies primarily in the resources sector.

MAJOR SHAREHOLDERS

MAJOR SHAREHOLDERS

ALK has two substantial shareholders

Alkane has two substantial shareholders:

- Abbotsleigh Pty Ltd (Ian Gandel) with 91.6m shares or ~22.1%
- FIL Limited with 41.3m shares or ~10.0%
- Alkane Board holds ~23% of the ordinary shares on issue.

Fig. 24: Alkane Top 20 Shareholders – 18 September 2015

Top 20 holds ~63%

	Shareholder	No of Shares (m)	%
1	Abbotsleigh Pty Ltd	85.56	20.66%
2	JP Morgan Nominees Australia Limited	80.35	19.40%
3	Citicorp Nominees Pty Limited	20.86	5.04%
4	National Nominees Limited	14.75	3.56%
5	National Nominees Limited <DB A/C>	12.53	3.03%
6	HSBC Custody Nominees (Australia) Limited	12.29	2.97%
7	Choice Investments Dubbo Pty Ltd	5.60	1.35%
8	Sandhurst Trustees Ltd <DMP Asset Management A/C>	5.40	1.30%
9	Funding Securities Pty Ltd <Colin J Ferguson S/F A/C>	3.88	0.94%
10	Leefab Pty Ltd	2.29	0.55%
11	Mr R M Dimond & Mrs D R Dimond <The Dimond Super Fund A/C>	2.00	0.48%
12	Ms Kathryn Swan	2.00	0.48%
13	Ms Jillanne Homewood	1.81	0.44%
14	S Maas Holdings Pty Ltd <Shawn Maas Family A/C>	1.64	0.40%
15	Berne No 132 Nominees Pty Ltd <152417 A/C>	1.54	0.37%
16	Mr David Hanbury Edmonds <David Edmonds S/F A/C>	1.49	0.36%
17	BNP Paribas Nominees Pty Ltd <Commerzbank AG DRP>	1.42	0.34%
18	BNP Paribas Noms Pty Ltd <DRP>	1.38	0.33%
19	Ms Boon Hong Ng	1.33	0.32%
20	ABN Amro Clearing Sydney Nominees Pty Ltd <Custodian A/C>	1.31	0.32%
	Total: Top 20	**259.42**	**62.63%**
	Remaining Holders Balance	**154.8**	**37.37%**
	Total on Issue	**414.22**	**100.0%**

Source: Alkane Resources Limited

OPTIONS, CONVERTIBLES AND UNPAID CAPITAL

No options.

The Company has performance rights as part of short-term and long-term incentive programs for ALK employees. Alkane also has share appreciation rights. The total number of performance and share appreciation rights is ~32.6m. The performance and share appreciation rights that do not vest will lapse unless otherwise determined by the ALK Board.

FINANCIALS

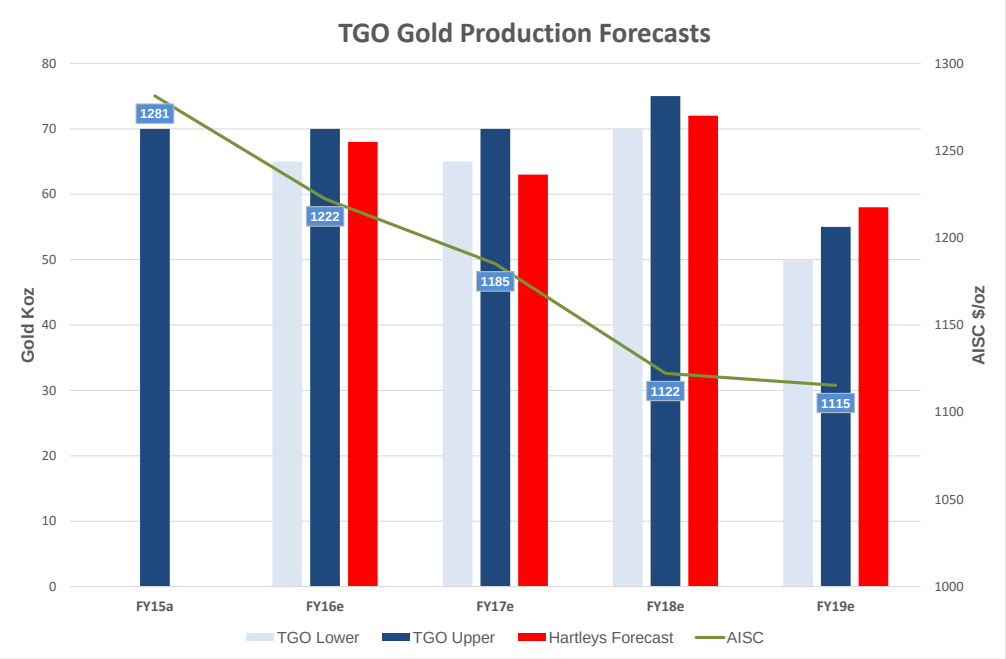
PRODUCTION FORECASTS

Company guidance TGO and DZP

Our modelling for the TGO is based largely on the most recent mine schedule which provides indicative timing for both open pit and underground sequencing and anticipated production ounces (see below).

Production targets and timelines are subject to change

Fig. 25: TGO Gold Production Forecasts

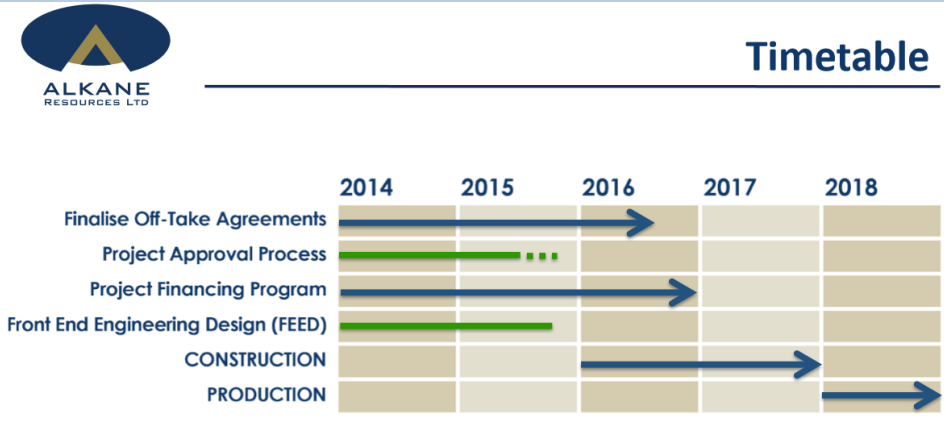


Source: Alkane Resources Limited; Hartleys Estimates

Our modelling for the DZP has been based on the DFS (released 2013) and refined by the project enhancements reported in the front end engineering design (FEED) study (released August 2015). Our modelling assumes that the project is fundable, potentially through part divestment of some project interest (strategic investment for long term supply of some specialty metals), Export Credit Agency (ECA) funding (long life project, international interest), bank debt and new equity (cornerstone investor(s), potential component for offtakes). Alkane's current indicative timeline is summarised below. All these timelines are subject to change and considered indicative only.

Funding remains the biggest hurdle to project development (project engineering is at construction stage awaiting finance).

Fig. 26: DZP Indicative Timelines



Source: Alkane Resources Limited; AGM presentation 18 Nov 2015

DZP Base Case Assumptions

Alkane is currently working with engineering contractors to deliver a fixed price EPC for development and to provide a bankable study for the financing of the project. Our current base case assumptions are summarised below.

At this stage we model a Debt to Equity ratio of 60:40

Fig. 27: Modelling Assumptions - DZP

DZP			
Reserves		Mt	35.9
Resources		Mt	73.2
Scale		Mt	1.0
Mine Life		yrs	20
Grade			
ZrO_2 %		%	1.93
HfO_2 %		%	0.04
Nb_2O_5 %		%	0.46
REO %		%	0.74
Production			
ZrO_2 (ZBC; Chem Zr)		tpa	16,374
Nb as FeNb		tpa	1,967
Hf as HfO2		tpa	200
REO		tpa	6,664
	Total		**25,205**
Saleable Production			
ZrO_2 (ZBC; Chem Zr)		tpa	16,356
Nb as FeNb		tpa	1,967
Hf as HfO_2		tpa	200
REO		tpa	2,714
	Total		**21,237**
Opex			
Mining		A$/t	3.3
Processing & Maintenance		A$/t	168
Transport		A$/t	11
Admin & Personnel		A$/t	43
Other		A$/t	5.4
	Total		**230**
Capex			
Project Construction		A$m	1,197
Contingency		A$m	103
	Total		**1,300**

Source: Alkane Resources Limited; Hartleys Research Estimates

The Company strategy of strategic investment, ECA finance and commercial debt will likely improve our D:E assumption

PROFIT & LOSS

Fig. 28: Profit and Loss

P&L	Unit	30 Jun 14	30 Jun 15	30 Jun 16	30 Jun 17	30 Jun 18	30 Jun 19
Net Revenue	**A$m**	**23.7**	**101.9**	**111.5**	**104.3**	**113.4**	**309.9**
Total Costs	**A$m**	**-16.2**	**-83.5**	**-78.6**	**-70.5**	**-81.2**	**-157.0**
EBITDA	A$m	7.6	18.4	32.9	33.8	32.2	152.9
- margin		32%	18%	30%	32%	28%	49%
Depreciation/Amort	A$m	-10.0	-26.7	-25.4	-22.9	-21.7	-64.1
EBIT	**A$m**	**-2.4**	**-8.3**	**7.5**	**11.0**	**10.5**	**88.8**
Net Interest	A$m	1.2	0.2	0.0	0.0	0.0	0.0
Norm. Pre-Tax Profit	**A$m**	**-1.3**	**-8.1**	**7.5**	**11.0**	**10.5**	**88.8**
Reported Tax Expense	A$m	-4.9	4.1	0.0	-1.5	-3.1	-26.6
Normalised NPAT	**A$m**	**-6.2**	**-4.1**	**5.3**	**7.7**	**7.3**	**62.2**
Abnormal Items	A$m	0.0	0.0	2.3	1.8	0.0	0.0
Reported Profit	A$m	-6.2	-4.1	7.5	9.5	7.3	62.2
Minority	A$m	0.0	0.0	0.0	0.0	0.0	0.0
Profit Attrib	**A$m**	**-6.2**	**-4.1**	**7.5**	**9.5**	**7.3**	**62.2**

Source: Hartleys Research Estimates

BALANCE SHEET

Fig. 29: Balance Sheet

Balance Sheet	Unit	30 Jun 14	30 Jun 15	30 Jun 16	30 Jun 17	30 Jun 18	30 Jun 19
Cash	**A$m**	**15.6**	**14.8**	**25.5**	**427.4**	**336.6**	**102.6**
Other Current Assets	A$m	25.2	13.5	15.6	14.4	16.0	38.4
Total Current Assets	**A$m**	**40.8**	**28.3**	**41.2**	**441.8**	**352.6**	**141.0**
Property, Plant & Equip.	A$m	100.0	89.8	69.7	552.2	1051.3	1299.3
Exploration	A$m	53.4	65.3	76.8	88.8	100.8	112.8
Investments/other	A$m	6.7	7.6	8.9	11.5	12.6	12.6
Tot Non-Curr. Assets	**A$m**	**160.2**	**162.6**	**155.4**	**652.4**	**1164.6**	**1424.7**
Total Assets	**A$m**	**201.0**	**191.0**	**196.6**	**1094.2**	**1517.3**	**1565.7**
Short Term Borrowings	A$m	-	-	-	-	-	-
Other	A$m	14.7	11.3	8.0	7.3	8.2	14.4
Total Curr. Liabilities	**A$m**	14.7	11.3	8.0	7.3	8.2	14.4
Long Term Borrowings	A$m	-	-	-	413.7	827.4	807.4
Other	A$m	12.0	9.3	9.3	9.3	9.3	9.3
Total Non-Curr. Liabil.	**A$m**	**12.0**	**9.3**	**9.3**	**423.0**	**836.6**	**816.6**
Total Liabilities	**A$m**	**26.8**	**20.5**	**17.2**	**430.3**	**844.8**	**831.1**
Net Assets	**A$m**	**174.2**	**170.5**	**179.3**	**663.9**	**672.4**	**734.6**
Net Debt	A$m	-15.6	-14.8	-25.5	-13.7	490.8	704.8

Source: Hartleys Research Estimates

We assume funding in FY17

CASH FLOW

Fig. 30: Cash Flow Statement

Cashflow	Unit	30 Jun 14	30 Jun 15	30 Jun 16	30 Jun 17	30 Jun 18	30 Jun 19
Operating Cashflow	A$m	-5.5	28.2	27.5	34.4	31.4	136.8
Income Tax Paid	A$m	0.0	0.0	0.0	-1.5	-3.1	-26.6
Interest & Other	A$m	1.6	0.4	0.0	0.0	0.0	0.0
Operating Activities	**A$m**	-3.9	28.6	27.5	32.9	28.3	110.1
Property, Plant & Equip.	A$m	-81.7	-18.1	-5.3	-505.3	-520.8	-312.1
Exploration and Devel.	A$m	-13.5	-14.5	-11.5	-12.0	-12.0	-12.0
Other	A$m	40.6	3.2	0.0	0.0	0.0	0.0
Investment Activities	**A$m**	**-54.6**	**-29.4**	**-16.8**	**-517.3**	**-532.8**	**-324.1**
Borrowings	A$m	0.0	0.1	0.0	413.7	413.7	-20.0
Equity or "tbc capital"	A$m	9.8	0.0	0.0	472.6	0.0	0.0
Dividends Paid	A$m	0.0	0.0	0.0	0.0	0.0	0.0
Financing Activities	**A$m**	**9.8**	**0.1**	**0.0**	**886.3**	**413.7**	**-20.0**
Net Cashflow	**A$m**	**-48.7**	**-0.7**	**10.7**	**401.9**	**-90.8**	**-234.0**

Source: Hartleys Research Estimates

Debt

Alkane is currently debt free. We model a funding requirement of ~A$1.3b as per the FEED study update. We assume a Debt to Equity (D:E) ratio of ~60:40, which could imply a future debt position of ~$800m, which is in-line of Company's indicative advice for Export Credit Agency (ECA) and Commercial Bank Debt (CBD) capacity of 60-70%.

ALK currently has no debt and some gold forwards in place

Hedging

ALK currently has 22,500oz at an average forward price of A$1,596/oz hedged (as at the end of September 2015).

Dividends

We expect the Company to focus on development and exploration and hence dividends are unlikely for some considerable time.

SENSITIVITIES

FX exposure

ALK is exposed to FX changes affecting AUD commodity prices.

Interest Rate exposure

The Company currently has no exposure to interest rates.

Commodity price exposure

ALK is exposed to gold, zirconium, hafnium, niobium, yttrium and other rare earths commodity prices. Some of the specialty metals are dominated by Chinese supply and can be subject to contract pricing.

Fig. 31: Commodity Price Assumptions used in our modelling

Price Assumptions	Unit	30 Jun 14	30 Jun 15	30 Jun 16	30 Jun 17	30 Jun 18	30 Jun 19
AUDUSD	A$/US$	0.92	0.81	0.72	0.72	0.75	0.76
Gold - US$	US$/oz	1286	1187	1183	1200	1175	1150
Gold - A$	A$/oz	1393	1473	1642	1661	1577	1508
Zirconia (ZrO2)	US$/kg	-	-	-	-	-	8
Ferro-Niobium (65% Nb)	US$/kg	-	-	-	-	-	38
Hafnium Oxide (95% HfO2)	US$/kg	-	-	-	-	-	500
Rare Earths (REO) - basket	US$/kg	-	-	-	-	-	56

Source: Hartleys Research Estimates; Note prices subject to change

PRELIMINARY BASE CASE VALUATION

We model an initial 20 year mine-life at the DZP

The gold operation (TGO) generates free cash which is in turn reinvested into the flagship DZP which is seen as the current key value driver for the Company.

Our sum of parts valuation for ALK assumes a ~7 year mine-life (LOM) at TGO with average production of ~65Kozpa at AISC of ~A$1,230/oz. We assume the current open pit operation transitions to a blended underground/open pit operation from late CY17. Our TGO valuation is A$96m, implies 23cps value (around current trading levels), on an undiluted basis (current ordinary shares). Our 8cps assigned value includes new equity for the DZP project development (diluted for new equity).

DZP modelling assumptions are summarised on Fig 27

Our valuation (NPV) for the DZP uses a discount rate of 12% and assumes the project can be successfully funded (seen as a major risk to our valuation). The Company is well advanced in regards to potential offtake partners for some of the specialty metals and due to the project's long mine life (+20 years) and anticipated cash generation could attract a strategic cornerstone investor (either at the project level or Company level). At this stage we assume 100% project interest, with debt funding from a combination of ECA finance and bank debt.

We assume a nominal A$40m (4cps) for exploration upside potential

The shallow Toongi deposit is capable of supporting open pit mining well in excess of 50 years (reserve mine life is ~35 year). We assume a nominal $A40m ($0.04/share) value for exploration upside potential.

Fig. 32: Hartleys Sum of Parts Valuation for ALK

Valuation (NAV)	A$m	A$/share
100% TGO (pre-tax NAV at disc. rate of 8%)	96	0.08
100% DZP (pre-tax NAV at disc. rate of 12%)	723	0.63
Other Exploration	40	0.04
Forwards	0	0.00
Corporate Overheads	-40	-0.03
Net Cash (Debt)	21	0.02
Tax (NPV future liability)	-286	-0.25
Options & Other Equity	0	0.00
Hedging	0	0.00
Total	**554**	**0.49**

Source: Hartleys Estimates

Our modelling dilutes for new equity

Hartleys NAV for ALK is A$0.49/share

PRICE TARGET

Our price target for ALK includes weighting for our valuation at spot and consensus pricing.

Fig. 33: ALK Price Target Methodology

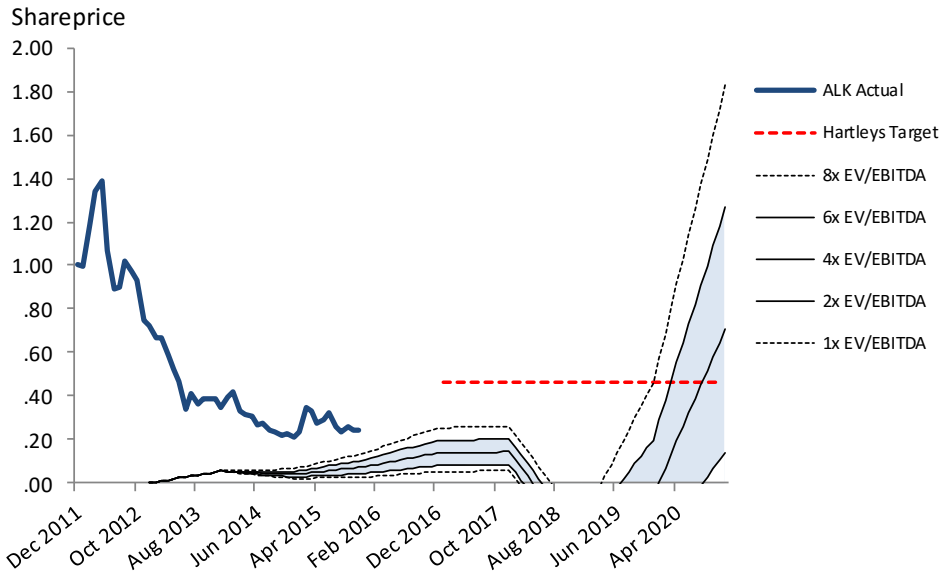
ALK Price Target Methodology	Weighting	Spot	12 mth out
NAV base case	60%	$0.49	$0.50
NAV at spot commodity and fx prices	11%	$0.77	$0.90
NAV less DZP value	15%	$0.28	$0.29
Net cash backing	14%	$0.05	$0.05
Risk weighted composite		**$0.43**	
12 Months Price Target		**$0.45**	
Shareprice - Last		$0.235	
12 mth total return (% to 12mth target)		**91%**	

Source: Hartleys Estimates

Hartleys 12 month price target is 45cps

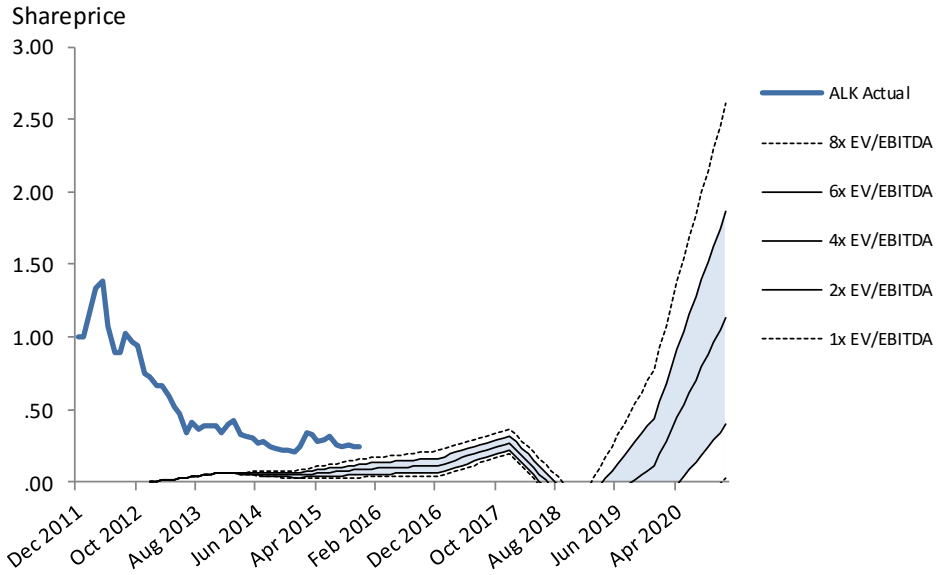
EV/EBITDA BANDS

Fig. 34: Using Hartleys base case commodity forecasts



Source: Hartleys Estimates, IRESS

Fig. 35: Using spot commodity prices



Source: Hartleys Estimates, IRESS

RECOMMENDATION & RISKS

INVESTMENT THESIS & RECOMMENDATION

We initiate coverage of Alkane Resources with a Speculative Buy recommendation and with a 12-month price target of 45cps.

We initiate coverage of ALK with a Speculative Buy recommendation

The Company has a gold production asset (TGO) which is generating solid cash flows. We forecast average production of ~65Kozpa at AISC of A$1,230/oz over a LOM of ~7 years. The gold asset underpins the current trading range, with generated cash funding the pre-construction activities at the world-class zirconia project (DZP). The development of the DZP is seen as the key value driver.

We have a 45cps 12-month price target

The DZP is currently progressing final permitting (ML and EPL) and bankable feasibility studies. The project financials appear robust (even at the current depressed commodity prices) but not without its significant funding challenges in this current market. Our valuation and price target assumes the DZP can be funded through development into production. Important near-term milestones such as marketing and offtake agreements for the specialty metals, and potential strategic cornerstone investment(s) at the project level are seen as potential precursors to the final funding solution. Government assisted ECA-style funding and bank debt are expected to provide a vast majority of the funds needed for the A$1.3b total project capex.

The DZP has the potential to become a strategic supply (non-Chinese source) of specialty metals, providing stable long-term production and cost competitive pricing to expanding zirconium (advanced ceramics) and hafnium (super alloys for the aerospace industries), and rare earth (permanent magnets) markets.

SIMPLE S.W.O.T. TABLE

Gold production generating cash

Exploration Upside

Significant funding requirement

Threat of commodity price weakness

Strengths	- *Gold production generating cash (being re-invested)*
	- *World-class specialty metals project (DZP)*
	- *Low cost operation*
	- *Strong board and management team – highly experienced*
	- *Solid cash position*
	- *Growing markets for target commodities*
	- *State and Federal environmental approvals in place*
	- *Early contractor involvement for the EPC*
	- *Proven process flowsheet – pilot plant testing since 2008*
Weaknesses	- *Significant funding requirement for the DZP development*
	- *Chinese supply dominance*
	- *Final permitting required (EPL and ML)*
	- *Lack of offtake agreements*
Opportunities	- *New markets and technology advances*
	- *Introduction of a strategic partner*
	- *Exploration upside*
	- *M&A activity*
Threats	- *Exploration downside*
	- *Commodity prices and market sentiment*
	- *Potential takeover*
	- *FX*

Source: Hartleys Research

RISKS

Key risks for ALK include final permitting for the DZP (Environmental Protection Licence (EPL) and Mining Lease (ML) approvals), completion of Early Contractor Involvement (ECI) for the fixed price EPC and financing of the project development.

Fig. 36: Key assumptions and risks for valuation

Assumption	Risk of not realising assumption	Risk to valuation if assumption is incorrect	Comment
DZP is fully permitted with EPL and ML granted	Low	High	Environmental approvals have been received at State and Federal levels. The EPL and ML approvals are expected soon.
DZP is financed through development into production	Medium	High	The DZP has a very high capital requirement (~A$1.3b). We model conventional debt & equity funding (60:40 D:E), we believe our assumptions are achievable though there are significant risks associated with funding in the current environment
Long mine life at the DZP	Moderate	Meaningful	ALK is leveraged to the success of the development and production at DZP. We model a 20 year mine-life, though the reserve mine life is +35 years. If the operations vary largely from our modelling our valuation will be at risk to the downside
Model parameters	Moderate	Meaningful	We have made a number of large assumptions in our valuation of ALK, changes in these assumptions can change our valuation to both the upside and downside
Orebody Risk	Low to Medium	Meaningful	As with all orebodies there is risk around geology, geotech and metallurgy although with a processing design fined-tuned through a pilot plant some of these risks are somewhat negated
Commodity prices	Moderate	High	ALK is reliant on strong commodity prices although both TGO and DZP appear economic at current spot prices
Conclusion	*We have made significant assumptions but believe these are achievable.*		

Source: Hartleys Research

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Hartleys Recommendation Categories

Buy	Share price appreciation anticipated.
Accumulate	Share price appreciation anticipated but the risk/reward is not as attractive as a "Buy". Alternatively, for the share price to rise it may be contingent on the outcome of an uncertain or distant event. Analyst will often indicate a price level at which it may become a "Buy".
Neutral	Take no action. Upside & downside risk/reward is evenly balanced.
Reduce / Take profits	It is anticipated to be unlikely that there will be gains over the investment time horizon but there is a possibility of some price weakness over that period.
Sell	Significant price depreciation anticipated.
No Rating	No recommendation.
Speculative Buy	Share price could be volatile. While it is anticipated that, on a risk/reward basis, an investment is attractive, there is at least one identifiable risk that has a meaningful possibility of occurring, which, if it did occur, could lead to significant share price reduction. Consequently, the investment is considered high risk.

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